

Making Home for Vancouverites:

An Incremental Approach to Vancouver's Missing
Middle and Affordability Challenge

by
Emily (Kailin) Bi

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirements for the degree of
Master of Architecture

Waterloo, Ontario, Canada, 2024

© Emily (Kailin) Bi 2024

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

The current housing landscape in Vancouver is characterized by exorbitant housing costs and low rental vacancies, posing great challenges to quality of life and urban vitality. This reality is formed by the urban manifestation of the so-called livable city implemented in the post-industrial era to establish Vancouver as a global metropolitan. The strategy was effective in marketing the city to the world, but inadvertently, it also sowed the seed for the manifestation of an entrenched and deeply unaffordable housing climate witnessed today.

One of the underlying conditions for the housing challenge in the city is the lack of adequate supply. Current policies have limited housing stock to two dominant typologies - detached single family homes and high-rise condominiums. The existing zoning regulation in Vancouver continues to restrict a sizable portion of underused residential land to the development of low density detached housing schemes. As a result, the city's housing crisis continues to deepen and in breath and scale.

The solution to the persistent challenge of unaffordability calls for a shift towards broad scale up-zoning of low-density residential neighbourhoods in the city. This thesis focuses on a proposal to incrementally densify Vancouver's yellow belt, to increase housing stock diversity and ultimately address issues of affordability. The design portion of this thesis will consist of a design synthesis followed by three proposals developed upon existing housing typologies to contextualize the potential of small lot interventions. The objective of this thesis is not to present an all encompassing solution to the city's complex housing problem; but rather to facilitate a broader discussion on how to up-zone Vancouver's yellow belt and create greater housing affordability for Vancouverites.

ACKNOWLEDGMENTS

I would like to take this opportunity to thank my supervisor Val Rynnimeri for his continuous encouragement and support. Our shared interest in urbanism and development has sparked many interesting ideas presented here. I truly enjoyed our meetings and conversations throughout this process.

To my committee member Marie-Paule MacDonald, thank you for providing me guidance and throughout this thesis process.

Thank you to my internal and external readers for your time and valuable feedback.

A special thank you to all the friends that I have made during this journey. Your constant words of encouragement and confidence in me has provided me with the strength and motivation needed to complete this thesis in a timely manner. Andy, thank you for seven years of friendship and always willing to hop on a call whenever I needed to comb through my thoughts. Selina, thank you for always validating my feelings and providing me with constructive feedback. Magdalena, thank you for being a great friend and providing support especially towards the end. Leo, thank you for withstanding my endless rants and your unconditional support.

Finally, I would like to thank my family for their love and support.

TABLE OF CONTENTS

Author's Declaration	II
Abstract	III
Acknowledgments	IV
List of Figures	VIII
0 Prelude	1
0.1 Introduction	5
0.2 Thesis Structure	11
0.3 Literature Review	13
1 Setting the Stage	19
1.1 "Vancouverism" and the Post-Industrial City	21
1.2 Livable City Ideology and Affordability	33
1.3 The Scenario	37
2 Missing Middle and Affordability	43
2.1 Overview of affordability	45
2.2 Social Well-Being and Affordability	49
2.3 Up-zoning Vancouver	51
2.4 Definition of "Missing Middle Housing"	53
2.5 Vancouver's Missing Middle Issue	55
2.6 Housing Profile and the "Yellow Belt"	63

3	Case Studies and Typologies	73
	Beverly Place	75
	Donnybrook Quarter	81
	Seijo Townhouses	85
	Le Jardinier	89
	La Geode	93
	White Cone House	97
	Evaluation & Lessons Learned	101
	Vancouver "Missing Middle" Proposals	103
4	Design Synthesis	109
4.1	Goals and Design Principles	111
4.2	Economic Framework	115
4.3	Policy Framework	117
5	Proposals	125
5.1	Vancouver Special 2.0	127
5.2	Roku Plex	143
5.3	Cornerstone Flats	159
	Conclusion	183
	Bibliography	191

LIST OF FIGURES

Fig 0.1 Benchmark price of detached homes in Vancouver neighborhoods

Image by Author. Data retrieved from: <https://www.rebgv.org/content/rebgv-org/market-watch/MLS-HPI-home-price-comparison.html>

Fig 0.2 Residential average sale price in Greater Vancouver from 1997 to 2023

Retrieved from: <https://members.rebgv.org/news/REBGV-Stats-Pkg-Jan-2023.pdf>

Fig 0.3 Share of affordable rental units for the lowest 20% income households

Edited by Author. Retrieved from: <https://www.cmhc-schl.gc.ca/-/media/sites/cmhc/professional/housing-markets-data-and-research/market-reports/rental-market-report/rental-market-report-2022-en.ashx>

Fig 0.4 Thesis structure diagram

Diagram by Author

Fig 1.1 Photo of downtown Vancouver viewed from North Vancouver

Photo by Reuben Krabbe. Retrieved from: <https://www.bccontenthub.com/dvan/en/media-assets/media/82324>

Fig 1.2 Aerial photo of crescent in Shaughnessy from 1924

Photo by Glen Roddick. Retrieved from: <https://searcharchives.vancouver.ca/aerial-view-of-the-crescent-in-shaughnessy>

Fig 1.3 Photo of Coal Harbor from 1924

Photo by Vancouver Rowing Club. Retrieved from: <https://searcharchives.vancouver.ca/aerial-view-of-coal-harbour-taken-about-1924>

Fig 1.4 Aerial Photo of Point Grey from 1927

Photo by James Skitt Mathew. Retrieved from: <https://searcharchives.vancouver.ca/aerial-view-looking-west-over-point-grey>

Fig 1.5 Zoning diagram from the Batholomew Plan published in 1931

Diagram published by Vancouver (B.C.) Town Planning Commission. Retrieved from: <https://searcharchives.vancouver.ca/city-of-vancouver-british-columbia-zoning-diagram-5>

Fig 1.6 Photo of False Creek South

Photo by City of Vancouver. Retrieved from: <https://vancouver.ca/home-property-development/false-creek-south.aspx>

Fig 1.7 Photo capturing the essence of “Vancouverism”

Photo by Larry Beasley. Retrieved from: <https://www.canadianarchitect.com/book-review-vancouverism/>

Fig 1.8 Map showing the location of Farview Slopes

Source: Mills, Caroline A. “Fairview Slopes, Vancouver: Gentrification in the Inner City.” *The Canadian Geographer* 35 no.3 (1991):307.

Fig 2.1 Vision for residential areas from The Vancouver Plan

Source: City of Vancouver. *The Vancouver Plan*. September 2022. <https://vancouver-plan.ca/>

Fig 2.2 Land-use strategy from The Vancouver Plan

Source: City of Vancouver. *The Vancouver Plan*. September 2022. <https://vancouver-plan.ca/>

Fig 2.3 Diagram of health related social needs

Diagram from Oregon Health Authority. Retrieved from: <https://lowinstitute.org/how-to-improve-health-related-social-needs-screening/>

Fig 2.4 Illustration of “up-zoning” low density residential areas

Image by author

Fig 2.5 Diagram of “missing middle housing”

Diagram by Author

Fig 2.6 Aerial representation of typical residential blocks

Image By Author

Fig 2.7 Postcard image of Vancouver

Image by Candice Gibson. Retrieved from: <https://www.destinationvancouver.com/meeting/our-services/attendance-marketing-toolkit/vancouver-postcards/>

Fig 2.8 Map of Vancouver’s residential land use types

Map by Jeff Allen. Retrieved from: <https://schoolofcities.github.io/yellowbelt-canadian-cities-2022/>

Fig 2.9 Map of Toronto’s residential land use types

Map by Jeff Allen. Retrieved from: <https://schoolofcities.github.io/yellowbelt-canadian-cities-2022/>

Fig 2.10 Render of Oakridge redevelopment project

Image By Henriquez Partners Architects. Retrieved from: <https://henriquezpartners.com/projects/oakridge/>

Fig 2.11 Graph of Vancouver household characteristics by structure

Graph by Author. Data retrieved from: <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Vancouver&DGUIDlist=2021A00055915022,2021S0503933&GENDERlist=1,2,3&STATISTIClist=1&-HEADERlist=0>

Fig 2.12 Map showing Vancouver’s grid system

Map by Author. Data retrieved from: <https://opendata.vancouver.ca/explore/dataset/public-streets/information/>

Fig 2.13 Diagram of single-family lot build up area

Diagram by Author. Data retrieved from: <https://vancouver.ca/home-property-development/zoning-and-land-use-policies-document-library.aspx>

Fig 2.14 Single family development options

Edited by Author. Retrieved from: <https://vancouver.ca/files/cov/housing-options-in-most-rs-zones-brochure.pdf>

Fig 2.15 Diagram of duplex lot build up area

Diagram by Author. Data retrieved from: <https://vancouver.ca/home-property-development/zoning-and-land-use-policies-document-library.aspx>

Fig 2.16 Two family development options

Edited by Author. Retrieved from: <https://vancouver.ca/files/cov/housing-options-in-most-rs-zones-brochure.pdf>

Fig 3.1 Photo of Beverly Place

Photo by Bob Krawczyk. Retrieved from: <https://www.acotoronto.ca/building.php?ID=6393>

Fig 3.2 Beverly Place axonometric illustration

Illustration by Author

Fig 3.3 Beverly Place floor plans

Edited by Author. Retrieved from: Miller-Fisher, Kris, Bruce Robertson, Natalie Shivers, Howard Shubert, Luis Hoyos, and Charles Warner Oakley. *Barton Myers: Works of Architecture and Urbanism*. Brooklyn, NY: punctum books, 2019.

Fig 3.4 Beverly Place east west sectional perspective -1

Edited by Author. Retrieved from: Miller-Fisher, Kris, Bruce Robertson, Natalie Shivers, Howard Shubert, Luis Hoyos, and Charles Warner Oakley. *Barton Myers: Works of Architecture and Urbanism*. Brooklyn, NY: punctum books, 2019.

Fig 3.5 Beverly Place east west sectional perspective -2

Edited by Author. Retrieved from: Miller-Fisher, Kris, Bruce Robertson, Natalie Shivers, Howard Shubert, Luis Hoyos, and Charles Warner Oakley. *Barton Myers: Works of Architecture and Urbanism*. Brooklyn, NY: punctum books, 2019.

Fig 3.6 Photo of Donnybrook Quarter

Photo by Peter Barber Architects. Retrieved from: <https://www.peterbarberarchitects.com/donnybrook-quarter>

Fig 3.7 Donnybrook Quarter axonometric illustration

Illustration by Author

Fig 3.8 Donnybrook Quarter Floor plans

Edited by Author. Retrieved from: https://westminsterresearch.westminster.ac.uk/download/7f485cda552f27b6ca53d000d923488c444a41be38caea-37220b7a9ae4af90ac/1931523/Barber_3.pdf

Fig 3.9 Donnybrook Quarter Floor plan of ground floor units

Retrieved from: <https://architizer.com/projects/donnybrook-quarter/>

Fig 3.10 Donnybrook Quarter Floor plan of duplex units

Retrieved from: <https://architizer.com/projects/donnybrook-quarter/>

Fig 3.11 Photo of Seijo Townhomes

Photo by Iwan Baan. Retrieved from: <https://iwan.com/portfolio/seijo-apartment-sejima-tokyo/>

Fig 3.12 Seijo Townhomes axonometric illustration

Illustration by Author

Fig 3.13 Seijo Townhomes floor plans

Edited by Author. Retrieved from: <https://arquitecturaviva.com/works/apartamentos-seijo-9>

Fig 3.14 Photo of Le Jardinier

Photo by Maxime Brouillet. Retrieved from: <https://adhoc-architectes.com/portfolio/le-jardinier-2/>

Fig 3.15 Le Jardinier axonometric illustration

Illustration by Author

Fig 3.16 Le Jardinier floor plans

Edited by Author. Retrieved from: <https://adhoc-architectes.com/portfolio/le-jardinier-2/>

Fig 3.17 Le Jardinier section

Section from ADHOC Architects. Retrieved from: <https://adhoc-architectes.com/portfolio/le-jardinier-2/>

Fig 3.18 Photo of Le Geode

Photo by Adrien Williams. Retrieved from: <https://adhoc-architectes.com/portfolio/projet-geode/>

Fig 3.19 Le Geode axonometric illustration

Illustration by Author.

Fig 3.20 Le Geode section

Elevation by ADHOC Architects. Retrieved from: <https://adhoc-architectes.com/portfolio/projet-geode/>

Fig 3.21 Le Geode ground level floor plan

Floor plan by ADHOC Architects. Retrieved from: <https://adhoc-architectes.com/portfolio/projet-geode/>

Fig 3.22 Le Geode building form diagram

Diagram by ADHOC Architects. Retrieved from: <https://adhoc-architectes.com/portfolio/projet-geode/>

Fig 3.23 Photo of White Cone House

Photo by Namsun Lee. Retrieved from: <http://apparat-c.com/?ckattempt=3>

Fig 3.24 White Cone House axonometric illustration

Illustration by Author.

Fig 3.25 White Cone House floor plan

Edited by author. Retrieved from: <http://apparat-c.com/?ckattempt=3>

Fig 3.26 White Cone House south elevation

Elevation by Apparat-C. Retrieved from: <http://apparat-c.com/?ckattempt=3>

Fig 3.27 Case studies evaluation matrix

Image by Author

Fig 3.28 Rendering of a concept for a single-family lot with six units

Image by MA+HG Architects. Retrieved from: <https://mahg.ca/six/fy7n96ck78r6ugq-8cxesbofopoc43t>

Fig 3.29 Rendering of the Microop

Image by Haeccity Studio Architecture. Retrieved from: <https://www.haeccity.com/wlog/urbanarium-missing-middle-competition>

Fig 3.30 Image of Microop concept

Image by Haeccity Studio Architecture. Retrieved from: <https://www.haeccity.com/wlog/urbanarium-missing-middle-competition>

Fig 3.31 Photo of Mole Hill Missing Middle Housing project

Photo by Sama Jim Canzian. Retrieved from: <https://www.haeccity.com/wlog/molehill>

Fig 3.32 Exploded axonometric diagram of Mole Hill Missing Middle Housing project

Diagram by Haeccity Studio Architecture. Retrieved from: <https://www.haeccity.com/wlog/molehill>

Fig 3.33 Rendering of Fab Plex 33 – Freestanding

Rendering by Lanefab Design/Build. Retrieved from: <https://www.lanefab.com/plexes>.

Fig 4.1 Diagram of Vancouver housing styles by era

Diagram by Author. Data Retrieved from: <https://www.vancouverheritagefoundation.org/vancouver-heritage-house-styles-hub/>

Fig 4.2 Mid-Century Builder and Vancouver Special housing typology

Image by Vancouver Heritage Foundation. Retrieved from: <https://www.vancouver-heritagefoundation.org/vancouver-heritage-house-styles-hub/>

Fig 4.3 Diagram of proposed set back requirement

Diagram by Author

Fig 4.4 Diagram showing parking space reduction

Diagram by Author

Fig 4.5 Diagram showing FSR and unit count increase

Diagram by Author

Fig 4.6 Diagram showing height increase

Diagram by Author

Fig 4.7 Diagram showing stratification of laneway house

Diagram by Author

- Fig 5.1 Render perspective of Vancouver Special 2.0
Image by Author
- Fig 5.2 Axonometric model of Vancouver Special typology
Image by Author
- Fig 5.3 Typical floor plan of Vancouver Special
Image by Author
- Fig 5.4 Diagram of Vancouver Special 2.0 building form
Image by Author
- Fig 5.5 Diagram of targeted demographics for Vancouver Special 2.0
Diagram by Author
- Fig 5.6 Vancouver Special 2.0 floor plans
Image by Author
- Fig 5.7 Vancouver Special 2.0 ground level floor plan
Image
- Fig 5.8 Vancouver Special 2.0 upper level floor plan
Image by Author
- Fig 5.9 View of Vancouver Special 2.0 courtyard -1
Image by Author
- Fig 5.10 View of Vancouver Special 2.0 courtyard -2
Image by Author
- Fig 5.11 Render of Vancouver Special 2.0
Image by Author
- Fig 5.12 Render perspective of Roku Plex
Image by Author
- Fig 5.13 Axonometric of Mid-Century Builder typology
Image by Author
- Fig 5.14 Mid-Century Builder lower level floor plan
Image by Author
- Fig 5.15 Mid-Century Builder main level floor plan
Image by Author
- Fig 5.16 Diagram of Roku Plex building form
Diagram by Author

- Fig 5.17 Diagram of targeted demographics for Roku Plex
Diagram by Author
- Fig 5.18 Roku Plex basement floor plan
Image by Author
- Fig 5.19 Roku Plex main level floor plan
Image by Author
- Fig 5.20 Roku Plex upper level floor plan
Image by Author
- Fig 5.21 View of Roku Plex courtyard -1
Image by Author
- Fig 5.22 View of Roku Plex courtyard -2
Image by Author
- Fig 5.23 Render of Roku Plex
Image by Author
- Fig 5.24 Render perspective of Cornerstone Flats -1
Image by Author
- Fig 5.25 Axonometric model of two types of Mid-Century Builder typology
Image by Author
- Fig 5.26 Consolidated lots basement floor plan
Image by Author
- Fig 5.27 Consolidated lots upper level floor plan
Image by Author
- Fig 5.28 Diagram of Cornerstone Flats building form
Diagram by Author
- Fig 5.29 Diagram of targeted demographics for Cornerstone Flats - 1
Diagram by Author
- Fig 5.30 Diagram of targeted demographics for Cornerstone Flats - 2
Diagram by Author
- Fig 5.31 Cornerstone Flats lower story floor plan
Image by Author
- Fig 5.32 Cornerstone Flats ground level floor plan
Image by Author

Fig 5.33 Cornerstone Flats second story floor plan

Image by Author

Fig 5.34 Cornerstone Flats third story floor plan

Image by Author

Fig 5.35 Render perspective of Cornerstone Flats from southwest

Image by Author

Fig 5.36 Render of Cornerstone Flats

Image by Author

Fig 5.37 Render of conceptualized block of “missing middle” housing forms

Render by Author

Fig 5.38 Plan view of conceptualized block of “missing middle” housing forms

Render by Author

Fig 6.1 Proposed zoning change for RS zones in Vancouver

Image by City of Vancouver. Retrieved from: <https://council.vancouver.ca/20230712/documents/cfscp1-presentation.pdf>

Fig 6.2 New zoning regulation for missing middle housing in Vancouver

Image by City of Vancouver. Retrieved from: <https://council.vancouver.ca/20230914/documents/phea1staffpresentation.pdf>

00 Prelude

0.1 Introduction

0.2 Thesis Structure

0.3 Literature Review



Fig 0.1 Benchmark price of detached homes in Vancouver neighborhoods

Restaurants, Beaches + forests

Vancouver Harbour

BC. Place

Trendy, fashionable, vibrant district of the city

Bikeable Walkable

Granville Island

Urban life style

Central to everything

West End

Downtown

Historically New comers and working class area

Historical Edwardian and Victorian homes

Discover oldest Vancouver's residential neighbourhood

Post 1946 large lot homes that have are being revitalized

New middle class + young people

Small businesses

\$2M+

MOUNT PLEASANT

STRATHCONA

Renewed interest in 1950 homes

Mixed use commercial + residential

Best neighbourhood to explore

\$1.8M

GRANDVIEW - WOODLAND

Most northern portion of Vancouver

"East Village"

Sky train

\$1,697,300

HASTINGS - SUNRISE

Major arterial road and convenience

Local stores

Young professionals, artistic community and new South Asia immigrants

Prestige

2M

detached homes

C.P.R.

VEAUX RICH

\$2.8M

SAUGHNESSY

Canada Line Public transit

1940s + homes

\$2,769,400

SOUTH CAMBIE

"Cambie Corridor"

Queen Elizabeth Park + Bloedel conservatory

Family friendly parks and recreation

"Little Mountain"

RILEY PARK

Newer homes built in "Vancouver Special" style

Redeveloping on the main streets

Gentrification

\$1.87M

COTTAGE

KENSINGTON - CEDAR

Kingsway

Major arterial road

generous lots that appeals to young families

Convenient

affordable up and coming

Vibrant working class neighborhood

\$1,738,600

RENFREW - COLLINGWOOD

Middle class detached homes

Growing families + great transportation + ethnically diverse + convenience

Post WWII detached homes

The shopping hub

rapid growth

Multicultural and racial enclave

3,42M

254,300

Most homes built between 1960 - 1980s

downtown core and the vibrant city of Richmond

MARPOLE

Punjabi Market can be found here

Good mix of commercial + residential

\$1.793M

Sunlex, slim lots - Built in 1970s and 1980s

Vancouver Special

SUNSET

Culturally and ethnically diverse

One of the last areas of the city to be developed. Traditionally an immigrant enclave and multicultural hub.

urban parks

Detached benchmark price

\$1.96M

KILLARNEY

1940's Victorian inspired homes

VICTORIA FRASERVUE

\$2,210,000

Fraser river

New townhome developments

Great for jogging and strolling

Fraser river

Great for jogging and strolling

New townhome developments

Fraser river

Great for jogging and strolling

New townhome developments

0.1 Introduction

This thesis is driven by a personal curiosity to understand the contradiction between Vancouver's global reputation as a livable city and the realities of a deeply unaffordable place. The prohibitive cost of living associated with housing is casting a formidable financial burden, particularly on shoulders of the emerging generation striving to establish a foothold in the city. Exacerbated rental costs and unattainable real-estate prices, present a prolonged paradox with the city's perpetuated image of livability and acceptable quality of life. Many years of market driven policies significantly shifted the perception of housing from a place of dwelling to an entity that is predominantly viewed as an asset, a consequential reality of commodification, financialization and gentrification of housing. This trend can be traced across the North American real-estate landscape. In the case of Vancouver, the affordability question has been present since the 1970s and continues to deepen throughout the twenty-first century, reaching new heights in recent years. In the span of just 10 years, the benchmark price of Greater Vancouver single detached home has increased 80%. From just over one million dollars in 2013 to now reaching 1.8 million dollars in the beginning of 2023.¹ The rental market has also undergone similar spike in prices attributed to the inflated costs of home ownership. According to CMHC's 2023 Rental Market Report, Vancouver has one of the most expensive and in-demand rental markets characterized by a vacancy rate of less than 1% and an increased rental rate of approximately 24% from the year before.² The rental supply in the city is severely inadequate



Residential Average Sale Prices - January 1977 to January 2023

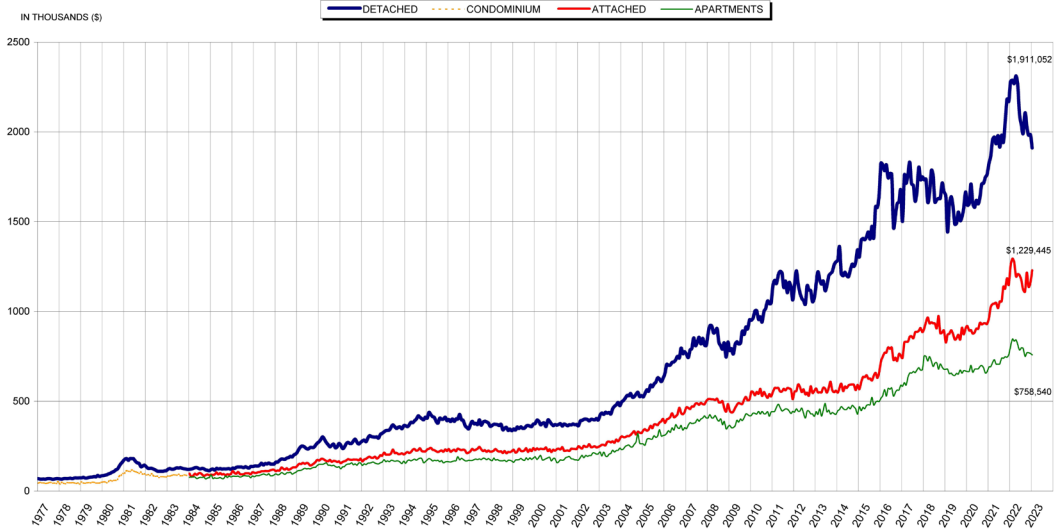


Fig 0.2 Residential average sale price in Greater Vancouver from 1997 to 2023

Montréal	23%
Edmonton	13%
Gatineau	8%
Regina	8%
Saskatoon	7%
Calgary	5%
Winnipeg	4%
London	3%
Halifax	3%
Victoria	1%
Vancouver	1%

Fig 0.3 Share of affordable rental units for the lowest 20% income households

in housing the lowest 20% of income earners in the city. Moreover, the cost of housing has already outpaced the growth in incomes, with Vancouverites facing the lowest median incomes amongst Canadian households.³ So why is livability frequently associated with a city that has demonstrated to be so unaffordable?

The current situation in Vancouver has been decades in the making and evolved over time from a local challenge to an acute regional crisis. The pressure is mounting for the city to address unsustainable levels of inflated housing costs, which calls for introduction of new policies and regulations. In response, Vancouver has initiated new policy changes over the years to help curb rising unaffordability. However, the solutions put forward have yet amount to any momentous change. As such, the discrepancy between the city's global reputation and the persistent challenge of housing prices continues.

The exploration of this thesis began with exploring the short comings of Vancouver's carefully crafted image of 'livable city' along with the inherit conflicts and elitist tendencies of livability as an urban construct. The involution of 'living first' urban strategies have subsequently created systemic affordability fueling inequality, impoverishment, and homelessness. Following this theoretical framework, this thesis dives into understanding the key component of today's crisis. The current crisis can be attributed to a multitude of factors but most prominent and widely determined as the main contributor is the interdependent symbiosis of supply and demand.⁴ Yet, simply adding more supply has

proven to be insufficient in addressing affordability; in some instances, it serves to further amplify real-estate prices. Therefore, the issue of supply and demand is more nuanced and requires looking at it from a different lens such the lens of “missing middle housing.”

Responding to the "missing middle" problem is a critical step towards addressing the larger systemic issues perpetuating Vancouver's affordability challenge. First, the lack of housing supply in the city is largely an adequacy issue, attributed to low diversity in housing stock and schemes. Secondly, the lack of adequate supply is an outcome shaped by stringent land-use policies formed by exclusionary zoning practices to safeguard the status quo. This understanding underscores the significant role of "missing middle" typologies in combatting unaffordability by doing away with zoning that prohibits the development of mid scale dwelling schemes. Comprehending the extend of Vancouver’s missing middle and yellow belt conditions, offers an insight into ways in which the current systems can be improved to affectively address affordability. This has led to the final goal of the design thesis which is to development a comprehensive framework that will enable the incremental up-zoning of Vancouver’s low density residential areas. The aim is to improve and enhance residential scheme options as well as create mechanisms for more housing affordability.

At the heart of this conversation is the imperative question of how to re-zone Vancouver's suburban lands and encourage the development of multi-unit residential schemes traditionally single-family neighbourhoods. The solution lies in three key elements: widespread upzoning of underutilized lands; incremental approach to urban intensification, and the development of new typologies that support gradual densification. The focus on gradual densification eliminates the need for complex planning and execution, which will incentivise small scale actors in the development and construction industry to participate in the movement. It is important to note that housing affordability is a complex, multifaceted issue. The final proposal of this thesis is not a one size fits all solution, but rather an example of how upzoning can be achieved with adaptation of existing forms to facilitate a broader discussion on diverse strategies to enhance affordability and housing accessibility for Vancouverites.

Recognizing the need for more affordable housing in Vancouver, the design proposal of this thesis seeks to address the crisis and promote the development of adequate housing stock in the city. The design scope of this thesis is about how Vancouver can be strategically upzoned with minimal interventions through adaptation. It aims to leverage existing housing typologies as a foundation to accommodate increased density and diversity. The objective is to greatly encourage development of "missing middle housing" typologies in the city, through a grassroots movement of individual landowners and builders. The approach is based

on interventions, taking a general and realistic stance on how density can be achieved in a broad scale across the city. Thus, the proposals are not based on a particular site or part of the city. Rather, it is based on identified typical lots and common housing typologies across Vancouver.

0.2 Thesis Structure

This thesis is structured into three main segments – analysis, exploration, and development. Chapter one presents an in-depth, historical analysis of Vancouver’s urban metamorphosis and manifestations of livability. It highlights the impact of idealistic urban strategies that have deeply informed the development trajectory of this city and come to create the affordability issues faced by today. It asserts that housing affordability in Vancouver is a systemic problem which requires an approach that challenges the inherited exclusionary practices of past development agendas. Chapter two focuses on the physical symptoms stemming from the issues pointed out in the previous section. It examines the role of policies in housing development and points out limitations in current zoning practices. This chapter also alludes to the importance of addressing “missing middle” to counter affordability in the city, through up-zoning of the yellow belt. The case studies in chapter three focus on small scale, mid density housing schemes and evaluates each precedent on innovation, density, and diversity in unit types. The studies help to inform the design goals and principles in the subsequent section. The two final chapters consists of design synthesis and proposal of three small lot interventions. First, the design synthesis acts as a foundation for which the proposal is developed upon. Each proposal is an exploration of incremental upzoning in the city guided by the existing lot conditions as well as policy changes proposed in the previous chapter.

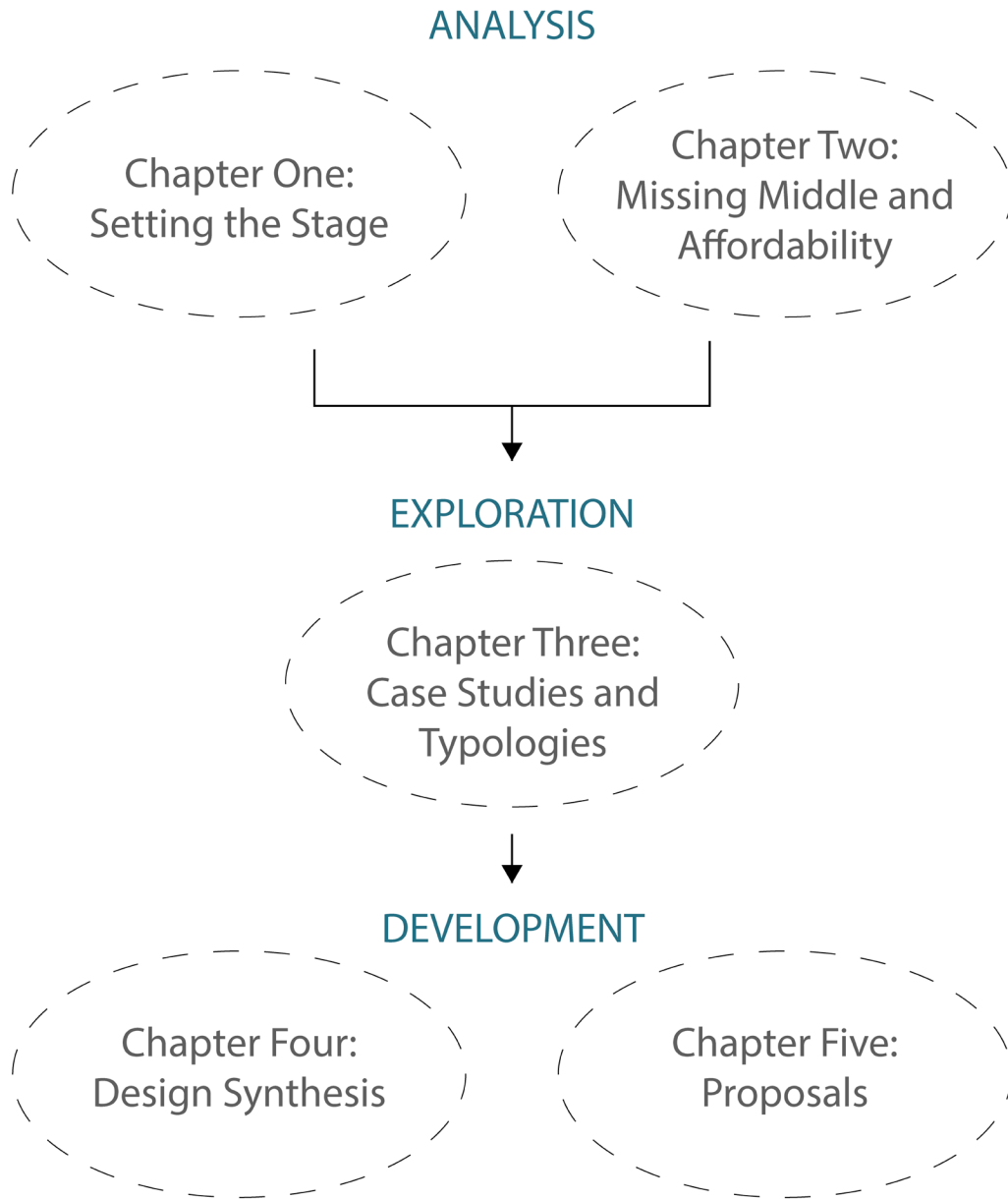


Fig 0.4 Thesis structure diagram

0.3 Literature Review

The following is a literature review to explain the theoretical framework this thesis has been developed upon. The seminal work of urban theorist Jane Jacobs and her book "*The Death and Life of Great American Cities*," has in part shaped the motivations behind this thesis on Vancouver's missing middle and overall housing crisis.⁵ In her book, Jacobs challenged the urban planning and development practices of North American cities by advocating for urban diversity, vitality, and mixed-use neighbourhoods. Her critique of North American top-down planning practices introduces the complexities that shape the physical and social fabric of our cities. The central part of this book focuses on urban vitality, something she believes is a condition that requires neighbourhood diversity; arguing that variety in functions and residential types is a necessary component in fostering healthy and vibrant urban life. Jacobs's emphasis on the importance of housing choices highlights the important role of multi-unit residential typologies in cities. In Vancouver's case, Jacobs's vision of a community-oriented neighbourhood offers a compelling model for addressing the city's housing crisis. In connection with Jane Jacob's advocacy for diverse, mixed-use neighbourhoods, and multi-unit housing; Daniel Parolek's book "*Missing Middle Housing: Thinking Big and Building Small to Respond to Today's Housing Crisis*" offers a similar take on urban density and diversity.⁶ The book offers an interesting discourse on housing challenges in North America by introducing the concept of "missing middle housing," a term coined by the author to describe the absence of moderate scale housing in contemporary cities.

He highlights the limitations of primarily low density and high-density housing schemes, perpetuating forms of exclusion and further fueling unaffordability. Parolek also addresses the obstacles existing planning and zoning by-laws have on the development of “missing middle” typologies. This reinforces the need to reassess current zoning bylaws in low density neighbourhoods and identify opportunities to embrace diversity in these places. The scenario described in this book mirrors the present urban landscape of Vancouver, informing the crafting of a policy framework along with the final design proposals presented in this thesis.

“The Death and Life of the Single Family House: Lessons from Vancouver on Building a Livable City,” by sociologist Nathanael Lauster provides a compelling study on the problematic tendencies of the detached home in cities; and offers discourse on the social, financial, and environmental implications of widespread suburbia.⁷ Lauster uses the analogy of ‘an invasive parasite’ to characterize the detached home, denoting its widespread and intrusive nature as a regulated creature; which is often created by planners with the goal of taming urban disorder during a period rapid urban growth. The book uses Vancouver as a case study and provides an historical analysis extending back to the 1920s of the unfolding events that solidified ‘the house’ in Vancouver’s social fabric, offering an insightful study of the city’s suburban development. In the book *“The New Middle Class and the Remaking of the Central City”* by geographer David Ley presents the social, political, and economic dimensions of Vancouver’s gentrification of the inner city during the

period of post-industrialization.⁸ Ley's examination particularly focused on the emergence of the 'new middle class' and the intricate web of social and political movements that have come about in response. Similarly, Ley's "Liberal Ideology and the Post Industrial city," offers a critical examination of urban transformations in Vancouver driven by emergence of upper middle class and its liberal ideologies.⁹ The paper introduces the fundamental role of TEAM (The Electors' Action Movement) as an influential group that have entrenched the ideology of 'livable city' in the city's planning trajectory. It provides contextual grounds towards the tension between progressive urban ideologies and social equity - a dynamic that is conflicting in nature and continues to influence the contractions of Vancouver's identity. TEAM's tenure and ideologies are chronicled in urban development scholar John Punter's book "*The Vancouver Achievement: Urban Planning and Design.*"¹⁰ Punter's book offers a comprehensive overview of the Vancouver's urban growth under the reform movements of TEAM. The discussion of planning a livable urban center in his book illustrates the achievements of 'living first' urban strategies and the international recognition it has garnered. However, the book also points out the suburban involution that continues to foster, serving as a reminder Vancouver's evolution paradoxes. Larry Beasley's book "*Vancouverism,*" is a story of the urban practices and philosophies behind the urban success story of Vancouver.¹¹ He writes from an insider perspective as a former city chief planner and explains "Vancouverism" as an urban planning doctrine adapted from TEAM's

urban strategies. In the book, Beasley also denotes the failures of the Vancouver model such as the Downtown East-side and the current housing challenge, pressing the need for new interventions.

Endnotes

- 1 "MLS® HPI Home Price Comparison January 2013," accessed September 5th, 2023, https://www.rebgv.org/content/rebgv-org/market-watch/MLS-HPI-home-price-comparison.hpi.greater_vancouver.all.all.2013-1-1.html: "MLS® HPI Home Price Comparison January 2023," accessed September 5th, 2023, https://www.rebgv.org/content/rebgv-org/market-watch/MLS-HPI-home-price-comparison.hpi.greater_vancouver.all.all.2023-1-1.html.
- 2 Canada Mortgage and Housing Corporation, *Rental Market Report, 2023* (Canada: CHMC, 2022), <https://www.cmhc-schl.gc.ca/en/professionals/housing-markets-data-and-research/market-reports/rental-market-reports-major-centres>.
- 3 City of Vancouver, *Housing Vancouver Strategy, 2018* (Vancouver: City of Vancouver, 2018), <https://council.vancouver.ca/20171128/documents/rr1appendixa.pdf>.
- 4 Abigail Bond, "Affordable Housing and Diversity in Vancouver," in *Cities and Affordable Housing: Planning, design, and policy nexus*, edited by Sasha Tsenkova (Oxfordshire: Routledge, 2022), 31. <https://doi.org/10.4324/9781003172949-4>.
- 5 Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 2022).
- 6 Daniel Parolek and Nelson Arthur, *Missing Middle Housing: Thinking Big and Building Small to Respond to Today's Housing Crisis* (Washington: Island Press).
- 7 Nathanael Lauster, *The Death and Life of Single Family House: Lessons from Vancouver on Building a Livable City* (Pennsylvania: Temple University Press, 2016).
- 8 David Ley, *The New Middle Class and the Remaking of the Central City* (Oxford: Oxford University Press).
- 9 David Ley, "Liberal Ideology and the Post-industrial City," *Annals of the Association of American Geographers* 70, no.2 (June 1980). s
- 10 John Punter, *The Vancouver Achievement: Urban Planning and Design* (Vancouver: UBC Press, 2003).

11 Larry Beasley, *Vancouverism* (Vancouver: On Point Press, 2019).

01 Setting the Stage

- 1.1 'Vancouverism' & the Post-industrial City
- 1.2 Livable City Ideology & Affordability
- 1.3 The Scenario

Vancouver is a city of contradictions, On the one hand, the city has been consistently ranked as a most livable city, attributed to its ideal setting and the enticing image of good urban design. On the other hand, Vancouver is also recognized as one of the least affordable cities; a reputation stemming from its persistent inflation of housing costs and growing concern of unaffordability impacting a growing range of social groups. The housing crisis in Vancouver is not a coincidental nor a temporary condition, but rather an outcome shaped by deliberate set of policies and socio-economical patterns deeply rooted in the elitists history of the city's development. The metamorphosis of Vancouver from an industrial town to a global city unveils the paradox of Vancouver's growth: While it is celebrated for its quality of life and livable factors, it has inadvertently fostered elitism and inequality.

1.1 “Vancouverism” & the Post-Industrial City

Vancouver is nestled between coastal mountains and the waters of the Pacific Ocean, a landscape which offers a picturesque backdrop of great natural beauty. Throughout its decades of post-industrialization and transformation into a major urban center, it has transpired to become a poster child of post-industrial urbanism. Characterized by being consistently ranked as one of the most livable places in the world along with Vienna, Zurich, and Copenhagen.¹ Historically, Vancouver was perceived to be a utopian city by its original settlers who were charmed by the natural landscapes and prospects of home ownership



Fig 1.1 Photo of downtown Vancouver viewed from North Vancouver

this land has to offer.² The readily available cheap land at the western end of the national railway made it easy for residents to build their very own detached homes, an achievement that couldn't have been possible in old world cities. The city was largely built of single-family dwellings as society widely accepted the concept of Canadian homeownership.³



Fig 1.2 Aerial photo of crescent in Shaughnessy from 1924

Originally set up by the Canadian Pacific Railway Company as its western terminus, throughout the first two decades of the 20th century, Vancouver experienced an exponential growth as a Pacific Ocean gateway city. By the early 1990s the population of the city surpassed half a million from around 2,700 inhabitants in 1900.⁴ That rapid growth of



Fig 1.3 Photo of Coal Harbor from 1924

the city brought a development boom which also threatened the vitality of its historical upper middle-class residential enclaves.⁵ In fear of neighbourhood changes, landed elites began to regulate the development

of the city through the passing of land regulations. The then adjacent municipality of Point Grey became the first in the country to pass a zoning-bylaw directly outlawing non-residential developments in 1922.⁶



Fig 1.4 Aerial Photo of Point Grey from 1927

Subsequently, Vancouver began to establish its own planning committee that governed the function, development and, more importantly, the value of land. Shortly afterwards, city officials hired the renowned planner, Harland Bartholomew and Associates from St. Louis, Missouri to devise a comprehensive plan. The plan, published in 1928 titled “A Plan for the City of Vancouver including Point Grey and South Vancouver” provided detailed planning suggestions for the city’s projected growth to one million residents in the following five decades. The plan covered

almost all aspects of urban planning from road networks, streetscapes, transportation, zoning, to recreation programs and even a guide for the visual appearance of buildings. It presented many of Bartholomew's own planning principles as well as many of the values of those sitting on the Town Planning Commission. The city, however, never formally adopted the strategy crafted by Harland Bartholomew and Associates. Despite this backing away, aspects of the plan were carried out, such as the zoning bylaw that accompanied the plan.⁷ Like in many urban centres of this period, the zoning bylaw was the city's attempt to regulate land use in a top-down manner, and its preference for low rise detached housing was evident. The map established the dominance of the single-family house by distributing majority of the land for residential use, underlining the central goal of protecting and enhancing property values for the growing middle class. It is worth emphasizing that the by-law also institutionalized the house as a protective entity, a move that would directly influence the urban development of the 'great house reserve' and perpetuate forms of exclusion in Vancouver.⁸

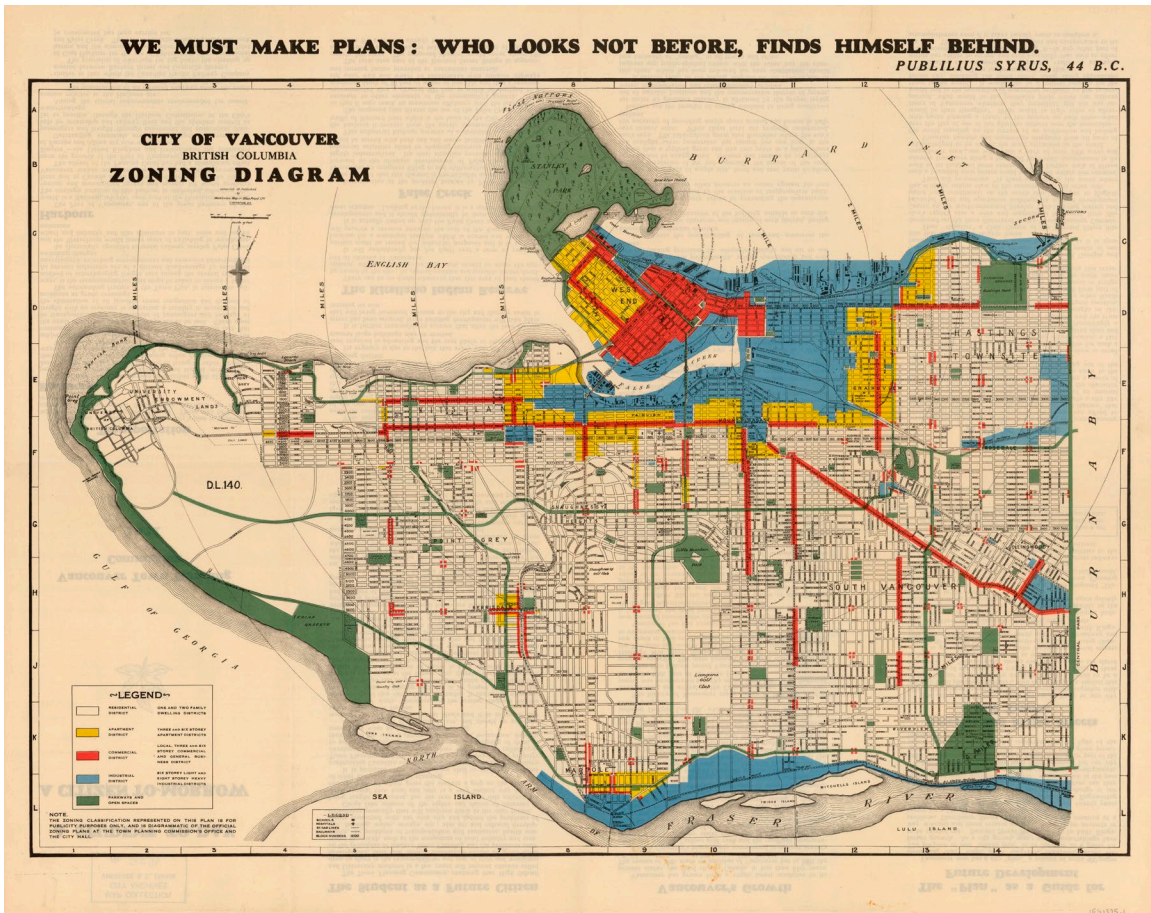


Fig 1.5 Zoning Diagram from the Batholomew Plan published in 1931

The rapid expansion and development of Vancouver in the 20th century sparked an economic transformation. Tied to its rail terminus location and the exploitation of its hinterland resources like timber and mining, the industrial sector, was once a dominant employment force in the city. The post-war era brought about a gradual industrial decline, leading to a shift from resource and manufacturing jobs to service-based employment.⁹ This transformation marked the beginning of a pivotal moment in Vancouver's history, reflecting a progression into the post-industrial period with an economy focused on knowledge and service-based industries. As the city embraced its new economic landscape, a new class of intellectual, middle-class professionals emerged; bringing with them a new idea and process of urbanism.¹⁰

Up until to the 1970s Vancouver's development had largely remained suburban with little to no change to the relatively 'flat' skyline from the 1930s.¹¹ The region's ongoing growth and persistent demand for development created new interest for urban renewal in the inner city. Influenced by West Coast American cities, suggestions to rejuvenate downtown centered around the construction of freeways.¹² However, the plan faced extensive criticism from the effected business owners and was met with widespread opposition from the greater public. This rejection towards superimposed development projects in the city provided an opportunity for a new political organization to emerge.

The Elector's Action Movement (TEAM) became a reform-oriented political party composed of urban reformers who represented newly

emerging middle-class professionals.¹³ TEAM gained popularity for their livable city urban strategies in opposition to both pro-growth and pro-development in the city. Influenced by the ideas of urban critics like Jane Jacobs, TEAM desired a more humanistic approach to urbanism, one centered around the quality of urban life and 'living first.' The group opposed plans to construct freeways that connected downtown to the suburbs. Instead, they implemented an intensification strategy to attract development to the inner city with the goal of diversified land usage, increased density, and enhanced public life. The urban strategies carried out by TEAM were vast and diverse, centred around more progressive planning ideals such as enhancements to the built environment, heritage protection and the provision of affordable housing.¹⁴ Amongst the projects was the redevelopment of False Creek South which has been regarded as the archetype of progressive urban planning implemented by TEAM.

False Creek south began redevelopment during the 1970s and was one of the first comprehensive redevelopment projects in the inner city. The vision for the once industrial wasteland was a revitalization of a well designed, mixed-use neighbourhood incorporated by a strong social engineering component. The plan offered a mix of residential housing enclaves nestled in a vast undeveloped open space designated for public recreational use. This promoted a blend of public and private community living with a focus on ensuring public access to amenities. The city decided to lease development sites with on six-decade lease terms and

allow for leaseholders to renew or purchase the land at market value at the end of the lease period.¹⁵ This decision allowed the city to use market disposals to build non-market housing schemes as well as retain control over the land assembly and servicing of the site. The project's success is partially in consequence of the active involvement of the city, not only in the planning but also in the execution and long-range management of the project. The endeavor resulted in a successful and diverse mid-rise neighbourhood with a legacy of good urban and social engineering.¹⁶



Fig 1.6 Photo of False Creek South

False Creek South's construction was during the time, in the 1960s and 1970s, of an affordable housing boom in Canada overall, which led to construction of many affordable housing units in the city and across the country. During this time, all levels of government showed great interest in innovative and experimental housing schemes which captured the spirit of the times.

Beginning of the 1980s marked a dynamic shift in welfare state housing policies, following a recession and pronounced downturn in economic growth. The state of the economy after the recession triggered a conservative backlash and a radical reduction in social services. Among those reductions was the program of social housing, which has lost its political momentum by the new fiscal environment.¹⁷ Due to these circumstances, a rather distinctively different future would be envisioned for the redevelopment of False Creek North.

The once industrial land was originally owned by Marathon, a real estate branch under the aegis of the Canadian Pacific Railway and, after many setbacks to the any development, the land was eventually acquired by the province, who constructed a new stadium and used it to host the 1986 World's Fair, Expo 86'.¹⁸ For the large part, Expo 86' was considered a success by many as it not only revitalized Vancouver's stagnant economy but also catapulted the city onto the global stage, bringing about new economic prosperity. Following the Expo's conclusion, the province found itself once again in need of a financial boost and made the strategic decision to sell the shore of False

Creek North as part of its privatization efforts to a Hong Kong based billionaire Li Ka-shing.¹⁹ The sale signalled a surge in global investment interest in Vancouver, specifically capital from Hong Kong into the city. In general, False Creek North's redevelopment resulted in positive outcomes for both the developer and the city, which was made possible by intensive collaboration. Vancouver's city council exerted influence in the development through design guidelines and demands that allowed for the implementation of 20% non-market housing, the preservation of views between buildings, and the creation of 1.1 hectares of open space per 1,000 inhabitants.²⁰

The project's success branded Vancouver as a global success story and led to the creation of the "Vancouverism" trademark. A term, denoting the success story of Vancouver's rejection of the freeway in pursuit of the revitalization of its downtown peninsula. According to Larry Beasley, the co-director of urban planning for the city between 1992 to 2006, "Vancouverism" is the ethos of livable, sustainable urbanism and an alternative to the lower density preservation of urban neighbourhoods in the Jane Jacobs planning approach. It was formulated through the deliberate planning of socially mixed, high density, high-level amenity neighbourhoods with the cooperation of local governments and developers, the change from earlier planning being the incorporation of high density dwelling types.²¹ This formula promoted sustainable, diversified living embraced in retrofitting the lands of False Creek –

a display of progressive social policy founded by TEAM's 'living first' movement.

The global image of Vancouver as an urban success story stems from its notable urban achievements of humanistic community-centred planning principles, and values that place emphasis on public amenities, social inclusivity, and diversity of usage. However, this image of Vancouver is not completely accurate and often misleading. While admirable in its aspirations, the celebrated progressive urban strategies have not always resulted in positive outcomes. In many instances, the pursuit of livability and "Vancouverism" have inadvertently promoted the emergence of elitism in housing development and its subsequent unaffordability.



Fig 1.7 Photo capturing the essence of "Vancouverism"

1.2 Livable City Ideology & Affordability

Expansive metropolitanization of Vancouver mainly developed over the course of the late 20th century under the influence of TEAM's livable city vision. Today, the result of pursuing that ideology presents a paradox that encapsulates both the original noble aspirations and the resulting unintended consequences. At its core, the TEAM's urbanism champions a socially conscious approach to urban development, with an emphasis on enhancing livability, fostering diversity, and promoting social inclusion. However, the pursuit of livability over decades also promoted gentrification and the displacement of the less wealthy, a reality often unspoken by city planners and architects alike.

The original redevelopment success of False Creek lands in the 1970's garnered the interest of investors who saw the potential for capitalizing on the urban renewal of the city and placed great interest in creating desirable areas for private investment. One example of this phenomenon was the gentrification of Fairview Slopes. Adjacent to False Creek South and bounded by major arteries connected to the central area, Fairview Slopes was part of the surge of inner-city renewal in the 1970s. After the unveiling of redevelopment plans for False Creek South, Fairview garnered the interest of developers who recognized the substantial opportunities for redevelopment in the area. The site's adjacency to False Creek South and proximity to the city created an ideal condition for gentrification. Subsequently, the city took the initiative to rezone the area from light industrial to medium density, with the bonus of allowing

higher densities to projects distinguished by good architectural design and the inclusion of desirable amenities.²² These incentives, along with the demand from the upwardly mobile professional class who were seeking a better urban lifestyle of urban living, propelled the large-scale redevelopment of Fairview Slopes. Despite pushback from residents and the livable city movement, the area underwent major changes, characterized by the replacement of low-density structures with mid-rise complexes. Today, Fairview Slopes stands as a fashionable district catering to professionals and the upper middle class, offering distinctive architecture and splendid views of the city center.



Fig 1.8 Map showing the location of Farview Slopes

The urban revitalization in the city brought about a wave of upper middle-class gentrification in inner-city neighbourhoods such as Kitsilano and Fairview Slopes. Contrary to the city-initiated renewal projects, redevelopment of these neighbourhoods was seen as a profitable endeavor to transform less-desirable areas into upscale communities. However, the process of this transformation displaced existing communities in favour of those with greater means and desires.²³ Such inner-city gentrification during the 1970s became a threat to housing affordability in Vancouver, the beginning of a decades long path to overall housing unaffordability for citizens with less financial means. These gentrified residential enclaves serve as a tangible manifestation of the shifting landscape of post-industrial society and are typically emblematic of the burgeoning middle class with its desires to return from suburban life to the city centres.

Following the recessionary economic downturns of 1980s, a wave of market-oriented reforms began to trickle down into the housing sector. These included the reduction of welfare state housing programs, withdrawal from building social housing; privatization policies for housing construction, financing, and the promotion of foreign capital investment into the country.²⁴ At the same time, globalization helped to amplify Vancouver's international appeal to pan-Pacific investment. The sale of False Creek North symbolized the city's global pull and in particular Asian interest in Vancouver's real-estate market. Since the 1980s Hong Kong and Chinese capital have been heavily invested in the city's property

market contributing to the sharp increase in property prices.²⁵ Housing prices have continued to rise throughout the 2000s and into the present day, further deepening the affordability crisis. Many have attributed the crisis to the influx of foreign capital; however, it can also be argued that the 'livable city' ideology and progressive urban strategies have created large scale development patterns that favour the wealthy. Moreover, Vancouver's experience in growth and development discloses a pattern of elitism and exclusion deeply ingrained in the fabric of the city - beginning with the city's historical preference towards single-family houses and the early adaptation of exclusionary zoning practices. Globalization has only amplified those preexisting historical conditions, and only intensifying the challenges of affordability in the city.

Fundamentally, TEAM's 'living first' philosophies were initially idealistic and significantly dependant on both economic stability and government intervention. David Ley, an urban geographer wrote that the balance of livability and social equity only exists "in special cases where economic strength is assured, public intervention is active, and private interests are constrained."²⁶ Under free market conditions of "Vancouverism", and the now evolved 'livable city' planning ideology only serves to create a desirable urban lifestyle for the more privileged. Further penalizing social groups with limited market power, the very groups that TEAM originally set to empower.

1.3 The Scenario

Housing affordability is amongst one of the most pressing matters faced by the city of Vancouver today. Housing prices have exponentially surged to levels far outpacing the growth of income levels. In fact, Vancouverites are grappling with the highest rental and property prices, but the lowest median incomes amongst other major Canadian cities, this situation is a looming crisis experienced by many households across different social classes and backgrounds.²⁷ Lower income, vulnerable and marginalized groups in the city are the most significantly impacted by this crisis, with 78,000 households identified in a most recent report for core housing needs, representing over one fourth of all households in the city.²⁸ The lack of affordable housing not only affects the residents but also the health and vitality of the city. Vancouver's housing problem has become an acute issue attributed to the complex interplay of ideologies, policies, and factors of private interests. Central to the argument of this chapter is that – TEAM's progressive planning ideologies and push towards privatization in the 2000s has created today's affordability challenge. The question then becomes, how does or can the city grapple with this acute affordability crisis?

Endnotes

- 1 Christele Harrouk, "World's Most Livable Cities in 2023: Discover the Cities Offering the Highest Quality of Life," Arch Daily, June 28, 2023, accessed <https://www.archdaily.com/1003040/worlds-most-liveable-cities-in-2023-discover-the-cities-offering-the-highest-quality-of-life>.
- 2 Larry Beasley, *Vancouverism* (Vancouver: On Point Press, 2019), 13-16, <https://books-scholarsportal-info.proxy.lib.uwaterloo.ca/uri/ebooks/ebooks4/upress4/2019-04-25/1/9780774890328>.
- 3 Deryck W. Holdsworth, "Cottages and Castles for Vancouver Homeseekers," *BC Studies* 69/70 (1986): 22, <https://doi.org/10.14288/bcs.v0i69/70.1227>.
- 4 John Punter, *The Vancouver Achievement: Urban Planning and Design* (Vancouver: UBC Press, 2003), 5.
- 5 Nathanael Lauster, *The Death and Life of Single Family House: Lessons from Vancouver on Building a Livable City* (Pennsylvania: Temple University Press, 2016), 70.
- 6 Lance Berelowitz, *Dream City: Vancouver and the Global Imagination* (Vancouver: Douglas & McIntyre Ltd, 2005), 60.
- 7 Elizabeth McDonald, "The Efficacy of Long-Range Physical Planning: The Case of Vancouver," *Journal of Planning History* 7, no. 3 (August 2008): 181-182.
- 8 Ibid, 73-74.
- 9 Ibid, 8-9.
- 10 David Ley, "Liberal Ideology and the Post-industrial City," *Annals of the Association of American Geographers* 70, no.2 (June 1980): 239.
- 11 Jamie Peck, Eliot Siemiatycki, and Elvin Wyly, "Vancouver's suburban involution," *City* 18, no. 4-5 (2014): 395-396.
- 12 Ibid, 396.

- 13 David Ley, *The New Middle Class and the Remaking of the Central City* (New York: Oxford University Press, 1996), 4.
- 14 John Punter, *The Vancouver Achievement: Urban Planning and Design* (Vancouver: UBC Press, 2003), 27.
- 15 Ibid, 35.
- 16 Larry Beasley, *Vancouverism* (Vancouver: On Point Press, 2019), 33.
- 17 David Ley et al, "Housing Vancouver 1972-2017: A personal urban geography and professional response," *The Canadian Geographer* 64, no.4 (2020): 446.
- 18 Erick Firley and Katharina Gron, *The Urban Masterplanning Handbook* (UK: John Wiley & Sons Ltd, 2013), 168.
- 19 Larry Beasley, *Vancouverism* (Vancouver: On Point Press, 2019), 46.
- 20 Erick Firley and Katharina Gron, *The Urban Masterplanning Handbook* (UK: John Wiley & Sons Ltd, 2013), 173.
- 21 Larry Beasley, *Vancouverism* (Vancouver: On Point Press, 2019), 38.
- 22 Caroline A Mills, "Fairview Slopes, Vancouver: Gentrification in the Inner City," *The Canadian Geographer* 35 no.3 (1991):306.
- 23 John Zacharias, "The redevelopment of Fairview Slopes in Vancouver, 1975-1995," *Urban History Review* 26 no.1(1997): 34.
- 24 Juliet Carpenter and Tom Hutton, "Vancouver - Critical reflections on the development experience of a peripheral global city," *Cities* 86 no.4 (2018):9.
- 25 Ibid, 11-12.
- 26 David Ley, "Liberal Ideology and the Post-industrial City," *Annals of the Association of American Geographers* 70, no.2 (June 1980): 257.

27 Abigail Bond, "Affordable Housing and Diversity in Vancouver," in *Cities and Affordable Housing: Planning, design, and policy nexus*, edited by Sasha Tsenkova (Oxfordshire: Routledge, 2022), 27.

28 Statistics Canada, 2021 Census of Population, 2021 (Statistics Canada, 2021), <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page>. Verdana

Pro

02 Missing Middle and Affordability

2.1 Overview of affordability

2.2 Social Well-Being and Affordability

2.3 Up-zoning Vancouver

2.4 Definition of “Missing Middle Housing”

2.5 Vancouver’s Missing Middle Issue

2.6 Vancouver’s Housing Profile

Vancouver's enduring housing crisis is a consequence of the strict zoning bylaws in residential areas. The first comprehensive zoning plan prepared by Harland Bartholomew and Associates for the city presented a scientific and rational land use strategy addressing the challenges and fear of urban infestation.¹ While this methodical approach may have prompted a valued city form at the time, it has garnered contemporary criticism on the limitations and the exclusionary development patterns it fosters. The underlying values which have promoted land management principles predominantly align with the interests of upper middle class residents, emphasizing property values and the preservation of the status quo. The outcomes of Vancouver's restrictive zoning bylaws have resulted in the creation of two main housing typologies: ground-oriented, single-family homes and large-scale multiunit housing condominiums. Consequently, the situation has created a shortfall of intermediate housing types primarily in the mid-density range. The lack of this housing type is the culprit of today's affordability crisis.

2.1 Overview of affordability

In the Canadian context, housing affordability is determined by the ratio of income levels and housing costs. The general threshold used by the government to determine affordability is 30% of total gross income. Thus, housing that does not exceed 30% of a household's gross income is considered within the affordability range. Using this benchmark to Vancouver's housing landscape, a stark reality is uncovered; 33% of households in the city are grappling with the burden of unaffordable housing. This statistic is representative of 26.3% of owner households and 39.4% of renter households. This statistic shows how housing affordability is impacting households across the spectrum but especially those who rent, the majority of whom reside in non-subsidized, market controlled rentals.² In recent years, vacancy rates have been very low, dropping to less than 1% according to CMHC's rental report.³ The financial strain on renters is heightened by the fact that only one third of rental units are considered affordable for individuals with a yearly salary of \$55,000 or less and a mere 0.5% of units are accessible to the lowest one-fifth income earners in the city.⁴

Despite the ramp up of housing development across Metro Vancouver, housing stock is still limited and remains inaccessible to many. This circumstance highlights the inability of the current housing market to produce adequate housing stock needed due to the constraints of policy, zoning, and socio-economic mechanisms. High land costs, restrictive land-use regulations as well as the higher cost of construction have created a development model that favours the construction of high-

end condominiums or luxury single-family homes. Without a change in course to the mechanisms that drive development patterns, housing will remain unattainable to many Vancouverites. This trajectory will adversely affect the overall health and vitality of the city. Many reports published by the city echo the need for Vancouver to expand housing choices and reform land-use policies. An example of this is found in The Vancouver Plan, which is described as a long-range, visionary plan set out to guide Vancouver's growth and development for the next three decades.⁵ In this plan, the city proposes big ideas and major shifts in land-use regulation, addressing the limitations of the current yellow belt and "missing middle" challenge. Both concepts will be expanded in the subchapters that follow.



Fig 2.1 Vision for residential areas from The Vancouver Plan

Map 3: City building blocks

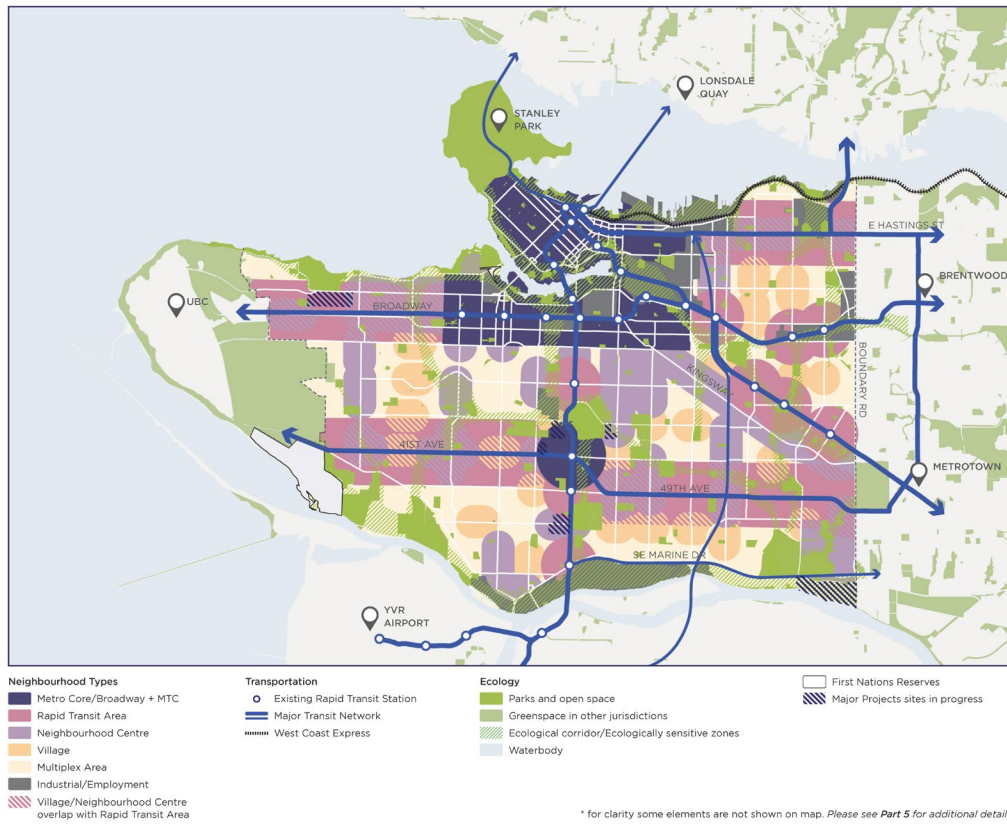


Fig 2.2 Land-use strategy from The Vancouver Plan

2.2 Social Well-Being and Affordability

Housing affordability is crucial in the context of meeting basic human needs and addressing societal requirements. Within the discipline of architecture, housing carries a fundamental role tracing its origins to the very concept of primitive hut, which symbolizes the conception of architecture and architectural practices. Recognizing the role of housing in this broader context of basic human needs highlights the link between dwelling and the makeup of our urban and social fabric. Housing stability is a prerequisite for healthy communities, where each member can fully participate and contribute to society. For individuals and households, it provides the foundation to foster a sense of belonging, and a platform for personal, economic, and social growth. It reduces the need for social services and burden on our society as the home is often the backbone for individual well-being which translates to social equity, thriving neighbourhoods and resilient, healthy cities. .

Diversity in neighbourhoods serves to enrich the health and well-being of residents as it fosters equity, posterity, and livability – qualities important to healthy cities. Industrialization and urbanization of our cities have introduced new constructs of ‘the house,’ which has emphasized the notion of homeownership in our societies and commodified the concept of housing. The lifestyle of consumption and commodification introduced along with progressive ideologies have amplified this perspective of housing as properties of cultural and historical value, thus prompting the middle class to construct self-identity and expression of one’s social status based on dwelling choice.⁶ This reality ultimately forces households

who are unable to afford in the same housing market to look elsewhere, creating less robust and more homogeneous neighbourhoods. The search for a solution to combat the acute housing crisis in Vancouver and many North American cities alike, is a search for how to restore neighbourhood vitality and reinforce housing stability in our cities. Many factors must be considered for creating a healthy housing supply. A technical and vital facet is the reform of regulations that continue to perpetuate forms of exclusionary zoning, block the development of housing stock diversity, and passively allow cities to protect and maintain the status quo of elites.



Fig 2.3 Diagram of health related social needs

2.3 Upzoning Vancouver

Up-zoning refers to the modification of existing zoning regulations to allow for developments of increased density, height, and types. The strategy can facilitate and contribute to a more dynamic and diverse urban landscape. Up-zoning usually calls for a relaxation of existing policies to promote more efficient land-usage and combat issues such as “missing middle housing” or exclusionary development patterns. The practice of Up-zoning is widely recognized as a viable solution to combat housing affordability by means of increasing housing stock and diversity in types. In the context of residential neighbourhoods, up-zoning indicates a regulatory shift away from the dominance of detached, single-family dwellings towards new typologies such as townhomes, multi-plexes and apartment buildings.

PARTI-DIAGRAM

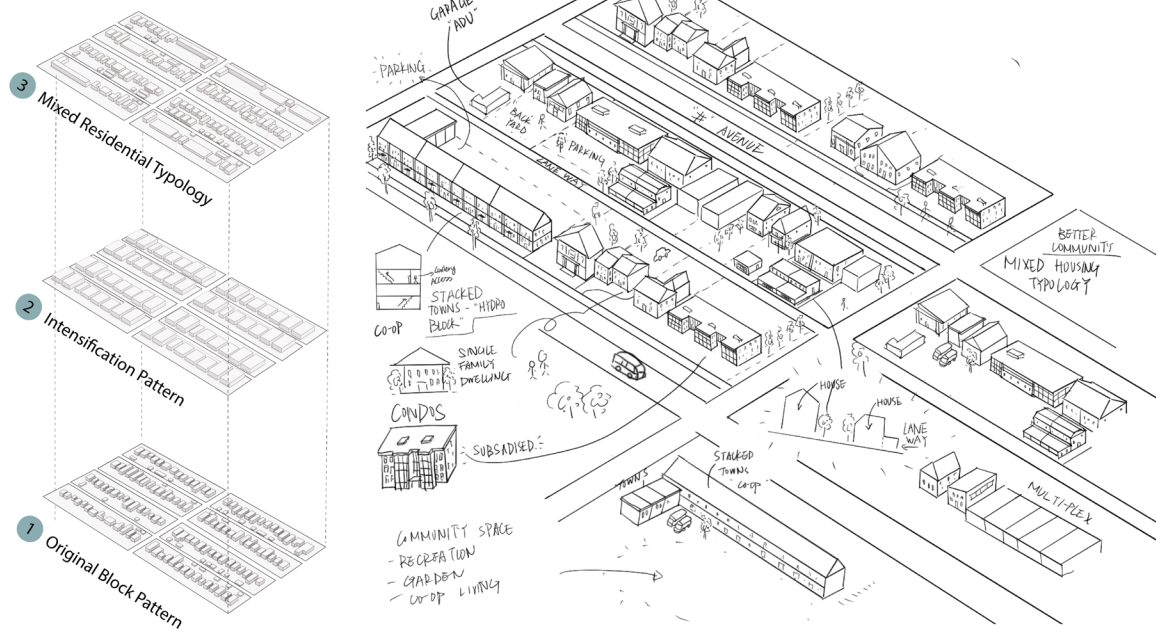


Fig 2.4 Illustration of "up-zoning" low density residential areas

2.4 Definition of “Missing Middle Housing”

The term “missing middle housing” was originally coined by architect Daniel Parolek, who is also the author of the book *“Missing middle housing: thinking big and building small to respond to today’s housing crisis.”*⁷ As the name implies, “missing middle” describes the absence of housing options that bridge the gap between low density, single-family dwellings and high density, apartment buildings. These housing types refer to multi-family developments such as duplexes, triplexes, and bungalow courts that serve to offer greater density all while remaining within the scale and context of a single-family house.⁸ ‘Missing middle housing’ is not about a particular housing scheme or typology but rather an emphasis on diversified residential choice in residential neighbourhoods, especially low density dominant single-family enclaves. The main objective of this type of housing is to inject density in traditional single-family neighbourhoods to support services and amenities that will create conditions for a more diverse, convenient, and livable place. In some ways, missing middle housing advocates for the return of housing types and development patterns before the domination of automobiles and suburbanization in city planning. The city of Montreal for instance embodies qualities of a “traditional” city with its development of mixed-use and more compact housing types within residential areas, offering residents greater walkability as well as access to services and amenities. Montreal’s greater flexibility in housing development types creates a housing market that is more affordable than other major urban centers in Canada, owing to its

relatively more lax zoning policies that promote the building of less exclusive homes.⁹ Within the North American urban landscape, 'missing middle' stands as a prominent and enduring feature in many cities. In connection, the concept of 'missing middle housing' is an emergent ideology to counteract the formidable challenge of housing affordability. It builds upon the fact that current housing stocks in most cities are not diversified enough to meet the demands of a changing demographic. In addition, the limitations of housing typologies incentivise exclusionary practices, resulting in a deeply unaffordable housing ecosystem.

In summary, "missing middle" refers to a shortfall of intermediate housing options between low-density and high-density housing schemes. The concept signifies critical urban challenges of adequate and affordable housing supply, neighbourhood diversity and urban dynamism in contemporary cities. Subsequently, 'missing middle housing' refers to multi-unit, house scale buildings "that fit seamlessly into existing residential neighborhoods and support walkability, locally serving retail, and public transportation options."¹⁰



Fig 2.5 Diagram of "missing middle housing"

2.5 Vancouver's Missing Middle Issue

Vancouver enjoys a reputation as an exceptional city situated in the West Coast of Canada. Its geographical location bestows upon a natural landscape nothing short of enchanting, creating a rather romantic backdrop for its urban achievements. The postcard image of Vancouver displays a harmonious coexistence between the urban buildup and nature - It captures a forest of glass condominium towers nestled against the backdrop of distant mountains; framed by the city's pristine coastline and tranquil emerald waters that mirror a reflection of its elegant, modern skyline. The global imagination of Vancouver is an idealistic perception of urban exceptionalism carefully cultivated by the manifestation of "Vancouverism." It demonstrates a compelling story of urban exceptionalism and innovation, making it a destination that captures the imagination of many. Yet, Vancouver is a city of paradoxes. Beyond the celebrated inner-city, the global image of Vancouver is disrupted by the spread of low-density residential neighbourhoods, grass monoculture and homogenic development patterns. Reflecting the enduring influence of North American suburbia - a dominant symbol of homogeneity, exclusion, and inequality.

The single-family home, constructed on its own property is an institution deeply ingrained in the fabric of this city. Since the inception of Vancouver and its journey towards urbanization, suburban values have been embraced, adopted, and become a dominant feature of the city's residential ecosystem. Despite the urban reform movement which campaigned for high-density development in the late 1960's, majority



Streets and Avenues

Lane ways

Front Yards

Fig 2.6 Aerial representation of typical residential blocks



Fig 2.7 Postcard image of Vancouver

of the city is relatively low in density outside of the urban peninsula. Studies have found that some 64% of Vancouver's residential land is still zoned for low-density detached housing schemes despite recent amendments to allow for more multi-unit residential typologies.

In comparison to Toronto, a city also facing its own "missing middle" problem, Vancouver's missing middle problem seems to be greater in terms of concentration, percentage of 'single detached only' zones relative to its size. The map shown in figure 2.8 illustrate how the single detached house continues to dominate the housing habitat of the city.

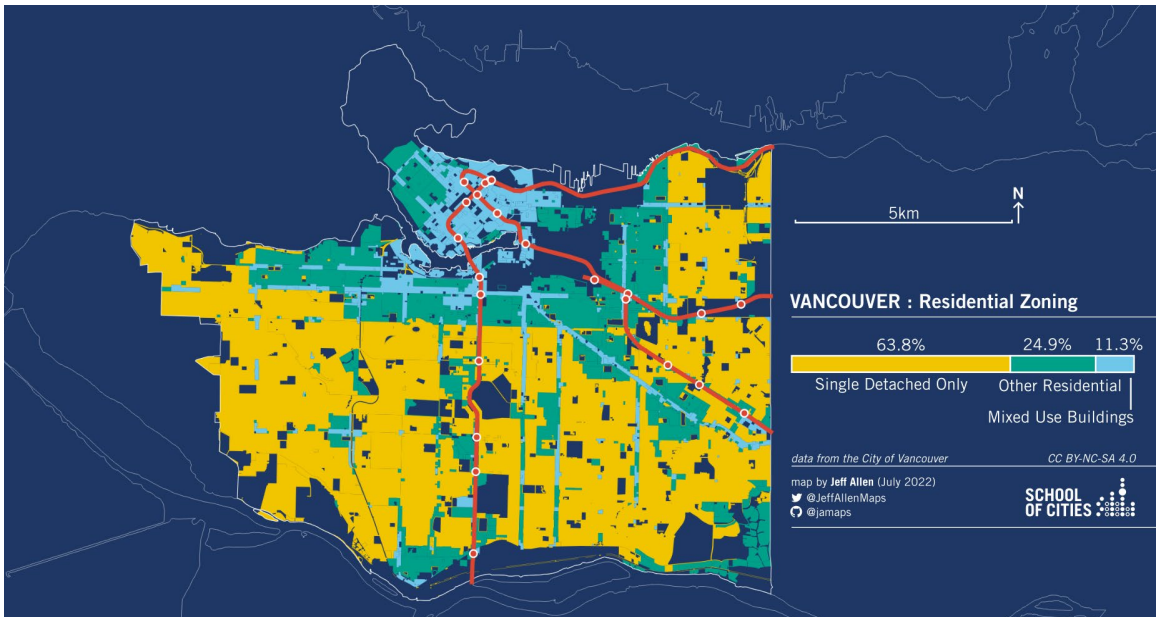


Fig 2.8 Map of Vancouver's residential land use types

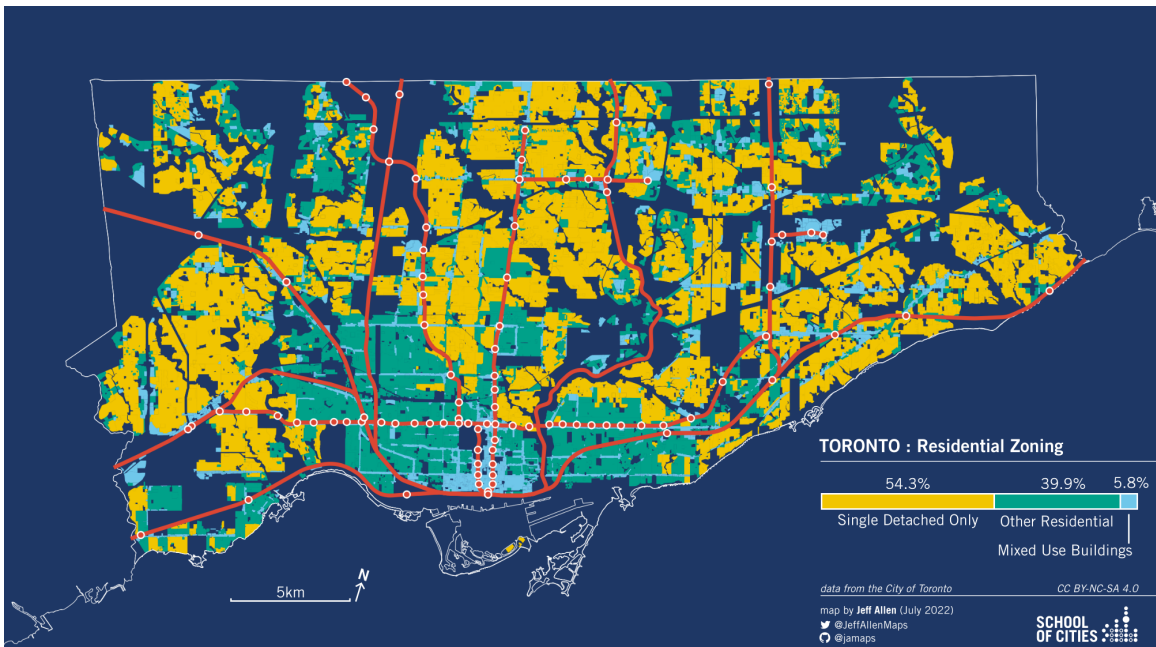


Fig 2.9 Map of Toronto's residential land use types

The enduring dominance of 'the house' in the city's residential landscape is a condition fabricated by zoning bylaws that prohibit the building of "missing middle" typologies. Vancouver is synonymous with using regulation to promote and protect single family home neighbourhoods against rapid urban growth beginning in the early 1920s. This is not a coincidence but rather a manifestation of systemic elitism embraced in Vancouver's urban development trajectory. This practice embeds a history of exclusionary planning and prejudice towards those unable to afford property. The city's first official land use map proposed by Harland Bartholomew and Associates in 1928 put into perspective the discriminatory agenda of single-family zoned planning which was primarily designed to protect the value of homes and safeguard the status quo. In fact, almost a century later, Vancouver's spatial development resemble much of what was initially set up, signifying the continued predominance of detached housing – and the ideological significance of 'the house' within the city. The problem of widespread detached housing is two folds. It creates a housing ecosystem that is unaffordable, because detached homes are inherently more expensive than other housing types all while inefficiently using valuable land space. Urban sprawl creates unhealthy urban environments and relies heavily on auto-mobile usage. Nathanel Luster, puts the case in a stronger case by equating the detached house to an invasive parasite in our society, it "threatens the health of our families, our cities, our democracy and our world."¹¹

The rare exception to Vancouver's prevailing homogeneous single-family development pattern seems to be high-rise condominiums and mega projects to the likes of False Creek redevelopments. The Oakridge Center redevelopment stands as a contemporary exemplar of this condition, further deepening the issue of "missing middle." For context, Oakridge is a typical suburban neighbourhood developed during the post war era in the 1950's largely buildup by detached, low density homes on tree-lined streets. The area consists of two major corridors Grandville and Cambie, with the intersection between 41st Ave and Cabie Street becoming a community and transit hub over the years. The existing mall of Oakridge Center is situated in this intersection boasting a major metro station with direct connection to the airport and downtown Vancouver. The area has garnered much interest over the years for its transformative potential which has been further propelled by the proposal of a mega project. The Oakridge redevelopment proposal boasts a high-end shopping center and park space surrounded by fourteen high rise housing complexes in replacement of the existing Oak Ridge Center.¹²

This project is driven by the desire of developers to extract maximum value through the developments of high end, high density housing schemes. It is representative of a gentrification scheme set to attract affluent individuals and increase the monetary value of property further contributing to the inflation of housing costs. The density target of this project is a significant selling point of the proposal, advertised to increase housing supply in the city. Yet, this narrative does not address

the affordability aspect of the units and overlooks the greater issue of housing supply in the city. What this proposal shows is the continuation of development tendencies that is influenced by a housing system in favour of 'built - to sell' economic model. This system is enforced by bylaws that prevent innovative housing forms that can offer more moderately priced units.



Fig 2.10 Render of Oakridge redevelopment project

2.6 Housing Profile and the “Yellow Belt”

The lack of diversified housing options has significantly contributed to the polarization of the housing market. Elevated housing costs can partially be attributed to the lack of adequate and diversified supply. Much of Vancouver’s residential landscape is dominated by what is commonly referred to as ‘yellow belt.’ The term describes residential neighbourhoods bound by stringent zoning bylaws that restrict the types of housing permitted within them.¹³ The first of its kind was established in Point Grey during the 20th century to shelter landed elites from unwanted urban encroachment with the goal to preserve the character of single family neighbourhoods. Yellow belt properties are often associated with higher prices due to its landed quality and desirability for families and wealthy residents. Statistics on household characteristic and structure type (Fig. #) shows the distribution of renter households and owner households by dwelling structure. The graph shows how renters primarily resided in multi-unit residential schemes. Landed properties such as detached and semi-detached typologies have a greater percentage of owner households. The distribution of household characteristic and housing types provides evidence for the exclusionary qualities of the ‘yellow belt.’ As it stands, the yellow belt is a barrier to accessible housing in the city. Development tendencies in these areas tend to favour, large, single family homes and are frequently discourage the development of purpose built rentals.

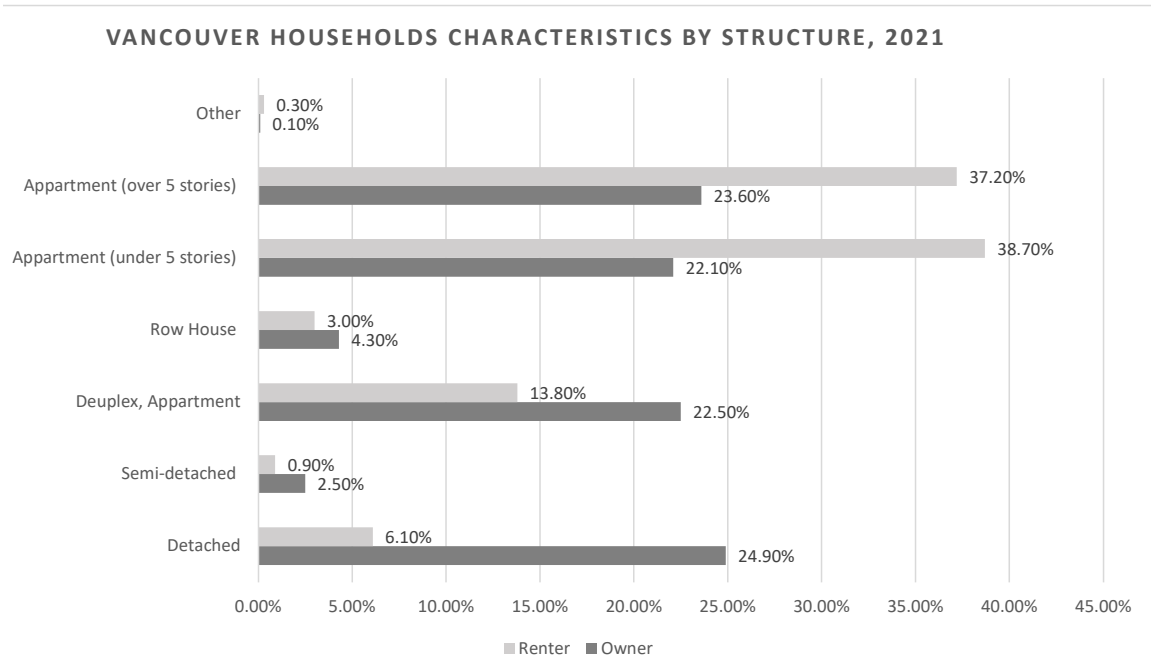


Fig 2.11 Graph of Vancouver household characteristics by structure

The city has introduced zoning amendments aimed at diversifying housing stock in 'yellow belt' areas. The legalization of more than one dwelling unit in a single lot began in 2004, when secondary suites were first legalized in almost all single-family houses. This was followed by the introduction of laneway housing in 2009, and more recently in 2018, city have also legalized the construction of duplexes, also know as 'semidetached' housing. The most recent developments allow up to 4 units– a duplex with secondary suites to be built on a single lot that meets minimum lot width requirements. Despite changes in bylaws, the strategy has proven to insufficient in tackling the housing crisis and continues to both deepen and broaden, affecting households across the income spectrum. To address the housing challenge in Vancouver calls for a shift towards enabling the development of the right supply through upzoning the yellow belt.

The main objective of the final design proposal in this thesis is tackling the city's yellow belt aimed at increasing density and housing choice from small lot interventions. The following is a study to understand the current zoning limitations and maximum build up of typical lots.

Vancouver is largely planned by a systematic grid system, a creation of uniform blocks and lots. The typical city block is 264 feet (80.5 m) wide and 396 feet (120.5 m) in length, the blocks are spaced by roads approximately 132 feet (40 m) wide and or laneways that are 20 feet (6m) wide to serve the rear end of each row in between blocks.¹⁴ Residential lots in Vancouver vary in width but the three typical lots in the city are 33 feet (10 m), 50 feet (15 m) and 66 feet (20 m) wide. The diagrams in the subsequent pages are exercises done to understand the current zoning limitations and to identify areas of improvement.



Fig 2.12 Map showing Vancouver's grid system

Typical Single Family Lot: 10m X 37.2m

- Front yard - min. setback 20% of total lot length
 - Side yard - min. setback 10% of total lot depth
 - Rare yard - min. depth of 45% of total lot length
 - ADU - Max depth of 7.9m
- — — Indication of Lane-way

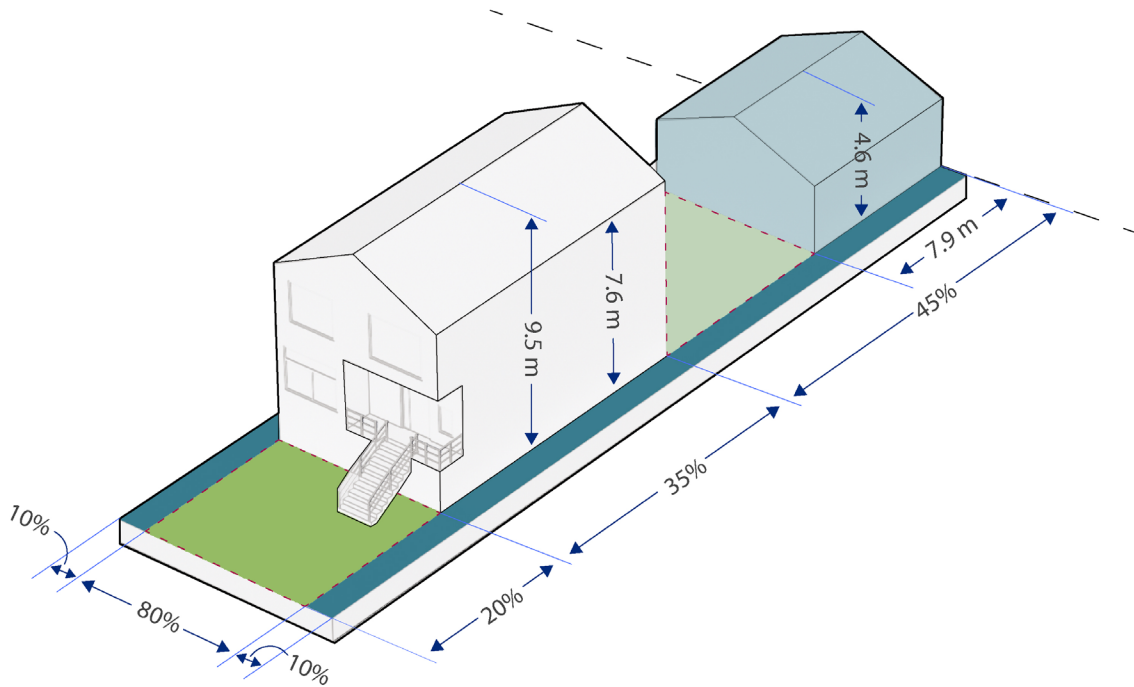


Fig 2.13 Diagram of single-family lot build up area

Development Type: Single family house with lane-way house

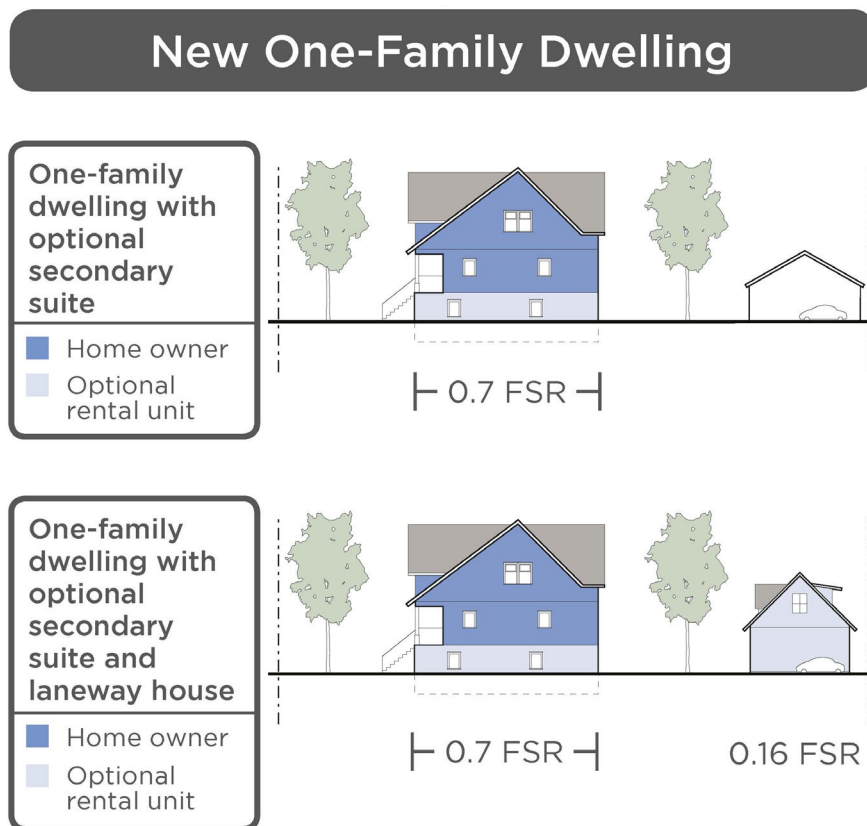
Lot Size: 374 m²

Density (U/HA): 80.2

Total Floor Space Ratio (FSR): 0.86

Maximum site coverage: 45%

Total Units: 3



Parking Requirements:

- Minimum 2 spaces for one-family dwelling with secondary suite
- Minimum 1 space for one-family dwelling with secondary suite and laneway house

Fig 2.14 Single family development options

Typical Duplex Lot: 15m X 37.2m

- Front yard - min. setback 20% of total lot length
 - Side yard - min. setback 10% of total lot depth
 - Rare yard - min. depth of 40% of total lot length
 - ADU - Max. depth of 7.9m
- — — Indication of Lane-way

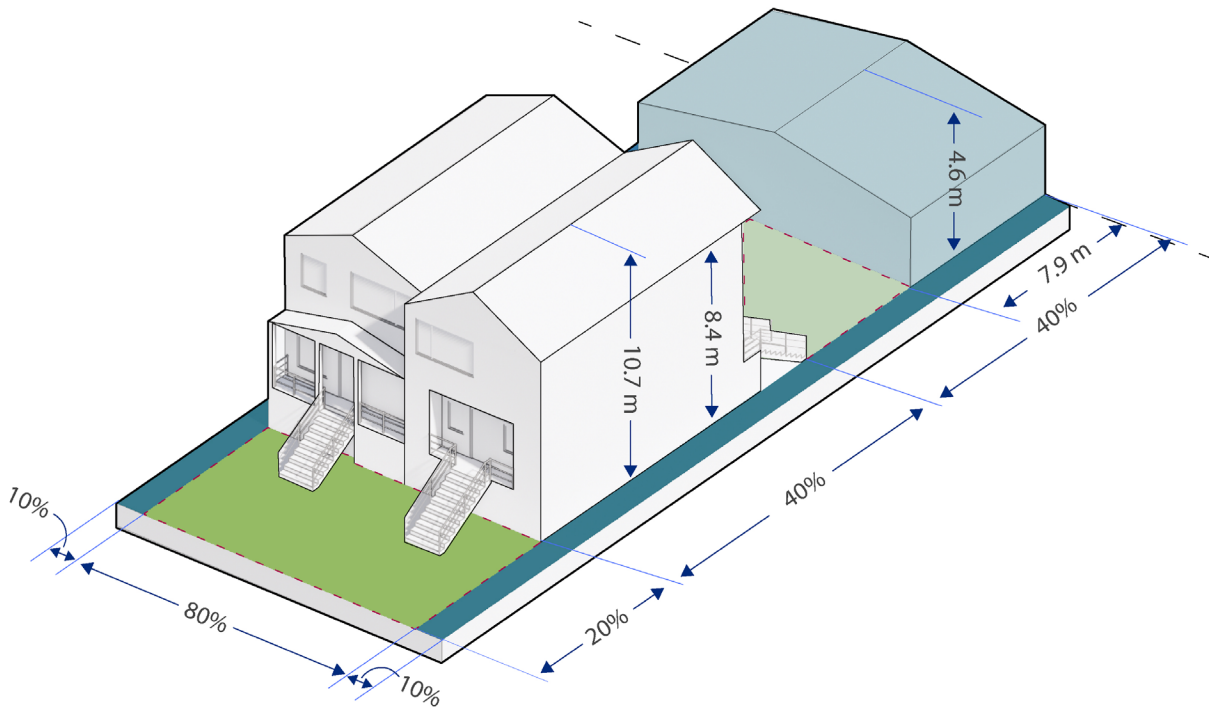


Fig 2.15 Diagram of duplex lot build up area

Development Type: Single family house with lane-way house

Lot Size: 567 m²

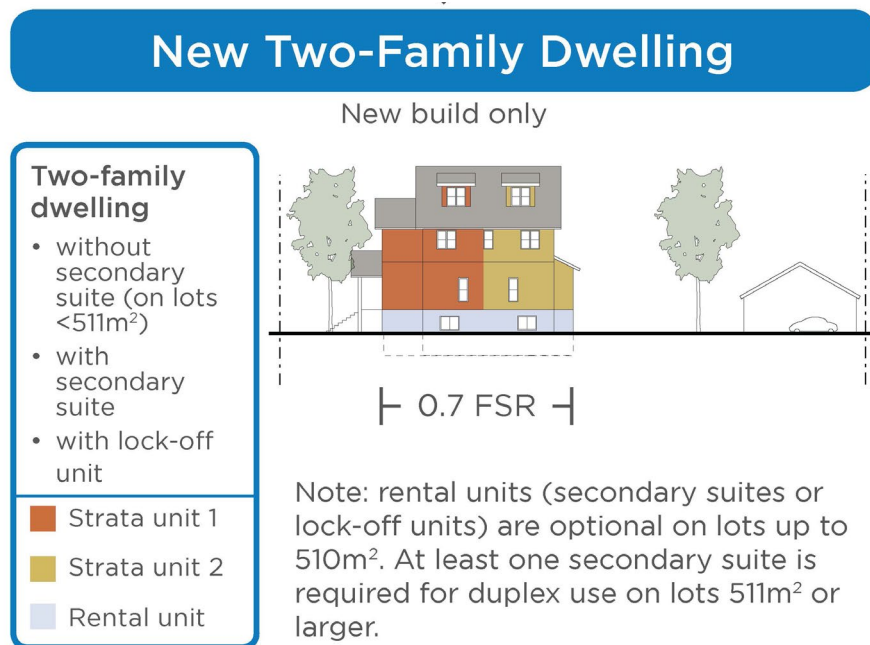
Density (U/HA): 70.5

Total Floor Space Ratio (FSR): 0.75

Maximum site coverage: 40%

Total Units: 4

Duplex typologies have been permitted to be built on single family lots that exceed the lot width of 15 meters.



Parking Requirements:

- Minimum 2 spaces for duplex
- Minimum 3 spaces for duplex with secondary suite(s)
- Lock-off unit: no additional parking required

Fig 2.16 Two family development options

Endnotes

- 1 Elizabeth MacDonald, "The Efficacy of Long-Range Physical Planning: The Case of Vancouver," *Journal of planning history* 7, no.3 (2008), 177.
- 2 Metro Vancouver, *Metro Vancouver Housing Data Book 2022*, December 2022, <https://metrovancover.org/services/regional-planning/Documents/metro-vancouver-housing-data-book-2022.pdf>
- 3 Canada Housing and Mortgage Consultation, *Rental Market Report*, January 2023, <https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/market-reports/rental-market-reports-major-centres>.
- 4 IBID.
- 5 City of Vancouver, *The Vancouver Plan*, September 2022, <https://vancouverplan.ca/wp-content/uploads/Vancouver-Plan-2022-09-23-1.pdf>
- 6 Amjad Almusaed and Assad Almssad, *Housing* (London: Intech Open, 2018), 8.
- 7 Daniel Parolek and Nelson Arthur, *Missing Middle Housing: Thinking Big and Building Small to Respond to Today's Housing Crisis* (Washington: Island Press).
- 8 "The Types," *Missing Middle Housing*, July 3, 2020, <https://missingmiddlehousing.com/types>
- 9 Todd Litman, *Learning from Montreal: An Affordable and Inclusive City* (Victoria: Victoria Transport Policy Institute , 2023), <https://www.vtpi.org/montreal.pdf>
- 10 "The Types," *Missing Middle Housing*, July 3, 2020, <https://missingmiddlehousing.com/types>
- 11 Nathanel Lauster, *The Death and Life of a Single Family House* (Pennsylvania: Temple University Pres, 2016), 40.
- 12 "Oakridge," Henriquez Partners Architects, November 23, 2022, <https://henriquezpartners.com/projects/oakridge/>

13 Stefan Novakovic, "Zoned Out," *Build-ing*, Jan 8, 2019, <https://building.ca/feature/zoned-out/#:~:text=Coined%20by%20urban%20planner%20Gil,permit%20only%20detached%20residential%20housing>.

14 Lance Berelowitz, *Dream City: Vancouver and the Global Imagination* (Vancouver: Douglas & McIntyre Ltd, 2005), 45.

03 Case Studies and Typologies

Beverly Place

Donnybrook Quarter

Seijo Townhouses

Le Jardinier

La Geode

White Cone House

Evaluation & Lessons Learned

Vancouver "missing middle" Proposals

The case studies examine multi-unit residential schemes from around the world to study the spatial configuration, form, and innovative design strategies for urban intensification. The first three projects included in this chapter were chosen for their notability as exemplars of low rise, high density residential projects. Smaller scale, Urban infill projects were also included to form comprehensive understanding of possible design solutions.

Beverly Place, former Hydro Block

Location: Toronto ON

Completion: 1978

Architects: Diamond Myers Architects

Development Type: Mid Rise Multi-Unit Housing

Density (U/HA): 96.9

Site Area: 9700 m²

Total Units: 94

This social housing project along with Regents Park was an unusual housing development of the time and was made possible through collective community activism. The housing scheme was designed to blend in with the existing residential neighborhood known as Baldwin Village.



Fig 3.1 Photo of Beverly Place

1. Retail is at the corner of Baldwin and Henry Street to maintain cohesion along the opposing street.
2. Rare yard between buildings is used as a courtyard, community park space.
3. Twelve Victorian homes were replaced with around 90m apartment units within 5 stories.
4. In order to fit with the existing neighborhood, the height of the 5 story building was controlled by having a semi-basement

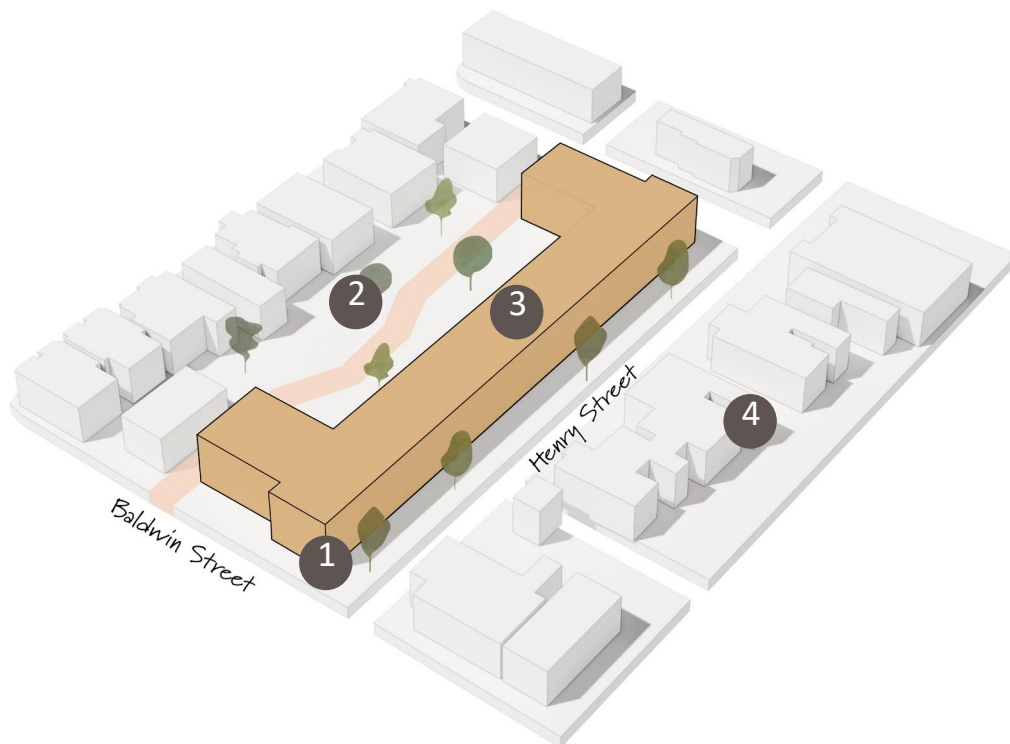
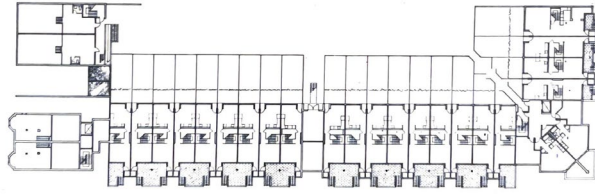
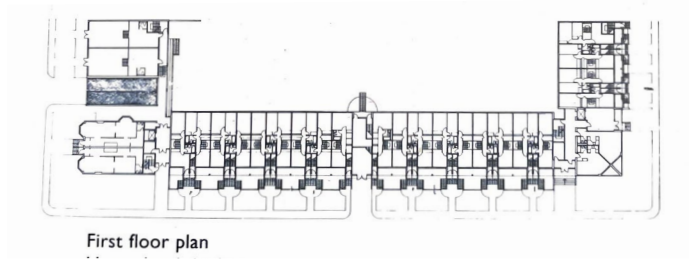


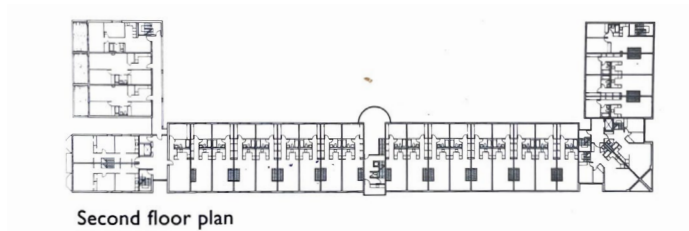
Fig 3.2 Beverly Place axonometric illustration



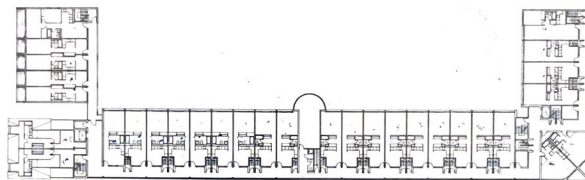
Ground floor plan
Lower level duplex



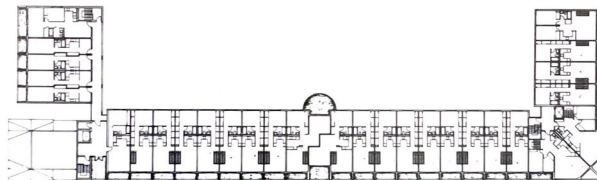
First floor plan



Second floor plan



Third floor plan
Bachelor apartments



Fourth floor plan
Two bedroom apartments

Fig 3.3 Beverly Place floor plans

Due to the creation of a semi-basement level, the units are not accessible at grade. The town home units are accessed through a staircase off the sidewalk below grade with a private front yard and backyard designed to house larger households. The second floor units are also accessed through a staircase leading to a shared landing and another set of stairs leading directly into the unit. These units are primarily one bedroom units, suitable for singles and couples. Both the townhome and second floor dwellings are through units, which allows views of the rare and front yard.

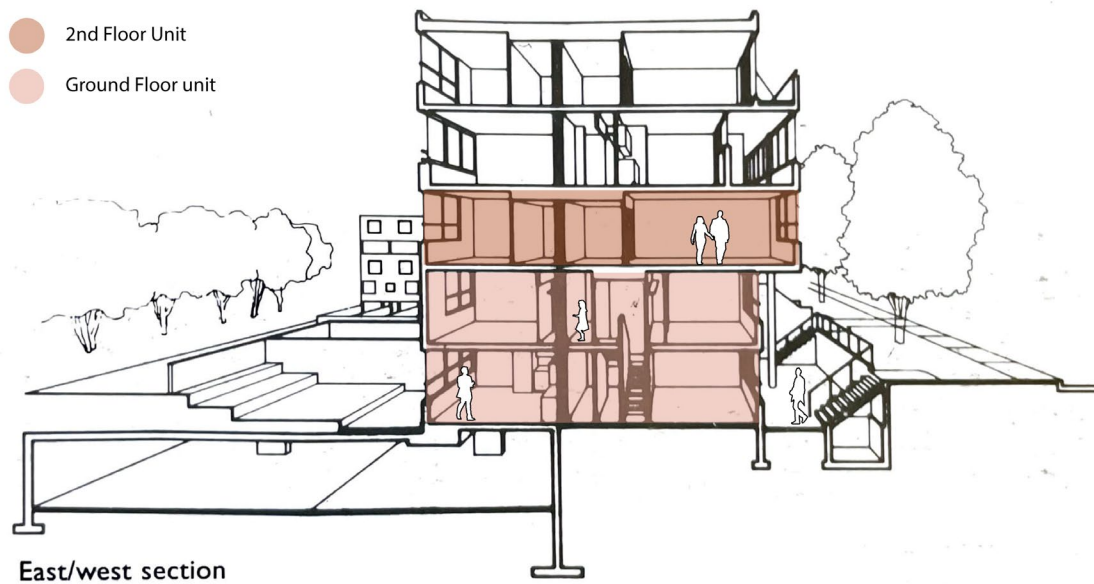


Fig 3.4 Beverly Place east west sectional perspective -1

Third and fourth floor apartments are accessed through a corridor on the third level. Apartments on the upper floors are primarily bachelor and one bedroom units, similar to the unit types offered on the second level. The fourth floor units have a staircase access from the lower level leading up to a through unit.

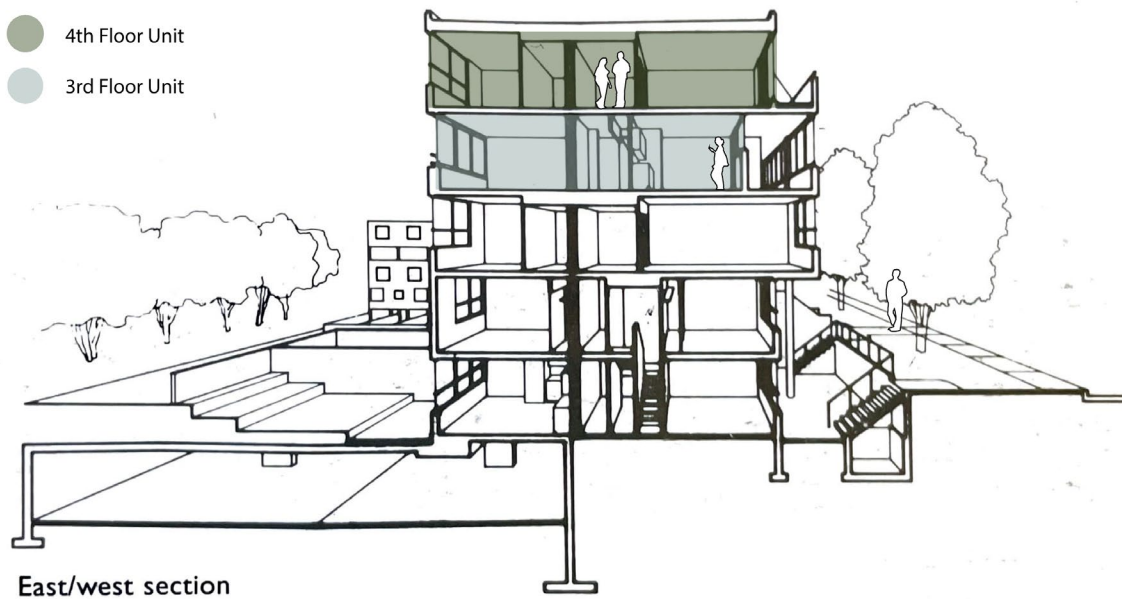


Fig 3.5 Beverly Place east west sectional perspective -2

Donnybrook Quarter

Location: London UK

Completion: 2006

Architects: Peter Barber Architect

Development Type: Low Rise Housing Complex

Density (U/HA): 152.8

Site Area: 2618 m²

Total Units: 40

This social housing project is a low-rise, high-density street based residential quarter in East London. The scheme is laid out around two new tree lined streets which cross the site creating strong spatial connections with adjacent neighborhoods.



Fig 3.6 Photo of Donnybrook Quarter

1. The project provides a total of 40 mostly 2 bedroom units in a 'notched terrace' configuration, providing high density to the scheme. The configuration also allows good amount of privacy between each dwelling.
2. The intimate streets created by the building configurations allow pedestrians to walk through to adjacent streets. The pathway also creates opportunities for neighbors to foster meaningful relationships and for people on the streets to engage with residents.
3. Each unit has access to a private outdoor space such as an entrance garden, side yard or back yard.

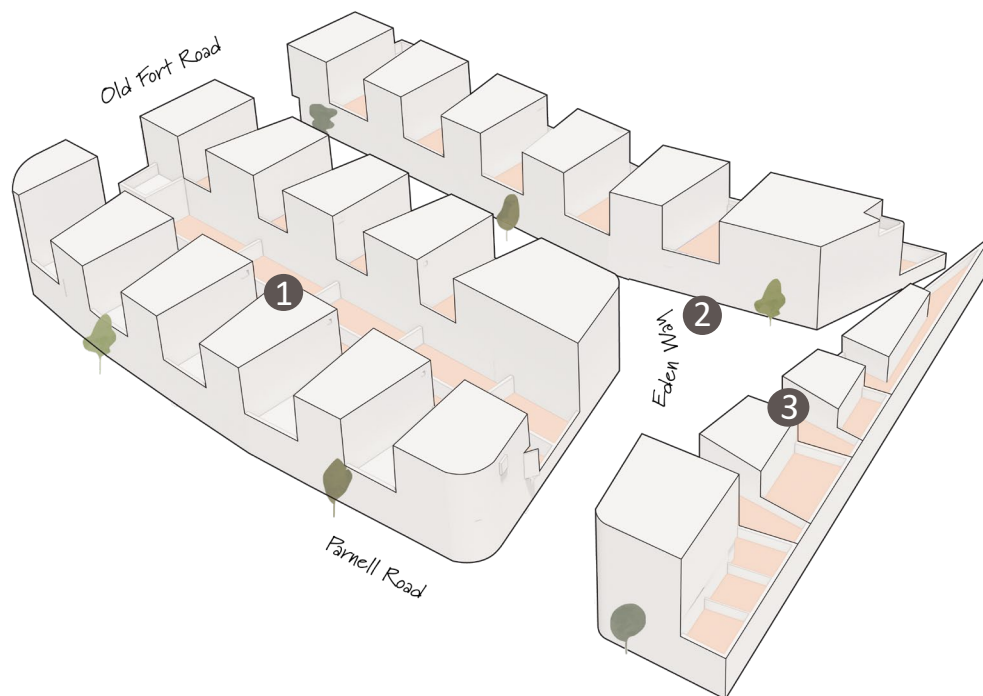
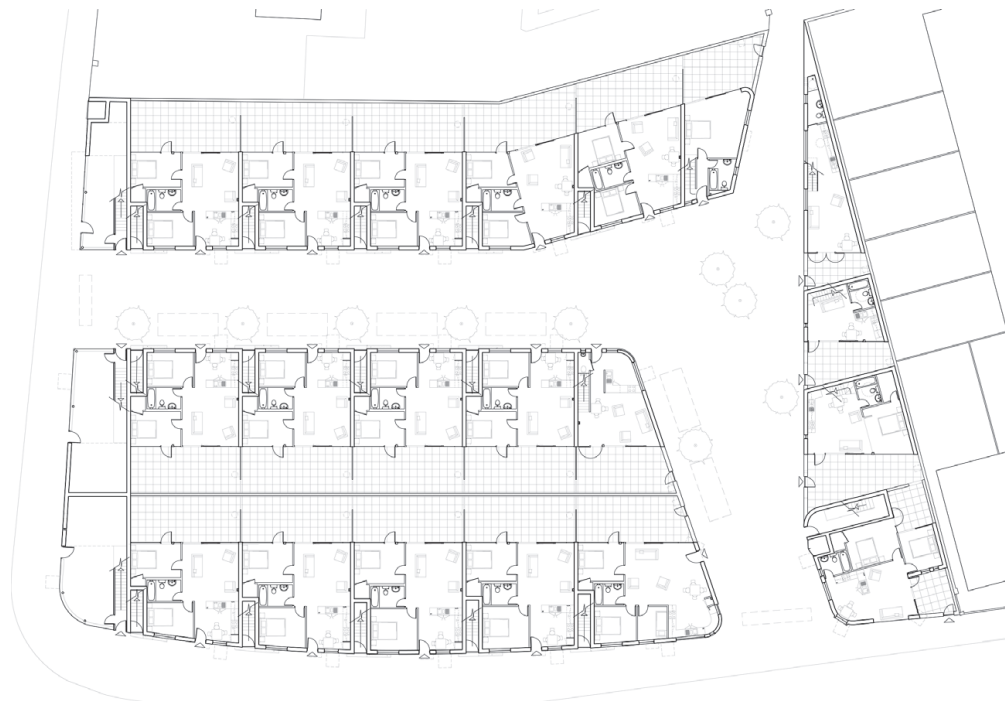
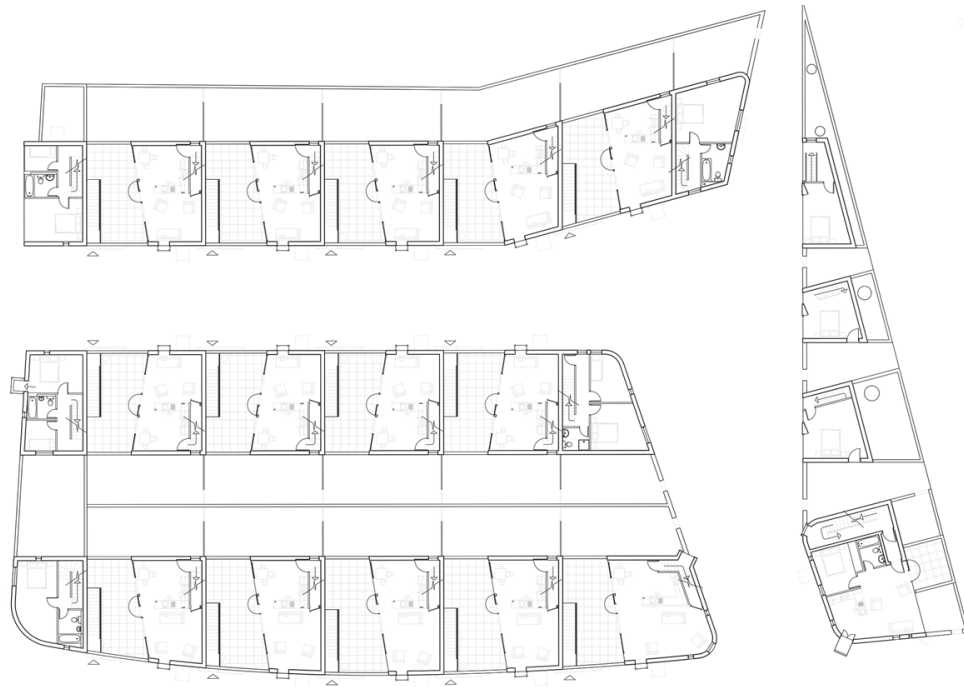


Fig 3.7 Donnybrook Quarter axonometric illustration



Ground level



First floor

Fig 3.8 Donnybrook Quarter Floor plans

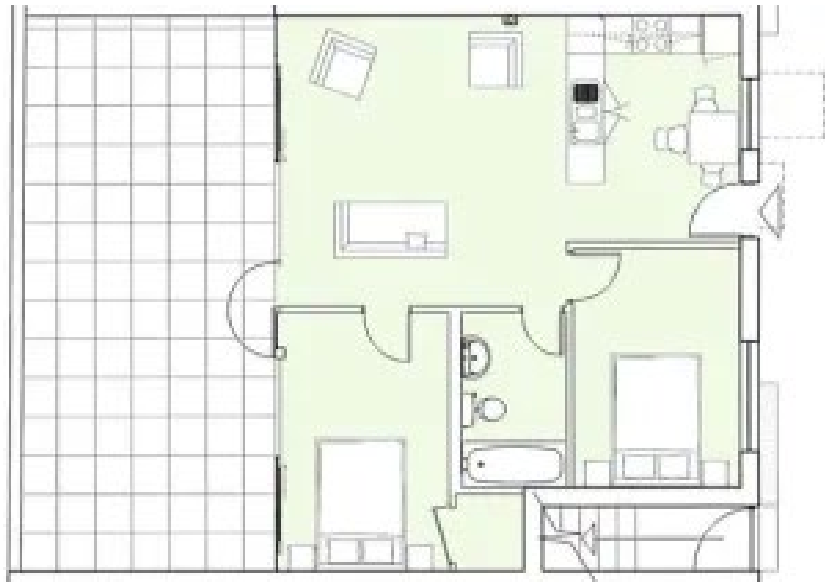


Fig 3.9 Donnybrook Quarter Floor plan of ground floor units



Ground level

First floor

Fig 3.10 Donnybrook Quarter Floor plan of duplex units

Seijo Townhouses

Location: Tokyo Japan

Completion: 2007

Architects: Kazuyo Sejima & Architects

Development Type: Low Rise Housing Complex

Density (U/HA): 116.9

Site Area: 1197.60 m²

Total Units: 14

Seijo Townhouses is an urban infill housing project and an example of low-rise, high-density housing design. The spatial configuration inside the building masses is similar to the interlocking pattern it creates, creating unique living experiences in each apartment.



Fig 3.11 Photo of Seijo Townhomes

1. The building typology creates an intimate residential community that consists of building masses placed in relation to another. The masses create irregular openings ranging from corridors to courtyards and interior gardens. Through this irregularity, density is cleverly added to the limited development area.
2. The surrounding low rise complexes makes a sharp contrast to the varying heights of the townhouses but also providing a buffer to the street
3. The project blurs the line of visual boundaries with it's unique spacial configuration. Each dwelling unit occupies spaces both vertically and horizontally across the building masses forming an interior spatial continuum in the interior without its boundaries being recognized from the exterior

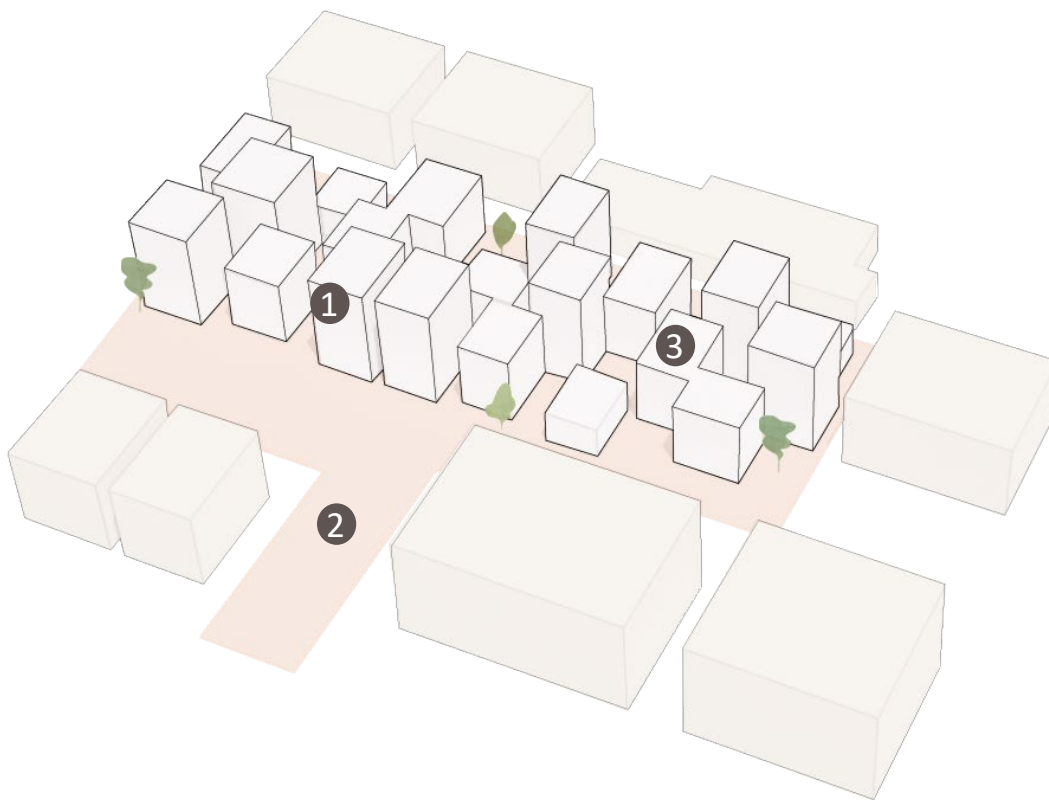
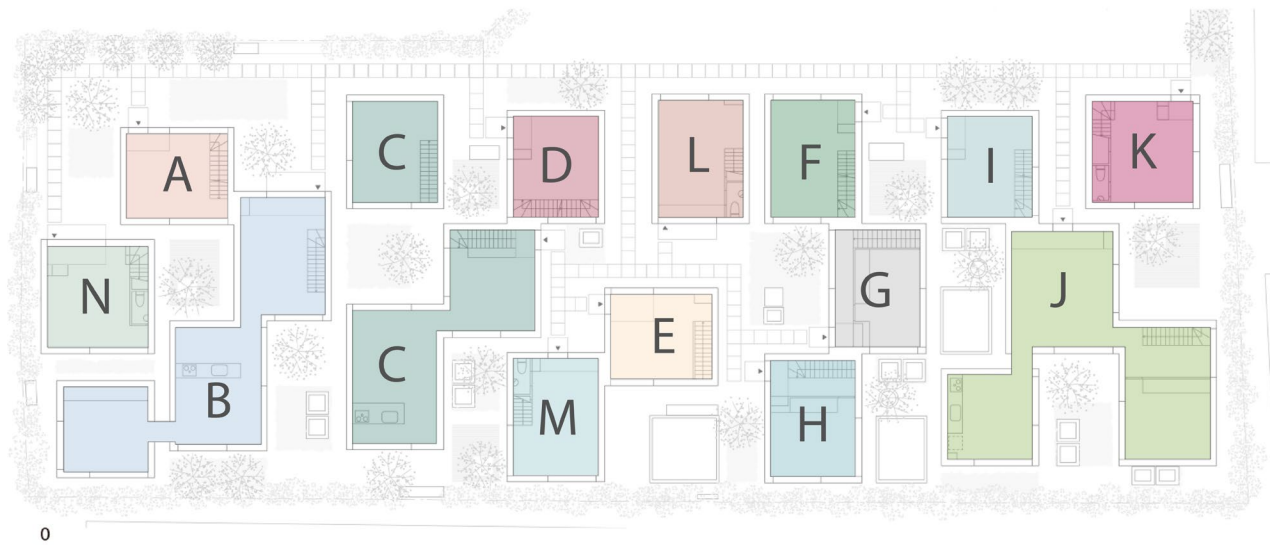


Fig 3.12 Seijo Townhomes axonometric illustration

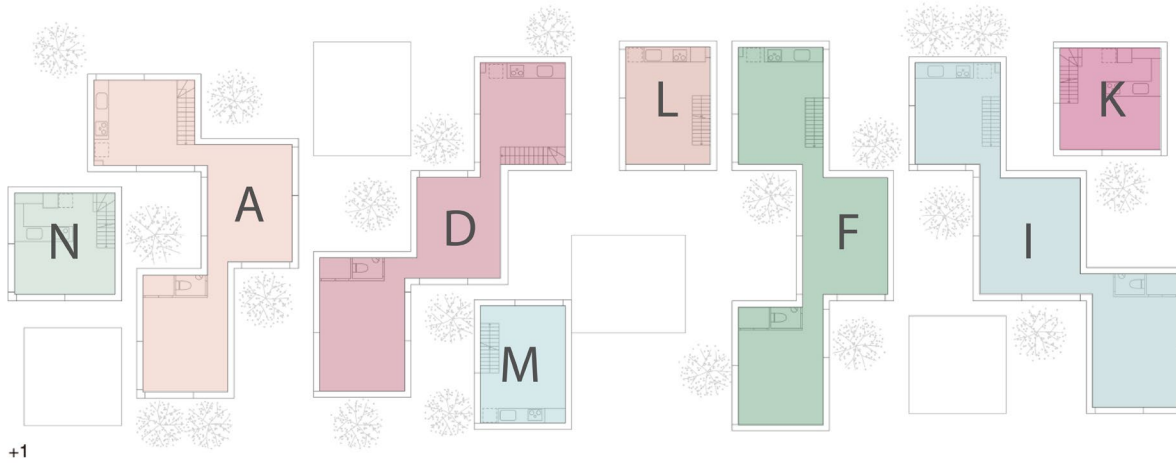


Basement floor plan

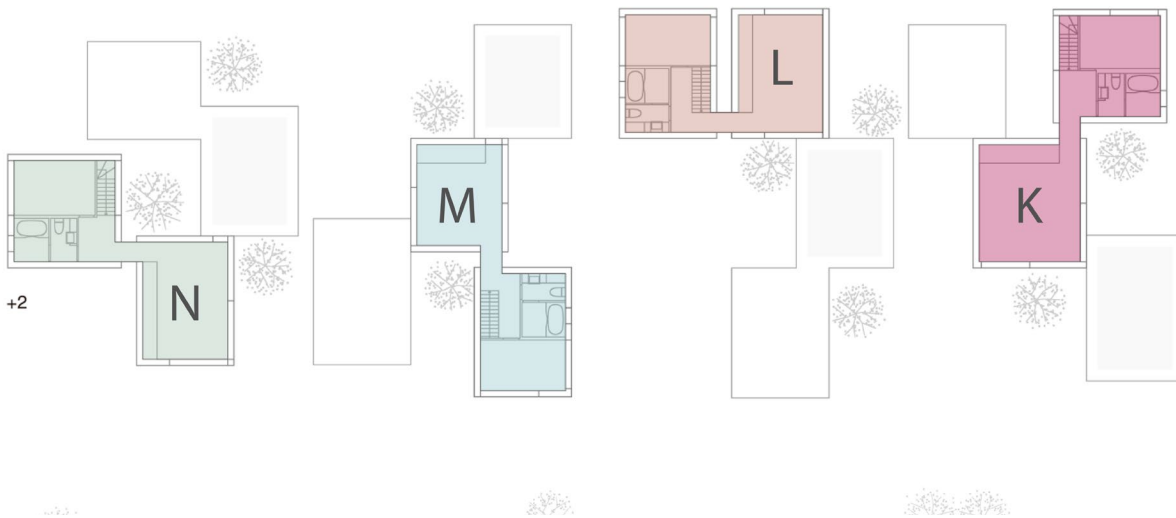


Ground level floor plan

Fig 3.13 Seijo Townhomes floor plans



First level floor plan



Second level floor plan

Le Jardinier, “The Gardener”

Location: Montreal QC

Completion: 2018

Architects: ADHOC Architects

Development Type: Mid Rise Multi-unit Housing

Density (U/HA): 213.8

Site Area: 749 m²

Total Units: 16

The development is a 16-unit affordable housing project comprised of dual aspect apartments that allows each unit to have a view of the inner courtyard as well as ample sunlight throughout the day. Most units are one to two bedroom types, for smaller households.



Fig 3.14 Photo of Le Jardinier

1. The building facade is very typical of the community, therefore it is able to blend in with other housing schemes in the area.
2. Each dwelling unit of le Jardinier has access to a loggia balcony which provides privacy and soundproofing from the other units. The courtyard is designed for resident gardening as it is a prominent hobby amongst city dwellers.
3. The project sensibly integrated the needs of the neighboring building by providing an emergency escape route that leads to the buildings rare yard in the form of a carriage entrance.

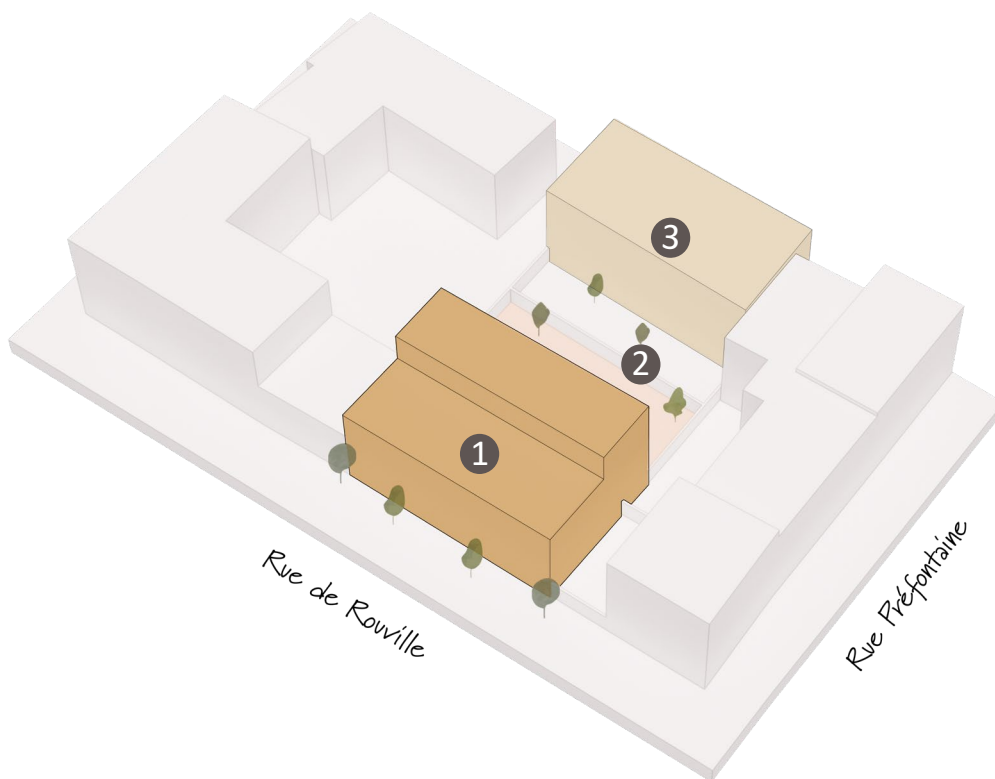
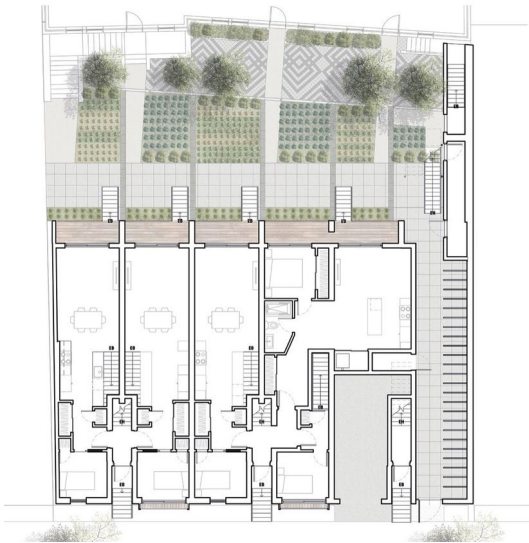
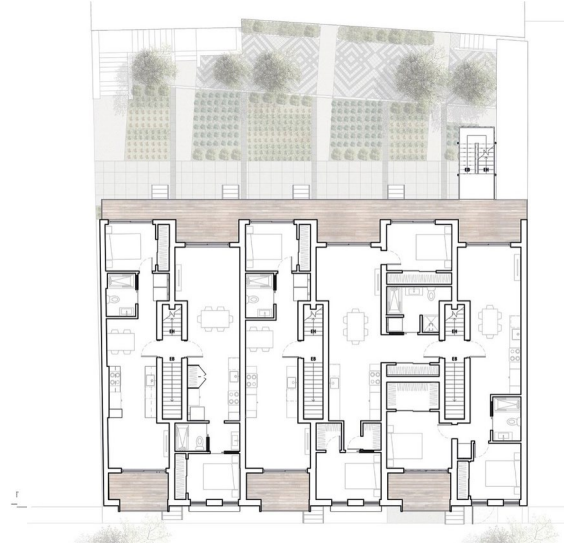


Fig 3.15 Le Jardinier axonometric illustration



Floor Plan of first story



Floor Plan of second story

Fig 3.16 Le Jardinier floor plans

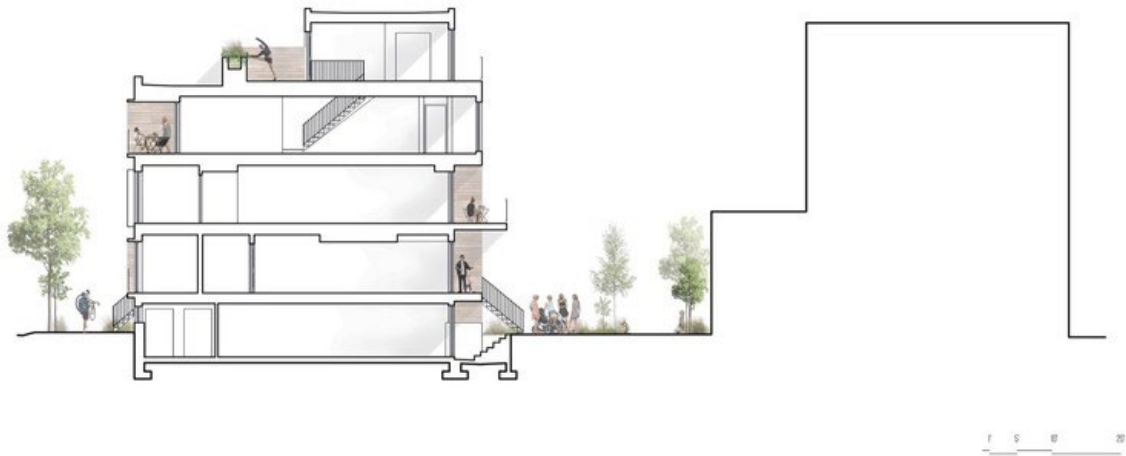


Fig 3.17 Le Jardinier section

La Geode

Location: Montreal QC

Completion: 2017

Architects: ADHOC Architects

Development Type: Mid Rise Multi-Unit Housing

Density (U/HA): 89.7

Site Area: 669 m²

Total Units: 6

This housing scheme separates a singular building mass with an inner courtyard to allow for sunlight to be entered in the middle which creates opportunities to configure a floor plan different to the typical multi-plex.



Fig 3.18 Photo of Le Geode

1. The building typology utilized the depth of the lot by creating two separate masses bookending a central court yard. This design allows for more sunlight to be distributed into the units, it also provides more opportunity to add density within the typical triplex typology in the existing neighborhood.
2. The facade blends in nicely with the Plateau, the entrance into the courtyard is highlighted to create interest and separation between private and public realm.

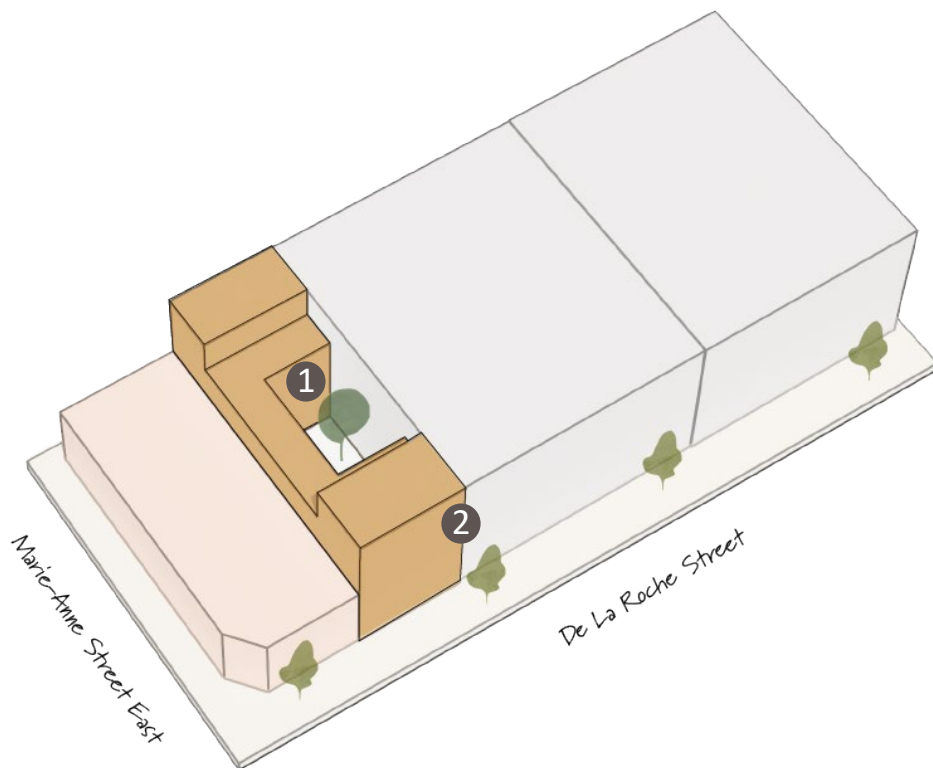


Fig 3.19 Le Geode axonometric illustration



Fig 3.20 Le Geode section

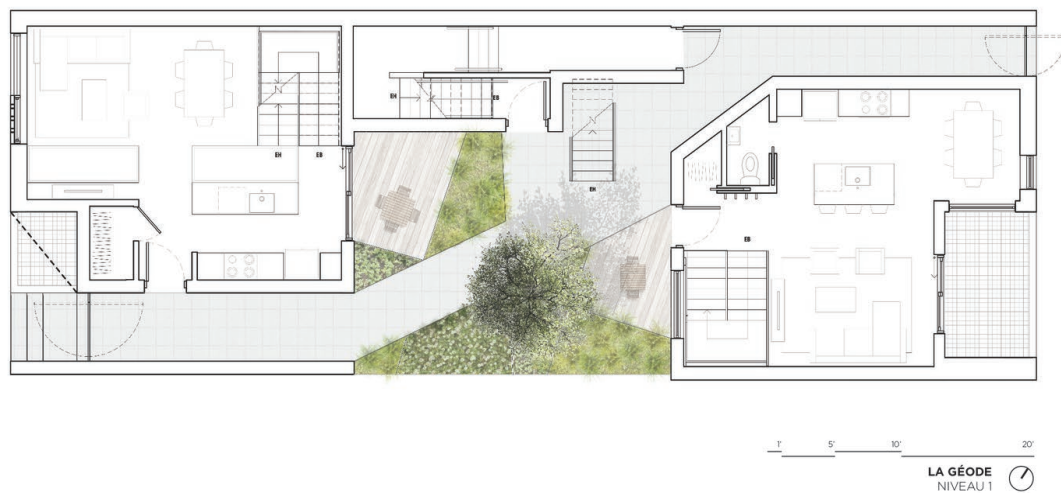


Fig 3.21 Le Geode ground level floor plan

The project is in the Plateau Mont-Royal neighborhood of Montreal, an urban area filled with vibrant character. The development utilizes the centrality of the location to bring in density in a small lot by creating two separate building masses connected with a corridor to open -up an inner courtyard space.

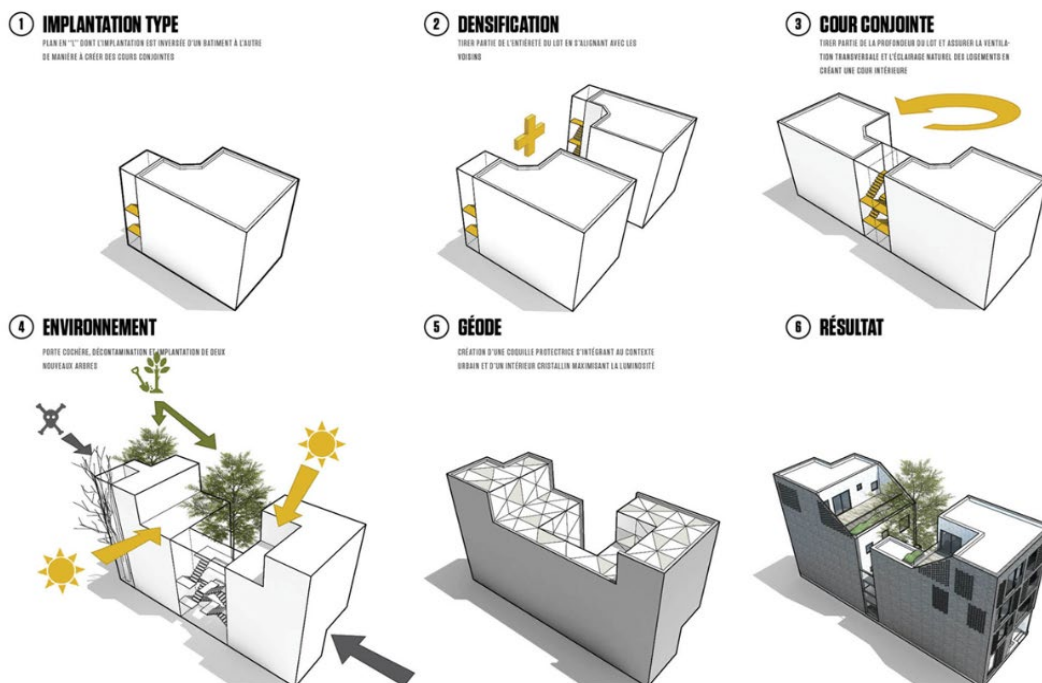


Fig 3.22 Le Geode building form diagram

White Cone House

Location: Seoul, South Korea

Completion: 2014

Architects: Apparat-C

Development Type: Mid Rise Multi-Unit Housing

Density (U/HA): 211.5

Site Area: 331 m²

Total Units: 7

This five story building comprises of six studio apartments and a double story penthouse in a small land parcel in the inner city of Seoul. This housing scheme cleverly utilizes the ground floor to create amenities such as a parking area and an office space on the ground floor.



Fig 3.23 Photo of White Cone House

1. In order to ensure all living areas receive plenty of natural light and ventilation, the architects created a series of recessed balconies to also maintain some level of privacy.
2. The top 2 floors boasts a double story penthouse with a tapered roof to create a balcony space.
3. A office space fronting the street as well as a garage is created by pilotis.

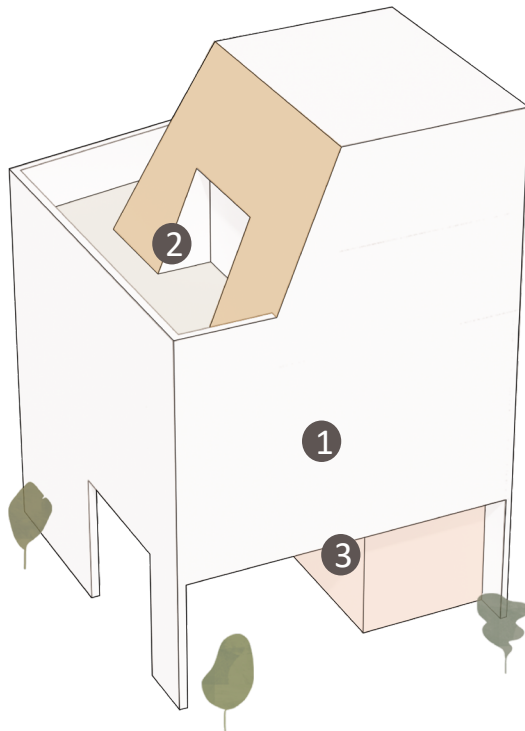
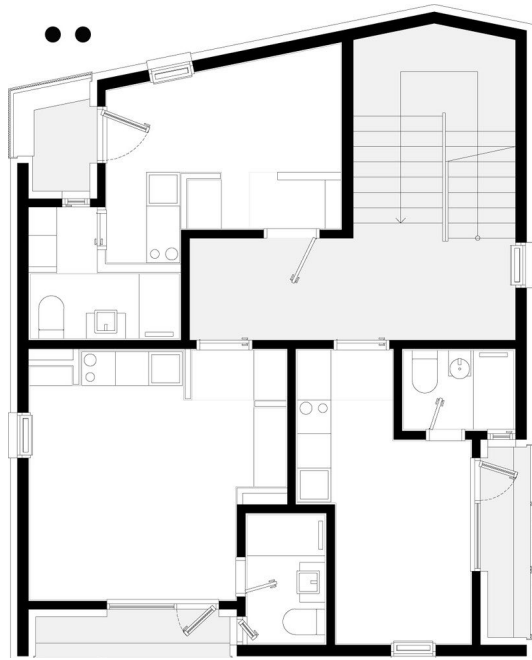
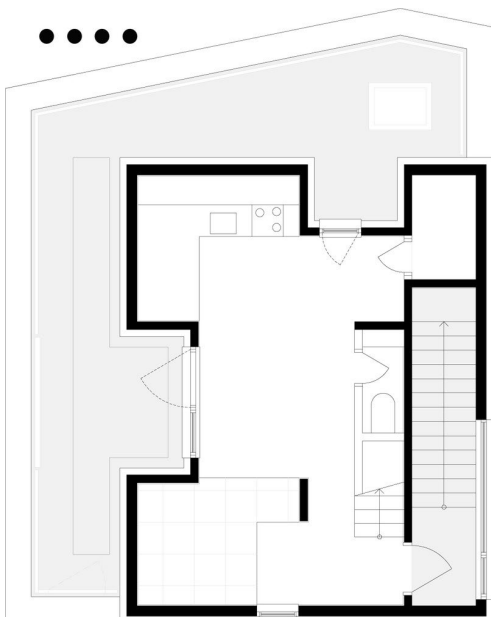


Fig 3.24 White Cone House axonometric illustration



Floor plan of typical floor



Floor plan of two story penthouse

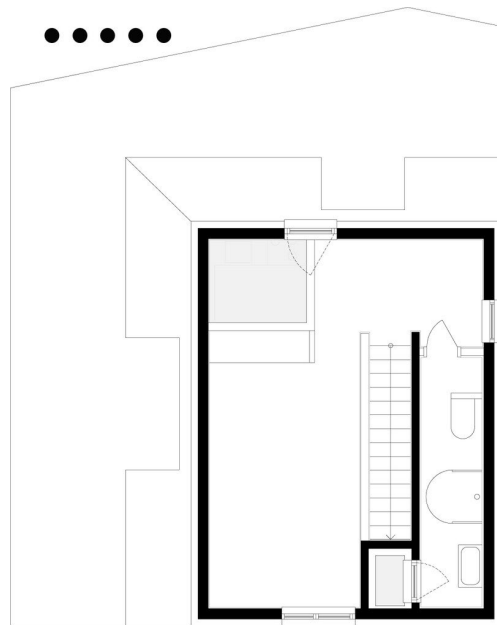


Fig 3.25 White Cone House floor plans

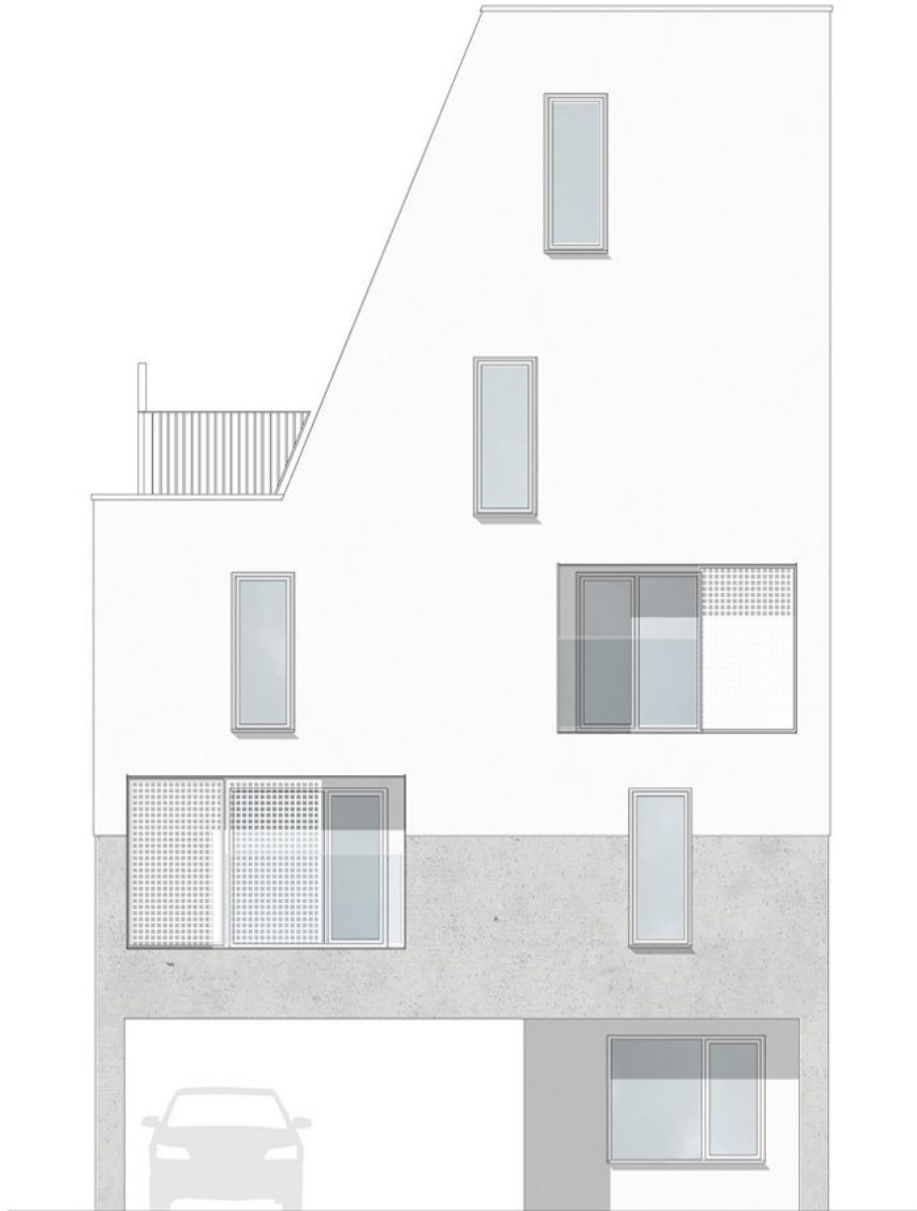


Fig 3.26 White Cone House south elevation

Evaluation & Lessons Learned

To facilitate the analysis of each case study, an assessment framework was developed. The criteria in which these projects are evaluated based on three categories:

- Density measured by U/HA.
- Diversity in unit types ranked out of 3. A ranking of 3 indicates the project offers a broad variety of dwelling sizes and schemes. A value of 1 implies that the units offered in the project are limited.
- Adaptability is also ranked out of 3. The assessment evaluates how easily can the typology be adapted in the context of Vancouver. A value of 3 implies that the project can be easily adapted to Vancouver's residential landscape. 1 indicates that the scheme may require some major changes or redesign to be applied in the city.

PROJECT NAME	DENSITY (U/HA)	UNIT DIVERSITY	ADAPTABILITY
Beverly Place	96.9	3	2
Donnybrook Quarter	152.8	2	3
Seijo Townhouses	116.9	2	1
Le Jardinier	213.8	2	3
La Geode	89.7	3	3
White Cone House	211.5	1	1

Fig 3.27 Case studies evaluation matrix

Lessons learned:

- Typically, higher density correlates with reduced unit diversity. In the example of White Cone House from Seoul, the compact units created a very high density for the residential scheme. Despite the shortfalls of unit diversity, the creation of more unit counts may benefit the community in terms of urban intensification through the redevelopment of small, individual lots.
- Projects with larger unit sizes necessitate additional amenities and open space to accommodate the type of demographic it houses. Exemplifying this principle are projects like Donnybrook Quarter and Beverly Place. Both schemes place emphasis on access to outdoor space either as private balcony and yards or a larger, shared area.
- Many of the schemes evaluated in this study utilized a sunken ground level to create additional dwelling units without the need to challenge height restriction. However, semi-basements pose a challenge to accessibility especially in small lot typologies.
- Reduction and elimination of on-site parking spaces allows for more flexibility and greater density. It also promotes the use of public transportation and encourages the change of urban mobility patterns in the city.

Vancouver "Missing Middle" Proposals

The notion of densifying Vancouver's suburban landscape to mitigate soaring housing costs has been widely discussed over the past few years. During the development of this thesis, policy measures that will enable the building of ground oriented multiplex's have yet to be approved. Nevertheless, proponents of housing affordability have already started to ideate new development typologies for "missing middle housing." The following section presents the housing schemes conceptualized and or developed in response to the growing demands for housing diversity.

The following image (Fig 3.28) is a housing scheme created by MA+HG Architects that consist of six units on a single family lot.



Fig 3.28 Rendering of a concept for a single-family lot with six units

The Microop project is a residential development proposed by Haecceity Studio Architecture for Urbanarim's missing middle competition. The proposal is a seven unit multi-residential complex situated on a single lot devised into two building forms separated by a courtyard. To significantly lower the cost of home ownership, this project is designed with a co-operative ownership model in mind. The model is also opted to address issues of land speculation that typically arise along with densification. Apart from the tenure, the housing scheme provides a new urban model for single family neighborhoods in the city. The housing typology can be made into a larger community when several schemes are developed next to another.



Fig 3.29 Rendering of the Microop



Fig 3.30 Image of Microop concept

Mole Hill Missing Middle Housing is another missing middle housing project developed by Haecceity Studio Architecture, completed in 2018 inspired by the previously mentioned proposal. The project is located in downtown Vancouver's Mole Hill neighbourhood surrounded by a mixture of mid-rise and single family housing. The building is a three story ground oriented multiplex with three one bedroom units and three larger units suitable for families and or couple households. In total, the project provides 6 units ranging from one bedroom to three bedroom units and includes two parking spaces. The building form consists of two masses joined by a breeze way offering a small courtyard for sunlight exposure. The compact building form on a single lot offers limited outdoor space in the housing scheme, but this aspect is justified by the ideal location and the large park adjacent to the site.



Fig 3.31 Photo of Mole Hill Missing Middle Housing project

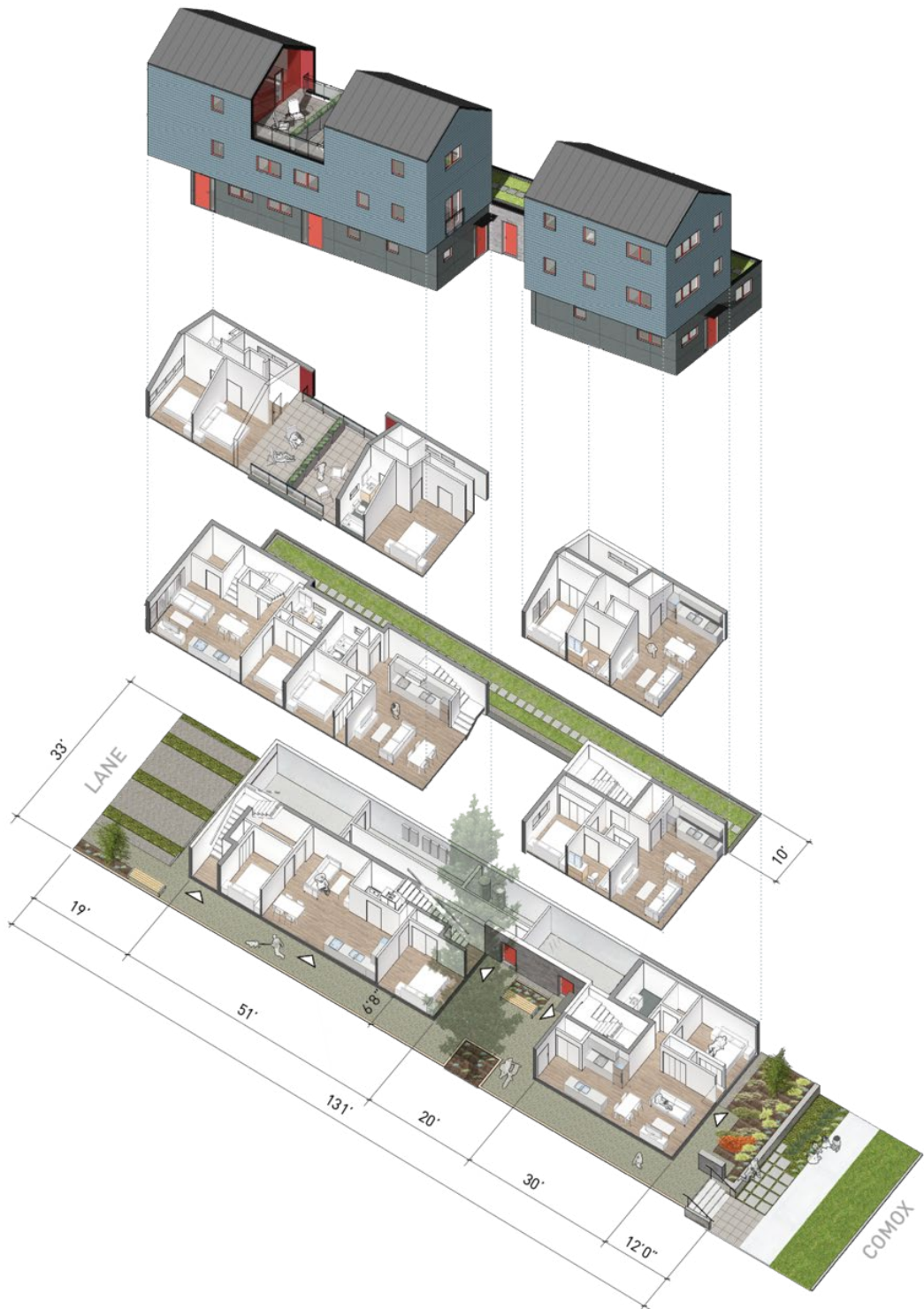


Fig 3.32 Exploded axonometric diagram of Mole Hill Missing Middle Housing project

The architecture firm Lanefab design/build created several multiplex proposals called the fab-plex which consists of several multi-unit housing schemes on 33 feet and 50 feet lots. Amongst the proposals is the Fab Plex 33 – Freestanding. This housing scheme offers four generous self contained units designed for larger households. The total FSR is 1.40 which is achieved by creating a lengthy building that is split in the middle offering two units on each end. The design intent of densification in this particular project seeks to combine four single family homes into one single lot. However, this approach has some drawbacks. One of them is the lack of open space offered on the site to support the intended household characteristics. Secondly is the lack of unit type diversity as all of the units in this proposal are three or four bedroom options.



Fig 3.31 Photo of Mole Hill Missing Middle Housing project

04 Design Synthesis

4.1 Design Goals and Principles

4.2 Economic Framework

4.3 Policy Framework

Chapters one and two discussed the various factors that contribute to the inflation of housing prices and persistent state of unaffordable housing costs in Vancouver. Chapter three examined precedent studies to guide the design framework and development portion of this thesis. This chapter seeks to integrate all the findings of previous chapters to formulate a design synthesis in which the design proposals will be developed upon. The aim of this chapter is to establish design goals, principles, address economic feasibility, and finally propose policy changes to support the up-zoning of low density residential areas.

4.1 Design Goals and Principles

The focus of this thesis is to support incremental up-zoning of the yellow belt through the proposal of small lot interventions. Incremental urban intensification refers to the gradual and strategic increase in density overtime. This approach focuses on small scale adjustments that respond to evolving needs and challenges. It looks at ways residential, R1 zones across Vancouver can affectively be up-zoned without huge interventions and changing the essential characters of the neighbourhoods. The gentle density approach is based on the understanding of the city's single family neighbourhood characteristics and the assumption that radical changes would not be as effective in densifying on a far reaching level. The design framework is based on existing lots and housing typologies. To explore how they can be adapted to create more dwelling units without the involvement of organizations and large scale developers. It places emphasis on the engagement of small actors such as individual homeowners, local individual builders to drive the development of higher density housing types, bringing about a grassroots movement. Greater densities are required to support the growing demand for accessible housing in Vancouver, and to foster strong, vibrant communities. The proposals will correspond to the incremental objective of this thesis by developing "missing middle" housing typologies with the purpose of diversifying housing stock, creating more affordable residential options as well as fostering a productive environment for a more diversified residential landscape. The following is a set of design principles set out to achieve the stated design goals. These principles act as a 'good design'

guideline to low-rise high density development within Vancouver's residential landscape.

- Each housing scheme proposed should focus on how to adapt existing conditions for the purpose of creating “missing middle housing.”
- The proposal must be within the limitations of a two to three story building and seemingly blend into the existing urban fabric. This involves respecting the characteristic of surrounding area and ensure the design compliments rather than overshadow existing structures.
- Offering a wide range of housing options is a primary goal. The proposals should offer a variety of units that support various demographics and correspond to the growing demands for smaller scale dwellings units.
- The scheme should be developed with the goal and purpose of long-term rental and or support the affordability of homeownership in the city.
- Aside from the stated goal of densification, the schemes should also include outdoor, open spaces to encourage socialization between residents and foster a sense of community. These outdoor spaces can be communal and or private. A mixture of these is a beneficial feature for the quality of space.

The design goal of densification through adaptation of existing form warrants the exploration of various housing typologies across the city. The diagram (Fig 4.1) shows some of the most prominent housing styles found in the city.

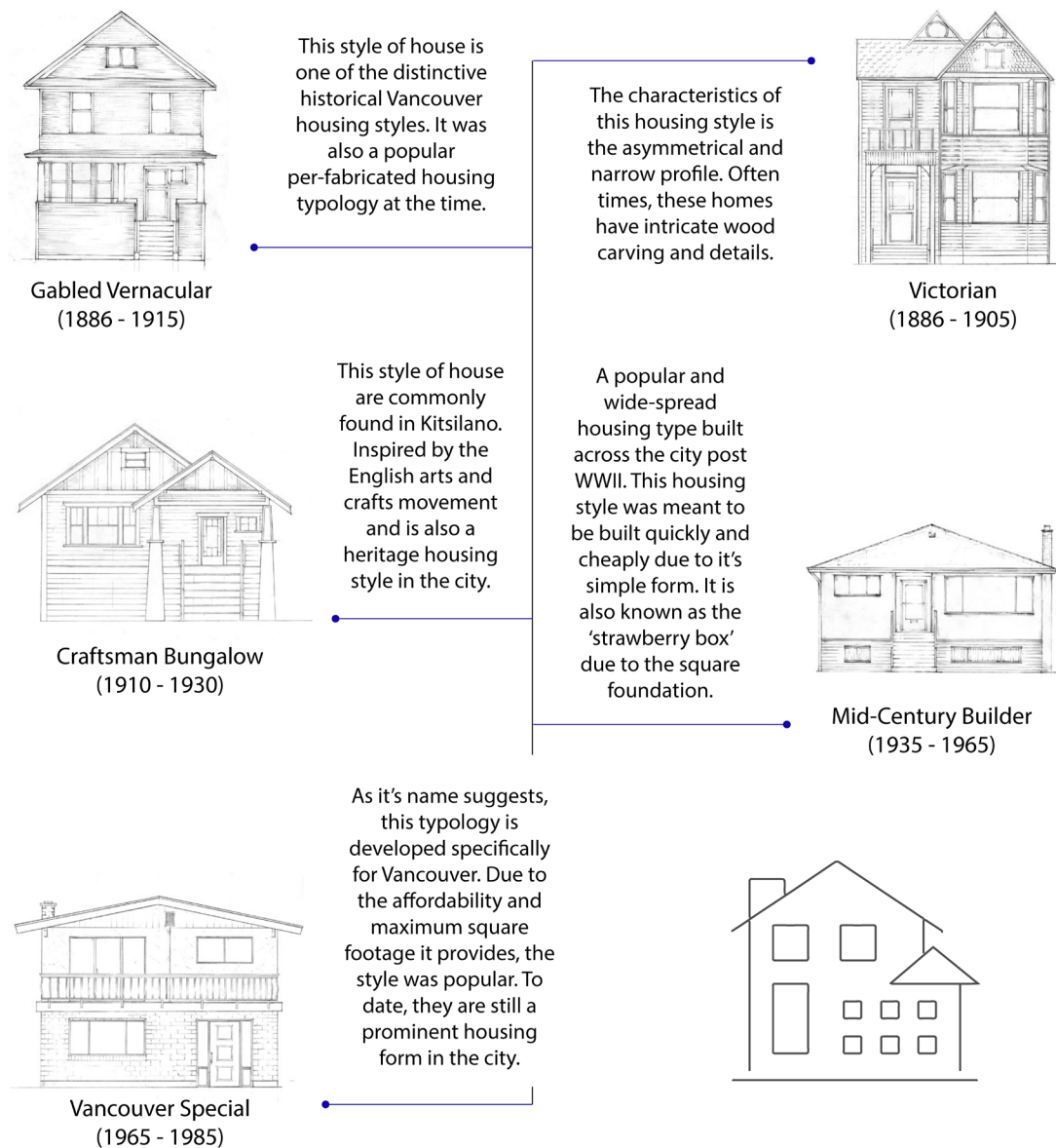


Fig 4.1 Diagram of Vancouver housing styles by era

Throughout the decades, housing typologies varied in Vancouver due to technological advancements, social and economical growth developments. During the analysis of Vancouver’s housing typologies and drawing on personal familiarity with the city, two housing typologies were identified to be well-suited for adaptive transformation of “missing middle” forms.

The mid-century modern house and Vancouver special are two housing schemes widely found across the city. These typologies are excellent subjects for exploration due to their widespread presence on both single family (33 feet) and duplex (50 feet) lots. In addition, their uncomplicated forms contribute to their selection, facilitating a smoother and more accessible process for adaption and densification.



Fig 4.2 Mid-Century Builder and Vancouver Special housing typology

4.2 Economic Framework

The current economics on housing development in Vancouver promotes the building of predominantly two housing types – single family homes and high rise condominiums. Due to the already exasperated land costs, under current zoning policies and land regulations, building multi-plexes is often economically unfeasible without the support of non-profit or government organization and often require zoning amendments. This condition pushes developers to build predominantly two types of housing – single family homes in affluent neighbourhoods or and high rise condominiums. The city is already seeing a trend of developers favouring developments of luxury new builds due to higher profit margins. Consequently, this type of housing creates an even deeper issue of affordability in an already unaffordable market.

As touched upon in chapter two, purpose built rental housing is in short supply but great demand in the city. The opportunity of “missing middle” housing typology can be explored to generate supply for rental units. Therefore, the tenure type of the proposals caters towards long term rental with an economic framework of ‘build to rent’ as opposed to ‘build to sell’. This model allows property owners and small scale investors to maintain homeownership and create multiple secondary dwelling units as mortgage helper schemes or as rental property for long term gains. There is also opportunity within the housing schemes to be developed as co-operative housing, adopting the model used in multi-plexes across Montreal.

Another factor to the economic viability of multi-residential housing scheme in the city is the possibility of creating a secondary strata-property for the laneway homes. This can reduce the burden of initial investment costs associated with densification of existing structure. In addition, the method will allow for quicker adaptation of incremental up-zoning in the neighbourhood, which in-turn will benefit the community from the influx of housing stock.

4.3 Policy Framework

It is crucial to recognize that current zoning bylaws prescribed to regulate urban land use no longer serve the growth trajectory and metamorphosis of the city. De-regulating the yellow belt is imminent to meet the growing demands for adequate and affordable housing in the city. Small lot interventions are a vital step towards more affordable housing in the city and central to generating heterogeneity in neighbourhoods and encourage urban vitality. Putting up-zoning into practice is the first step towards more equitable housing and vibrant neighbourhoods characterized by walkability, convenience, and diversity. Over the years, Vancouver has made efforts to update the zoning regulation in low-density residential areas by legalizing secondary suites, allowing the building of an additional dwelling unit in the form of a laneway house and most recently the development of semi-detached homes also known as duplexes on certain lot sizes. However, these changes did not include flexibility in building height, setbacks and floor space ratio which limits the impact of the policy changes aimed at addressing the housing crisis. Other aspects that limit flexibility in urban intensification include parking requirements, subdivision of laneway house lot, and the potential of small lot-consolidations.

Putting up-zoning into practice requires change in current zoning regulation and land-use policies. This thesis identifies five main policy changes which will enable the development of new housing typologies and expand housing stock diversity in the city:

- Reduce requirement for front yard set back
- Reduce minimum parking space requirements
- Increase FSR allowance and unit capacity per lot
- Increase building height limitations
- Relax regulation for lane-way house

1. Reduce requirement for front yard set back

By reducing the required front yard setback, it will increase the allowable building area and allow for the possibility of more unit counts and variations. This thesis proposes the new front yard setback to be a minimum of 4 meters for developments with at grade access to the main level. For units with staircase access to the main level, the minimum setback should be 5 meters.

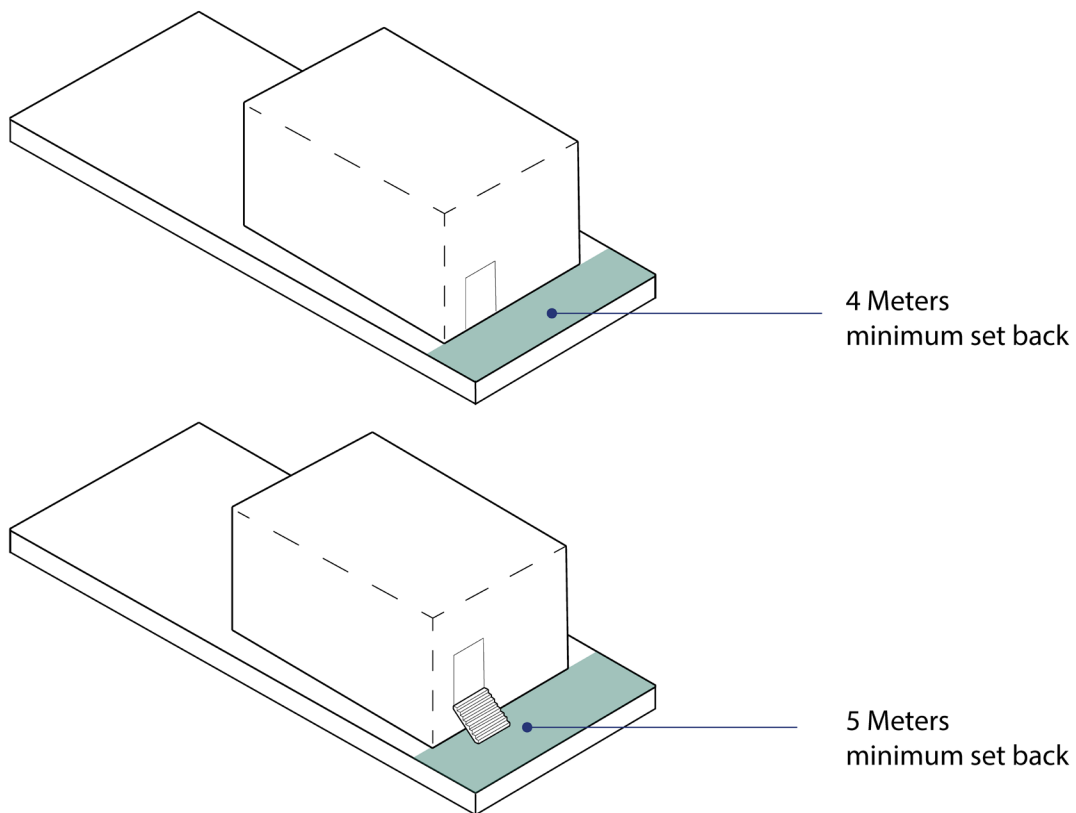


Fig 4.3 Diagram of proposed set back requirement

2. Reduce minimum parking space requirement

Parking spaces often take up valuable land space that otherwise can be developed. Part of the “missing middle” strategy is to reduce reliance of automobiles as primary source of transportation. Thus, this thesis proposes the removal of minimum parking space requirements if the scheme is catered more towards single person households and provides a density greater than 130 U/HA.

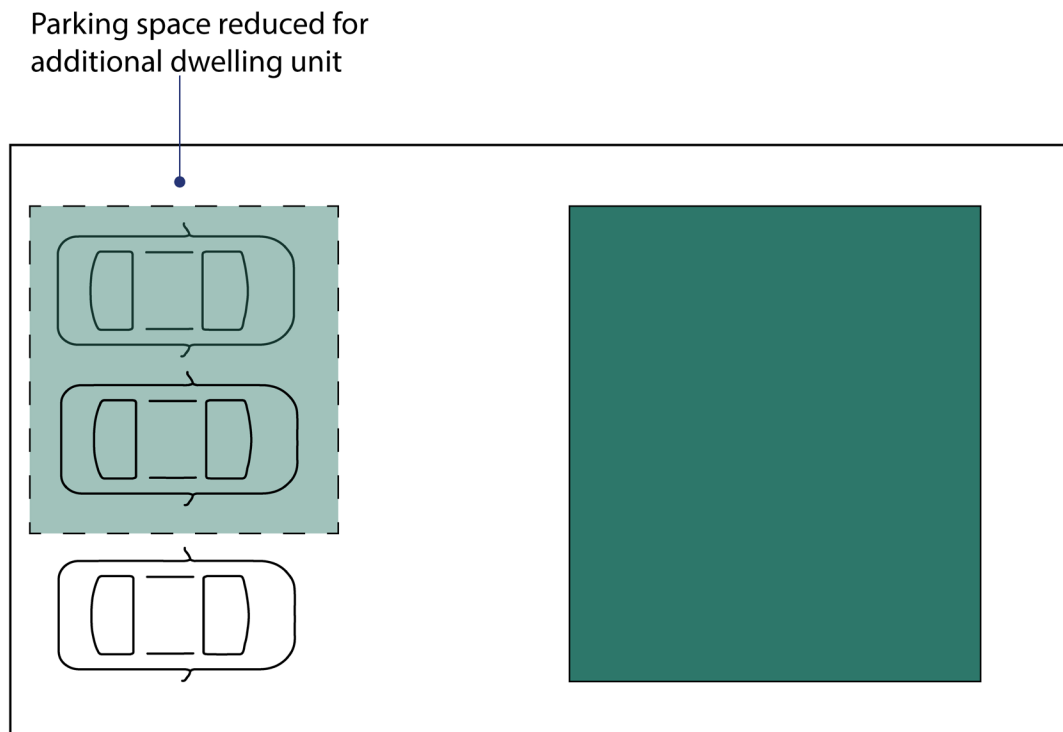


Fig 4.4 Diagram showing parking space reduction

3. Increase FSR allowance and unit capacity

Increase FSR and building height allows the opportunity for further urban intensification and housing density. The proposed increased FSR for lots under 50 ft is 0.9; for lots 50 ft to 66 ft, the proposed FSR is 1. By foregoing the unit count limitation on each lot, unit configuration can be expanded to accommodate for a wider range of demographics, especially one person to two person households which make up over half of the city's households.

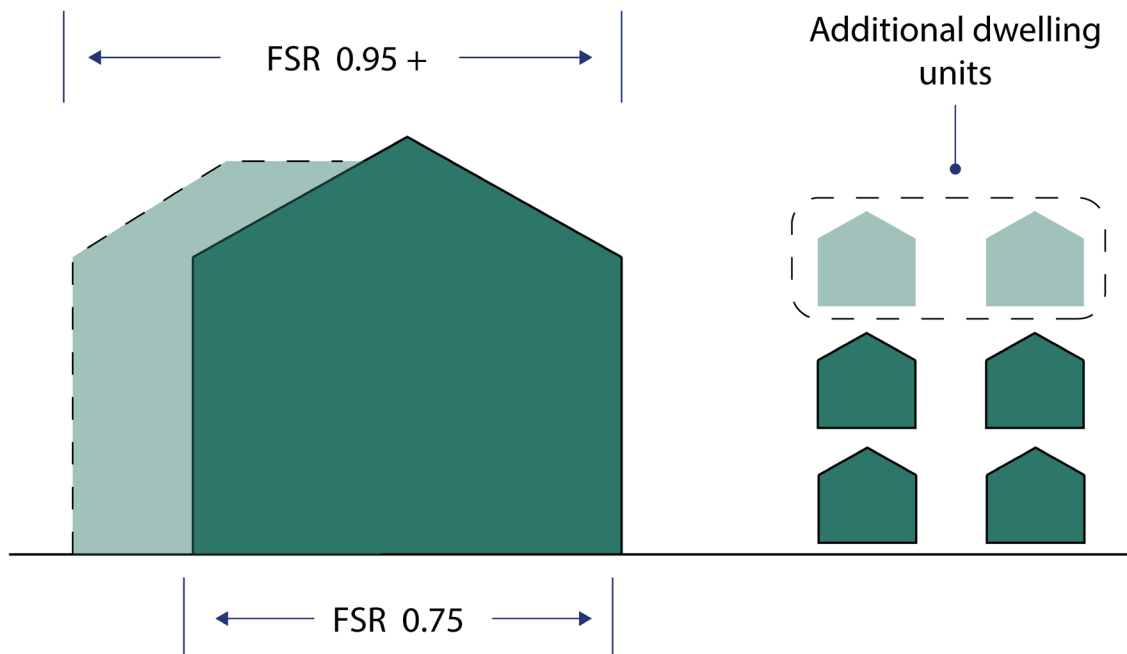


Fig 4.5 Diagram showing FSR and unit count increase

4. Increase building height limitations

Building height should be allowed to be increased based on the housing scheme's design and added benefits to the neighbourhood. Corner lots should be allowed to go up to three and a half stories on lots greater or equal to than 55ft which will allow the building form to become a low rise apartment, increasing diversity in typology.

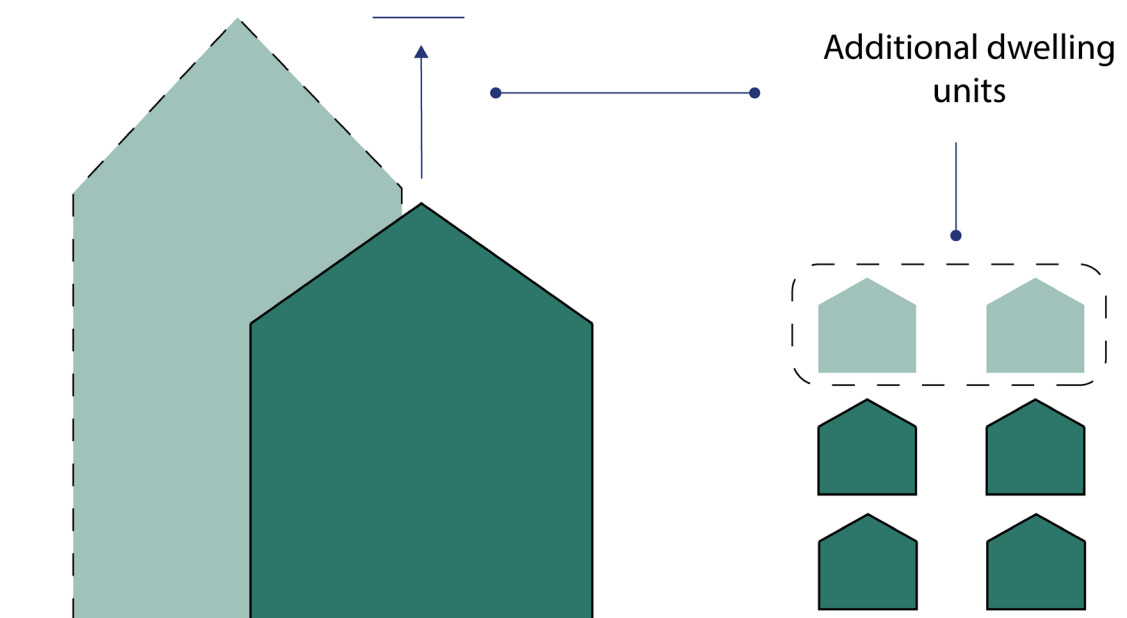


Fig 4.6 Diagram showing height increase

5. Relax regulation for lane-way house

The potential of lane-way houses not only as additional dwelling units but also as stand alone strata properties can greatly encourage the building of “missing middle” housing. This strategy will allow potential developers to decrease initial investment in converting the existing structure to a multi-plex. In addition, the building height Laneway homes should increase to the height two stories, creating a small house at the rare end.

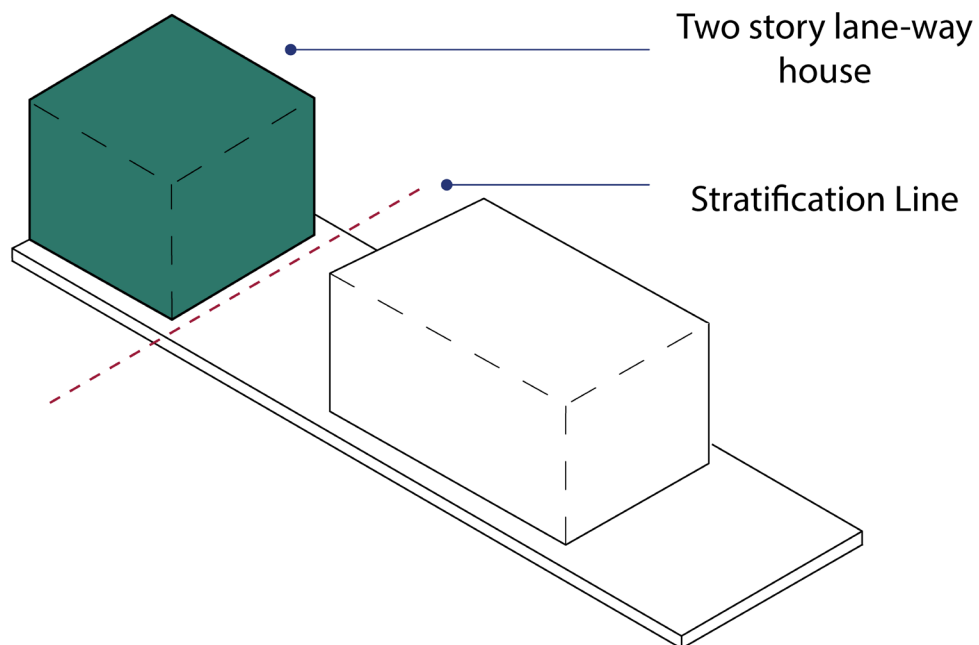


Fig 4.7 Diagram showing stratification of laneway house

05 Proposals

5.1 Vancouver Special 2.0

5.2 Roku Plex

5.3 Cornerstone Flats

5.4 The Vision

The following chapter will propose three interventions: the Vancouver Special 2.0, to be considered as an adaptation of the Vancouver Special housing typology on a typical single family lot; Roku Plex, to be considered as an adaptation of mid-century building typology on a duplex lot; and finally, cornerstone flats, as an exploration of two single family lots consolidated to form a larger housing complex. Within each of these three scenarios, the typologies as they currently exist will be explored, followed by a proposed densification strategy to support incremental upzoning.

5.1 Vancouver Special 2.0





Lot size: 10m X 37.2m

Site Area: 331 m²

Total Units: 6

On Site Parking: 0

Density (U/HA): 161.3

FSR: 0.82

Development Type: Low Rise

Multi-Unit Housing

Fig 5.1 Render perspective of Vancouver
Special 2.0

The Vancouver Special is a distinctive style of home widely built across Vancouver and the Greater Vancouver region as an affordable, accessible housing type designed to be mass produced with the goal of maximizing floor space and reduce construction costs.¹ The model was first considered a 'monster house' by many because of its boxy and bulky form. These homes were a pragmatic response to the need for more housing during a period of rapid urban growth. The utilitarian layout and simple construction make it easy to reconfigure and adopt into a duplex with a primary owners' unit above and a self-contained lower suite below. The Vancouver special was a relatively economical housing solution to help absorb the city's sharp increase in population, providing many new residents with affordable housing.²

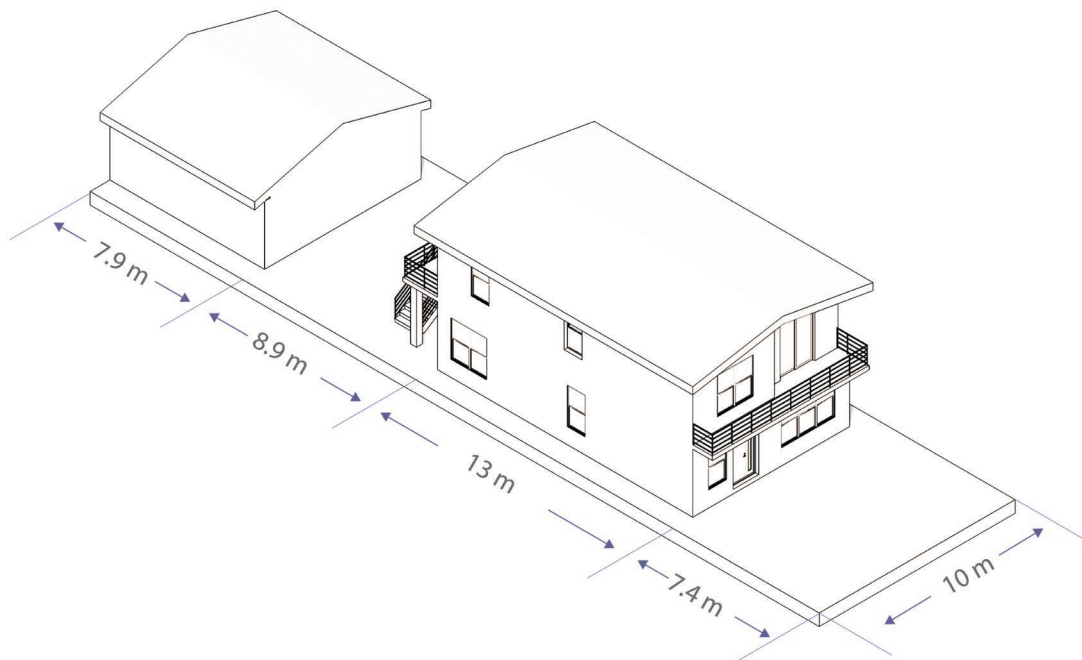


Fig 5.2 Axonometric model of Vancouver Special typology

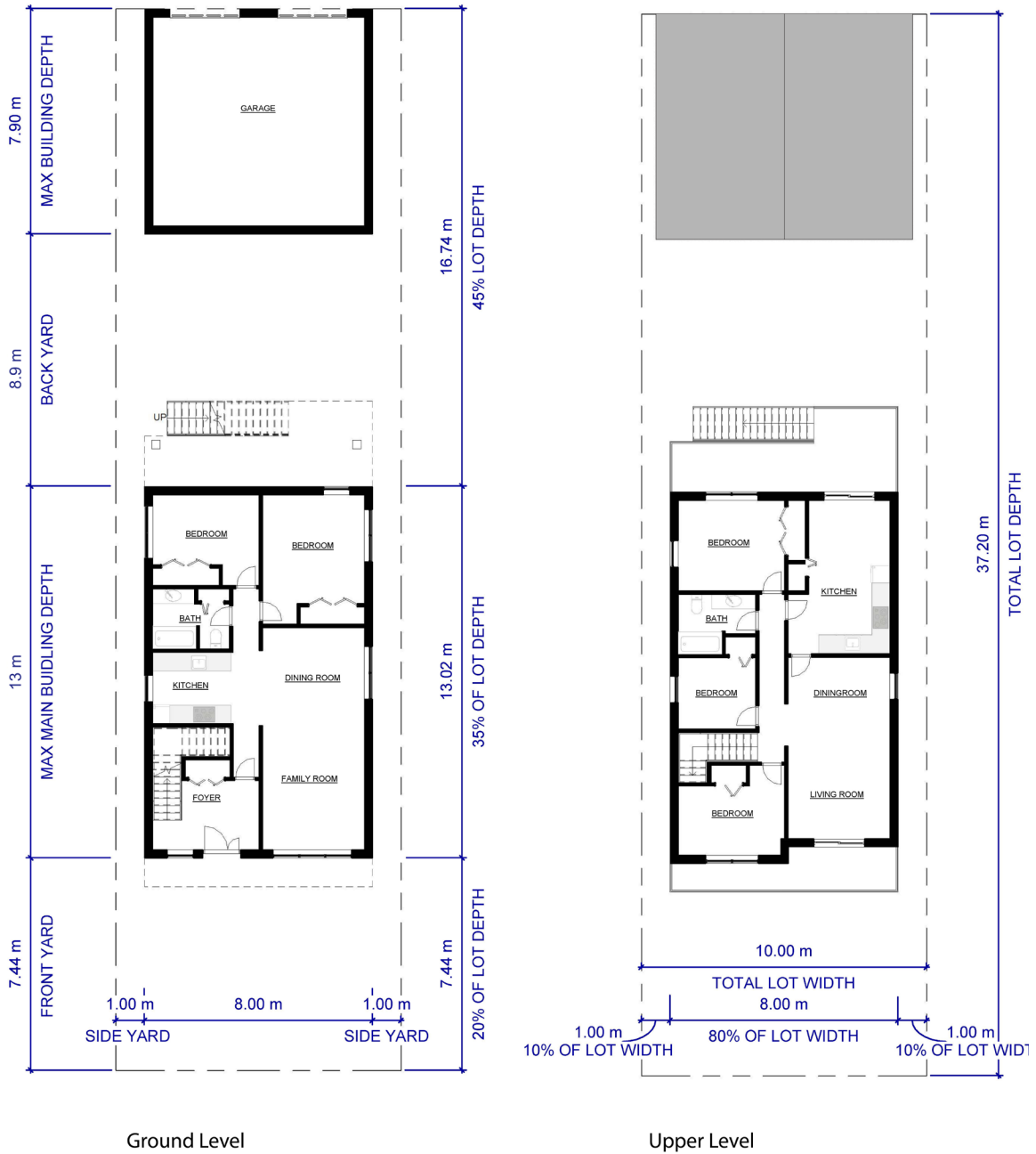
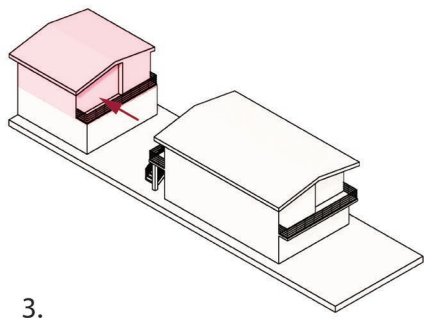


Fig 5.3 Typical floor plan of Vancouver Special

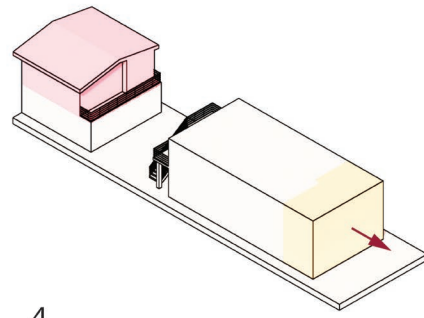
Vancouver Special 2.0 is a multi-plex with 6 small scale units. The design and development of this housing scheme takes advantage of the boxy configuration of existing structure and seeks to add density through two interventions.

The adaptation of Vancouver special is done in two phases: starting from converting the garage to a two story laneway house, creating two units stacked above another. The second phase focuses on reconfiguration of the main building with an extension at the front to enlarge usable space while reducing front yard set back to 4 meters. The extension allows two units to be configured on each floor, creating four units in total.

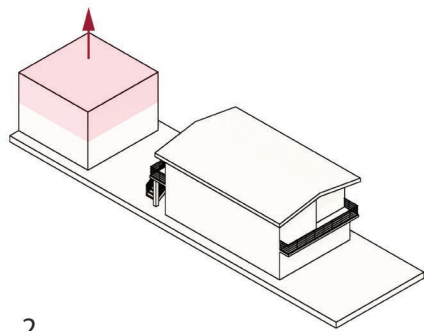
The unit types in this proposal are smaller and more compact, yielding a higher density and corresponding to the high demand for bachelor and one bedroom units in the city. The scheme's high density aims to reduce land costs and financial burden it puts on private investors. In the case of private property owners, the phasing of this development allows for a gradual change in housing configuration. In comparison to the typical Vancouver Special model, this version greatly increases density from 53.8 U/HA to 161.3 U/HA.



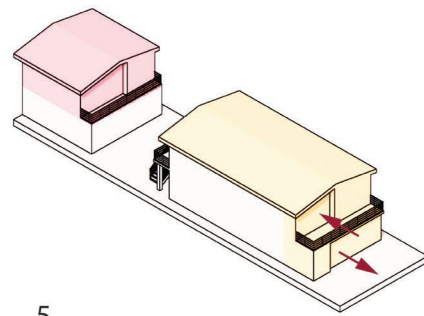
3.



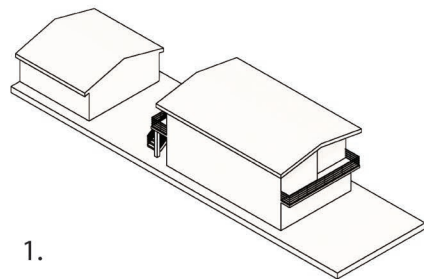
4.



2.



5.



1.



6.

 LANE-WAY HOUSE

 MAIN BUILDING

Fig 5.4 Diagram of Vancouver Special 2.0 building form

Targeted Demographics:

Household Types



Carrie 62

Occupation: pension
Household income: \$30,000/ year
Needs: 1 bedroom unit that is accessible at grade



Nadia 22, Mark 21

Occupation: Barista & Labor worker
Household income: \$79,000/ year
Needs: 1 bedroom unit in an area that is residential



Frank 25

Occupation: newly graduated software engineer
Household income: \$75,000/ year
Needs: Accessible unit, studio apartment in a quiet area



Ronnie 30

Occupation: New resident, teacher
Household income: \$65,000/ year
Needs: 1 bedroom unit that is affordable



Diana 27

Occupation: PHD candidate/freelancer
Household income: \$30,000/ year
Needs: an apartment with a large outdoor area

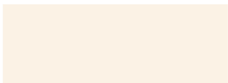


Eva 19

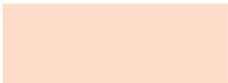
Occupation: collage student/part-time employee
Household income: \$25,000/ year
Needs: Small unit with great access to parks and buses

Fig 5.5 Diagram of targeted demographics for Vancouver Special 2.0

Ground Level Units:



Accessible Studio Unit
488 sqft (45.4 m²)



1 Bed 1 Bath Unit
639 sqft (59.4 m²)



Bachelor / Studio Unit
485 sqft (45.1 m²)

Upper Level Units:



1 Bed 1 Bath Unit
552 sqft (51.3 m²)



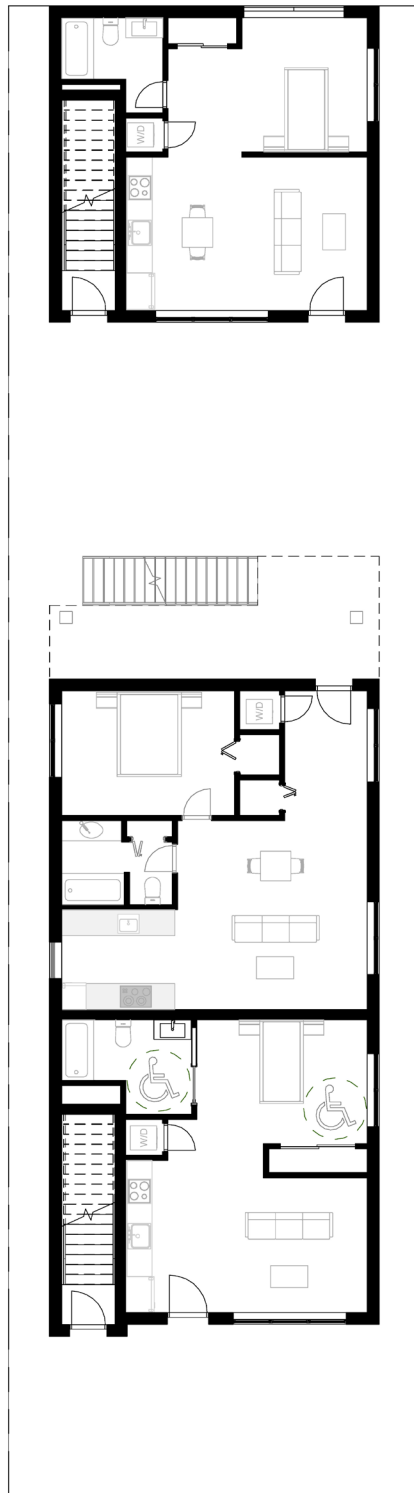
1 Bed 1 Bath Unit
583 sqft (54.2 m²)



Bachelor / Studio Unit
515 sqft (47.8 m²)



Fig 5.6 Vancouver Special 2.0 floor plans



The at grade access to ground floor units provides opportunity to create accessible units. Here, the floor plan shows an accessible studio unit facing the front yard allowing for greater ease in accessibility. The main building is effectively split into a front and back section, with two entrance points. The back entrances can be access through the side yards. In between the laneway house and the main building is a courtyard like space designated as a shared outdoor area to foster connection between residents and encourage community building within the multi-plex.

Fig 5.7 Vancouver Special 2.0 ground level floor plan

Each unit on the upper floor has access to private outdoor space. The balcony and deck also act as a space separator between the two facing units at the back end of the lot, allowing for more light to be distributed in the living quarters of those units. Every unit has access to a private staircase, eliminating the need for a secondary egress stair while preserving the historical look of the 'Vancouver Special' model.

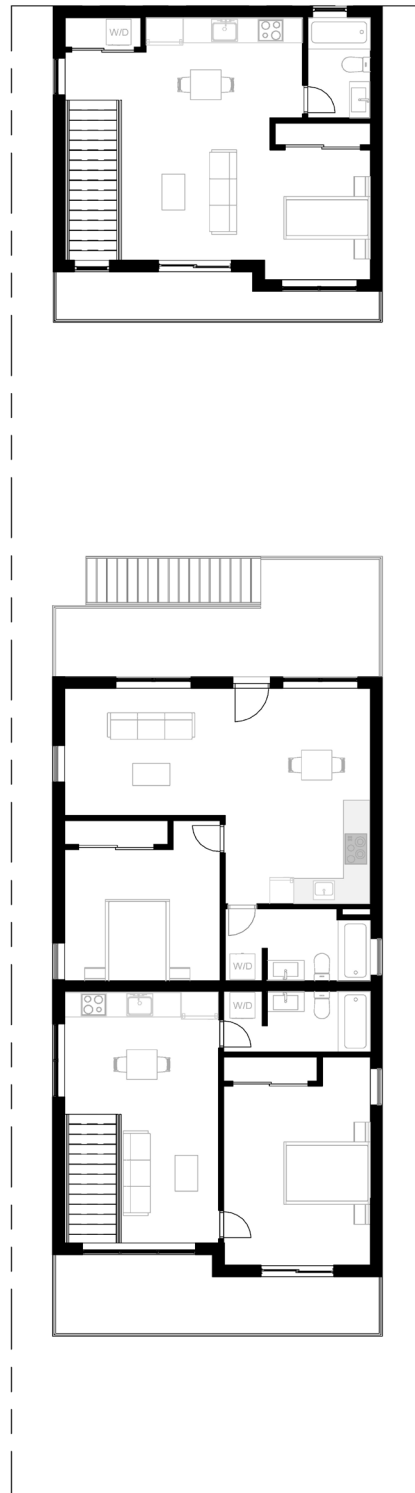


Fig 5.8 Vancouver Special 2.0 upper level floor plan



Fig 5.9 View of Vancouver Special 2.0 courtyard -1



Fig 5.10 View of Vancouver Special 2.0 courtyard -2



Fig 5.11 Render of Vancouver Special 2.0



5.2 Roku House





Lot size: 15m X 37.2m

Site Area: 558 m²

Total Units: 6

On Site Parking: 2

Density (U/HA): 107.5

FSR: 0.85

Development Type: Low Rise

Multi-Unit Housing

Fig 5.12 Render perspective of Roku
Plex

The Mid Century Builder is a housing typology that emerged after WWII to house returning soldiers and their families across the city.³ These homes were designed to be very modest to cut costs and speed up production. The low-sloping roof, absence of a front porch, and the simple treatment of the facade contribute to the simplicity and affordability of construction. Typically, the Mid Century Builder takes the form of a 1 1/2 story boxy cottage , with the main level usually set half a story above grade. This creates a basement level with windows to illuminate the space. This style of house is commonly found on 30 feet and 50 feet frontage lots; the 50 feet lot was chosen for exploration.

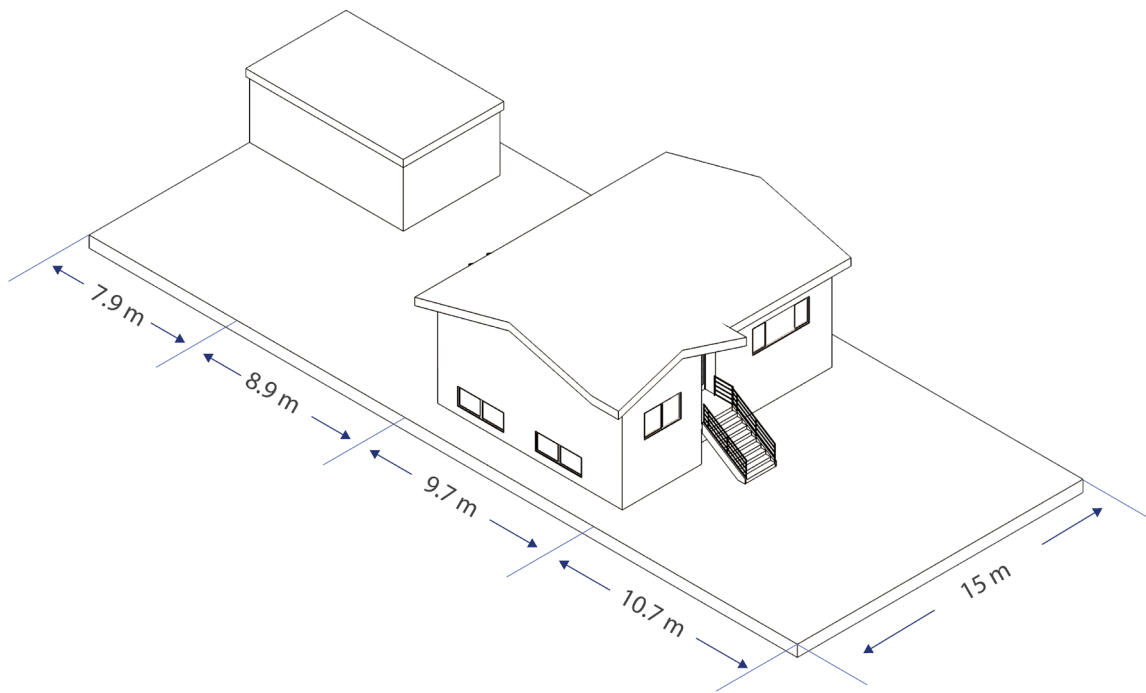
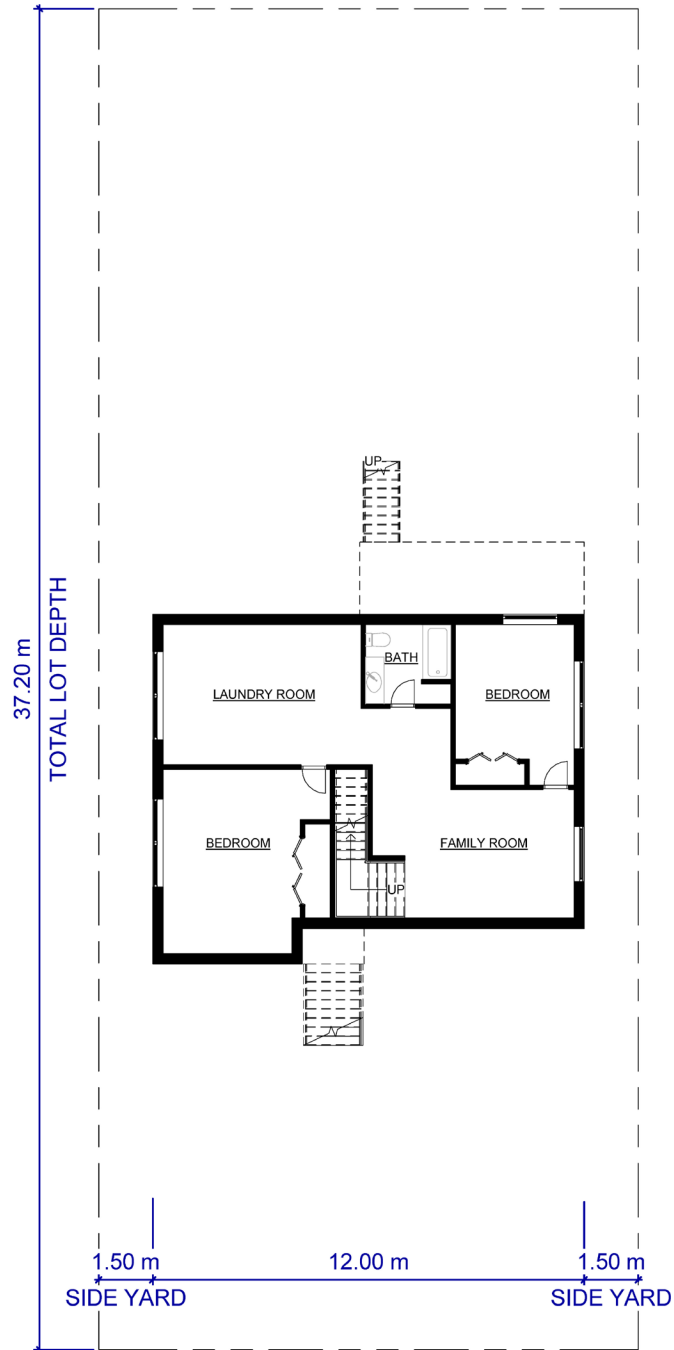
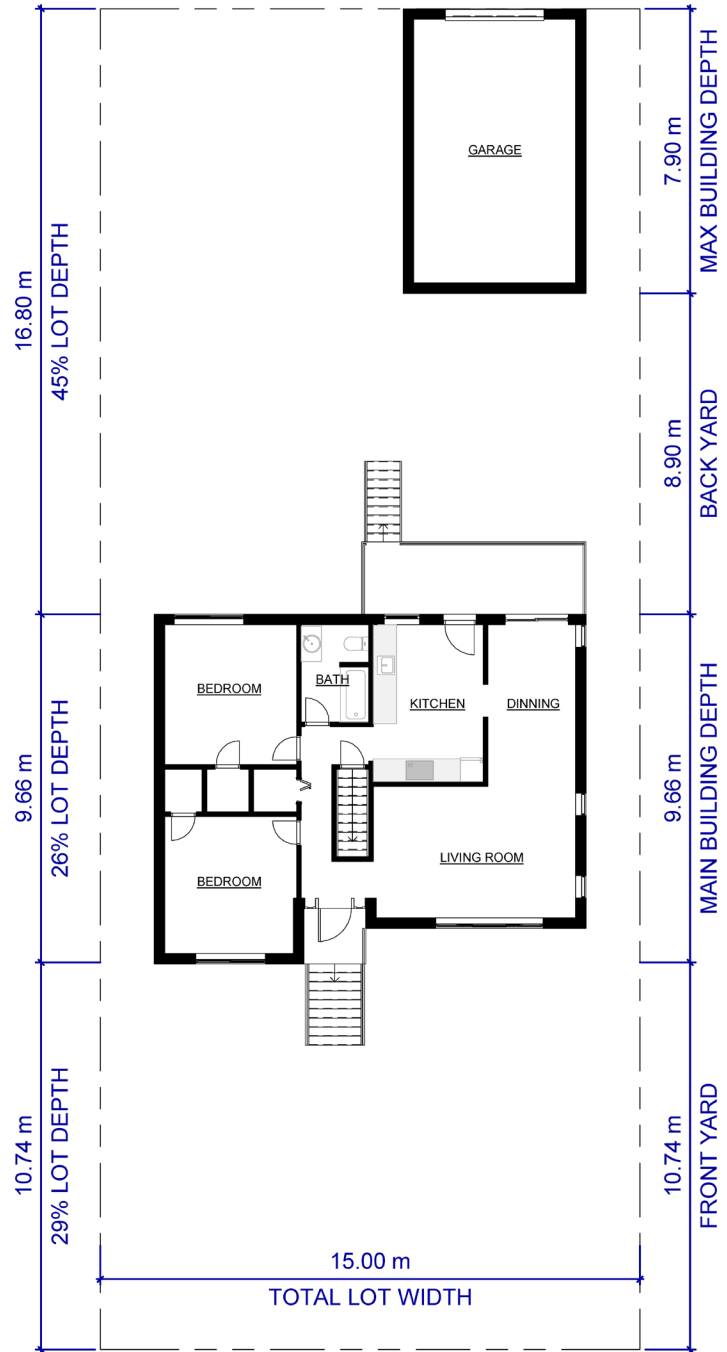


Fig 5.13 Axonometric of Mid-Century Builder typology



Lower Level

Fig 5.14 Mid-Century Builder lower level floor plan



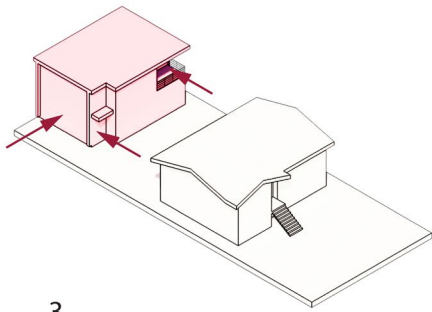
Main Level

Fig 5.15 Mid-Century Builder main level floor plan

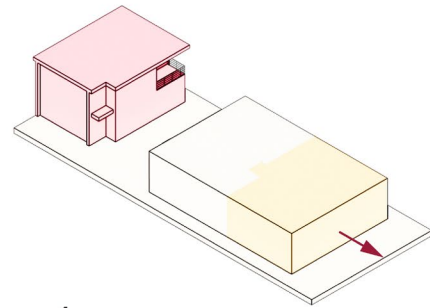
Roku Plex is a 6 unit, multi-residential proposal adapted from the Mid Century Modern house typology boasting a density of 107.5 U/HA. The units within this housing typology are larger in size offering a range of one bedroom to two bedroom and a den unit. The wider street frontage allows for the configuration of two units side by side.

This proposal can be completed in two phases. first, the development of the laneway house and secondly, the development of the main structure. The laneway house consists of an enclosed garage for two parking spaces and a one bedroom apartment above. By extending the front of the house and adding an additional story above, the main house has a total of five units. All the units in this housing scheme are through units, maximizing natural light and ventilation.

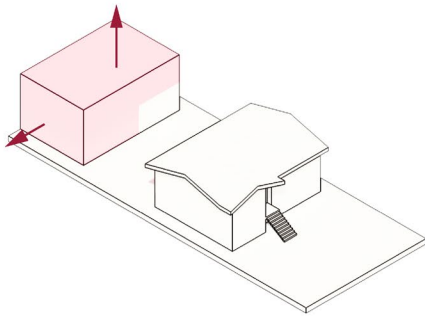
Because of the lot width, the building mass was broken up to create a separation between entrances to the upper level units and the entrance to the main level unit. This also reduces the bulkiness of the form, making it less imposing to the surrounding homes.



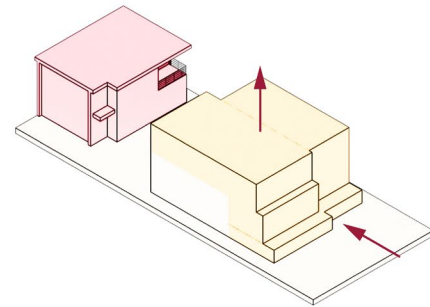
3.



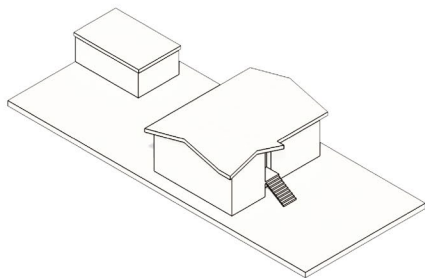
4.



2.



5.



1.



6.

 LANE-WAY HOUSE

 MAIN BUILDING

Fig 5.16 Diagram of Roku Plex building form

Targeted Demographics:

Household Types



Jamie 30, Lisa 28, Tommy 3

Occupation: IT worker & full time mom

Household income: \$90,000/ year

Needs: Large 2 bedroom unit in a residential neighborhood



Samantha 32, Nick 33

Occupation: consultants

Household income: \$150,000/ year

Needs: A two bedroom unit with an office space and parking



Frank 25

Occupation: graduate student /part-time employee

Household income: \$35,000/ year

Needs: A fairly affordable one bedroom unit close to transit



Ronnie 19, Martha 25

Occupation: New residents, university student & teacher

Household income: \$83,000/ year

Needs: 2 bedroom unit that is fairly inexpensive



Reem 20, Nicholas 20

Occupation: university students/part-time employee

Household income: \$55,000/ year

Needs: A one bedroom unit with a balcony



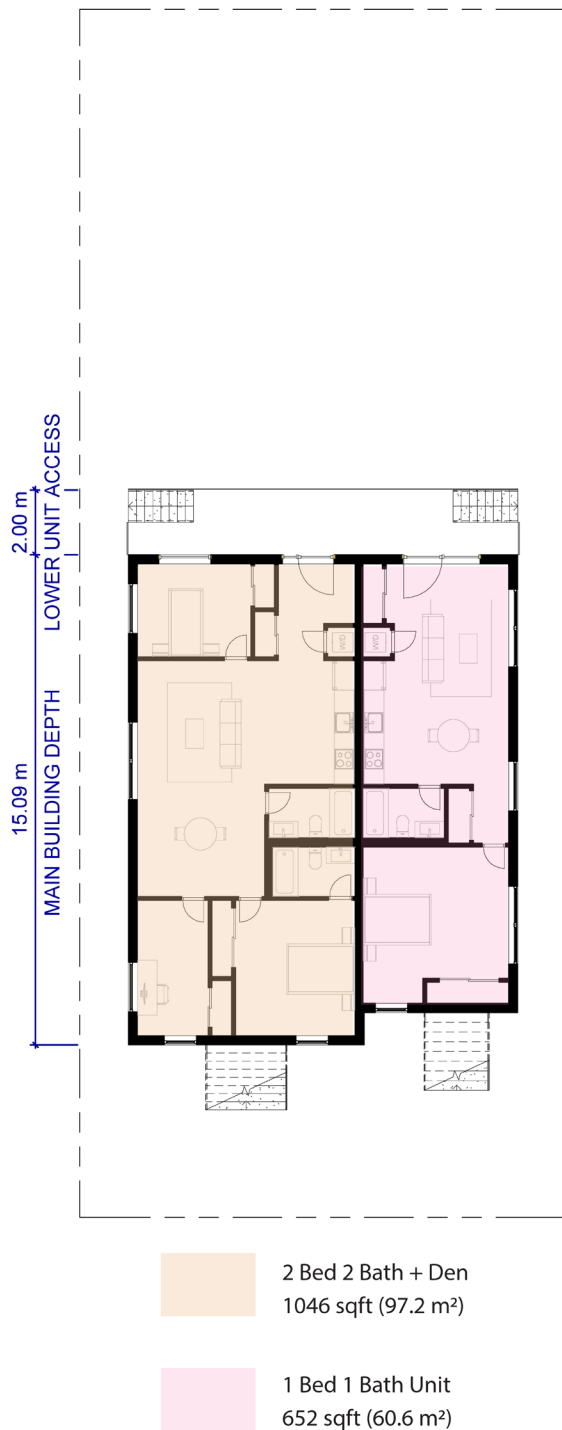
Ellen 44

Occupation: Accountant

Household income: \$86,000/ year

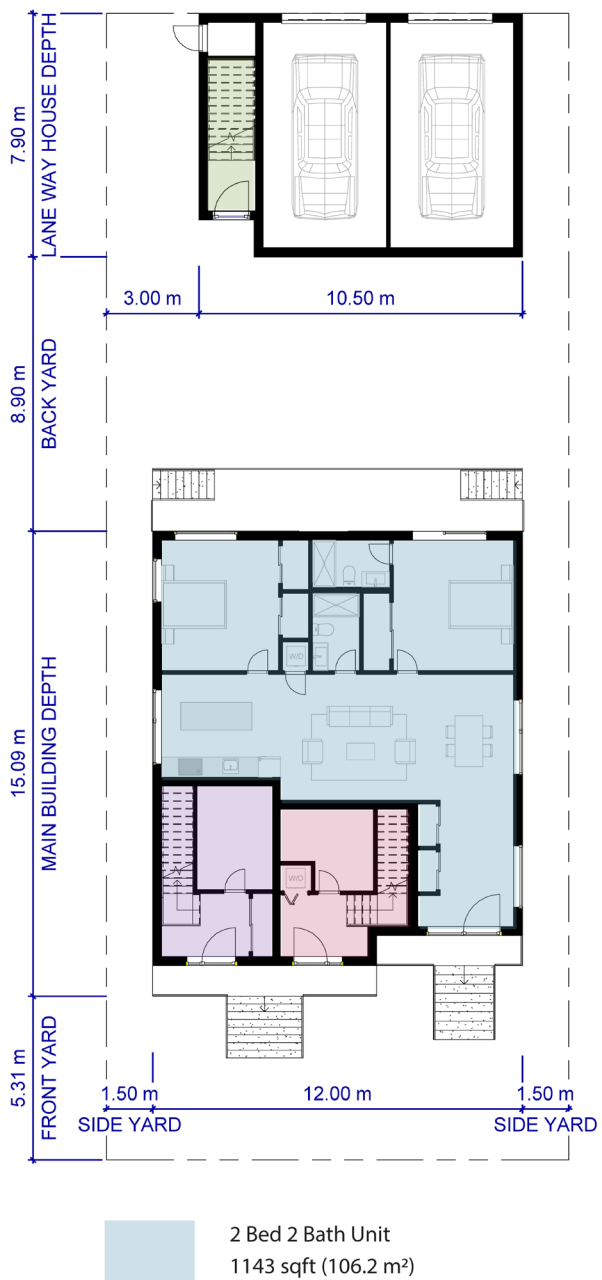
Needs: A one bedroom unit with an office space close to work

FIG 5.17 Diagram of targeted demographics for KOKU PIEX



Because of the raised ground floor, opportunity was created to have units below grade that are more accessible to lower income groups. The basement units have entrances at the rare end of the main building. The basement offers two units, a 1 bedroom and a 2 bedroom plus den unit. These units are more affordable and are a great option for newly graduated individuals or students.

Fig 5.18 Roku Plex basement floor plan



The main level has three entrances towards the front of the house leading to three self-contained units. The main level consists of a t2 bed 2 bath unit that is quite generous in size, ideal for young families or higher income couples. Although parking takes away from usable space that otherwise can become a unit, this proposal believes that the housing scheme would benefit from two parking spots mainly for the two 2 bed 2 bath units above grade.

Fig 5.19 Roku Plex main level floor plan



- 2 Bed 2 Bath + Den
1116 sqft (103.7 m²)
- 1 Bed 1 Bath + Den
674 sqft (62.6 m²)
- 1 Bed 1 Bath Unit
674 sqft (62.6 m²)

Fig 5.20 Roku Plex upper level floor plan

Units on the upper level have less access to the shared open space at grade, therefore, each unit boasts a balcony providing residents with a private outdoor area for seating and even gardening. The through units provide the units with greater access to sunlight exposure and reducing the need for artificial lighting during the day.



Fig 5.21 View of Roku Plex courtyard -1



Fig 5.22 View of Roku Plex courtyard -2



Fig 5.23 Render of Roku Plex



5.3 Cornerstone Flats





Lot size: 20m X 37.2m

Site Area: 744 m²

Total Units: 10

On Site Parking: 4

Density (U/HA): 135.1

FSR: 0.93

Development Type: Low Rise

Housing Complex

Fig 5.24 Render perspective of
Cornerstone Flats

The third scenario explored in this thesis involves the consolidation of two mid-century builder single family lots at the end of the block. Single lots, as explored in the previous two proposals offer limited possibilities when it comes to multi-residential housing typologies. The amalgamation of one to two lots introduces new typological prospects. Notably, the corner lot condition amplifies the potential for up-zoning, facilitated by the increased street frontage and the strategic utilization of the side yard as a designated entrance point. The combination of factors not only expands the range of architectural possibilities but also enhances the viability of multi-residential developments.

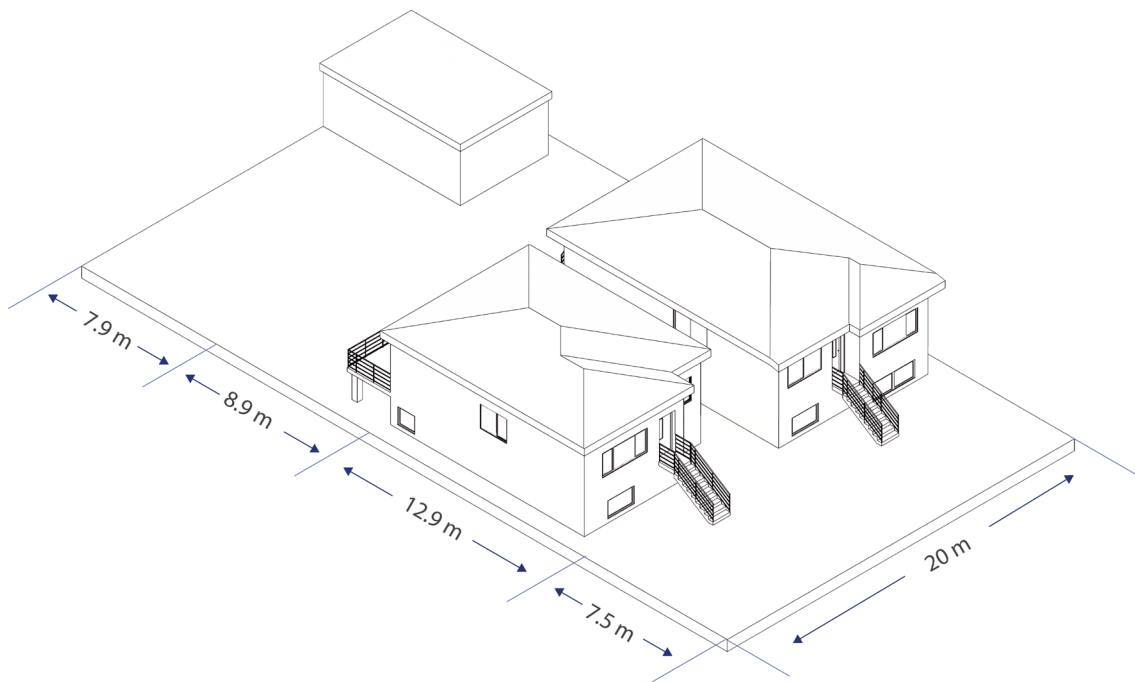


Fig 5.25 Axonometric model of two types of Mid-Century Builder typology

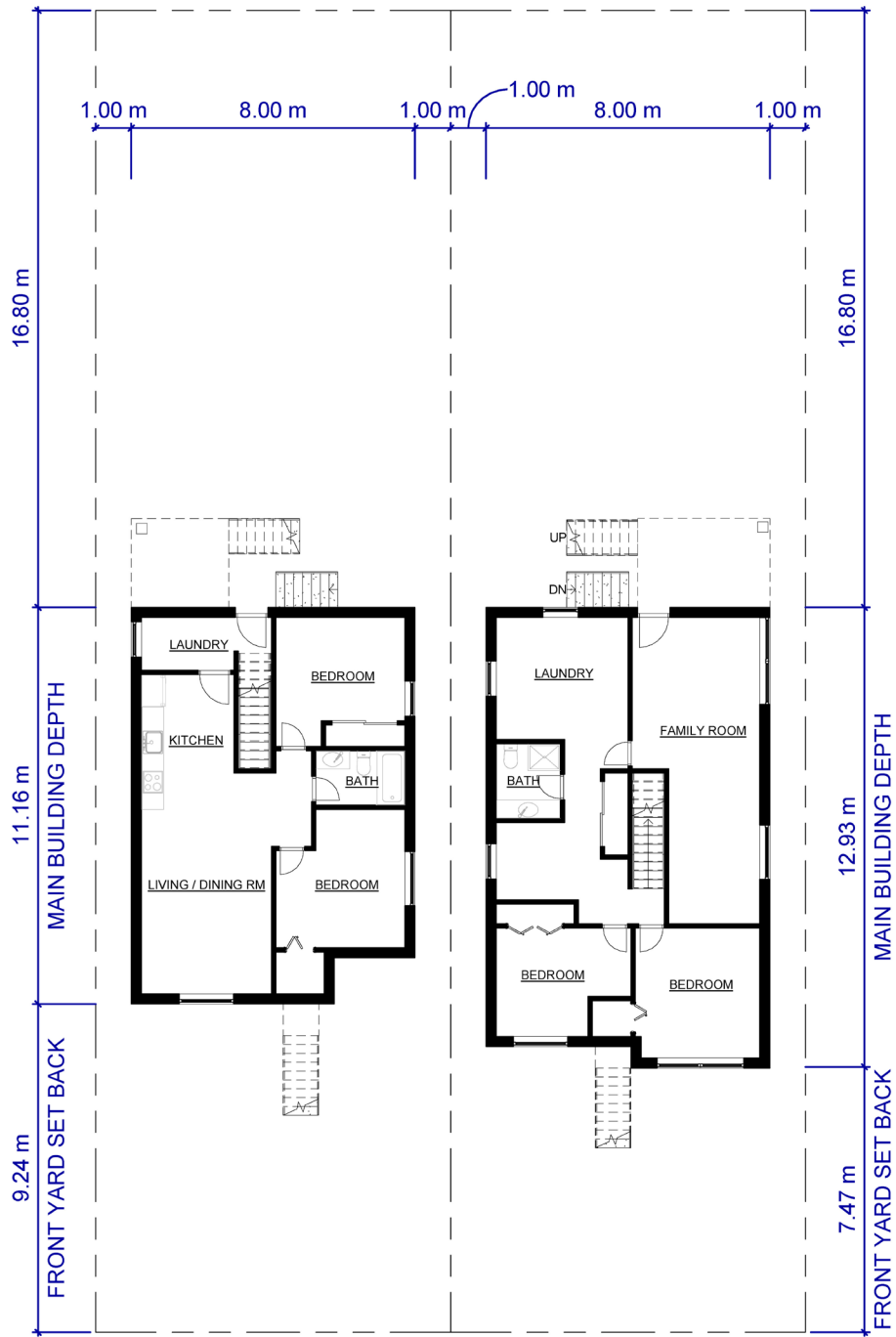


Fig 5.26 Consolidated lots basement floor plan

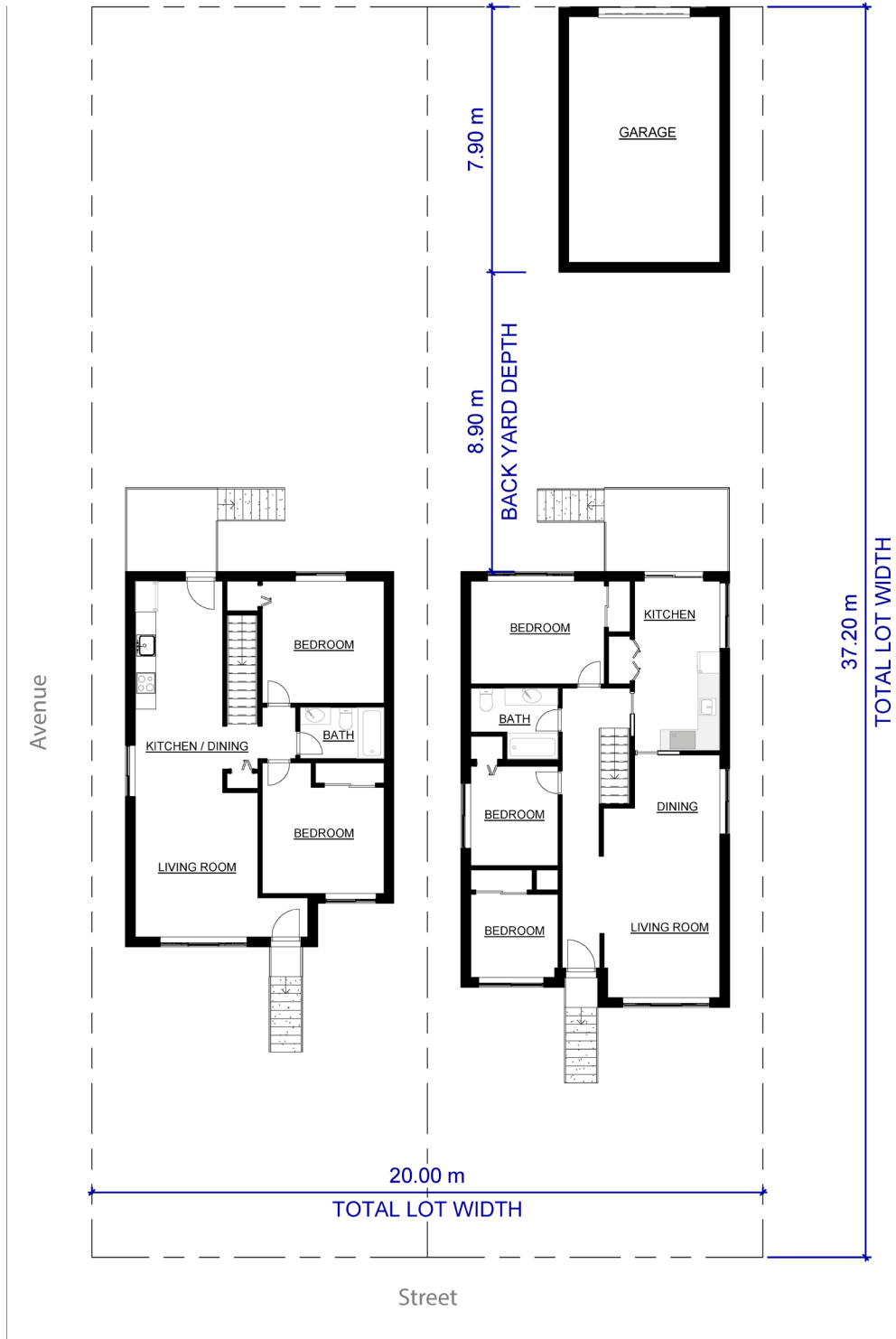


Fig 5.27 Consolidated lots main level floor plan

Cornerstone Flats is a 3 ½ story residential complex boasting 10 units ranging from 1 to 3 bedroom units with a total density of 135.1 U/HA. Unlike previous proposals, this exploration requires more undertaking; first to consolidate two lots, and secondly the added effort of connecting two single family homes into a single structure. However, what this results in is a new typological form and greater unit diversity.

This low rise apartment is comprised of two building forms, a main building and a secondary building connected to a carport. Each of the larger units above ground level have a designated parking spot including an additional spot for visitor or other residents. There are two types of three bedroom units in this proposal; one of which is a two story semi-detached laneway house, and another is the third story unit in the main complex. These units were added to accommodate family households which are many of the existing residents that reside in the yellow belt.

The adaptation of two detached structures involves total reconfiguration of the existing structure, except for the basement level. The core of the residential complex is created by connecting the two properties with a raised foundation. In addition, due to the corner lot conditions, a third story was added to increase housing scheme diversity.

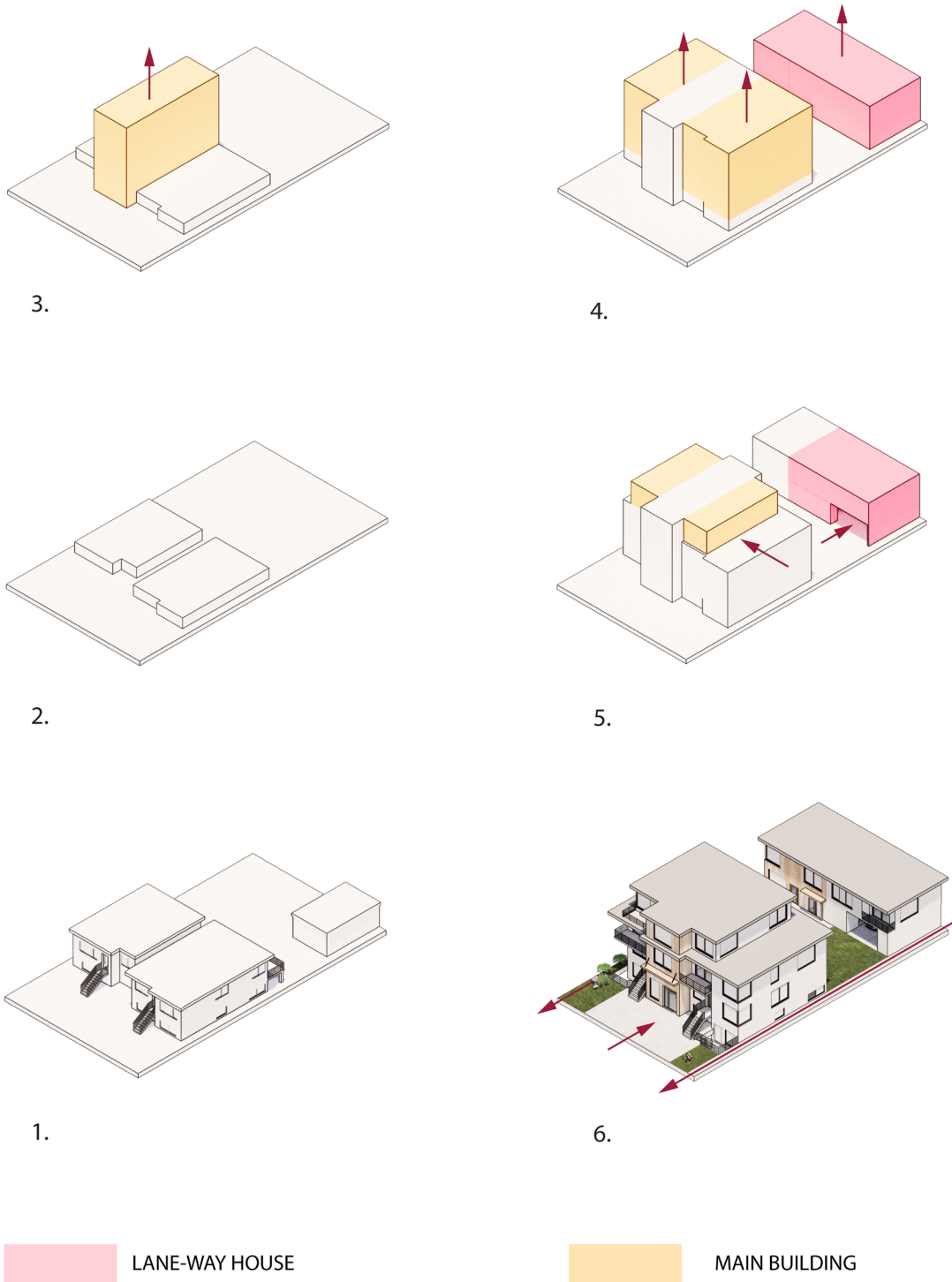


Fig 5.28 Diagram of Cornerstone Flats building form

Targeted Demographics:

Household Types



Jane 65

Occupation: retired, on pension
Household income: \$20,000/ year
Needs: 1 bedroom with great sun exposure



Mathew 26, Lily 22

Occupation: accountant & freelancer
Household income: \$96,000/ year
Needs: 2 bedroom unit in an area that is residential



Sarah 25

Occupation: real-estate agent
Household income: \$90,000/ year
Needs: Spacious 1 bedroom unit with on-site parking



Andrew 30, Janice 30, Selina 4, Charles 2

Occupation: new residents
Household income: \$110,000/ year
Needs: 3 bedroom unit located in a residential neighborhood



Diana 20, Jack 19

Occupation: university students
Household income: \$35,000/ year
Needs: an affordable 2 bedroom unit

Fig 5.29 Diagram of targeted demographics for Cornerstone Flats - 1

Household Types



Linda 32, Jack 3

Occupation: single mother/part-time worker

Household income: \$35,000/ year

Needs: 1 bedroom unit that is fairly affordable



Eason 26

Occupation: med-school student

Household income: \$50,000/ year

Needs: a 1 bedroom unit with balcony



Nancy 25, Rick 28, Rebecca 2

Occupation: Consultants

Household income: \$120,000/ year

Needs: Spacious 3 bedroom unit in a walkable area



Candice 30

Occupation: Social worker

Household income: \$65,000/ year

Needs: A unit close to work and access to public transit



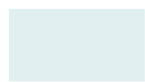
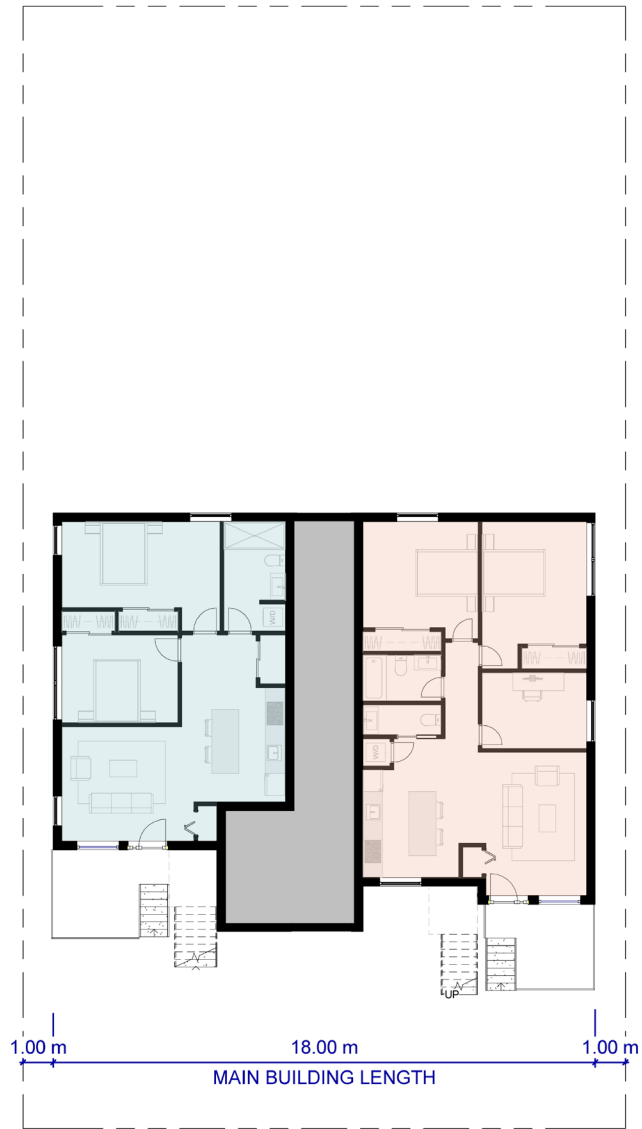
Owen 24

Occupation: entrepreneur

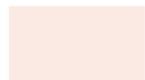
Household income: \$88,000/ year

Needs: Spacious 2 bedroom unit with on site parking

Fig 5.30 Diagram of targeted demographics for Cornerstone Flats - 2

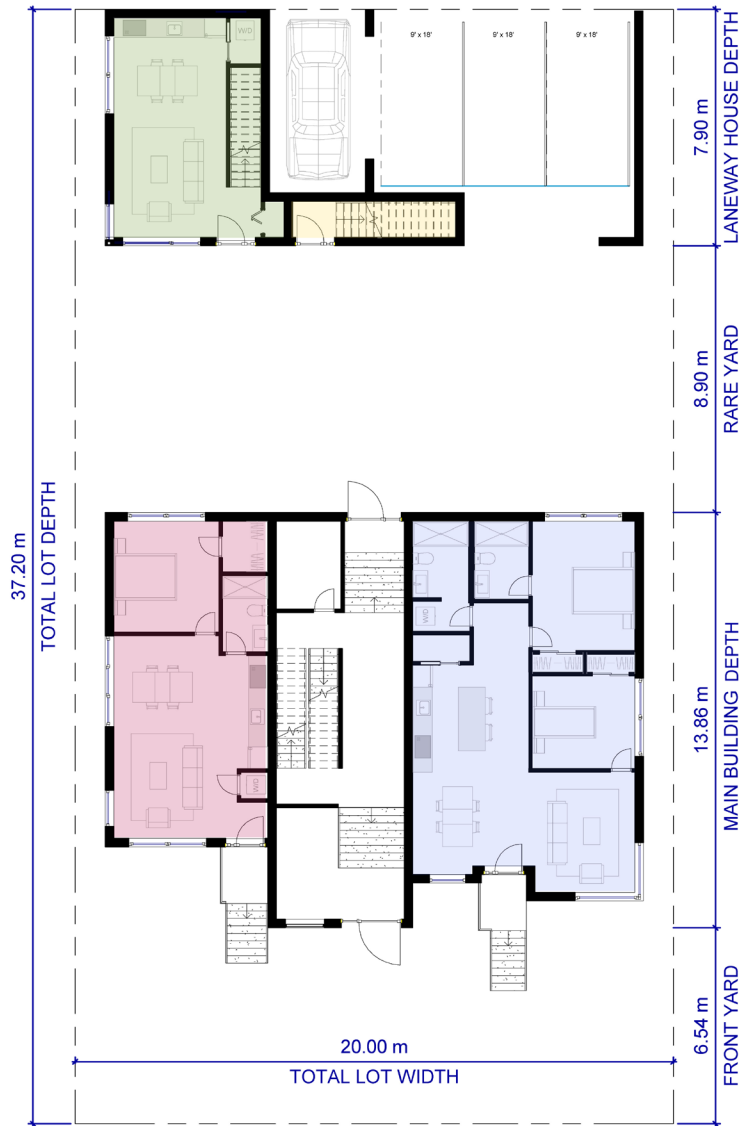


2 Bed 1 Bath Unit
814.8 sqft (75.7 m²)



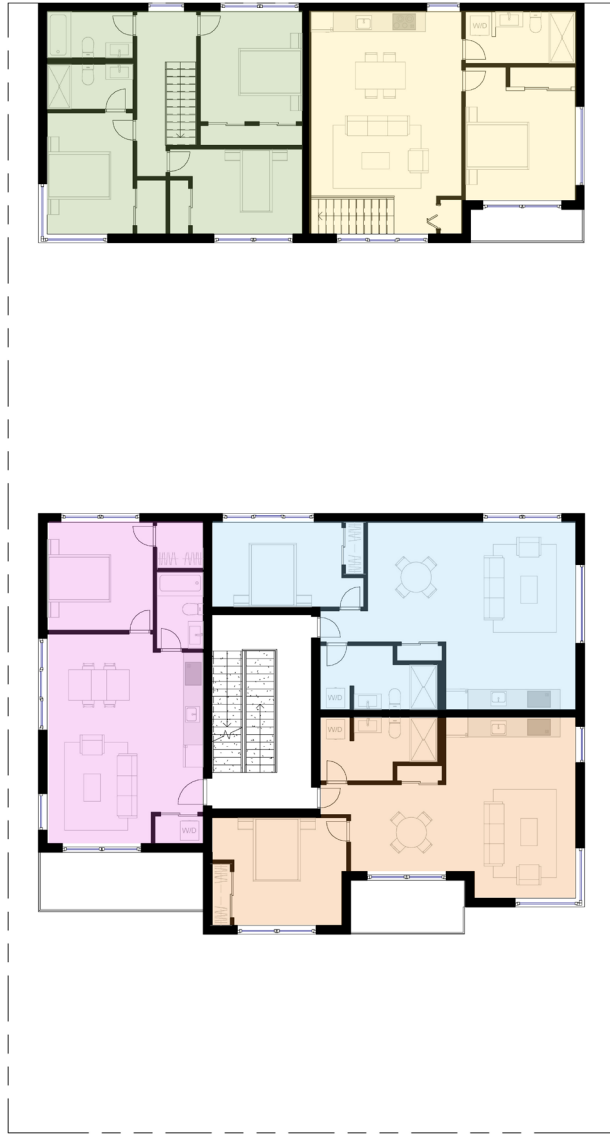
2 Bed 1.5 Bath + Den Unit
963.4 sqft (89.5 m²)

Fig 5.31 Cornerstone Flats lower story floor plan



	1 Bed 1 Bath Unit 586.6 sqft (54.5 m ²)		3 Bed 2 Bath Unit 990.3 sqft (92 m ²)
	2 Bed 2 Bath Unit 956.9 sqft (88.9 m ²)		1 Bed 1 Bath Unit 685.6 sqft (63.7 m ²)

Fig 5.32 Cornerstone Flats ground level floor plan





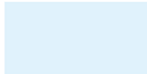


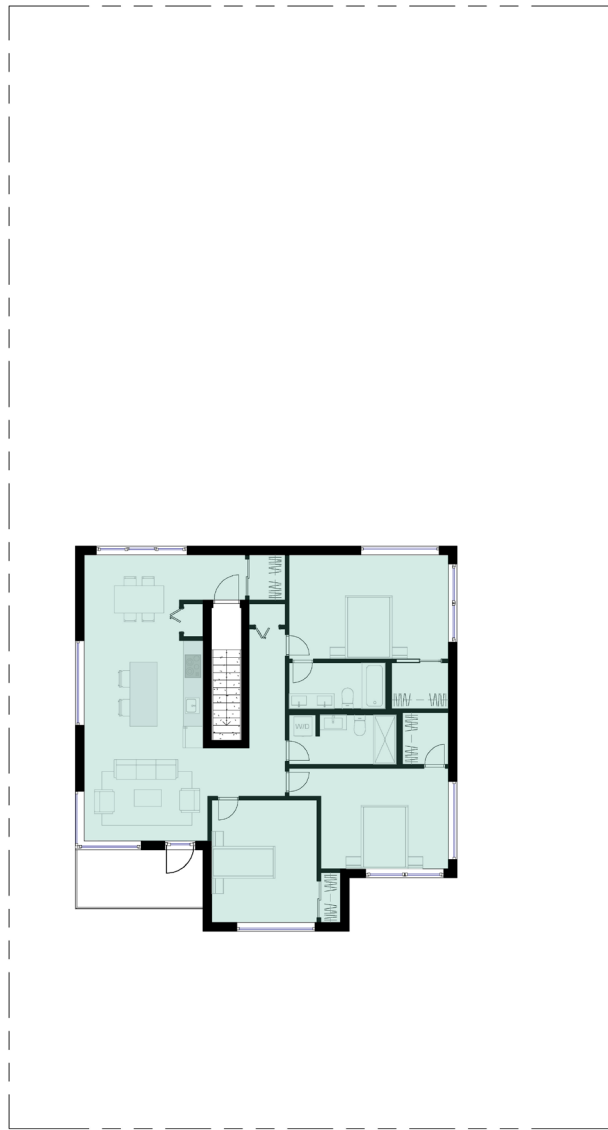
	1 Bed 1 Bath Unit 694.3 sqft (64.5 m ²)		3 Bed 2 Bath Unit 990.3 sqft (92 m ²)
	1 Bed 1 Bath Unit 665.2 sqft (61.8 m ²)		1 Bed 1 Bath Unit 685.6 sqft (63.7 m ²)
	1 Bed 1 Bath Unit 641 sqft (59.6 m ²)		

Fig 5.33 Cornerstone Flats second story floor plan



3 Bed 2 Bath Unit
1313 sqft (122 m²)

Fig 5.34 Cornerstone Flats third story floor plan



Fig 5.35 Render perspective of Cornerstone Flats from southwest





Fig 5.36 Render of Cornerstone Flats





Fig 5.37 Render of conceptualized block of "missing middle" housing forms

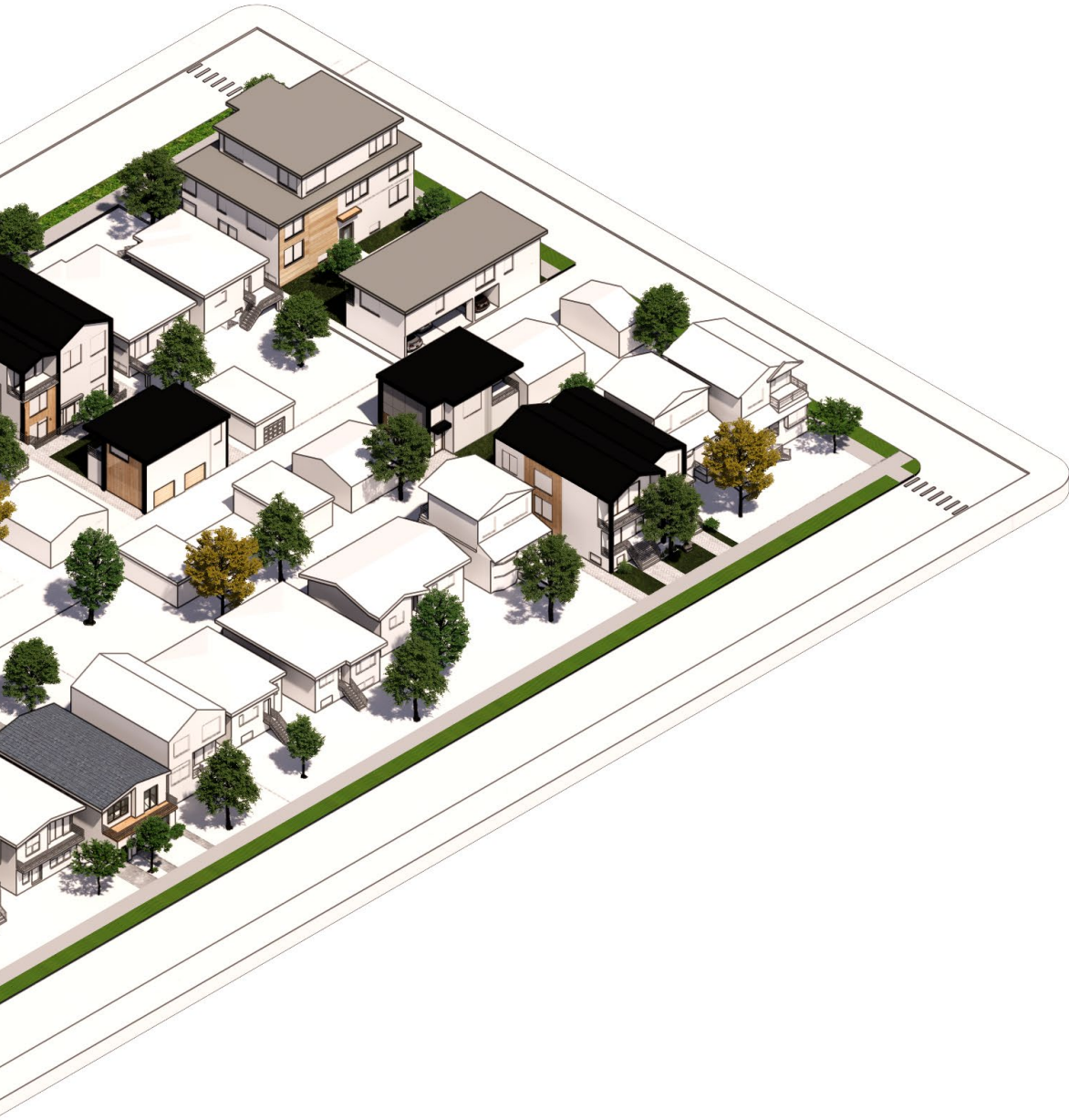




Fig 5.38 Plan view of conceptualized block of "missing middle" housing forms



Endnotes

- 1 Xenia Benivolski, "Vancouver Special," The Canadian Encyclopedia, January 31, 2017, <https://www.thecanadianencyclopedia.ca/en/article/vancouver-special>.
- 2 Curranne Labercane, "The History of the Vancouver Special," Montecristo Magazine, December 21, 2017, <https://montecristomagazine.com/design/history-of-the-vancouver-special>.
- 3 "Mid Century Builder," Vancouver Heritage Foundation, Accessed December 10th, 2023, <https://www.vancouverheritagefoundation.org/house-styles/mid-century-builder/>.

06 Conclusion

A soft density approach

Housing as a commodity have historically been emphasized in Vancouver society and ingrained in the city's social and urban fabric. Throughout the in depth research undertaken in this thesis, it becomes apparent that strategic deregulation of the 'yellow belt' and mechanisms that continues to protect it. Breaking away from the exclusionary zoning practices is a crucial step to effectively addressing the housing crisis at stake. Therefore, the proposed solution advocated in this thesis is centred around up-zoning low density neighbourhoods through incremental, small lot interventions and the adaptive transformation or renovation of existing housing forms. This approach to upzoning not only renders the process of densification more feasible on a broader scale but eliminates the need for extensive measures that require multiple lot consolidations, demolition, reconstruction, and significant capital investment.

The design development of this thesis positions itself as an exploration of one of many ways in which housing can be made more accessible to Vancouverites. It is not intended to become a sole solution that will solve the complex issue of Vancouver's affordability issue, but rather a different approach from the redevelopment schemes put forward by many architects in the city. The proposals seek to add to a discussion of how the remaining 64% of residential land can be comprehensively densified across the city. Thus, In this thesis, Vancouver Special 2.0, Roku Plex and Cornerstone Flats attempts to offer new possibilities and to showcase how densification can be achieved with the prospect of modifying existing built forms.

Challenges

One of the main challenges encountered in progression of this thesis was defining the scope and trying to tackle adequate housing supply in a more nuanced and comprehensive manner. Within the overarching objective of large scale, comprehensive up-zoning. The seemingly straight-forward goal of densifying individual lots in the city revealed a layer of added complexity. Prompting questions such as:

- What housing typology that is 'typical' to the city should be explored?
- How to densify without redeveloping the lot?
- How would the proposal present innovative housing typologies under the constraints of existing structure?
- Who are the actors in developing such type of multi-plex?
- Is adaptation an effective way to up-zone under the conditions of lot consolidation?
- What type of tenure would the housing scheme present its residents, and how would affordability be maintained?

These questions have been largely addressed in the design proposal chapter of this thesis.

New developments

The search for “missing middle” in the city of Vancouver has been years in the making and has proven to be a lengthy process of research and development. As stated in previous chapters, over the years, the city has rolled out new policy in attempt to densify the yellow belt and combat housing unaffordability. However, those solutions have made little to no impact on the overall housing affordability in the city. Recognizing the need for a more radical and comprehensive solution to densify residential areas in parallel to curbing the cost of housing, the city has put forward an ambitious plan to implement wide-spread upzoning such as the Vancouver Plan published in 2022 which envisions a new land use strategy that eliminates single family zoning. The vision establishes the role of multi-plexes as the new ground oriented typology that of the ‘single family home,’ while delivering more affordability and housing options.

In the final stages of this thesis, new advancements have emerged, effectively dismantling the once constraining regulations within the ‘yellow belt,’ thereby creating opportunities of “missing middle housing” to exist in the city. The new amendments made effective in October of 2023 consolidated all of the RS zones into one RS inclusive zone, allowing for up to four units per typical, 33ft single family lots and up to 8 units per typical, 50ft duplex lots. The new zoning also increases FSR to 1 for new infill housing developments with a focus or development goal for long term rental tenure. Parking space requirements have also been eliminated to allow for increased density.

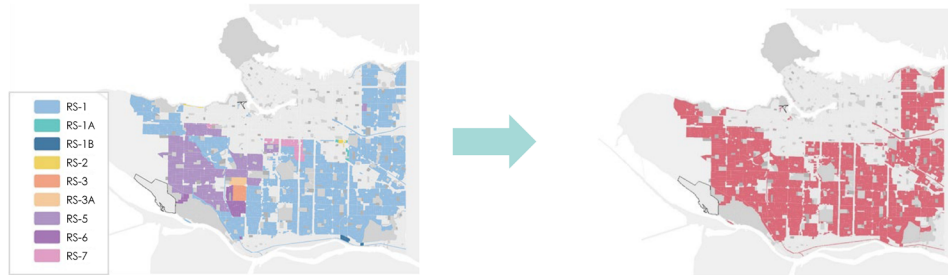


Proposed Changes to Simplify Regulations

Moving Towards 3-3-3-1 Framework

17

Changes allow 9 existing zones to be consolidated into 1 simplified zone



Adding Missing Middle Housing
+ Simplifying Regulations



Fig 6.1 Proposed zoning change for RS zones in Vancouver

New Multiplex Option

Proposed Changes

10

Existing Options



House + Laneway

- 3 Units
- 0.86 FSR



Duplex + Suites

- 4 Units
- 0.70 FSR



Character Retention

- 6 Units
- 0.85 FSR

Proposed Option



Multiplex

- 3 to 6 ownership units (8 units for rental)
- 1.0 FSR with
 - Density bonus charge, OR
 - All units secured as rental, OR
 - Below-market unit provided
- 3 storeys (grade or shallow basement)
- Focus on family-size units (2+ BRs)
- No required on-site car parking



Adding Missing Middle Housing
+ Simplifying Regulations



Fig 6.1 Proposed zoning regulation for missing middle housing in Vancouver

Moving forward with housing affordability

It is important to note that while the “missing middle” issue constitutes a significant facet of Vancouver’s currently housing crisis, this thesis acknowledges that many aspects related to housing affordability have yet to be explored. Addressing those issues warrant further exploration.

BIBLIOGRAPHY

- Almssad, Asaad, Amjad Almusaed, and Asaad Almssad. 2018. *Housing*. London: IntechOpen.
- Benivoski, Xenia. "Vancouver Special," *The Canadian Encyclopedia*, January 31, 2017. <https://www.thecanadianencyclopedia.ca/en/article/vancouver-special>.
- Berelowitz, Lance. 2005. *Dream City : Vancouver and the Global Imagination*. Vancouver: Douglas & McIntyre.
- Bond, Abigail. 2022. "Affordable Housing and Diversity in Vancouver." In *Cities and Affordable Housing: Planning, Design and Policy Nexus*, edited by Sasha Tsenkova, 27-37. Oxfordshire: Routledge, 2022.
- Canada Mortgage and Housing Corporation. *Rental Market Report, 2023*. Canada: CMHC, 2022. <https://www.cmhc-schl.gc.ca/en/professionals/housing-markets-data-and-research/market-reports/rental-market-reports-major-centres>.
- Carpenter, Juliet and Tom Hutton. 2019. "Vancouver - Critical Reflections on the Development Experience of a Peripheral Global City." *Cities* 86: 1-10. doi:10.1016/j.cities.2018.12.006.
- City of Vancouver. *Housing Vancouver Strategy, 2018* (Vancouver: City of Vancouver, 2018). <https://council.vancouver.ca/20171128/documents/rr1appendixa.pdf>.
- Firley, Eric, Katharina Grön, Calver Lezama, and Kate Ward. 2013. *The Urban Masterplanning Handbook*. West Sussex, England: John Wiley & Sons.
- Harrouk, Christele. "World's Most Liveable Cities in 2023: Discover the Cities Offering the Highest Quality of Life." *ArchDaily*, June 28, 2023. <https://www.archdaily.com/1003040/worlds-most-liveable-cities-in-2023-discover-the-cities-offering-the-highest-quality-of-life>.
- Holdsworth, Deryck. 1986. "Cottages and Castles for Vancouver Home-Seekers." *BC Studies* (Apr 01,): 11. <https://search.proquest.com/docview/1308819662>.

- Jacobs, Jane. 1961. *The Death and Life of Great American Cities*. New York] Random House:.
- Lauster, Nathanael Thomas. 2016. *The Death and Life of the Single-Family House : Lessons from Vancouver on Building a Livable City*. Philadelphia: Temple University Press.
- Labercane, Curranne. "The History of the Vancouver Special." Montecristo Magazine, December 21, 2017. <https://montecristomagazine.com/design/history-of-the-vancouver-special>.
- Ley, David. 1996. *The New Middle Class and the Remaking of the Central City*. Oxford: Oxford University Press.
- Macdonald, Elizabeth. 2008. "The Efficacy of Long-Range Physical Planning: The Case of Vancouver." *Journal of Planning History* 7 (3): 175-213. doi:10.1177/1538513207309360.
- Metro Vancouver. "Housing Data Book." Metro Vancouver. Accessed December 15, 2023. <https://metrovancover.org/services/regional-planning/housing-data-book>.
- MLS® HPI Home Price Comparison January 2013. Accessed September 5th, 2023. https://www.rebgv.org/content/rebgv-org/market-watch/MLS-HPI-home-price-comparison.hpi.greater_vancouver.all.all.2022-12-1.html.
- MLS® HPI Home Price Comparison January 2023. Accessed September 5th, 2023. https://www.rebgv.org/content/rebgv-org/market-watch/MLS-HPI-home-price-comparison.hpi.greater_vancouver.all.all.2022-12-1.html.
- "Mid Century Builder." Vancouver Heritage Foundation. Accessed December 10th, 2023. <https://www.vancouverheritagefoundation.org/house-styles/mid-century-builder/>.
- Mills, Caroline A. 1991. "Fairview Slopes, Vancouver: Gentrification in the Inner City." *The Canadian Geographer* 35 (3) (Sep 22,): 306-310.

doi:10.1111/j.1541-0064.1991.tb01105.x. <https://api.istex.fr/ark:/67375/WNG-VQJMORVP-2/fulltext.pdf>.

Novakovic, Stefan. "Zoned Out." Building. Accessed December 15, 2023. <https://building.ca/feature/zoned-out/#:~:text=Coined%20by%20urban%20planner%20Gil,permit%20only%20detached%20residential%20housing>.

"Oakridge." Henriquez Partners Architects, November 2, 2023. <https://henriquezpartners.com/projects/oakridge/>.

Parolek, Daniel G. and Arthur C. Nelson. 2020. *Missing Middle Housing : Thinking Big and Building Small to Respond to Today's Housing Crisis*. Washington: Island Press.

Peck, Jamie, Elliot Siemiatycki, and Elvin Wyly. 2014. "Vancouver's Suburban Involution." *City* (London, England) 18 (4-5): 386-415. doi:10.1080/13604813.2014.939464.

"Vancouver Housing Styles." Vancouver Heritage Foundation. Accessed December 10th, 2023. <https://www.vancouverheritagefoundation.org/house-styles/mid-century-builder/>.

Vancouver Urbanarium Society. The Missing Middle Competition, 2018 (Vancouver: Urbanarium). <https://drive.google.com/file/d/1o2Hk1cIAQMc3U-TQ5SaTKQimwtm0jLCC/view>.

Zacharias, John. "The Redevelopment of Fairview Slopes in Vancouver, 1975-1995." *Urban History Review / Revue d'histoire Urbaine* 26, no. 1 (1997): 32-42. <http://www.jstor.org/stable/43559891>.

