Backyard Densification:
Resectioning Urban Residential Lots

by

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Submitted in partial fulfilment of the requirements
for the degree of Master of Architecture

at

Dalhousie University
Halifax, Nova Scotia
June 2017

CONTENTS

ABSTRACT

City densification techniques have become stagnant. Suburban land use needed to be revisited and a resectioning of lots implemented. This thesis investigates the typical characteristics of the suburban city lands, neighbourhoods, blocks, individual lots, and architectural forms. By implementing the new densification model on a project neighbourhood in Victoria, BC, this thesis aims to show that resectioning the lot and urbanizing the program composition of the suburban neighbourhood is a long-sighted model for housing in the city. Access is focused on walking, biking, and transit suiting the demographic living there rather than vehicular transportation. Pulling from the success of laneway housing, backyard housing offers new opportunities such as ownership, shared land, and updated infrastructure. This solution combats the oversized max-zoning of homes and the large scale redevelopment of urban blocks. By dividing lots the backyards become a viable space for citizen redevelopment and a hub for social activity.

ACKNOWLEDGEMENTS

Thank you too all my family and friends that have helped me overcome my reading and writing disability. Without your love and support I would not have made it this far.

CHAPTER 1: INTRODUCTION

Welcome to the Backyard

Suburban sprawl has spread uncontrollably and is perceived as necessary to achieve the ideal family lifestyle. Traditional urban residential zoning has taken over forests, watersheds, and farmland as cities grow beyond a human scale and the common land around the cities become private. Architectural interventions seek ways to mitigate the damage that low density has created while strengthening urban life. Unfortunately, the systems in place are set up in such a way that citizens cannot take control for themselves. Families are being pushed farther from the cities' cores, and in turn, cities are seen as unsafe and hostile places for children to grow up. The intent of the following research is to fix the systematic forces pushing families from cities and to further the discussion of the way densification is implemented.

Cities do not have a space problem; rather, they have an access to space problem because all property is privately owned. Furthermore, convincing the owners of the greater good to acquire the underutilised land is difficult. This problem should be approached in a constructive way rather than the destructive methods in use now. Accessing the land becomes a key factor in the practicality of development. While tackling urban sprawl, it is important to assess how the problem manifested itself in Canada. Old Canadian cities follow a rectangular block layout that was superimposed upon the landscape regardless of the site's topography or landscape elements. Historically, a dense core was advantageous tactically and defended by an outer wall; however, expansion pushed the suburban areas to grow outside the town along a similar grid. Many older cities in Canada struggle with slow growth while still over extending the resources within their cores. Despite the lack of sky scrapers, these cities remain active but on a smaller scale. The traditional residential areas of smaller cities tend to attract families, but with the high demand for housing, developing these areas has become a profitable enterprise. Suburban sprawl housing is endangering family oriented cities because of the ease of availability outside the city. Where larger cities have the ability for efficient, fast, mass transit; these smaller cities rely on either living close to the core, or further away with a car in the suburbs. Another obstacle is the division of land around cities into different municipalities; thereby, offering

less control over the building and zoning practices. Metropolitan cities have had a higher need for urban densification, so looking to them for solutions spurred the Backhouse concept. Laneway housing is compatible with old Canadian cities; however, without an efficient transit system, it must be placed within a reasonable 30-minute walking distance from the core to be comprehensive. The issue with implementing laneway housing in older towns is the lack of lanes built for garbage collection, electricity, plumbing and cars. Moreover, new subdivisions are built tighter together leaving no space for a lane. Despite this, the lack of laneway networks may help foster minimally car-oriented residents.


What's in your backyard? collage

The laneway house is a recent development in density solutions and although well-thought out for zoning setbacks and codes it is missing the social development of the traditional residential homes and properties. The social aspect is the least researched aspect of implementing a backhouse and how it would be integrated into the space as an amenity rather than necessity. Architecture has been known to act beyond the physical building and will be the critical part of developing a viable solution. Privatization has threatened the idea of courts and squares as a place for the public to interact with each other

socially on land. Automobiles have disrupted urban living and have become inseparable from suburban living. They have diluted cities rather than maintaining the conception of a core amenity. People no longer interact with their neighbours and communities are segregating; at the same time, informal interaction has declined often leading to a fear of strangers. Regrettably, these issues persist even in dense city cores. Density is vital to the growth of cities because of its environmental benefits. Once used for growing food; private yards are underutilised today. While there has been a resurgence of urban agriculture, most families do not have the need nor do they choose to produce their food. As a result, backyards have much more potential to implement density.

Environmental pressure for densification of the communities around cities has caused buildings, and the people in them, to be displaced. Underutilised space should be used before rebuilding infrastructure to mitigate this issue in ageing cities. However, infill should not degrade parks or natural areas, nor should they become homogenous and diminish into residential towns. Old Canadian cities are growing faster than the housing market can keep up with thereby pricing families out of cities. Mass rezoning combined with the cost of land means most developers are looking for a quick turnaround when building new housing. Unfortunately, poor housing quality prevails because there is no better affordable option available to the average family. Two ways cities can infill are finding vacant industrial lots where culture and people have left, or using oversized plots of private land. Backyards should be utilised over industrial sites because an increase of population in the city core will place a higher demand on the services provided by industrial areas to keep the city thriving.

A solution is needed if families are to return to the cities and teach the next generation how to live in an urban context without dependence on cars. The Backhouse is the next urban revitalization tool for this family-oriented densification. It will blend demographics and situate families close to services. The Backhouse solution should not be seen as a holistic solution and must also be combined with other urban densification strategies to optimise the core while simultaneously phasing out the endless streets of postwar suburbia. To make a space, the lot will be divided again like lots were historically. Backhouses are a citizen's approach to saving the cities they have grown to love rather than uprooting their families.
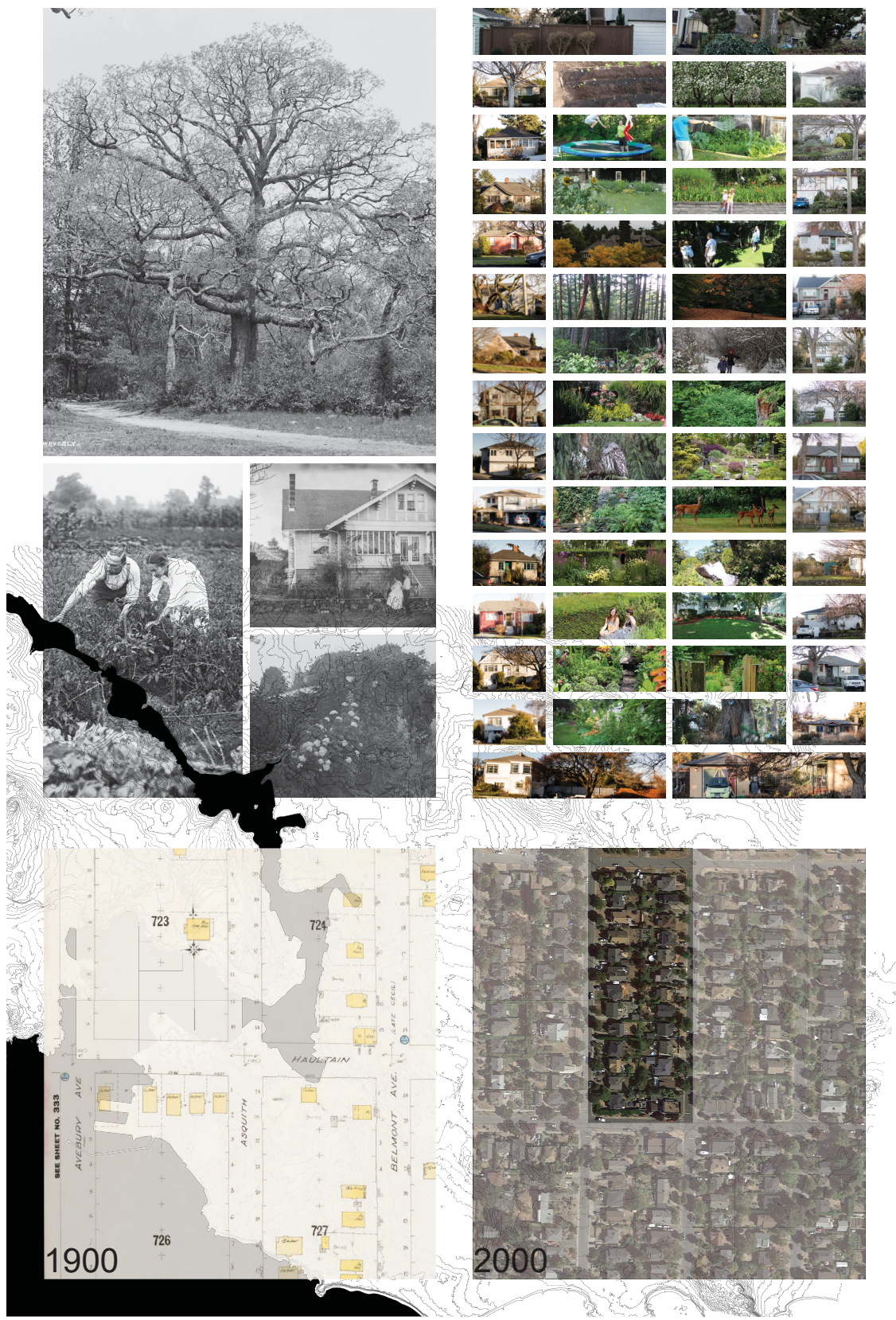
Photomontage of zoning development over time

The backhouse will be placed in backyards and may be developed by the owners of the property, but selling them off is also an option. Laneway guidelines serve as a starting point, but backhouses will focus on the relationships in the backyard. Densification will further require a re-sorting of the demographics. Larger families will inhabit the main homes with underutilised bedrooms, while owners or 1-3 person households will use smaller backhouses. Communities will be more accepting of backhouses if the houses follow positive design guidelines paired with codes, regulations and access schemes. The test implantation site will be in Oaklands, Victoria, B.C. using the design guidelines while taking into account site specific conditions of the area and its environment, history, economics, and community.

When executed in the majority of a block, the relationships can be renewed, and reactivate neighbourly bonds. A rise in informal interactions will subsequently increase people's willingness to help each other in symbiotic ways. Moreover, the families who choose to remain in the neighbourhood after children move out of the main house, but move to a backhouse, will foster, preserve, and grow the intangible community, unlike other densification typologies which rely on new tenants from outside the neighborhood. The increase in population will mean the smaller local shops will be able to compete with the larger stores that are farther away but within driving distance. With fewer people traveling in and out of the city, residing closer to work, after work activities and interactions will become easier and more common. Likewise, with more free time volunteering will be seen as less of a chore and more of a benefit to the community. Density is also vital to recreation because just as jobs vary so do hobbies; therefore, being able to bond over personal interests is key to reestablishing interpersonal bonds of a neighborhood.

The following chapters are sequenced to guide you from problem to implementation. Starting with an overview of the Canadian housing issues architecture is facing today. Moving from a broad scope and analysis of urban sprawl and where the problems lie within that discourse. Indicating what the thesis will encompass and omit from the problems sets up a defined project interjection. The solutions to the problem are then developed incrementally around traditional urban residential lot typology. The solution will then be applied holistically to the test location in Victoria, B.C. detailing faults and successes that emerge from the typological solution.

There where it is we do not need the wall:

He is all pine and I am apple orchard.

My apple trees will never get across

And eat the cones under his pines, I tell him.

He only says, "Good fences make good neighbours."

Spring is the mischief in me, and I wonder

If I could put a notion in his head:

"Why do they make good neighbours ?"

(Frost 1915, 12)

The timing is perfect for backhouses to be taken seriously. The public is informed of all the systems that have lead to the current state of housing. Neighbourhood councils are willing to listen to designers who care for the individuality of each place. Although municipal councils are defensive of development, having more options will help them come around to the more urban ideals of public spaces. A resurgence of community-centered design around desegregation of the property will propel fragmented neighborhoods into complete communities.

Thesis Question

What is the ideal way to implement densification in underutilized traditional urban residential lots, and how does architecture form and support the resulting relationships?

CHAPTER 2: CANADIAN HOUSING CONDITIONS

Defining the suburban condition and the density typologies developed to combat it will help identify the ideal implementation of this areas densification. Canadian cities are pursuing densification as a solution to social, economic, and environmental sustainability. However, the evaluations of success are based solely based on people per square kilometre and assuming the benefits of densifying are linked directly to it. Cities in housing crises will need more than just places to house humans but also the amenities that come with supporting humanity. Suburbias existence proves density in cities is not the end all be all, and there must be benefits to the suburban lifestyle or it would have capped out and stopped growing. Dividing up the factors associated with housing four categories are discussed. Starting with who is living in suburbia and defining the needs of these demographics. Delving deeper into the activities traditional residential housing supports will define the needs and wants of the place. What pressures have been placed on cities to justify the zoning of new suburbs? Lastly the effects of living in the suburbs on social integration. All are having an impact on the architecture of the place.

Zoning

Zoning has been around since the colonisation of Canada. It was used to regulate land use and control the growth of cities. There are three types of zoning areas: urban, suburban, and rural. Urban zoning looks to be diverse and holistically accommodate the needs of the residents without having to journey out of the city. Suburbs were named from "Latin suburbium, from sub- 'near to' + urbs, urb- 'city'" (Google 2017) these areas were to rely on the enmities of the city. Rural provided the supplies for the city to operate despite the size of the population.

The urban dwelling had a humble beginning starting as single family homes transformed from the rural farmstead "big house, little house, back house, barn" where one family would own land and their sons or daughters, depending on the culture, would build a home for their family and so on. As parcels of land became more subdivided the urban typology emerged, but the "ideal" home persisted where land and financial means allowed it. These villages acted as nodes along travel routes of roads, rivers, and ports. By the time settlement of Canada was taking place the city had zoned and planned regardless

Sports	Planting	Walking	Watching
Burning	Harvesting	Cooking	Mowing
Gardening	Building	Fixing	Climbing
Learning	Meeting	Composting	Reading
Celebrating	Eating	Discovering	Sleeping
Playing	Storing	Imagining	Drying

PUBLIC

GROUP — INDIVIDUAL

PRIVATE

Backyard activity matrix showcasing some of the current uses of backyards

of the landscape it was put in. This repeating grid did not define a border leading to sprawl.

Canada has a unique problem compared to European cities in that we still have land surrounding our cities to continue to spread out. Since there is no immediate need for densification from a land perspective, the attention has shifted to how can roads be made to cope with an influx of workers from outside the city and where do they park. The zoning responded with tremendous setbacks to widen the roads. The increase in cars also forced zoning to mandate parking in every urban building. These go against the traditional urban idea of sharing public space; such as, courts and squares as a place for the public to interact, and surrendering it to the people who live outside of the city and commute daily. As such, cities have recognised the need to densify themselves.

Underutilised space in cities offers a space for change as populations grow out of their capacity. The city councils look to the industrially zoned land to help mitigate the density problem because it is cheap to buy and changes in how goods are made and transported means they are underutilized. The problem with rezoning industrial land is it is not keeping the future of the city in mind. When densifying for the sake of having more people in the city is only useful if it can support the new residents and therefore industrial land should be reserved first for a resurgence of locally made products and secondly as recreational and commercial zones both offering jobs and resources to the city's population. It is important not to overpopulate and strain the cities services. Because a complete rezoning of industrial land may result in overcrowding. There have been very successful developments of vacant industrial land, and it can help to humanise previously abandoned and troubled sectors of a city. Setting a development precedent of urban areas means developers will use that against councils who try to stop rezoning of all of the industrial zones. Lastly, it needs an area around it to buffer the noise and air pollution associated with its uses.

The symbiosis between residential and commercial is less conflicting than industrial land uses because it does not produce the same volume of pollutants. They can be combined and layered vertically allowing a public interaction with the ground floor and private units above. Other uses that do not need a street presence such as offices can

also occupy the floors above retail; thereby, utilising public space for the needs outside of the home. The concentration allows the needed retail to flourish without requiring massive parking lots. Therefore, the zoning is more fluid in this area and provides the perception of setbacks rather than the defined uses and areas of living space. Consequently, a profit based assessment has outweighed the social needs.
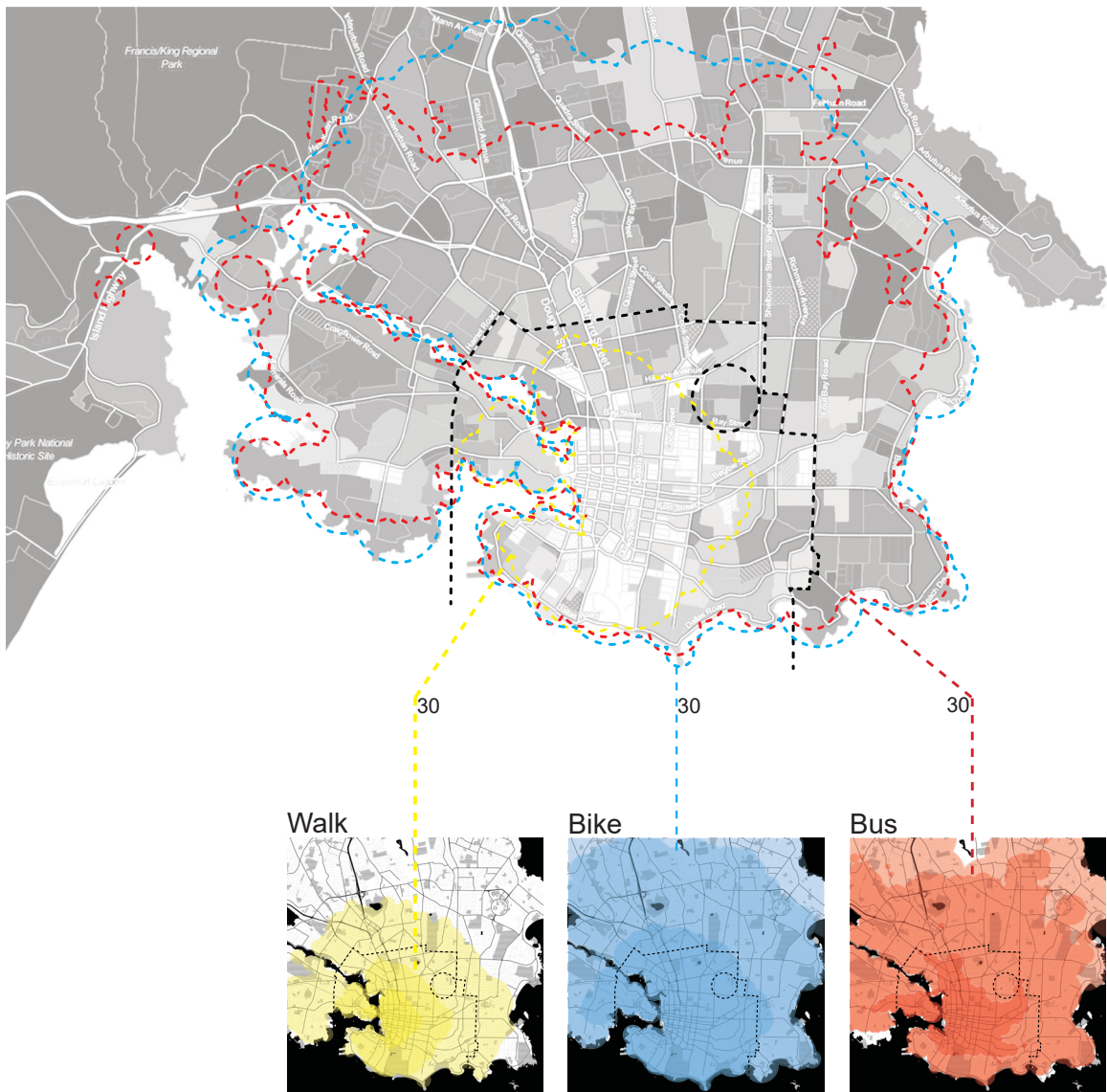
Suburban Zoning

The suburban zoning has moved far from its concept of a buffer of land between the rural farms and city life. Many suburbs are only "near" if you are using cars as transportation which did not exist in the conception of the zoning method. The areas of Traditional Residential housing sets itself apart from the suburban housing in location as they are truly near to the city using car-less transport. Suburban lots in traditional residential areas originally only had one house, but as settlements grew into towns the lots were subdivided, and new lots followed this trend from their inception. This introduction of zoning around the city prevented the natural subdivision of land. There was a push for family homes after WWII alongside the car as a must have for every nuclear family. This proliferation of larger homes far from the city is the Suburban typology, as it is understood today, is so detrimental to urban living. Suburbia is not the traditional residential typology that cities should be working to densify they will need a more drastic intervention then just more people. The proliferation of sprawl has developed its own big box store retail method these stores or complexes try to be the one-stop shop. Some parking lots are so large that
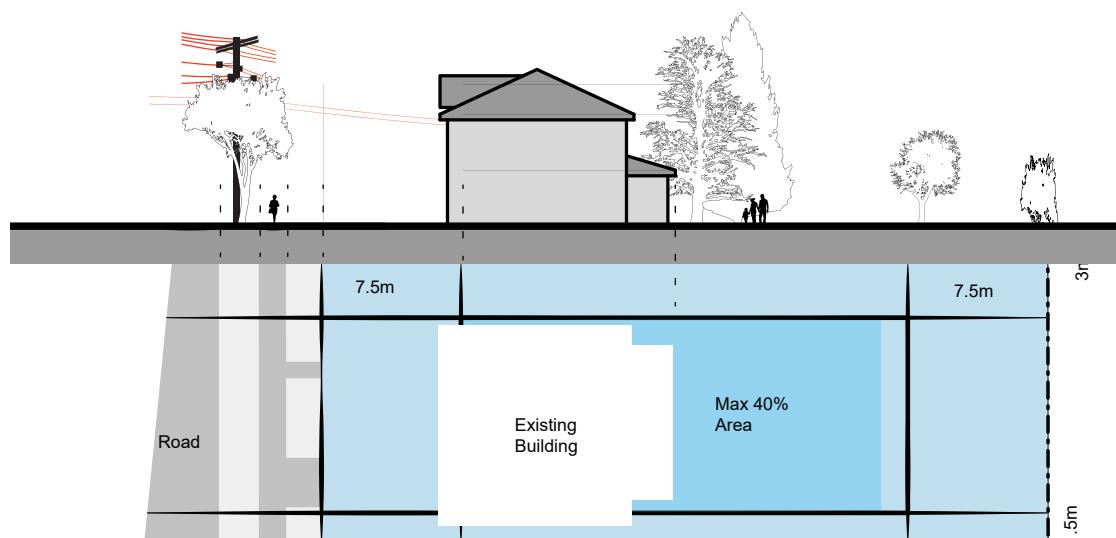

Typical lot dimensions

shopper will drive from one store to the next in the same complex. The equivalent urban scale of eight city blocks.

Traditional residential has outdated zoning for its urban setting. Still based on car travel although it utilises the amenities of the urban core. Traditional residential was developed close to town before the car and fit in the British rectangular block typology. Now with these older cities outgrowing the existing housing stock, many residents are forced to move farther away because of the lack of availability and therefore affordability. The zoning is such that space is left void of structures and private. The backyards in these zones are utilised by families.

Transportation times overlaid on car ownership map, the lighter the zone the less cars per family.

The area of suburban homes close to the city is being rezoned. The rezoning that takes place in masterplans for cities can be detrimental to the existing population in these suburbs. When used in dying communities to help save them by consolidating the existing community that has managed to stay despite economic change it can be positive and allow growth in a new direction. However, if the city is forcing rezoning upon its residents to meet new resident demand and land costs are high, it pushes the public out of the design process that replaces urban residential housing. Developers are the entity that has taken up making a profit off of buying out blocks and building midrise buildings. Not every city needs the density of the high-rise typology in large cities like Vancouver or Toronto. All cities do however need to accommodate a mixed demographic to prosper.
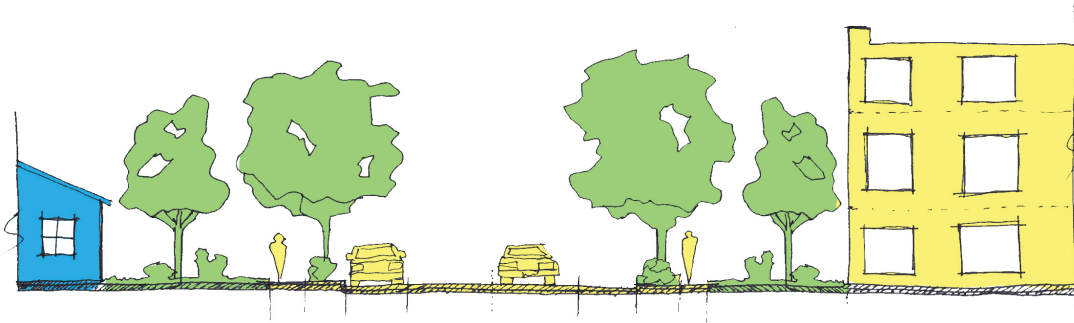
RS1 vs multi-residential mid rise comparison

Laneway Housing Zoning

Laneway housing does increase density overall however not in a targeted way it densifies all areas of the suburbs. Lanes are not limited to a pedestrian radius because their introduction was as a service road for cars. There is a case for laneway houses along transit routes in the city. The only downfall for implementation directly into back yard is their integration with garage and car typology. After reworking this though the goals of rejuvenating lanes it will be easier and better suited to a cohesive block strategy, rather than the fragmented reality of laneway housing. The living environment will be safer and cleaner because it will be prioritized over garbage and cars currently using the lanes.

Rural Zoning

Not to be overlooked rural zoning enforcement is essential to protect agricultural and natural land for environmental benefits. "Population growth is a serious threat to prime agricultural land, along with urban sprawl, changing weather patterns, competing for land

uses and land speculation"(Shore 2013, 11). Suburban creep uses the argument that using the space for housing prevents development further yet from the city. This argument is flawed because the rural areas are part of a green belt that the town needs to uphold. At that distance from the city, cars are the primary transportation method and should not be developed. An issue with preventing this suburban creep is the fragmentation of city councils. The bordering municipalities have their say on what is beneficial to their economy this puts pressure on the urban core to support its surroundings and the daily migratory workers.

This sprawling suburban zoning is unnatural as long as humans have been settling land and even before that because "we find our best selves not alone on the savanna, or on the highway, but in the group, on a team, in the village." (Montgomery 2013, 316). So why have families populated these areas? Availability is part of the reason there just isn't anywhere to live in the city that families can afford. This is because shrinking families do not want to move out of their neighbourhoods. Changing all of the city housing stock to mid to high rise residential will effectively keep the demographic the city needs most out of the city. Areas close to town have the lowest vacancy and the highest costs. This correlation is inevitable regardless of the quality of living. The correlation also linked to the increase of 1-2 bedroom households which are be too small for families to live comfortably. These 1-2 bedroom suites offer more profit for landlords because their base rent is the same per unit and only changes slightly as you add more rooms to the suites making them fit for families. On the developer side as long as there is a demand they will fill it. New families need a place in the city also to begin integrating themselves into the urban culture, and current residents need places to downsize without changing lifestyle drastically.

There are benefits in changing owners of homes as family size changes, it would allow for a better utilisation of bedrooms. The issue is you cannot force citizens out from their homes just because they are not efficiently using them. Although there should be benefits to utilising a property to its capacity, this would also be difficult to control. To passively resort the community the families who want to live out there lives in the neighbourhoods where they raised their kids would need to be able to move within the community. Older couples are not moving homes after their children move out which would free up homes for new families. Instead, families are clustering in the suburbs and fueling the building of

new communities with the sole purpose of filling the demand. Legislation of sprawl is an issue because of municipal boundaries stopping the regulation of growth outside the urban centre can not be stopped. Suburbs lack resources and amenities for new occupants who now live in one community but work and shop elsewhere.

Heeding the warning signs of why sprawl and developers have degraded the housing stock across Canada, cities should focus on encouraging families to come back to the core. There are solutions for housing families in city centres that work for mid to skyscraper building, but the problem is the control over units is not in the hands of the citizens. Developers only build units that are profitable tend to be 1-2 bedroom units. Availability and affordability push families out of the core giving sprawl a business model that is profitable. Having a place that is safe to raise a family is a primal feeling. It does not help that where affordable housing is in town also comes with social issues related to crime and substance abuse. Opposite to these are the expensive areas of town appealing to wealthy buyers and transient travellers staying in hotels that can rent rooms out to people visiting for a short time. Rental units are better suited for buildings where the building owner will be the landlord and therefore will care about the installation costs as well as the longevity of the building. The density response will lead to more 1-2 bedroom units and take up the demand being put on homeowners to rent out their multi-bedroom units to multiple tenants.
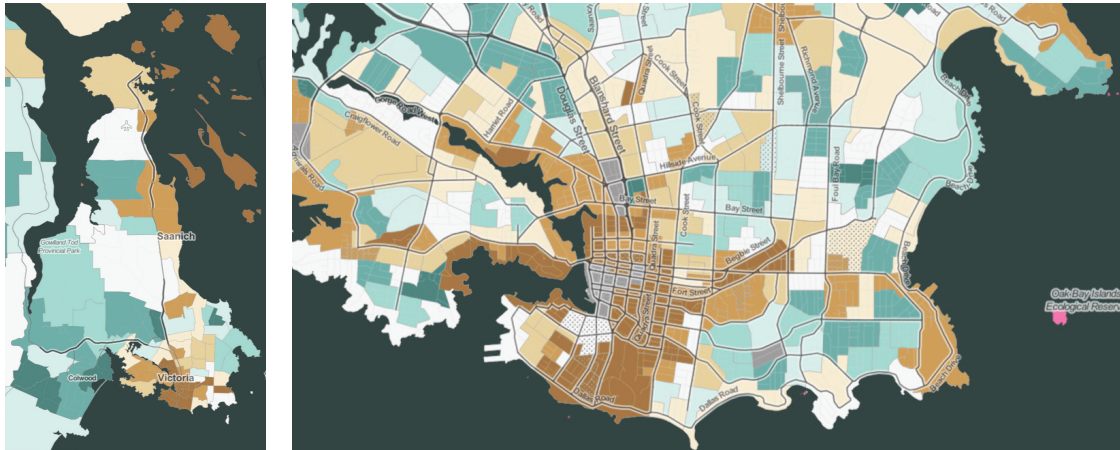

Population destiny census mapper

Additions to old homes in yellow showing slow growth

Culture and the Intangible

The Canadian dream of raising a nuclear family in a quiet traditional residential part of town has merit. As children lose their independence because of safety concerns, they also lose their ability to socialise and explore their environment. In a time when articles, like the bubble wrapped generation, are being published to warn against controlling all aspects of a child's life how can cities justify removing areas of town where playing in the yards is a safe and constructive activity.

Child destiny census mapper low density in browns high in blues

Suburbia has links to loneliness because of its sprawling tendencies alongside a highway or other major road out of the city. The reason loneliness has happened is car-dependent travel sets unrealistic human transportation boundaries. Residents feel trapped and informal interaction is limited because of the privatisation of yards.

Yards have always been intended for living in; they can handle the density increase if deprivatized. As for the acceptance of sharing the backyard with another family laneway housing has proved families can coexist. Of course, they use the lane to access the home rather than the main street leaving the front yard for the main home. This means there will be societal issues with accessing the space in the back yard for a building if the whole block does not take on the subdivision of land at one time. Laneway housing is the clearest example and argument for backyard housing. Laneway housing has been useful and flushed out the stigma of living in the backyard. Laneway housing still offers the drive up lifestyle Canadians have become accustomed to, but in areas closer to the city core a transition from the car lifestyle is easily altered. This closer living style that would

come with backyard housing will foster relationships in a chain effect. The most obvious would be the main house and backhouse relationship which will inevitably be sharing their backyards. Next would be the neighbour across because there is not a street dividing them and their interactions will become less segregated. This will link streets that have been separated by fences and human-made barriers.

Condo living has not enticed families to move into the city. Distance does not seem to have much of an effect on the decision of buyers, and they are willing to drive great distances and sit in traffic to be able to have their own private oasis. Another factor in the availability of housing is its link to the cost through supply and demand. Responses for densification do not tend to take into consideration the reasons low density prevails despite its environmental flaws. Citizens are not against the small space it is where they are and the rules they must obey to live in them. Freedom of expression is essential to the social nature of housing. Backyard actives vary on a spectrum from private to public and groups to individual as seen in the activity matrix.

Industrial rezoning tends to work best when seen as a holistic approach and offer a variety of uses and development types. If cities are to become self-supporting again, they will need these parts of town for industrial purposes. The reason that masterplan densification development works is that it's holistic nature allows councils to demand uses and dedicate numbers of types of units and space for the public. Municipalities cannot justify this on a lot to lot basis, but the need for rezoning forces the developer into a negotiation with the city. The negotiations inevitably lead to socially positive plans and are not based solely on profits, or they would not be passed.

Availability and Conditions

Canadian cities are not dying off instead availability is dropping to record lows. Low availability means there is a major demand for places to rent. The lack of options is forcing many to settle for inadequate living conditions. Inevitably some units are illegal and not only do not meet code but also tend to be poorly built and finished. A reason many don't want to buy new homes is that their resale value is so low in comparison to an older house which has lasted. Ownership of a home, rather then renting, increases the environmental benefits in that owners tend to take better care of the home because

owners recover the long term investment put into the home and repair and upkeep rather than a total renovation. Rentals, on the other hand, are for-profit and landlords care less about the quality of life during a housing shortage. Low availability will inevitably lead to a deteriorated housing stock.

The ideal home citizens are seeking is a detached house with a yard they have control over. The market has driven home sizes up to make them more appealing than the small urban condos counterparts. Uninformed buyers are looking at only the area and the top finishes, square footage, bathroom fixtures, and kitchen appliances. There is little interest at this time, although growing, into the efficiency of a building, so it is the first cost to be dropped from the budget. Poor finishes affects not only the longevity of the suite but also its environmental impact. Low quality has also taken over in cities as the demand for these small units has to lead to installing low-quality finishings and pushing code minimums in every way possible.

Housing conditions are affected by the quality of construction and looking into how efficiency and materials can be used to rebuild a sustainable energy efficient housing stock is valuable for every growing city. Even poor quality buildings have a life span and cities need to take this into consideration when planning the future. The durability of a building could allow it to last for 100 years or 20, either way; it means changes in the regulations need to be seen in anticipation of the needs in the 20+ year time frame. Many older houses are around today because they were leaking air that helped dry out the building and keep the walls warm and dry. Today both sides need to be united to have a holistic environmentally conscious solution.

There are many rating systems for efficiency what they have in common is to absorb passive energy, use less input power, and conserve or mitigate the heat in the building. The rating systems go deeper into how to do this, but the why to do this is left to the owner to decide how far they want to push the limits of efficiency. This should be an important aspect of city intervention since growing cities are stretching their imported resources thin as they become denser. Canadian government has offered rebates for improving the efficiency of old buildings and started to introduce stricter building code minimums for insulation. Alongside efficiency is the long-term cost savings for the occupant. When the

savings do not profit the builder, they are pushed to code minimum when not forced to do so by non-governmental rating systems because of the high upfront cost.

High upfront cost with long term cost saving means a long term ownership model will naturally move to a high efficiency living model. Ownership can mean the resident or a landlord but not a developer. The client needs to be invested in the building for the construction phase to see the benefit. With the high cost of any building in the city core much of the budget is sunk in buying the lot. Therefore, clients have little to invest in perceived extras that they will not see the cost saving benefit until years later. This can be a renovation after the useful life of the current state of the building. The issue with this is many new builds are being built to short 20-30 year life spans meaning they need to be rebuilt starting the cycle over again. Materials vary drastically in quality, environmental impact and durability but using the right material can help extend the life of the building however cost can inhibit the freedom of choice because there is a significant amount of surface area in typical buildings. As such, a smaller building using fewer materials can stretch the budget farther. Materials also need to be high quality throughout the wall assembly to be efficient.

Moving Forward

Cities have been tearing down traditional residential blocks and redeveloping them to help prevent sprawl. There are two points of contention around this mass rezoning that lead to damaged communities. First a demographic of people are being forced out and not being able to come back in. Secondly, heritage buildings are being torn down or moved in some cases and the community needs a block typology to support the culture that has developed (Citified Victoria 2016). Buildings also have lasted generations, and the community grew around them including businesses, schools, and municipal infrastructure. The adage "they don't build them like they used to" perfectly describes new homes. They are better in many ways; however, people are neither willing nor can they afford to maintain their homes, so replacements have become the norm. Instead of the tradition residential building that may last over 100 years despite their wood construction; today, they are built to a 30-year replacement timeline which is not long enough to offset their environmental upfront cost. The benefit of this low life span is it will give cities a chance to reshape the zoning and introduce new regulations for their replacements.

CHAPTER 3: DECENTRALISED DENSIFICATION

Decentralised densification seems to contradict itself because the problem is housing sprawling out making it decentralised. Accordingly, the approach in today's cities must be spread out throughout problem areas. Unlike other plans of city revitalization from the past where governments repossessed the land undemocratically, for example in Haussmann's "Revival of Paris" through the renovation of its main avenues, instead, cities rezone full blocks and leave it to developers to shape the city. Another way of densifying is finding underutilised land and rezoning that portion, but again that is lead by developers. Infill project is then the best for neighbourhoods when compared to rezoning because the work must please the existing community. Searching for underutilised land via GIS data revealed a new area for densification, the backyard. Backyards are private and therefore controlled by the owners in the community. There are many examples of laneway housing, but they don't deal with the social constructs of the backyard and its activities. Not in my backyard, or "NIMBY", shows us people do care what happens because in NIMBY backyards extend out of the owner's yard and into the neighbours'. Strangely physical fences making borders do not prevent NIMBY attitudes from this scale jumping to the block, city or country. Robert Frost's poem Mending Wall talks about the phrase "good fences make good neighbours" asking "Why do they make good neighbours ?" (Frost 1915 pg 12). Living with other people requires effort, rules, and consideration. If good fences
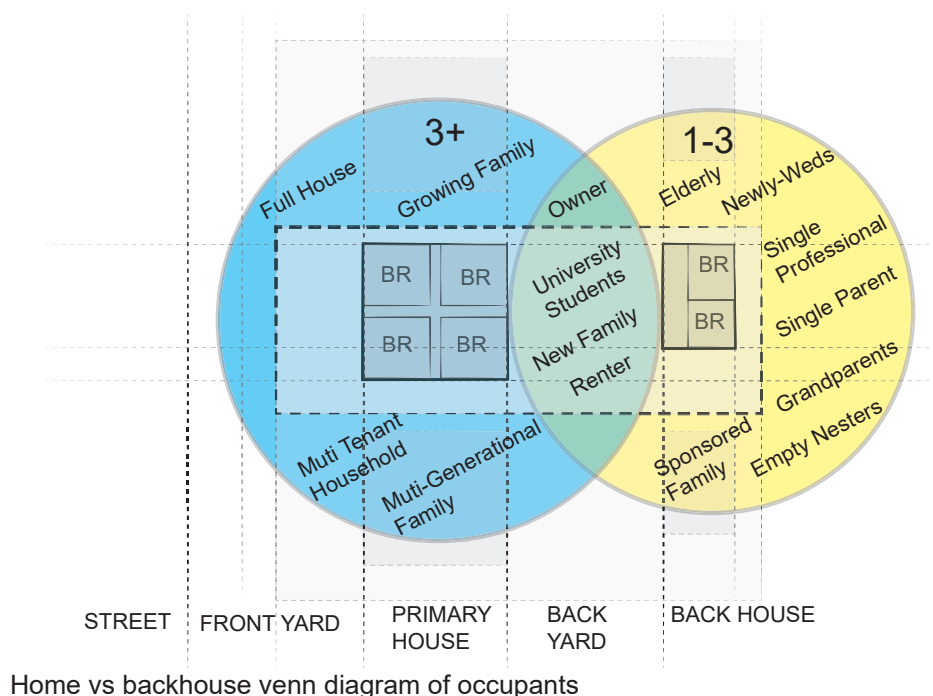

Finding space using thick lines
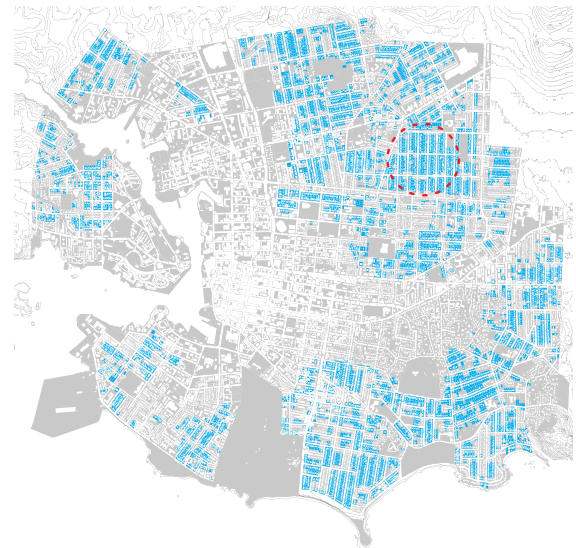
Finding space using perimetric scripts

make good neighbours, do no fences make no neighbours and instead build stronger relationships. Many families already live with each other out of necessity and share the private backyard space. There are numerous combinations of owner, renter, family, and generation living together in traditional residential houses. Renters tend not to care for the home as much as an owner would; however, those seeking a lane house would prefer to be buying rather than renting. The ideal way to implement densification in underutilised traditional urban residential lots is a division of existing properties with the addition of small homes.

In What Ways Can Cities Densify

One building cannot save a city from urban sprawl and there must be a collective solution to offer variety and sense of place. City planning needs to implement some sort of rules so the city doesn't delve into an anarchy of densification and therefore need typologies that they can fit rules around. Offering the new backhouse density solutions will give them more tools to work with and prevent them from being pressured to allow redevelopment of existing neighbourhoods. There seems to be no middle ground when the deduction comes to ideas of density. The fight is between either flattening to rebuild or redefining the zoning to let it gradually grow for decades. The large scale being the highest density but also the most invasive because it is unobtainable at a community level.

Home vs backhouse venn diagram of occupants

Where are We at Now

Garden suites have been legalized but have yet to take off in popularity. In a pool by a Victoria BC news station 59% of 1000 responses said they would live in a tiny house if they could (CHEK 2017). So it is not the lack of interest in the market that is holding garden suite houses back. The reason is the time and effort that goes into each project sees no efficacy when compared to subdividing an existing home. Bureaucratic steps must be navigated to build a new structure on one's property more then dividing an existing home in a new way and adding a kitchen and bathroom to the unit. The zoning is also a hurdle as the garden suites are restricted in size and location on the property.

> Strata properties are a popular housing choice in B.C. for the convenience, security, added amenities and good value. Over a million people live in strata housing. Strata housing can include: condos, townhouses, duplexes, even single family homes in bare land strata corporations.
>
> (Office of Housing and Construction Standards 2017, 1)

Word cloud from Facebook comments in response to the question "would you live in a tiny home?"

CHAPTER 4: THE BACKHOUSE: A DENSITY SOLUTION

Backyards, with or without lanes, offer density in the form of Backhouse implementation. Furthermore, this is an alternative to rezoning the area for larger homes or mid-rise residential, which is the current fate of the neighbourhoods within this radius of the city. Historic maps show landowners have been subdividing their lots since the introduction of ownership on North American land (BC Archives. 1861-1916). This subdivision of land whether that be formal or not will allow for the creation of backhouses. The Backhouse will let people who need less space transition out of the larger homes. Therefore, families can move into the existing housing stock without rebuilding. The Backhouse will be small 1-2 bedrooms and utilise the backyard as an outdoor room. Building placement should maximise access to sunlight. All properties must be respected in the location of the structure as well as sightlines of the Backhouse.

Access

Backyards have space, but it is not accessible in laneless committees. There are two types of access: the traditional side lot paths and the creation of a new lane. Although both types have pros and cons; the new lane offered more opportunities and transformed the blocks from suburban to urban. Moreover, lanes maintained the existing residential streetscape and individuality of the neighbourhood.

Backhouse main house relationship

PATH BLOCK FINGER BLOCK FINGER & PATH RIGHT OF WAY
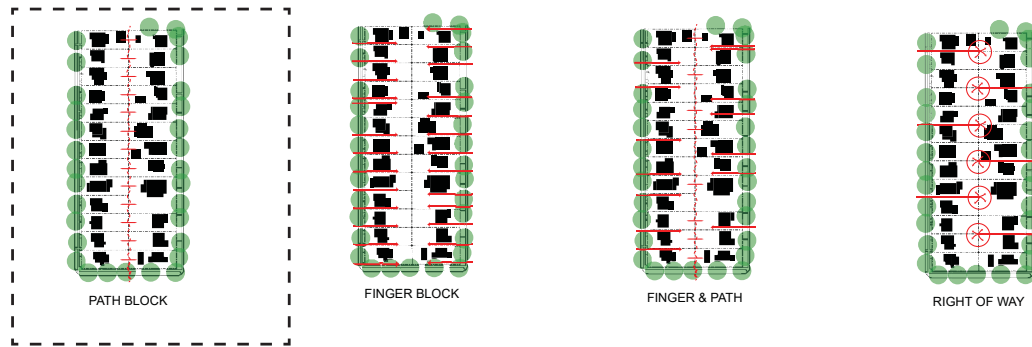
Access variations

A side lot path is the favourite method of access for garden suites. Regrettably, there has been substantial hesitation for citizens to develop their yards in this way. Not only do the garden suites take up space in their backyards, but the setbacks from the side are, and the rear yards leave unusable patches of land. Clusters of zero lot line units surrounding a courtyard were placed on alternating side lot access paths to improve space utilisation. The courtyard isolated the backhouses from the main houses similar to the suburban fenced-in backyard; however, this seclusion undermines the efforts to create an urban lifestyle.

Laneway housing is a typology that focuses on access from lanes and rear service roads. Unfortunately, not all cities have lanes to implement this type of density; however, those that do have widely accepted and applied laneway houses as a density solution.

Effectuating the lane along the entire block allows for municipal services and vehicular access; however, it also accentuates the less desirable urban aspects such as garbage collection. Moreover, the urban layout does not fit the suburban setbacks imposed on laneway housing. The lane is rarely designed with consideration for dwellings or pedestrian access and instead is segregated by walls and fences. This reveals the need for offsets from each side of the lane to allow for light and space to either side along narrow widths.

The backhouses can be arranged as to enclose an outdoor room from four lots as seen in side-yard courtyard developments. Cars would not be the primary use of the lane because the existing houses have access from the road; therefore, the lane will be called a path. The path is used to emphasise that designs for new areas should strive for
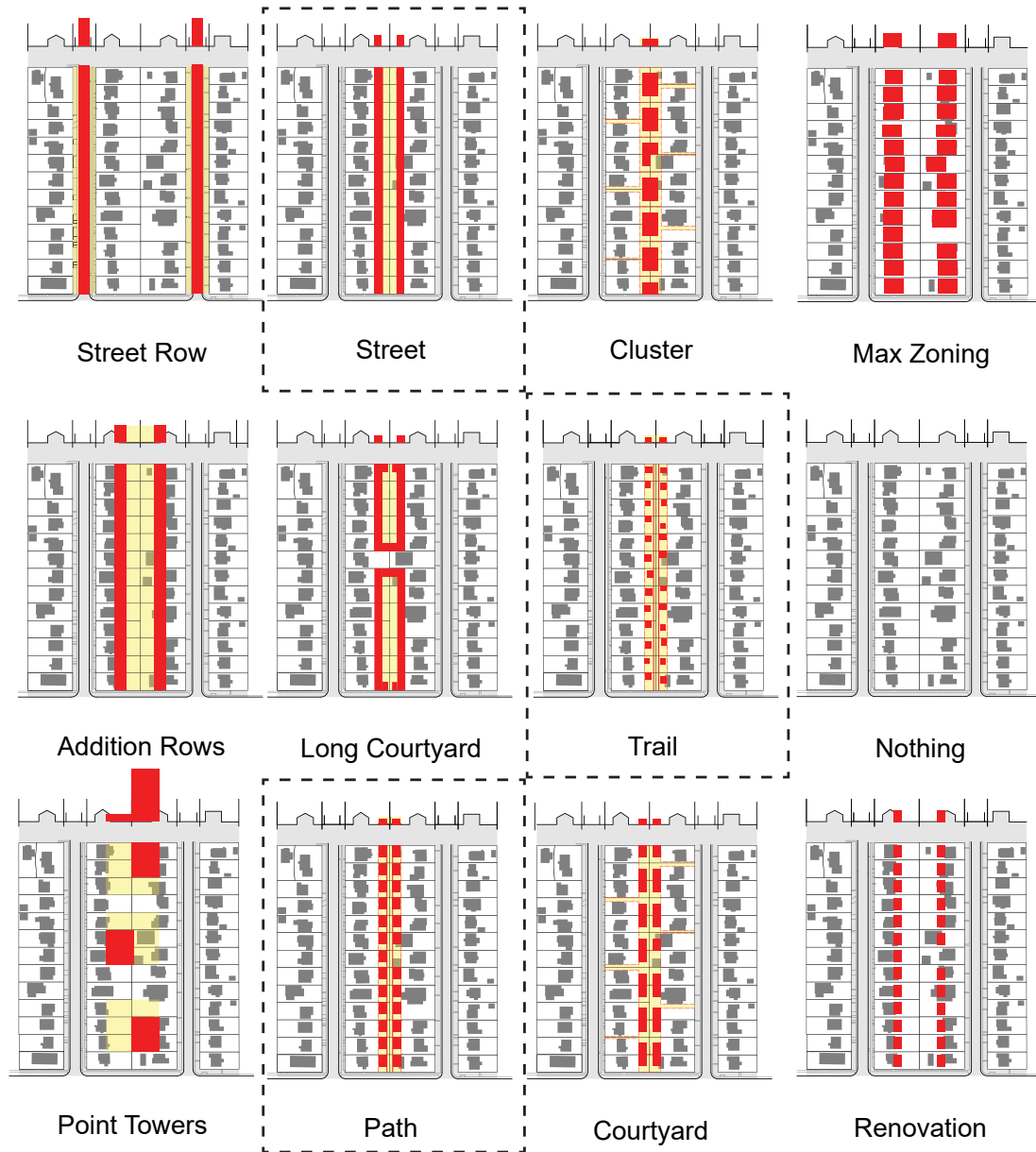
Ways to implement backhouses

the anti-car urbanism ideal. Instead, limiting the access to municipal services including recycling pickup and fire trucks. The width of the path is 5m with the 2.5m setback off each rear lot line. Developing the projects urban influences further revealed the possibility of a rowhouse typology, but this meant offsetting would be less effective, and the lane would need to be wider. The 10m lane will be called a street and introduce a retail, commercial ground floor and short term parking for loading. The housing is set on top and entries are set back from the street in a throughway to the main houses' backyards. The last lane variant conceived, stems from a different need of densification: trees, which are far

too few in urban settings. Backyards have acted as forests in the traditional residential neighbourhoods. To urbanise these forests, a 2.5m trail will be placed as not to cut down trees. Moreover, raising the Trail and the Backhouses will help prevent damage to roots. The landscape will be returned to a wild state to preserve biodiversity as the city densifies.

Strata

A strata subdivision would be a drastic change for the current block; however, for the lane solutions to have the intended effects the block must be developed in entirety. To divide the existing lots for the three types of Backhouses setbacks will all maintain a 5m distance between homes as a minimum. The use of a master plan draws from successes of industrial lot rezoning. The chance to assess the needs and opportunities of each block when picking the Backhouse solution best for each block is beneficial. Master Planning will allow the infrastructure to be put in while the individual plans are developed to suit the needs of each lot. This design is similar to MVRDV master plans or the West 8 master plan at Borneo-Sporenburg, Amsterdam, The Netherlands (West 8 1993-1996). The strata urbanised the backyard by deprivatizing them. As a result, a democratic discourse can develop and evolve the theme of the courtyards. Tearing down walls between neighbours and activating the space. The specialised backyards can become less general places where each house has a little bit of something that is not great and works together to refine the community helping where they can. By not removing family housing the adage "It takes a village to raise a child" can be reintroduced to the urban lifestyle.
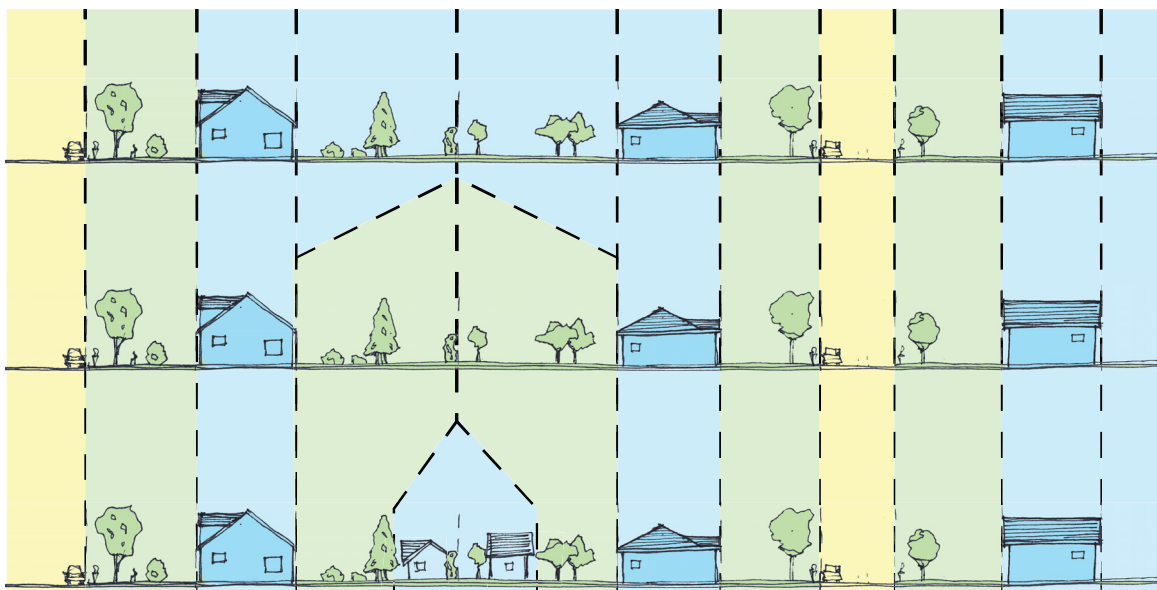
Finding space in the garden

Street

Street typology can only be implemented if the main house is 15m or more from the rear setback. Moreover, the street typology will be applied only to the perimeter of the blocks stretching at most five lots in from the side streets. The new setbacks will be 5m from the rear lot line for the existing lots. From this line, the first ground floor will take up the next 5m leaving at least another 5m for the shared backyard. The residential second floor will help frame the street with an overhang of not more than 2.5m. The height of the first floor will be at least 3m, and the maximum height of the Backhouse will be 7m. An exterior stairwell off of the side courtyard provides access to the second floor.

Street Backhouse zoning set backs
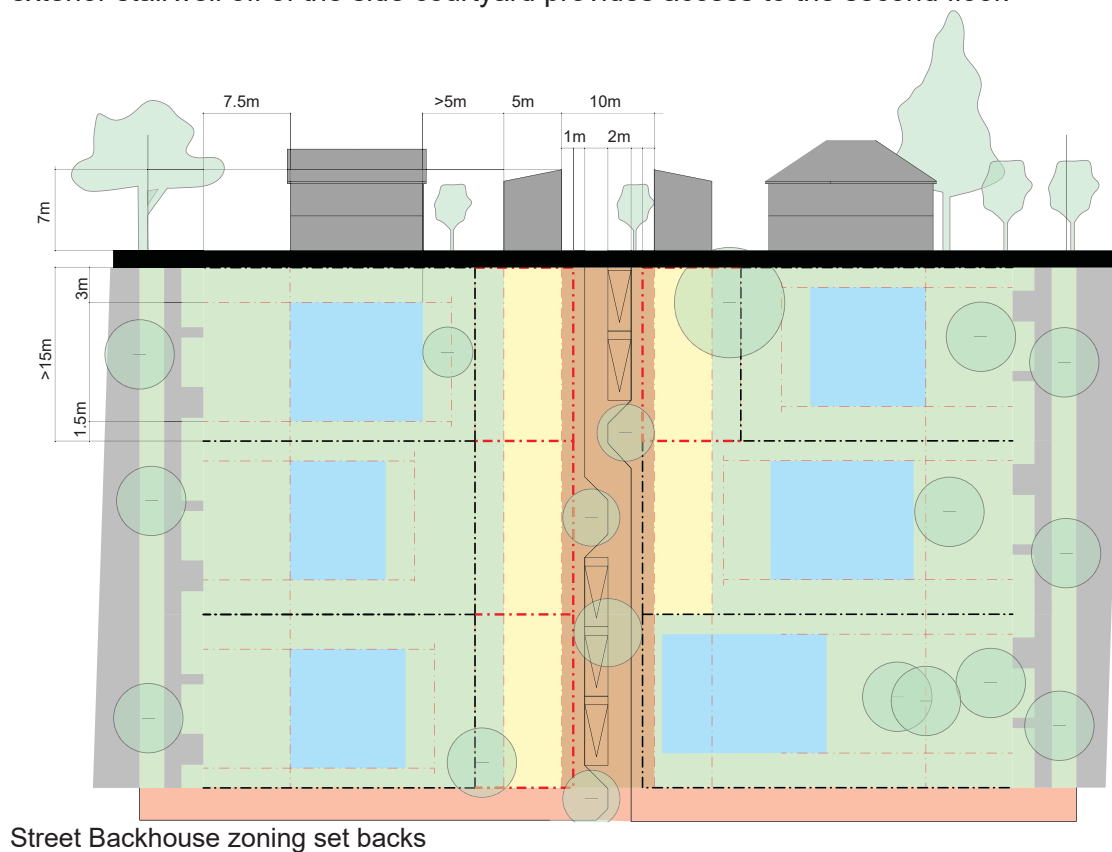
Street Backhouse vignette passing in a bus

The street Backhouse will be mixed use divided vertically. The street will be a public street where the division of vehicular and pedestrian streets called a woonerf. Woonerf is a Dutch word translated to living yard. (Lvblcity 2015). The Backhouse footprint will be zero lot lined opposite of the neighbouring property across the Street and alternating along one side to maximise the distance between backhouses and allow for windows to have lines of sight past the other backhouses. The space made between the first floors creates a relief from the walling in of the street
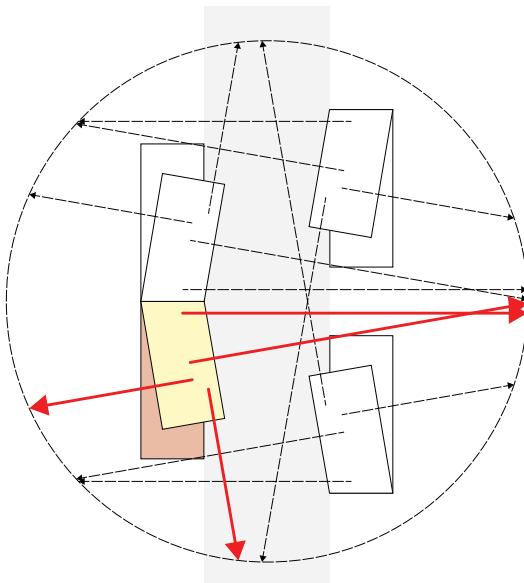
Street configuration

Path

Similarly, the Path typology should be reserved for lots with rear setbacks of 12.5m or more; thereby, leaving a 2.5m rear lot setback and a 5m main house setback. Although, the remaining space must be more than 5m but will vary in length. The Path Backhouse will be zero lot lined opposite of the neighbouring property across the Path and alternating along one side to maximise the distance between backhouses. The maximum width will be 5m off the side lot line. The four Backhouses will surround a public backyard which is the combination of two lots minus the space for the backhouses and path. As for the height, the Backhouse shall not be more than 6m along the main house set back or 7m along the Path rear yard setback.
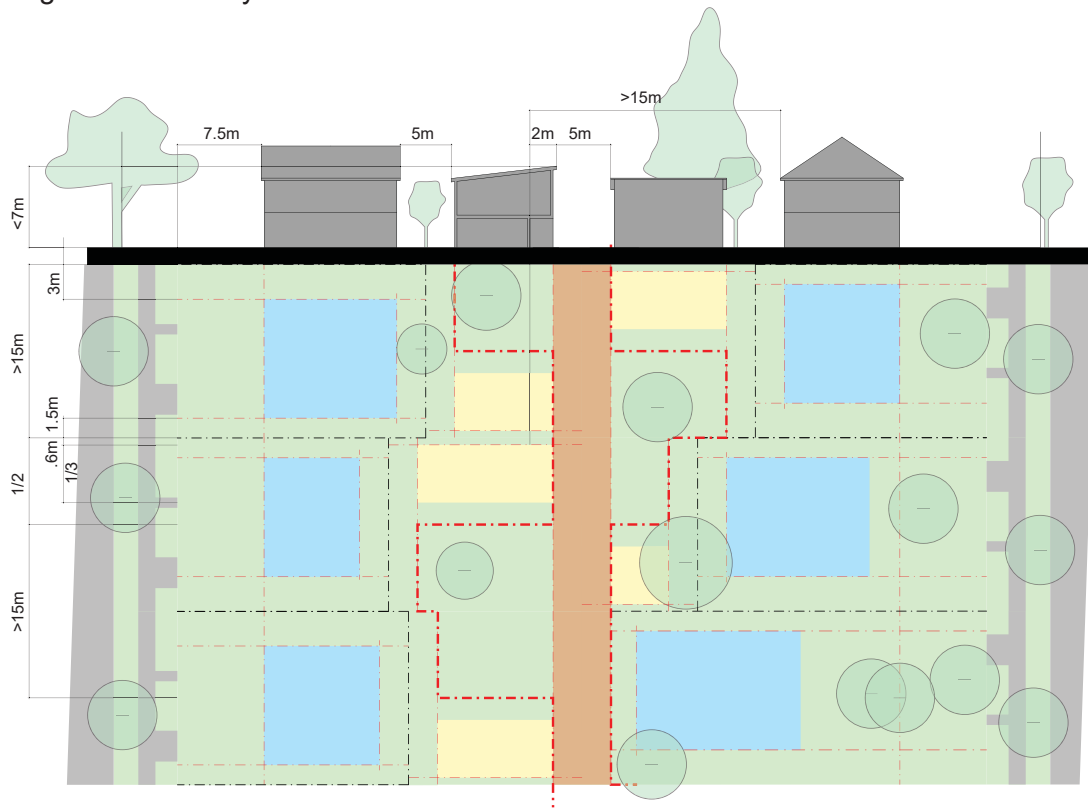
Path Backhouse zoning set backs

Path Backhouse vignette looking out

The Path Backhouse may be a two story or single story wheelchair accessible unit. The minimum size is 5m by 5m. The layout should look to reach out into the public backyard. The enclosed rooms and services shall be pushed to the zero lot line. Thereby allowing a great room for indoor living, this open space is necessary for small homes. The areas rather than rooms use the concept of the borrowed landscape from Japanese gardens this continues into the garden. The 2nd floor may have full-width rooms one story backhouses may also have a full-width room if needed for barrier free design to be possible.
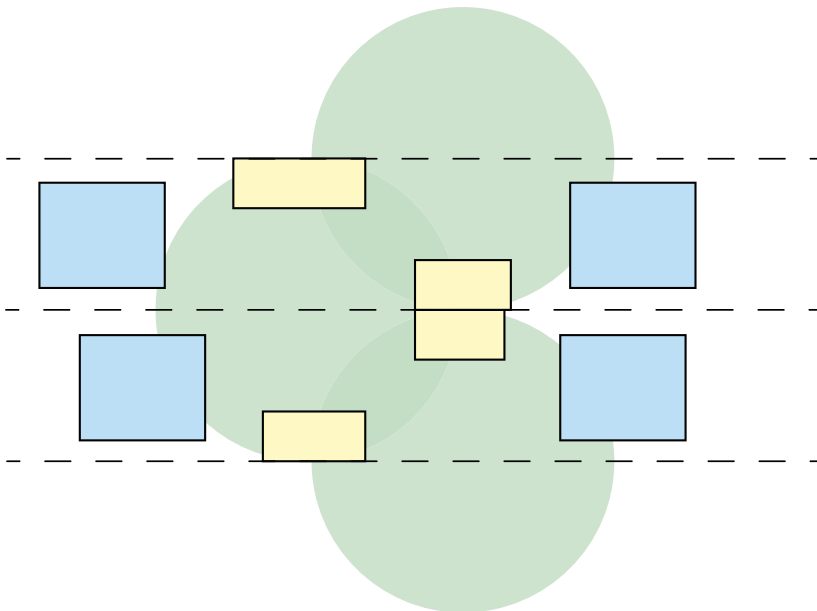
Path diagrams configuration

Trail

Trail typology can only be implemented if the setback is 12.5m or more from the rear setback. Very different in its arrangement within the old lot lines as they are not allowed to remove trees to place the trail back house. They can be rotated off the lines and use a 7.5m radius as their setback from each other and the main house. Still only a 2.5m from the old lot property line. The maximum height is 6m the layout of the floors will be such that there is a shift in the floors and open space.
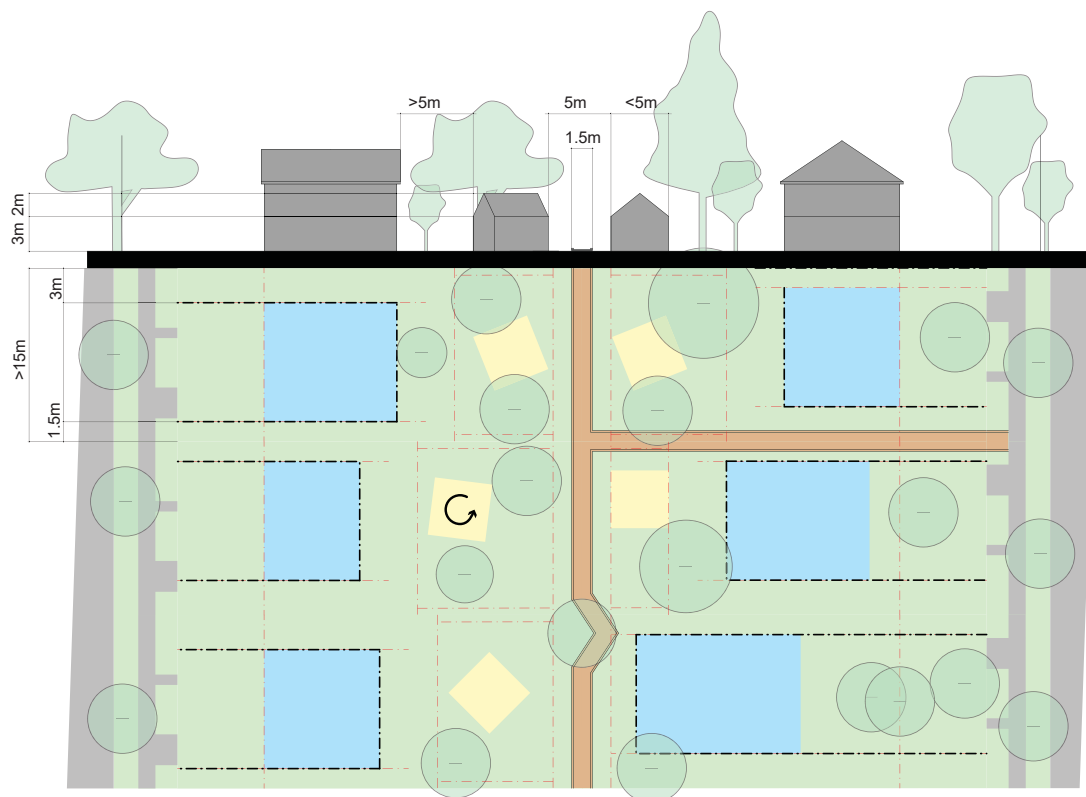
Trail Backhouse zoning set backs

Trail backhouse vignette

The Trail Backhouse should be conceived as an object in the landscape shrouded by trees. Standing 1.5 stories and atypical shapes the Trail Backhouse offers a personal expression. A double height section is used to open up the small space and give the perception of a larger room. Also, the setting of the building in the urban forest means there should be at least one window focusing on the three elements of the forest: ground, trunks, and canopy. Framing these views emphasises the connection to the forest and will utilise the borrowed landscape idea.
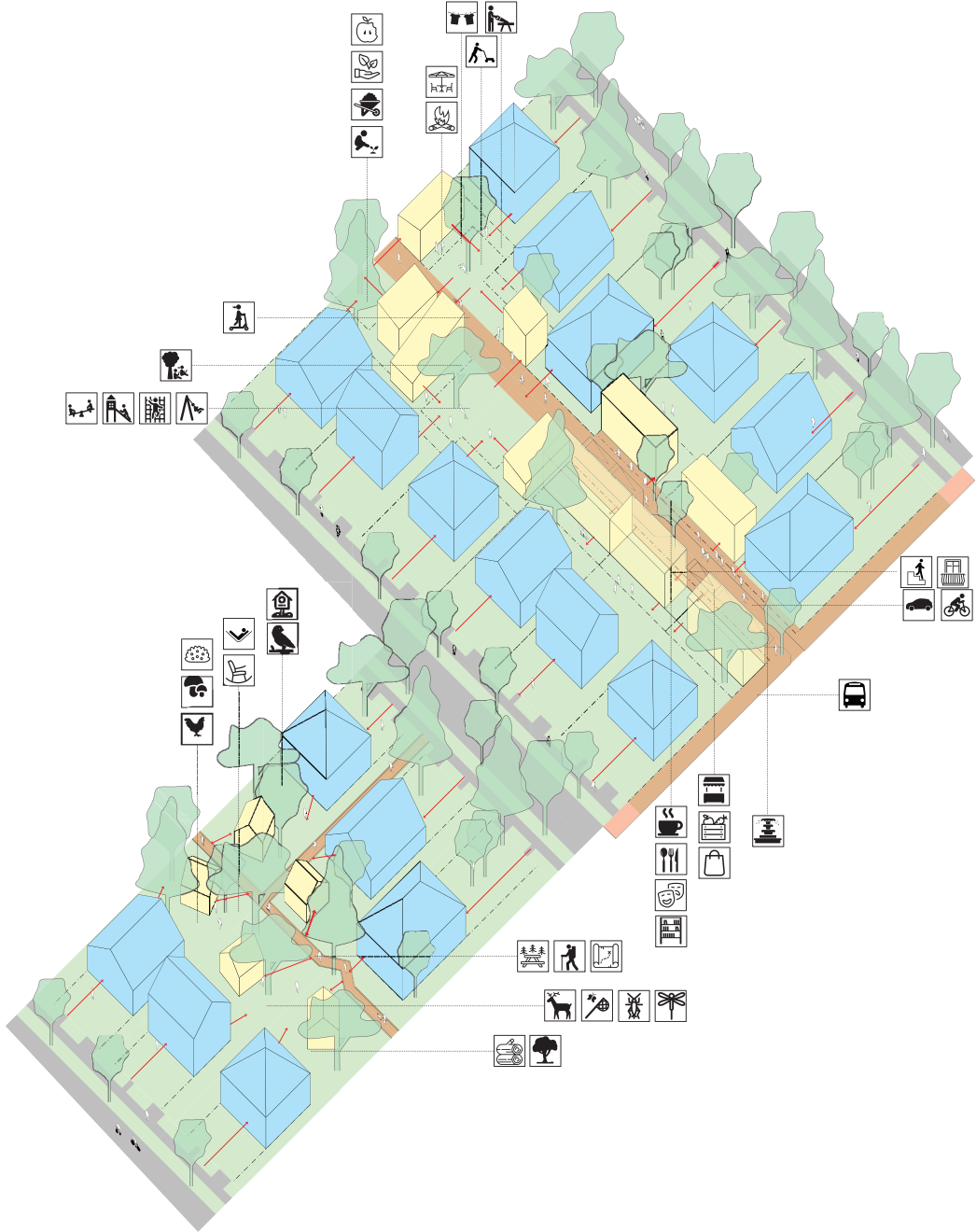
Backhouse zoning axo of all three types

Relaxations Needed for Small Homes

Although there is a substantial need for backhouses; codes have limited the size of them. Many tiny homes try to skirt the rules by building on trailers and finding loopholes in building codes. Albeit, the case for minimum dwelling sizes is to prevent inhumanly sized homes; they do not consider the home is larger than the house. Thoughtful design can help integrate indoor and outdoor living rather than separating them. Small homes will need to be well insulated because of their larger surface area; however, heating will be lower due to the smaller volume of air in the space. Air quality issues are exacerbated in small homes because scents, aerosols, or smoke travel quickly to other rooms. Therefore, adequate ventilation is crucial to ensure vents in the kitchen and washroom bring fresh air in and expel foul air. Advancements in heat recovery mean all the fresh air coming into the home can absorb the heat before entering circulation.
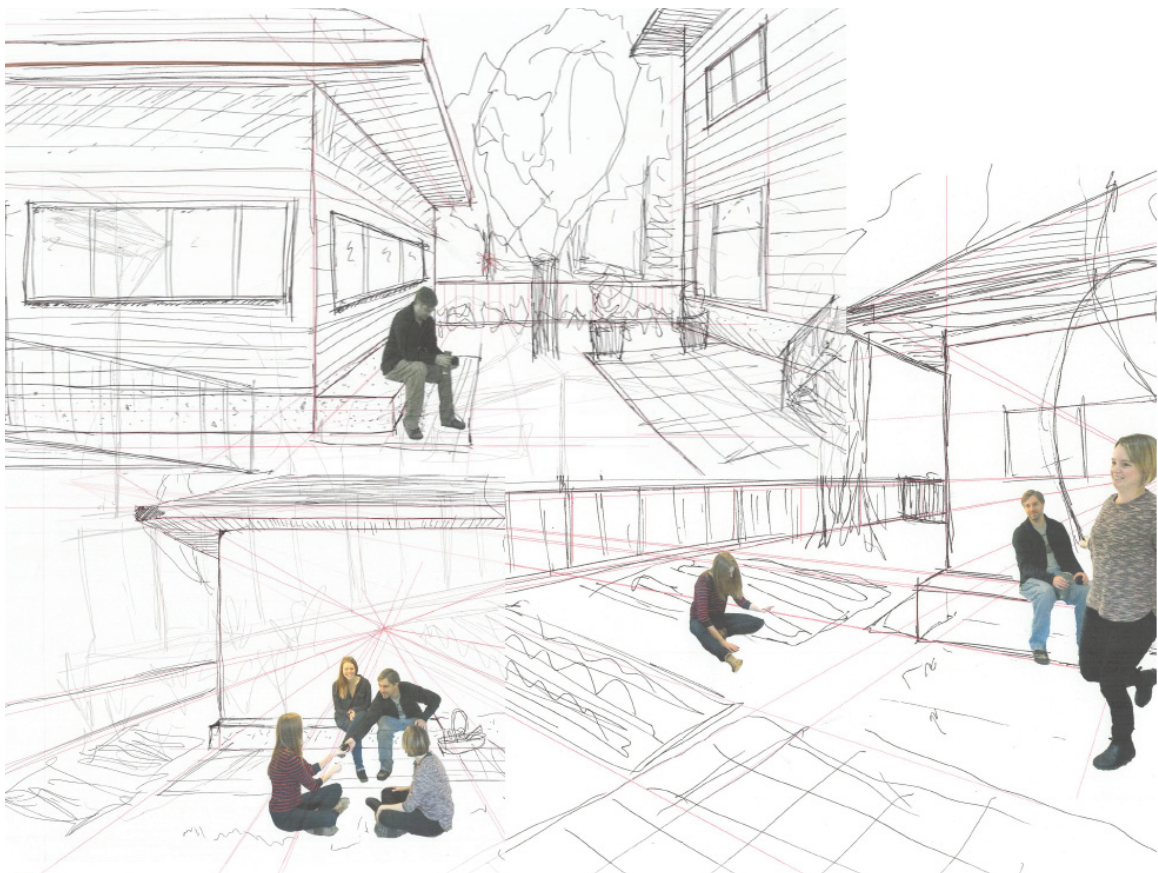
Vignettes of informal interactions between neighbours

CHAPTER 5: VICTORIA, B.C. IMPLEMENTATION

As pressure on Victoria's traditional residential areas grows to meet the 2012 official community plan predictions, the community of Oaklands will inevitably be at risk of irreversible change. "Victoria's population is expected to increase by approximately 20,000 new residents taking the city population to roughly 100,000 by 2041" (Victoria 2012). Implementing the Backhouse solution will reduce the redevelopment threat in the community. The city of Victoria is highly supportive of environmental initiatives furthering the practicality of backhouses. The site is an area of typical blocks chosen because it has many underutilised bedrooms. Using census data to find zones of underutilised housing was key to this thesis. This neighbourhood had many bedrooms which were empty, and census data infers that the families are shrinking as children move out.

The practicality of the thesis requires a convincing argument for the drastic land use change. To start the argument environmental pressure for density is needed in traditional residential neighbourhoods. The counter being "I own the land and don't want to change my way of life". Moving to an emotional tactic and explaining that they are forcing their children to move further from the city, if not relocating to other cities because of tremendously low vacancy rates and prohibitive costs. Although the neighbourhood demographic and culture may change; communities can adapt while being in control of the changes.

Site Plan

The Backhouse options allow for three distinct block implementations on the site in Oaklands. The first type is a combination of the Street and Path because a full block of the street type is not realistic in this area. Secondly, a path type will build backhouses and courtyards, if the lot has the required dimensions, throughout the entire block. Lastly, the trail type in place of a lane is used due to environmental constraints to allow for a feasible densification option.

There is an existing commercial area of four lots its name is Haultain Corners. But with doubling the population, there will be opportunities for business' and offices to be feasible in the area. The local hair salon, produce store, and fish and chip shop would

Neighbourhood plan site map

be overrun if the development of the neighbourhood did not include some commercial aspects. In today's society, there has been a resurgence of making what you want and sharing what you need. So there may be a tool library and a maker space in the new commercial spaces. Just as condo living has recreational spaces to rent out, there could be amenities like a games room, gym, or art studio. These uses fit with the concept of unfencing the borders and sharing as an urban ideal.

Backyards are for gathering, and the applications in the neighbourhood vary. For families with children, it is a safe place to get outside and play without needing to travel to a nearby park. However, the benefits of gathering to play in a park are informal; for instance, if you see others playing in the park, the need to connect and interact with other children or adults will draw more families out of the social isolation of their backyard. Jane Jacobs talks about a designated park in the inner city areas and how they are breeding ground for trouble. Jacobs argues that parks being out of sight of the windows are unsafe; whereas, the street in front of a house naturally deters the criminal activity because people may be watching (Jacobs 1961). The path in this neighbourhood will be a play street a happy medium where children can learn and interact without a set plan. The idea of a play street or park was developed by Aldo van Eck and showcased in Hubertus house in Amsterdam, The Netherlands.

Other than the spacing of the building on the site being a limiting factor some have rugged rocky backyards making the trail the only option from the three backhouses in some of the blocks on the site plan. The site is full of Garry oak trees that are a local habitat.

> Garry oak forms open parkland and meadows that are scattered with Douglas-fir and a lush spring display of herbs - Camas, Easter lilies, western buttercups, and shooting stars. These meadows are threatened by urban development. A diverse bird community makes its home in Garry oak meadows, as well as numerous mammals and insects. Garter snakes and alligator lizards can be seen basking on sun-warmed rocks.

(Coward 1977, 133)

The ground cover being an important aspect of the Trail the raised path will help people enjoy the Trail year round. The raised nature of the Trail stops erosion in with the increased traffic passing through the urban forest.
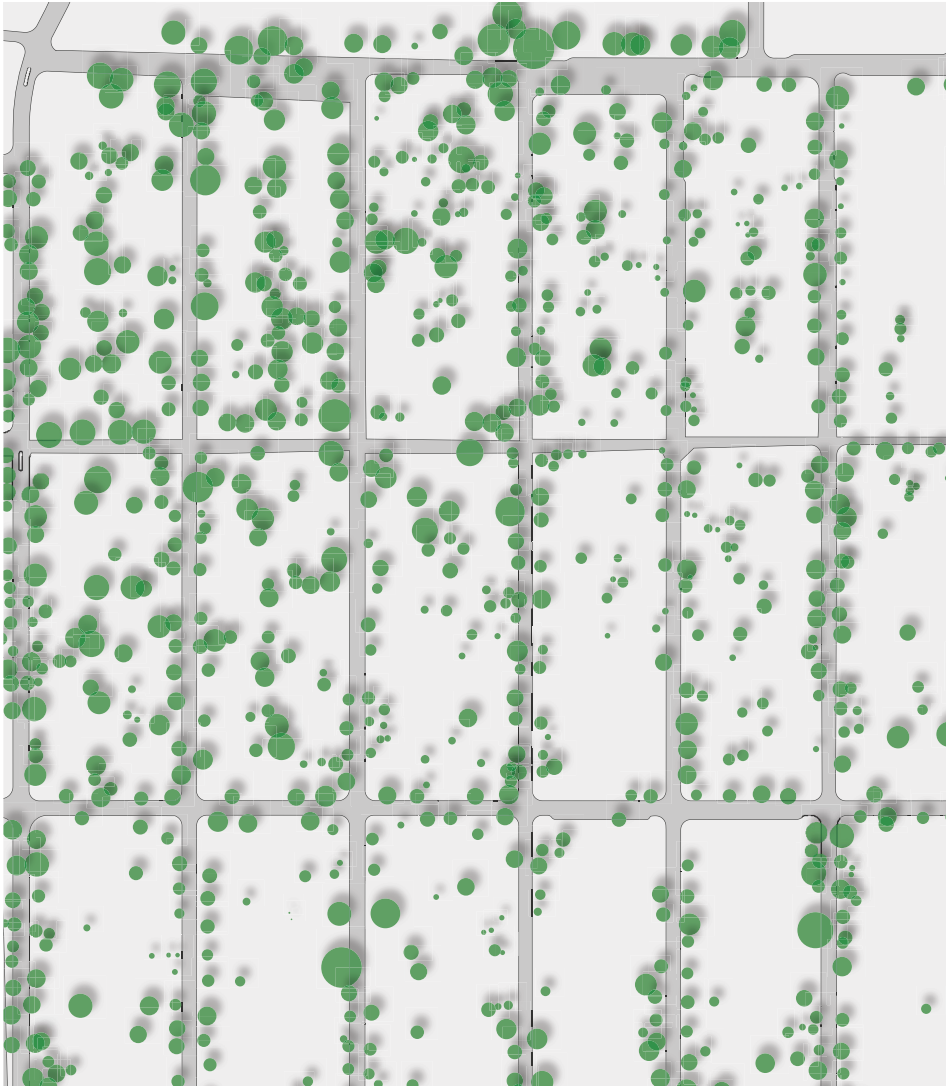
Tree map

Victoria green space map google earth

Street Backhouse Design

The architectural character of the Street Backhouse starts with the commercial aspect reaching out into the lane. While the stores are only 5m deep, being open to the 10 m wide lane allows for additional space, such as a summer patio or loading area out front. The retail will only have windows on the street side and enclose at most a storage room and bathroom along the back wall. The standard plan will have an open floor plan structural support within the wall and beam in the ceiling. This plan will leave the commercial space open to change when filing the shops as not to limit the design of the space. Moreover, occupants appreciate overhangs due to the rainy climate of Vancouver Island. Therefore, the design shifts the second story of the Street Backhouse into the lane.

A courtyard adjacent to the residential unit will give relief to the occupants before going upstairs to their unit. This shared yard provides access to the backyards of the primary homes as well as access for residents to the shops. Moreover, there is an upstairs patio before entering the backhouse. Entering the house, you arrive in the main living dining and kitchen open floor plan room. The key to the small space is views out in all directions. Starting with the view down the street past the building created by the overhang atop the commercial space and views looking back toward the main house. Next, the bedroom has another window looking out past the unit across the street. Setting the windows close to a wall that runs perpendicular creates diagonal views; thereby, increasing the sight line distance.
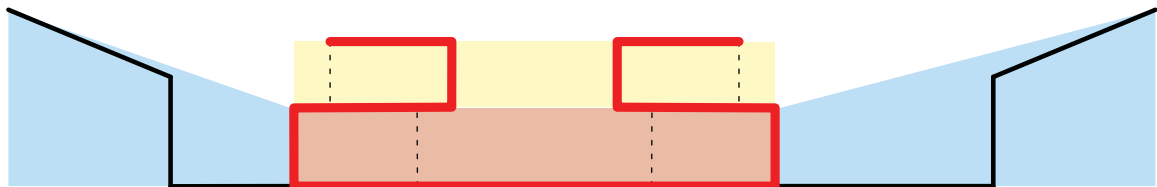
Street backhouse formation, layout implications diagram
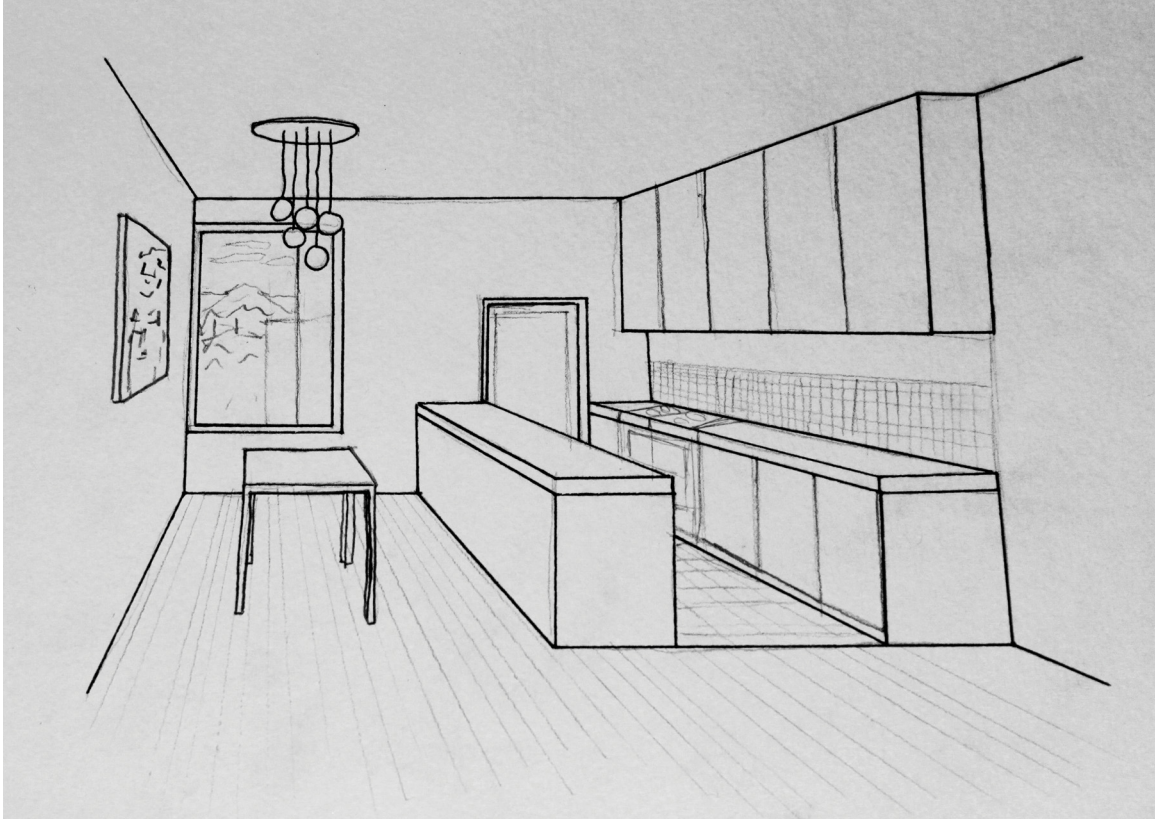
Street backhouse vignette looking out overhung window
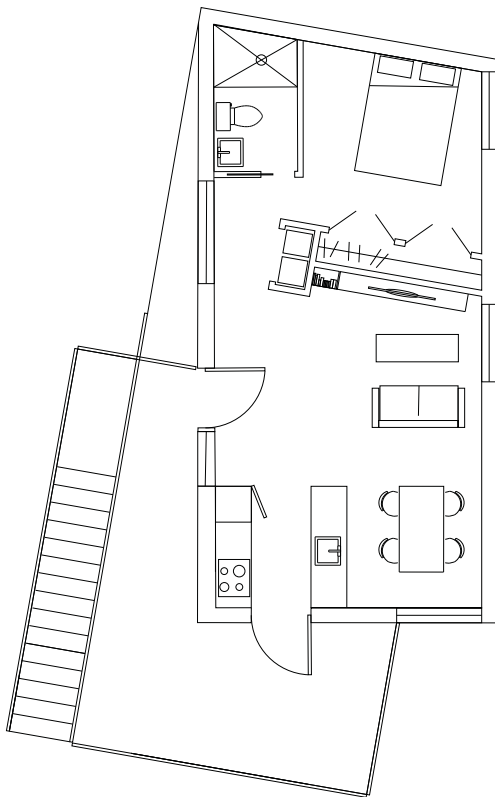
Street Backhouse plans after defence

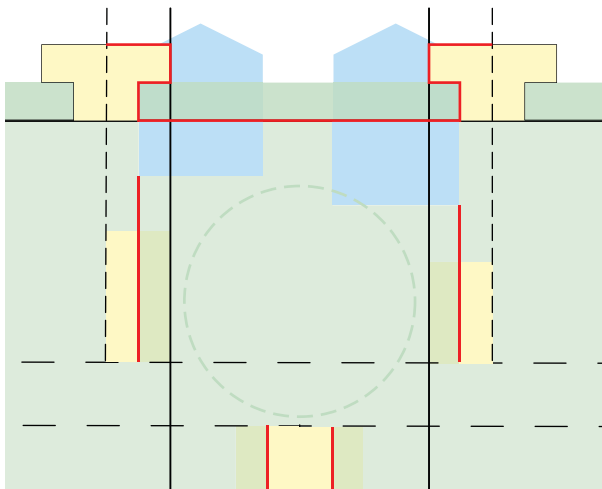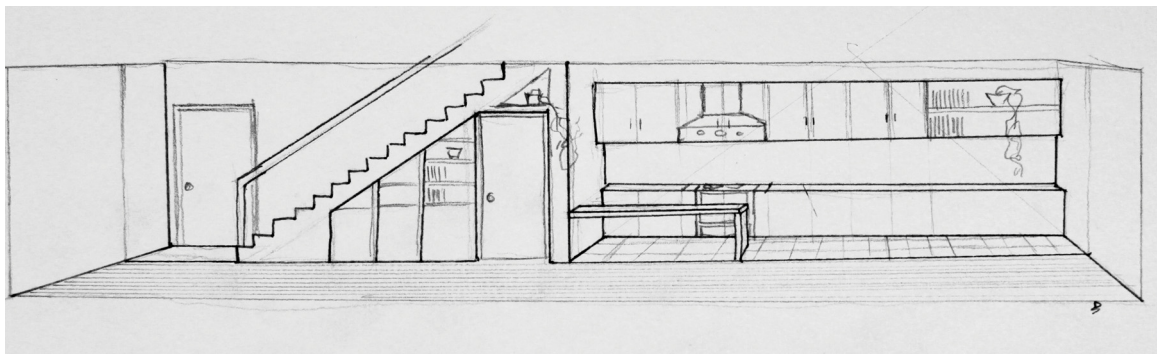Street Backhouse section and plan

Site plan side view

Site plan view

Path Backhouse Design

Path backhouses entries are off of the lane and inset to shelter from the rain they are along the zero lot line and therefore shared with the neighbouring property this is the first informal space for interaction between neighbours. When exiting the Backhouse directly in front of you is a courtyard across the lane. The indent also prevents you from stepping directly into the Path. After entering the space the first thing you will notice is the great room an essential aspect of many small homes, but this one extends to include the courtyard flanking the backhouse. The extension to the outside is possible because the service and rooms are built along the zero lot line wall

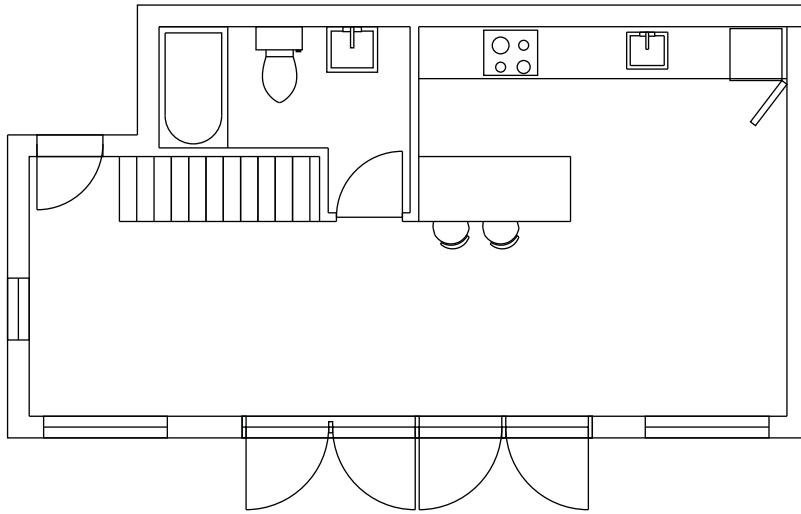Path diagrams implications

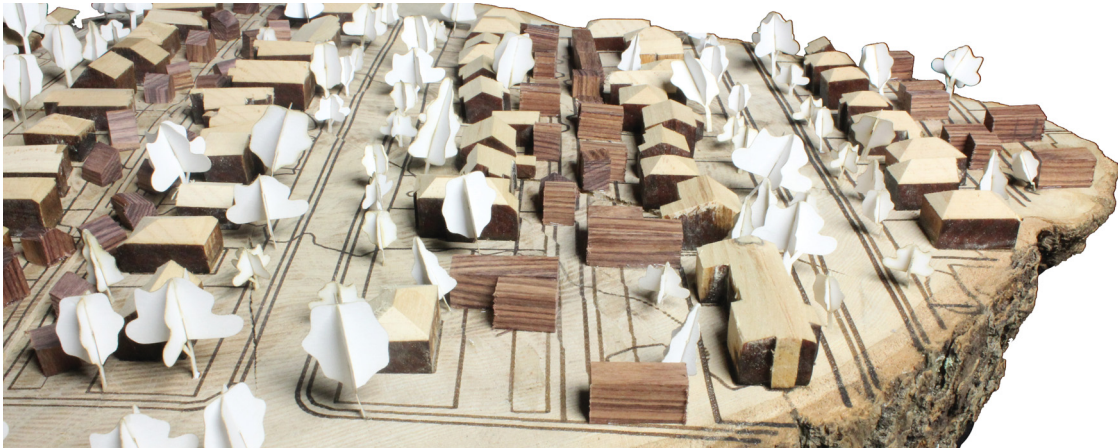Path Backhouse vignette of zero lot line core

Path Backhouse section and plan

Path Backhouse plans after defence

Site plan Path and Street view

Path and Street courtyard view

Path and Street side view

Path and Street plan view

Trail Backhouse Design

The Trail Backhouse focuses on removing the occupant from the city as they walk along the trail to their dwelling. Furthermore, the second you step foot on the raised walkway are entering the backhouse. The proximity to nature, with ceilings tree canopies, walls of trunks, and a floor of native plants, mimics walking down the hallway. Finally, the journey ends with entering the private room which is the physical building. From here views looking out capture the ground, trunk, and canopy reminding the residents of the outdoor space around them. Consequently, this borrowed space helps decompress the tight rooms for sleeping, cooking and storing. Victoria has excellent weather compared to the rest of Canada. It has a mild, wet climate which, if prepared for the rain, suites an outdoor living lifestyle.
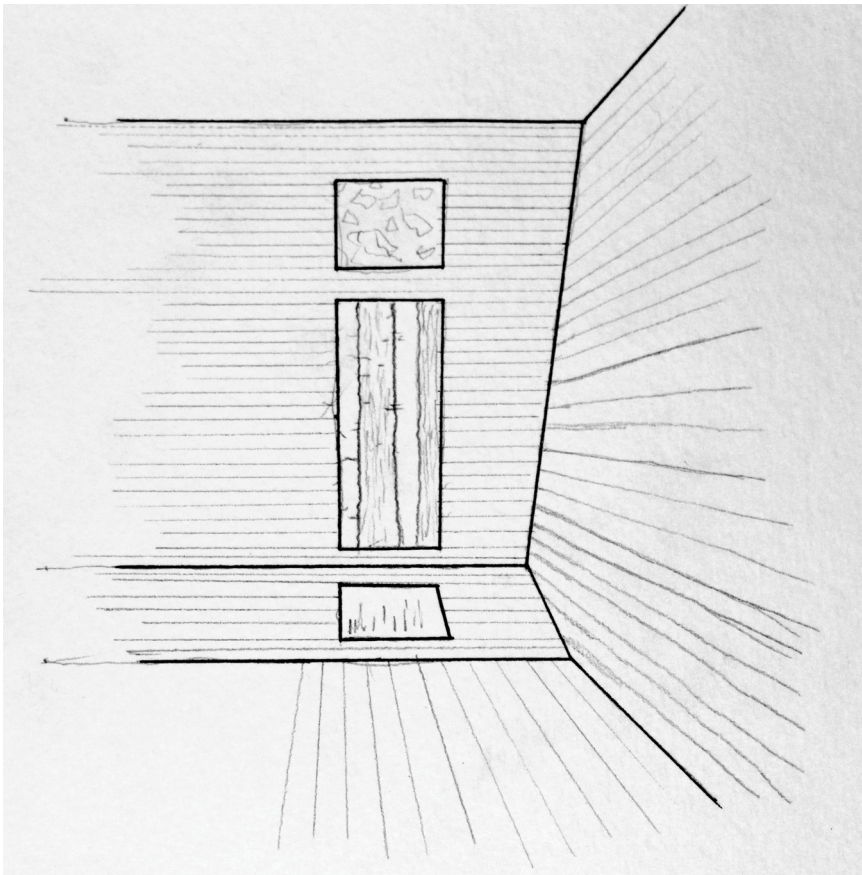
Trail Backhouse vignette main three part window
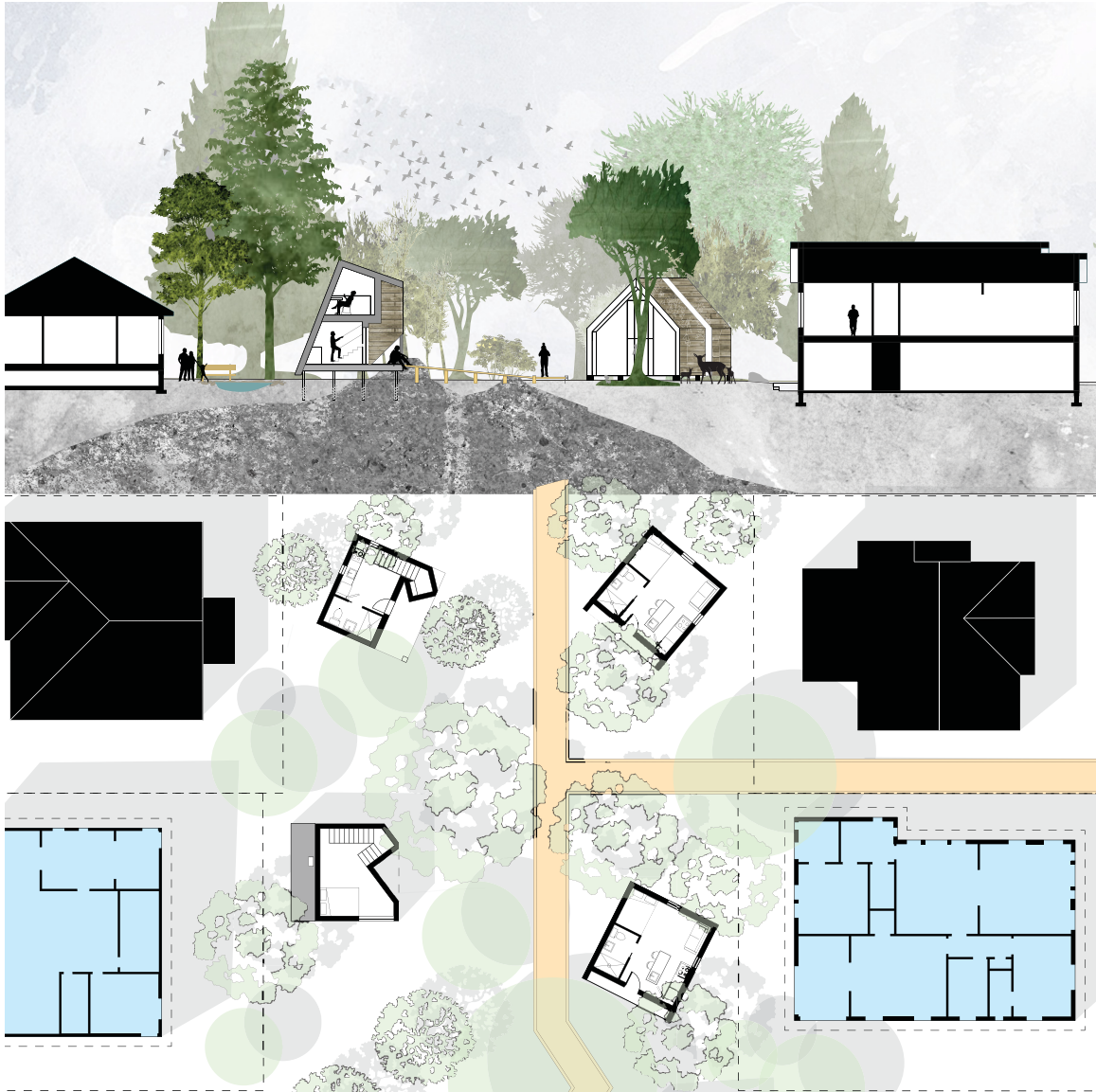
Trail section and plan
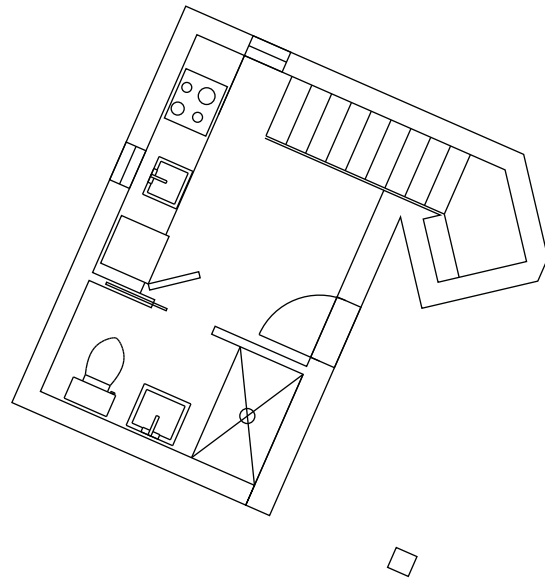
Trail plan after defence


Site plan Trail view

Trail side view

Trail plan view

CHAPTER 6: CONCLUSION

Ideal densification is situational, and therefore the three variations on backyard housing developed will not necessarily be ideal in every case. The solutions developed are dependent on the variables of culture, housing demand, population demographics, and the physical dimensions of the site. The need for the new typology arose from the housing crisis Victoria is experiencing and its search for innovative solutions to the lack of housing. The problem with many densification typologies that already exist is the need for bare sites. Demolishing the existing housing stock erodes the cultural identity of the neighborhoods. Laneway housing, which utilizes the backyards, is not holistic in its implementation as it neglects the changing lifestyle living in a backyard would bring. Underlying cultural dependence on vehicular transportation threatens the practicality of all densification typologies regardless of architectural form. Despite the resistance, densification is required to relieve the housing pressure felt in the inner suburban areas surrounding city cores. Many homes are underutilized exacerbating the low density with only one or two occupants per home that could support three or more. Families are losing housing as development forces families out of the inner suburb housing making room for mid-rise buildings with profitable one bedroom units. Changing demographics need to be equalized in the city before the imbalance renders the traditional urban residential obsolete and the city is void of families.
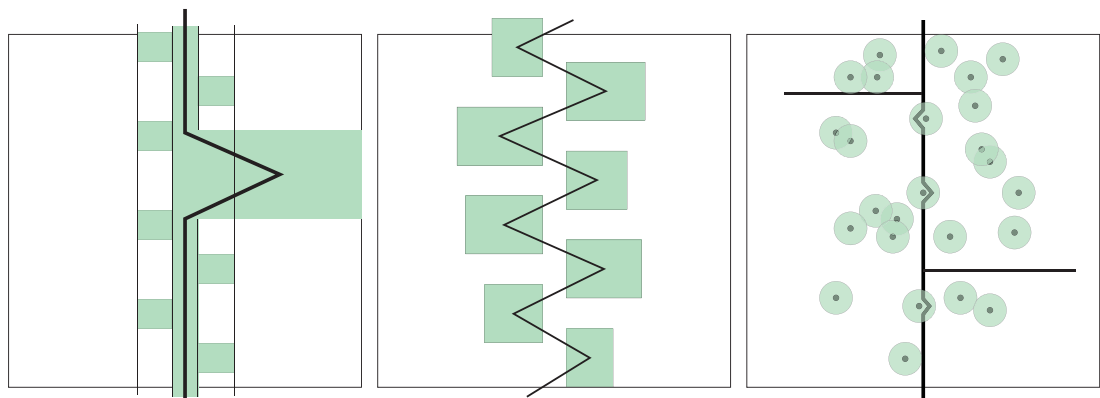
Parti drawings Street Path and Trail backhouses

The solutions developed for the thesis are multi-faceted revealing three backhouse variants to add to the densification discourse. The backhouses along street, path, or trail designs have been developed along the new access route. The end block access is the ideal entry method and disrupts the existing housing stock the least. The implementation of backyard housing was possible because of the empty space contained in the backyards. The rear yard property line is offset to determine the access width. After the access offset, there is a minimum 5m offset to designate the building area. A lot is only able to be built on if there is yet another 5m setback to the back of the house.

The street option offers a platform for commercial activity in an area rigidly zoned residential. Allowing this program variation strengthens a community when used in moderation. Protecting the amenity of the backyards is vital, and the path scheme looks to amplify the activity through co-ownership of the backyards. Alternating the Backhouses opens a courtyard area to be used by all residents effectively deprivatizing the backyard and activating the space between all six adjacent homes. The street and path schemes work together to urbanize the backyards while retaining a residential identity. Backyards in Victoria are also urban forests where trees have been able to grow to maturity unrestricted by construction. The trail backhouses are placed along a raised trail and foundation on piles to limit harm to the surrounding trees. Trail backhouses are objects in the blocks collective backyard where natural growth is fostered creating an oasis from the city's manicured landscape.

The protection of backyards is important as a social arena for children and families as well as the natural features they enclose. The idea of being able to transition from home to home without leaving the community support network is idealistic, but not unattainable. The need for starter homes and retirement downsizing is not just density for the numbers sake. Whole block planning solves the issues of laneway housing fighting the garage typology for control of the lane. Using backyards without lanes showcased it was not the lane but the existing uses and staggered implementation of housing that is holding back implementation.

Victoria is in a housing crisis and new ideas for densification are needed now. The "garden suite" or "granny flat", although accepted by the city council, has not taken off in
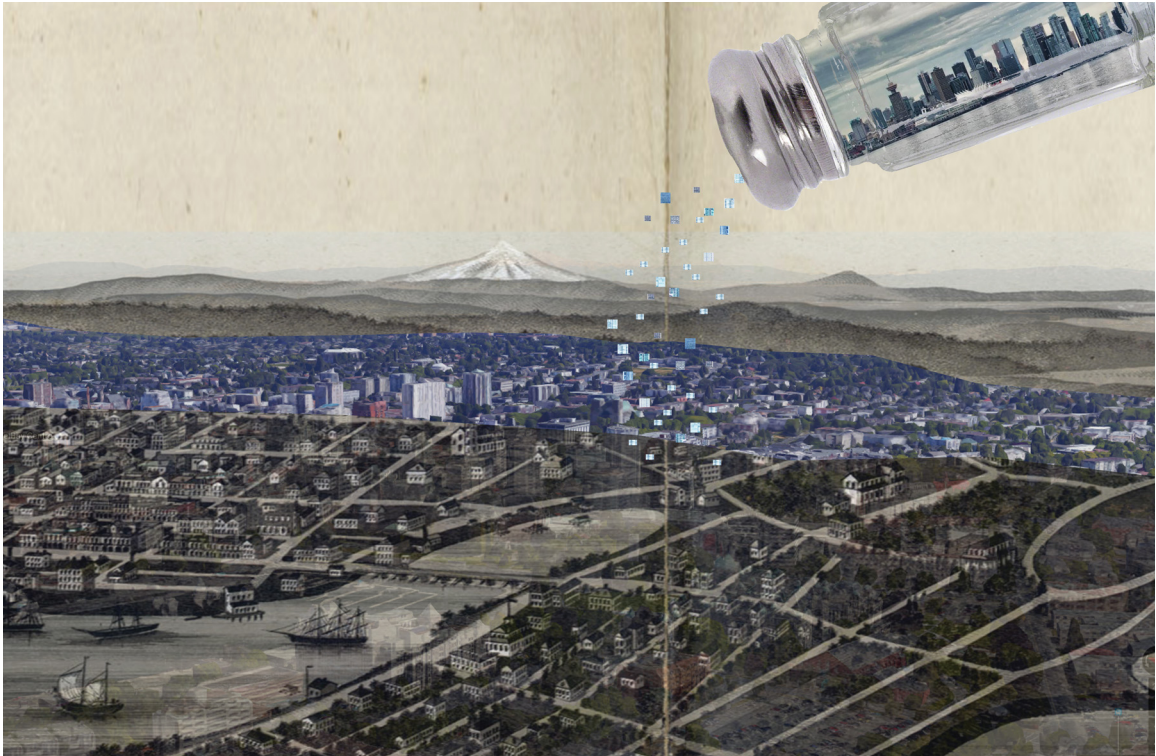
Decentralized densifacation collage showing the addition of a small amount of density from a large city into Victoria

the public realm. The developers are the ones shaping the city and deciding how Victorians will live. Profit based approaches have removed homes and driven up property values pushing families out of the city. Victoria needed a citizen-based approach to retain the character of its districts. Being close to downtown will allow greater utilization of existing pedestrian infrastructure.

Backhouses in all variations, not just the three developed, can help densify areas threatened by redevelopment. Only areas accessible via public transportation, cycling, or walking should be considered for densification of any kind. Restoring the entire block as a stratified masterplan is needed to successfully create the intended density and coexistence of the block. Comparing backyards beyond the fences for aspects that are not supported in the urban setting and using setbacks and zero lot lines. Merging backyards together offers a deprivatized urban ideal to the stagnant traditional urban residential lots.

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