

**Learning from Sudburbanism:
An Identity-Based Infill Framework for
Downtown Sudbury**

by

Breana Chabot

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APPROVED/APPROUVÉ

Thesis Examiners/Examineurs de thèse:

Prof. Jean-Philippe Saucier
(Thesis Advisor/Directeur(trice) de thèse)

Damon Hayes Couture
(Thesis Second Reader/Deuxième lecteur(trice) de thèse)

Carol Phillips, OAA
(External Examiner/Examineur(trice) externe)

Approved for the Faculty of Graduate Studies
Tammy Eger, PhD
Vice-President Research
Vice-rectrice à la recherche
Laurentian University / Université Laurentienne

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Keywords

Urban Renewal, Infill, Density, Housing, Identity, Interdependence, Well-being, Sudbury

Abstract

Once a thriving urban environment, Downtown Sudbury is now a place the average Sudburian avoids. Due to a lack of local residents and urban density, it is unable to sustain public life, support the well-being of its inhabitants, and as a whole, provide an enjoyable atmosphere. It is in dire need of urban renewal and a key part of the solution is to add more housing through sensitive infill densification projects.

This thesis thus studies people-oriented approaches to learn how to implement infill projects in order to foster interdependence and well-being at the architectural and urban scale. It also studies the uniqueness of the place in order to define identity-based guidelines that can help ensure the design better relates to Sudbury's identity. This theory-based and place-based knowledge is then paired to an architectural infill framework that is then applied to three Downtown sites, demonstrating its potential and flexibility.

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Preface

Growing up in the suburban and rural areas outside of Toronto, my exposure to dense urban environments was few and far between. My first experience of living in a city was when I moved to Sudbury to pursue my Bachelor of Architectural Studies at the McEwen School of Architecture (then LAL), which was purposefully located in Downtown Sudbury to act as a catalyst for urban renewal. This was where my love for the urban realm was first realized, with my few daily needs met within a small walking radius. For the first time in my life, I no longer required a car to get to where I needed.

For my third year co-op, I was lucky enough to move to Vancouver. As a well-designed city with a strong pedestrian and cyclist culture, I learned the importance of the human scale and life between

buildings. Two years later, my graduate co-op took me to Calgary, where I experienced two sides of the city: how quality public spaces can play a role in our lives, and what it was like to be a pedestrian and a cyclist in a predominately conservative car-cultured place.

Now with the ability to see my education in retrospect, I feel incredibly grateful to have these places as my teachers, alongside my professors at the MSoA, for whom I have limitless appreciation. I feel that my education has come full circle, starting with my first exposure to urban life in Downtown Sudbury, and ending with my small contribution to bettering it.

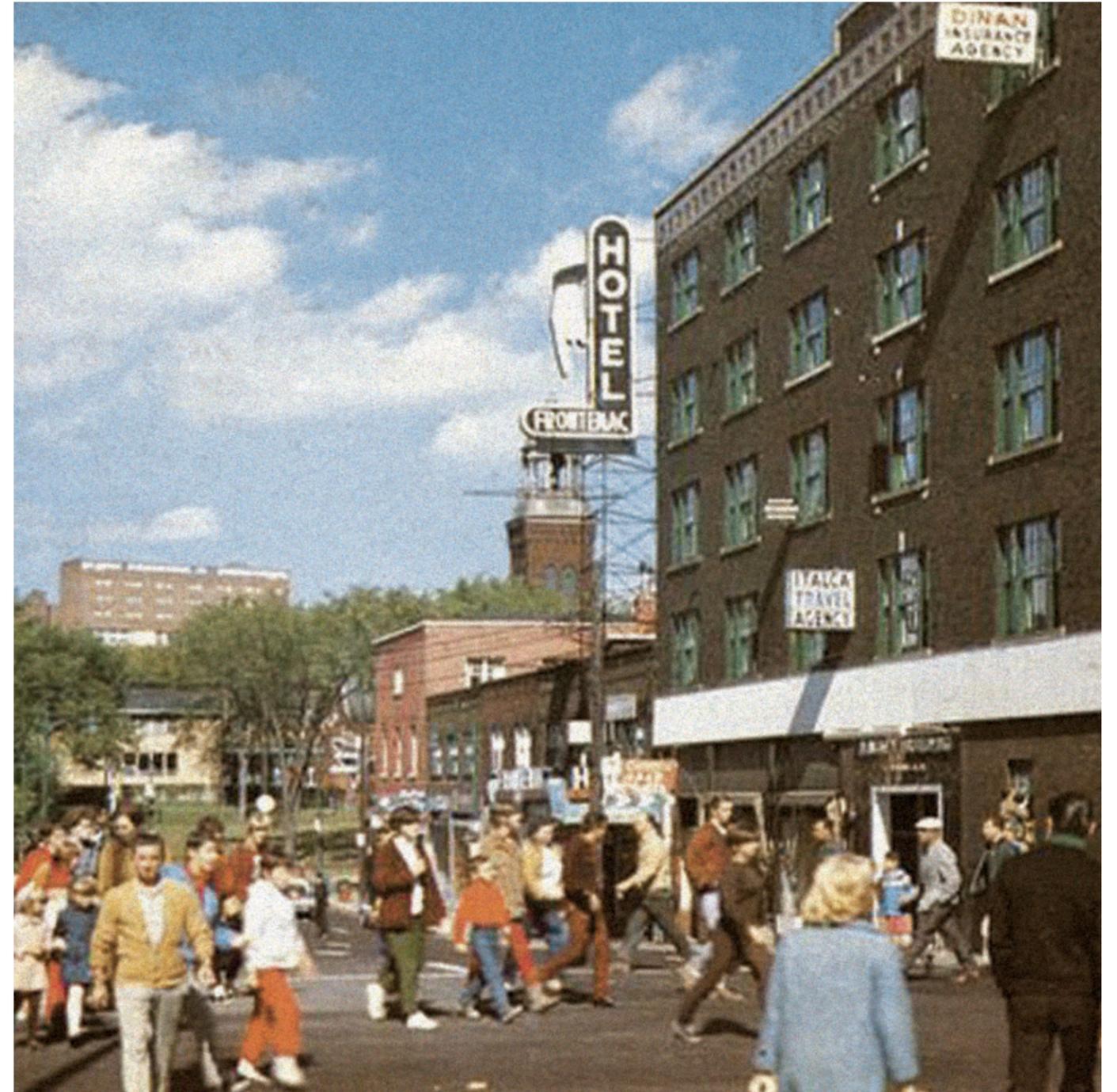
The presence of children within a city is often an indicator of a flourishing community, and in Downtown Sudbury, there are virtually none.^{1,2} Once a thriving urban environment [01], Downtown Sudbury is now a place the average Sudburian avoids. With the popularization of the suburbs and the socially-desirable detached single-family home in the mid 20th century, Downtown Sudbury's inhabitants migrated to remote outlying neighbourhoods, ultimately leaving the Downtown to self-destruct.

Today, Sudbury's Downtown is a low-density neighborhood with a very small population of residents (mostly elders, students, or people with a low-income), a large amount of office buildings, and a few commercial spaces, all surrounded by many surface parking lots. It is somewhat lively in the middle

1. City of Toronto, "Growing Up: Planning for Children in New Vertical Communities," 9.
2. City of Greater Sudbury, *ArcGIS Demographic Data*.

of weekdays while office workers are out, but very quiet during the evenings and weekends. Three gaps can be drawn within the Downtown: one being the gap within built densities, a housing gap or lack of housing given the small population of the city's core, and a gap in demographics, given that there are nearly no children, and therefore no families, living within the Downtown.

Downtown Sudbury's current lack of both built and population density have been detrimental to its ability to support continuous public life. Moreover, with the decline of the Downtown's population starting in the 1970s came the abandonment and neglect of many historic buildings. A common trend in the built history of Sudbury is the seemingly thoughtless demolition of buildings that were deemed useless once the building's program was no longer needed, regardless of the historical and architectural value of these buildings. This has led to the Downtown



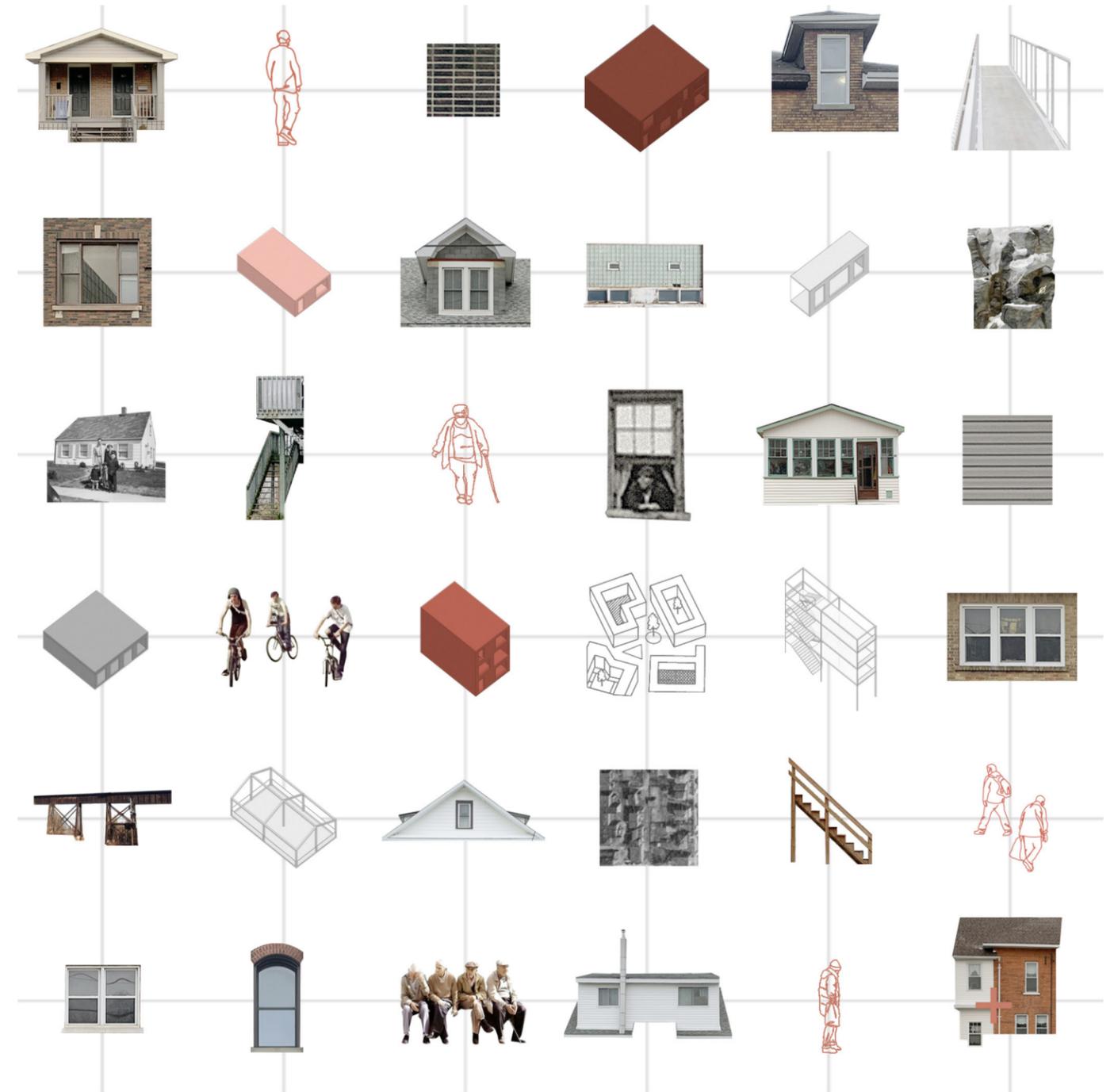
Above
01 // The Sudbury amble scramble, when pedestrians could cross the intersection in all directions, at the intersection of Elm and Durham, c. 1963

Since Downtown Sudbury needs more than one infill project to initiate a profound urban renewal, this thesis is not so much interested in applying the set of guidelines to a standalone project, but to instead develop an architectural framework that could be utilized by various designers to design a large number of high-quality infill projects, each of them abiding by the people-oriented and identity-based guidelines [03]. There is a hope that such a framework could be used by the City of Sudbury and designers to extend past its life in academia. Consequently, the architectural response to Downtown Sudbury's dire need for densification and housing is an identity-based infill framework. The framework consists of a set of programmatic modules intended to be applied to existing void lots within the Downtown to densify existing conditions, along with a set of rules to further explain how to best utilize the modules with respect to the overall architectural and urban objectives. In addition to filling Downtown Sudbury's physical gaps and densifying the many parking lots, this infill framework aims to improve the human and urban conditions of the Downtown, promote interdependence and well-being amongst inhabitants, and catalyze a flourishing public life, all while relating to place.

In order to test the infill framework's ability to create a variety of designs within the Downtown through the use of the same modules, the framework is applied to three distinct sites, forming three different infill projects. The carefully-selected sites range in size and context and are presently all parking lots where prominent buildings once lived. The sites and thus the infill projects are each named based on their respective sizes; Large, Medium, and Small, stylized L / M / S.

This leads to the thesis question, which is *how can we develop a flexible infill framework based on Sudbury's distinct identity to bring inhabitants back to the Downtown and foster interdependence and well-being at the architectural and urban scale?*

With the creation of an identity-based infill framework for Downtown Sudbury, this thesis both learns from and contributes to Sudburbanism.



Above
03 // A conceptual collage of the framework and the guidelines: the people-oriented approaches, the details of Sudbury's identity, and the modules

2.0 People-Oriented Approaches to Urbanism

This section presents the thesis' theoretical framework and analyzes people-oriented approaches to urbanism in order to catalyze healthy urban environments that support the well-being of their inhabitants. The section discusses the concepts of life between buildings, density, pedestrianism, well-being, neighbouring, interdependence, diversity, multigenerational living, and adaptability. The section concludes with a set of people-oriented guidelines based on these concepts to contribute to Downtown Sudbury's urban renewal.

2.1 Life Between Buildings, Density, + Pedestrianism

When studying public human life in urban environments, we are looking at our lives between buildings.³ How we move from one place to another, whether it be from home to work, to daycare or school, to running errands, or leisurely without destination, is really how we experience the built environment around us at the urban scale. These movements between buildings influence our well-being and affect the built environment's ability to deliver everyday contentment and sociability, so long that the environments in question prioritize human life [04].⁴

In a setting where density is low, like the suburbs for example, these daily in-between movements are done almost entirely through the lens of our vehicles [05]. Jan Gehl goes as far as saying that Suburban environments are the epitome of unhumanistic

3. David Sim, *Soft City: Building Density for Everyday Life* (Island Press, 2019), 19.
4. Ibid, 19.

approaches to urban planning, designed with modernist approaches that have little regard for the human scale.⁵ Oftentimes when looking to point a finger at the failures of these pseudo-urban places, the car is to blame, but as Jane Jacobs states quite spot on, "Automobiles are often conveniently tagged as the villains responsible for the ills of cities and the disappointments and futilities of city planning. But the destructive effect of automobiles are much less a cause than a symptom of our incompetence at city building."⁶ For decades, this low-density, modernist way of planning has been focused on organizing human activity into districts by clearly allocating an activity to a zone.⁷ This includes complete separation of pedestrian traffic from vehicular traffic, workplaces

5. Jan Gehl, "In Search of the Human Scale" (Auckland, 2015).
6. Jacobs Jane, *The Death and Life of Great American Cities* (New York: Random House, 1961), 7.
7. James C. Scott, *Seeing Like a State, How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998), 109.

"Automobiles are often conveniently tagged as the villains responsible for the ills of cities and the disappointments and futilities of city planning. But the destructive effects of automobiles are much less a cause than a symptom of our incompetence at city building."

// Jane Jacobs

and shopping centres from residences, and more. The logic behind this rigid segregation of urban zones is that it is far easier and more efficient to plan an area if it only has one purpose. As a result of this poor planning practice, we depend on a vehicle to span these different districts instead of the human body alone.⁸ Planners rarely put city life at the forefront of their plans and for years had no knowledge on how our built environment influenced human behaviour.⁹ Too often, they place human organization and efficiency through the automobile over human well-being and the quality of life of inhabitants who are being shuttled from place to place. When the automobile is the lens through which we experience our everyday environments, our contentment in these experiences are hindered, as our connections to others and the

8. Ibid, 110.
9. Ibid, 111.

atmospheres around us are removed.¹⁰ The more the automobile is required, the less we are able to walk or cycle through our environments, and consequently the less pleasurable they become and the less content we are.

In denser city neighbourhoods, the automobile becomes much less a necessity than a burden, as the scale of the city is more relatable to a human than a car. The density of cities shrinks the distance for which necessities are located, changing the scale to one that is far more human and allowing us to walk or cycle to our daily nodes. Neighbourhoods that encourage walking are more likely to instill positive social encounters and a strong sense of community.¹¹ Through walking these daily paths and navigating these spaces between buildings on foot, the atmosphere around us becomes more tangible.¹² We can better experience our environment and the people around us without the barrier of a vehicle and at a much slower pace, contributing to our basic human need of feeling connected to our surroundings in our everyday lives.¹³

A greater density in our cities allows for flourishing pedestrianism, which increases our quality of life through experiencing our lives between buildings at the human scale. Pedestrianism also creates a greater convenience to public spaces, as in a denser environment there is minimal commitment to enter and use a public space, and they fit into people's lives easily.¹⁴ With more use of public spaces comes an increase in safety. When the inhabitants of a city have greater connections to the street level and are

10. Jan Gehl, *Life Between Buildings: Using Public Spaces* (Island Press, 1971), 133.
11. Paty Rios, Charles Montgomery, and Lili Friedler, "Social Wellbeing and Sociability in Multi-Family Housing Design" (Happy City, 2017), 23.
12. Jan Gehl, *Cities for People* (Island Press, 2010), 114.
13. Sim, *Soft City: Building Density for Everyday Life*, 22.
14. F.E. Brown, *The Urban Experience: A People-Environment Perspective* (Taylor & Francis Group, 1995), 292.



able to observe happenings, neighbourhood safety is increased. In large urban centres, buildings are often considerably taller than six stories above the ground level, which is the threshold for people in buildings to maintain audio and visual connections to the street and other public spaces, and vice versa.¹⁵ This is why it's important for buildings to have a maximum of six stories and to build to the edges of the site, to maintain connections to their direct surroundings, increasing safety in public spaces. These feeling of safety contribute to a greater sense of community.¹⁶

These three concepts together, density, life between buildings, pedestrianism, feed off each other as a humanist approach to our city planning. By contributing to the density of Downtown Sudbury, pedestrianism and the experience of our outdoor

15. 360 Degree City and Intelligent Futures, "Building Up Well-Being," 2018.
16. Jacobs, *The Death and Life of Great American Cities*, 35.

environment can flourish. In part, Sudburian lives between buildings would no longer need to be entirely through the lens of a vehicle. This could strengthen the social function of Downtown Sudbury and support the overall well-being of its inhabitants.¹⁷

17. Gehl, "In Search of the Human Scale."



Left
04 // Pedestrians experiencing life between buildings in Copenhagen outside of Cobe's Krøyers Plads

Right
05 // Suburban environment with low density and life between buildings through the lens of the vehicle in Sudbury, c. 2007

2.2 Well-being, Neighbouring, + Interdependence

Well-being is defined as the state of being happy, healthy, or prosperous.¹⁸ In reality, this concept of well-being is multidimensional, with several types of well-being as contributing factors to overall well-being. Out of these factors, the ones most related to the architectural realm include psychological and social well-being, the degree to which we feel a sense of belonging and are able to connect with others around us.¹⁹ Within an urban context, our built environment has the power to influence one's psychological and social well-being, as they can either support or hinder our comfort levels and our social connections to the people and atmosphere around us.

Since the modernist movement, sociability in our changing urban environments has become more difficult to come by and depression, social isolation,

18. Rios, Montgomery, and Friedler, "Social Wellbeing and Sociability in Multi-Family Housing Design," 1.
19 Ibid.

and loneliness have become normal phenomena that are persistent issues in Canadian cities.^{20,21} With the isolation due to the COVID-19 pandemic, many of us have witnessed these phenomena first hand. Our living environments and the greater neighbourhoods around us, where we spend the majority of our time, can be designed to support both our social and psychological well-being, helping us feel connected and providing a sense of belonging. Our lives have been more interior and private, and we have been transporting ourselves through cars, which are seen to have negative impacts on our well-being.²² Although privacy and individuality in our daily lives are important, so is community. As humans, we need to balance both individuality and sociability to fight these collective feelings of depression and loneliness imposed by our living environments.

20. Sim, *Soft City: Building Density for Everyday Life*, 19.
21. Rios, Montgomery, and Friedler, "Social Wellbeing and Sociability in Multi-Family Housing Design," 1.
22. Sim, *Soft City: Building Density for Everyday Life*, 28.

Looking at the smaller scale of the neighbourhood, relationships are particularly important to the human environment and social well-being, as the term neighbourhood is a state of being in a relationship.²³ A core concept throughout this thesis is interdependence, defined as the state of mutual dependence of two or more things, forming a relationship. Interdependence can be studied at three scales; interdependence between people and neighbourhood, people and their home (the greater building in which they live as opposed to private dwelling), and people and people.²⁴

Interdependence between people and neighbourhood focuses on how the neighbourhood, as a family of buildings and spaces in-between, can support its inhabitants. In denser urban environments, the close proximity of the buildings and people to each other allows for necessities to be nearby, permitting people to live more locally and sustainably,²⁵ while also promoting pedestrianism as aforementioned. This also allows for inhabitants of the different homes to mix. Interdependence between the people and their home is a building's ability to respond to its inhabitants' needs.²⁶ This relationship between people and their home is strengthened when people can adapt their home to suit their evolving needs. A building's adaptability to various programs, living arrangements, and inhabitant preferences is crucial for psychological well-being. Interdependence between people and people is more about being a neighbour, aided through the level of densification, the design of public spaces, multi-residential buildings, and the spaces in between. At the scale of the multi-

23. Ibid, 29.

24. Ibid, 28.

25. Tommy Garling, Anders Biel, and Mathias Gustafsson, "The New Environmental Psychology: The Human Interdependence Paradigm," in *Handbook of Environmental Psychology* (New York: John Wiley & Sons Inc, 2002), 85.

26. Rios, Montgomery, and Friedler, "Social Wellbeing and Sociability in Multi-Family Housing Design," 18.

residential building, this level of interdependence can be strengthened by grouping dwellings together, allowing inhabitants to have a smaller quantity of strong encounters. When the environments around us are designed to allow for chance encounters with our neighbours, our human need for sociality is fulfilled.²⁷

In the past, successful neighbouring has allowed us to thrive and live fuller lives,²⁸ contributing greatly to our social well-being. These scales of interdependence create various types and qualities of relationships with the people around us. When applied to Downtown Sudbury, these concepts of interdependence and neighbouring can aid in social isolation and foster these important feelings of belonging in both social and psychological well-being.

27. Ibid, 18.

28. Sim, *Soft City: Building Density for Everyday Life*, 29.

“If you see a city with many children and many old people using the city’s public spaces, it’s a sign that it’s a good quality place for people”

// Jan Gehl

2.3 Diversity, Multigenerational Living, + Adaptability

Diversity often comes along with a high density and is natural to larger cities, but its importance should not be overlooked. Diversity can be seen in two ways: diversity in uses or activities and diversity of population. In urban environments that support a diversity of population, people with different needs and interests can live in close proximity to each other, which better generates a diversity in uses or activities.²⁹ In a truly diverse format, diversity in population demographics is often the sign of a healthy public space. As Jan Gehl has states quite well, “If you see a city with many children and many old people using the city’s public spaces, it’s a sign that it’s a good quality place for people.”³⁰ This need for a mixture of diverse uses in one place allows for occupation at different times, keeping the public realm consistently active and safe. This sustains healthy life between

29. Jacobs, *The Death and Life of Great American Cities*, 144.
30. Gehl, “In Search of the Human Scale.”

buildings and neighbouring, further contributing to the betterment of our well-being.

Demographic diversity can also be applied to the slightly more private realm of a multi-residential building. Common multi-residential settings usually cater to a specific type of demographic, in terms of age, income, and even sometimes occupation. This is especially seen in high-end condo towers, low-income buildings, retirement residences, and student residences, to name a few. This segregation of demographics hinders diversity at the building scale and damages chances for intergenerational interdependence between people, both of which contribute to better neighbouring and well-being.

To understand the benefits of diverse multi-residential environments, multigenerational living can be studied. Within the realm of domestic architecture, multigenerational living typically entails

multiple adult generations of a family living under one roof with both shared and private amenities. This is often seen in families with grandparents living in the same dwelling, sharing a core living space and kitchen while having the opportunity to enjoy private areas within the dwelling.³¹ This way of living has many benefits, from in-house childcare, aging-care, decreased isolation, intergenerational socialization, and emotional bonding.³² This can also be achieved through a lighter multigenerational approach, where multiple adult generations live in the same multi-residential building with their own private dwellings, but share communal amenity spaces, like common rooms.³³ These multigenerational bonds are thus created between close neighbours, as opposed to a

31. Stephanie H Shin, “Planning for a Multigenerational Future: Policies, Regulations, and Designs for Multigenerational Housing in the United States” (Cambridge, MA, Massachusetts Institute of Technology, 2012), 11.
32. Rios, Montgomery, and Friedler, “Social Wellbeing and Sociability in Multi-Family Housing Design,” 14.
33. Ibid, 15.

family living under one roof. This diversity in dwelling types also promotes tenure for inhabitants, allowing people to stay in the same community for longer as their needs change over time.³⁴ The greater the tenure within a community, the greater the social connections, which further contribute to the likeliness of multigenerational bonds and reducing risk for social isolation.

Another factor contributing to diversity, tenure, and multigenerational approaches to housing is adaptability, allowing inhabitants to adapt their dwellings to their needs that change through different life stages. Over the course of a family’s life, renovations are often required throughout the child’s growth, from welcoming the child into the home, to when they grow and require more space, to when they eventually move out and their spaces are no longer needed. In typical multi-residential settings (apartments or condos), this renovation is not as easy because these buildings are usually quite rigid, but providing the flexibility for inhabitants to adapt to these changes allows them to stay in their homes longer. Additionally, the greater sense of control inhabitants have over their living environment, the better their well-being and quality of life is.³⁵

Where various demographics are supported, a plethora of benefits emerge. Providing a range of adaptable dwelling types in multi-residential housing allows for the building itself to be diverse, in addition to the greater context of the neighbourhood. This implementation of diversity at a variety of scales throughout our urban environments betters our well-being and the quality of the environment around us.

34. Ibid.
35. Ibid, 16.

2.4 People-oriented Guidelines

As discussed in previous subsections, there are several people-oriented concepts that can be applied to an urban environment to better our quality of life. Density in an urban environment is crucial as it allows for pedestrianism and experiencing life between buildings at the human-scale, without the barrier of the automobile. Pedestrianism creates better neighbouring and interdependence as it allows people to interact with each other, which circles back to bettering our lives between buildings. All of these humanistic concepts depend on each other to influence our psychological and social well-being. These concepts can be applied to Downtown Sudbury to aid in its clear need for urban revitalization. Thus, a set of guidelines for people-oriented approaches to urbanism have been designed [06, 07, 08]. The guidelines are as follows:

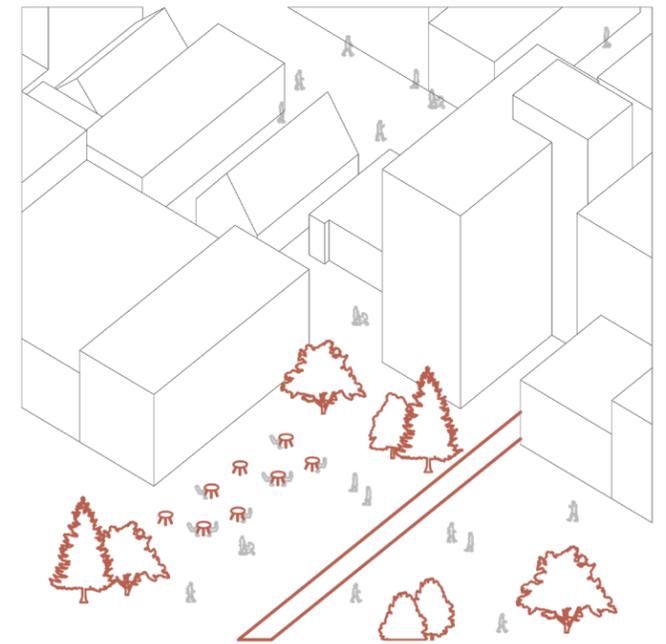
01 // Encourage a diversity in inhabitants and activities

Demographic diversity should be applied at different scales of our urban environment, including the scales of a multi-residential building and its surrounding neighbourhood. By encouraging true diversity in all aspects, including inhabitant age, income, and occupation, this fosters greater interdependence and allows for various necessities to be within close proximity to each other, permitting people to live more locally and sustainably.³⁶

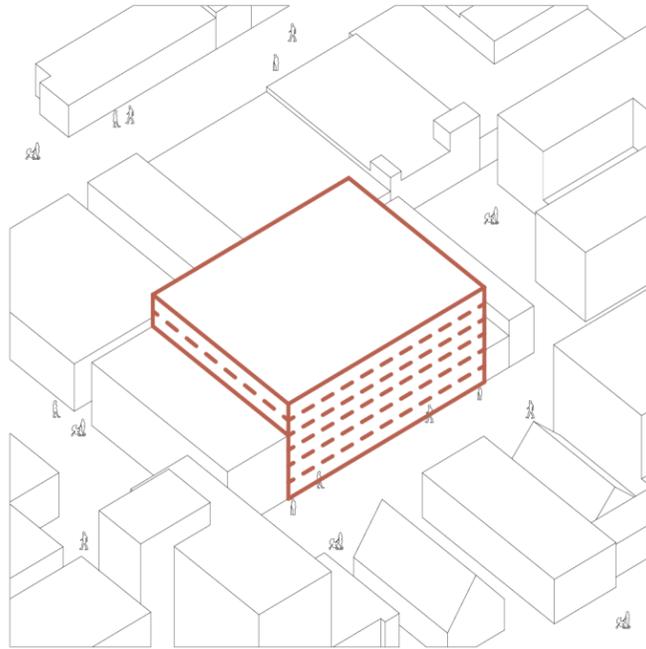


02 // Design quality public spaces

Quality public spaces act as meeting places and communal backyards for urban dwellers. The quality of these spaces can influence community well-being and feelings of safety.³⁷ These public spaces must be designed with many visible connections for passersby or people in adjacent buildings to be able to observe happenings. These public realms can also be woven into the design of multi-residential buildings, promoting interdependence between people and their neighbourhood.

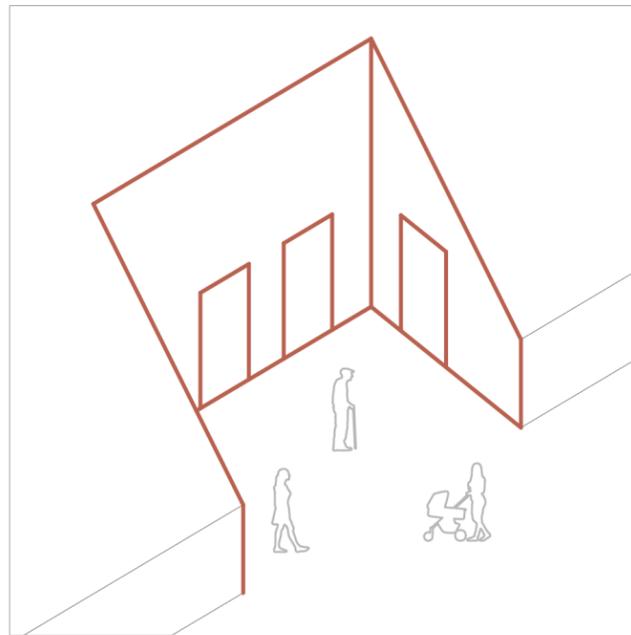


36. Sim, *Soft City: Building Density for Everyday Life*, 334.
37. Gehl, "In Search of the Human Scale."



03 // Build to the edges of sites and to a maximum of 6 stories

Buildings should extend to site boundaries where possible and build to a maximum height of 6 stories.³⁸ This maintains visual and audio connections to the street from all levels of the adjacent buildings, increasing safety through having eyes on the street.³⁹



04 // Group dwellings together to allow for interdependence

Grouping dwellings together can foster interdependence between people. A smaller grouping of dwellings can influence the quality of relationships that people develop. Gathering dwellings in clusters allows inhabitants to experience regular, close contact with only several dozen people.⁴⁰

38. Gehl, *Cities for People*.
 39. Jacobs, *The Death and Life of Great American Cities*, 35.
 40. Rios, Montgomery, and Friedler, "Social Wellbeing and Sociability in Multi-Family Housing Design," 35.

05 // Provide a balance between individuality and sociality in multi-family housing developments

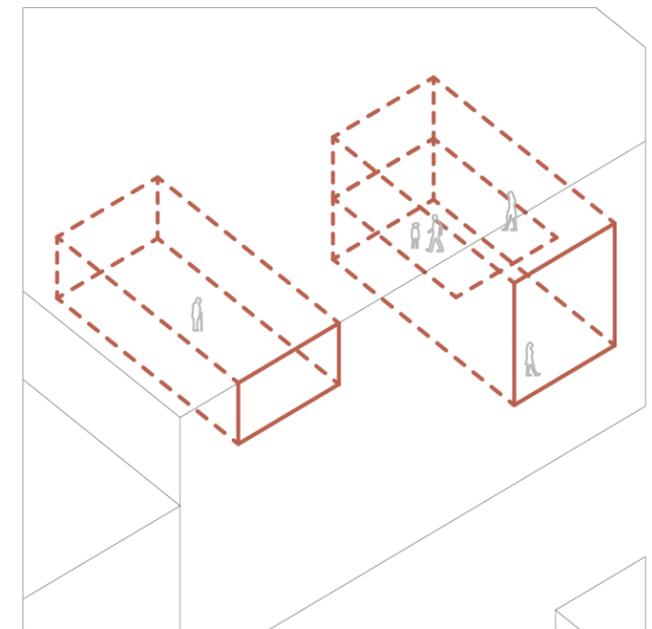
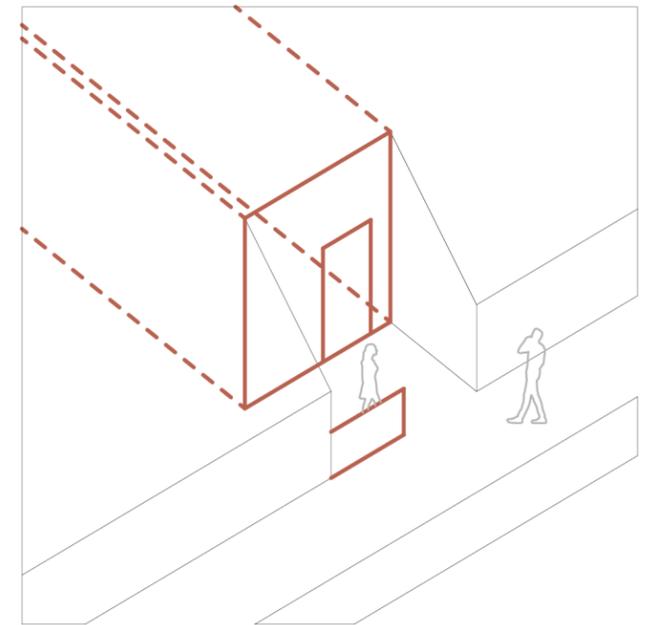
Providing flexible social spaces supports interdependence between people. Additionally, providing a range in levels of publicness or privacy allows for a greater chance to build positive social connections.⁴¹ For these more public spaces to be successful when interacting with private dwellings, it's important to clearly define divisions between private, semi-private, and public spaces.

06 // Design adaptable and space-efficient dwellings

Designing spaces to be adaptable throughout different activities and lives also provides inhabitants with greater agency over their dwellings.⁴² Functionality is also important, such as allocating spaces for appropriate storage and activities.

Through studying people-oriented approaches to urbanism, the affects that a healthy urban environment can have on people's lives becomes more clear. The creation of the people-oriented guidelines, based on the aforementioned concepts, can be applied to an urban environment like Downtown Sudbury to aid in urban revitalization and better the quality of life of its inhabitants. The applications of these people-oriented concepts can also be studied in various architectural works in the following section.

41. Ibid, 13.
 42. City of Toronto, "Growing Up: Planning for Children in New Vertical Communities" (Toronto, 2020), 45.





Above
09 // Bridgeland Community Centre by Sturgess Architecture in Calgary, Alberta, 2005

There are many architectural projects that can be studied to support this thesis' people-oriented approaches to urbanism and architecture. The notable projects to be studied in this section include projects that utilize the concepts of adaptability and framework and bring them under a different light: Bridgeland Community Centre by Sturgess Architecture, Blok Y by Marc Koehler, and New Housing on Briesestraße by EM2N. Other projects worth studying because they relate more to the concepts of interdependence and neighbouring are 8 House by BIG, youCUBE by 5468796 Architecture, and Full House by Leckie Studio. In all of these cases, inhabitants' well-being and quality of life are prioritized.

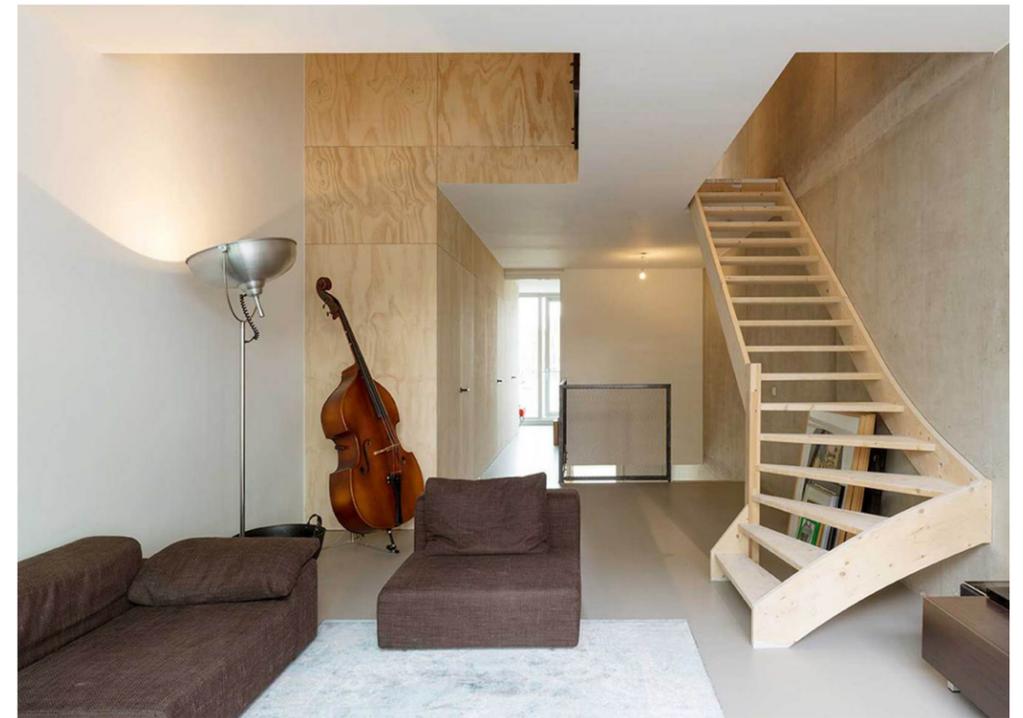
The Bridgeland Community Centre by Sturgess Architecture in Calgary, Alberta is a two-story physical frame occupying the corner of a park as part of the redevelopment of the Bridgeland neighbourhood

[09].⁴³ The frame of the building is mostly exterior, with some smaller interior spaces housing public meeting rooms on the lower level. The exterior areas of the building rely on simple open frames that act as adaptable community living rooms with no programmed functions for the community to use in whichever way they like. Currently, the upper portions of the frame house a community garden and an apiary, while the lower portions are seen to be used as community gathering spaces. This project is a wonderful example of how an unprogrammed space can be occupied by a community, fostering adaptability and interdependence. The concept of an unprogrammed exterior structure to support community activities is a very promising idea worth exploring in this thesis' project.

43. Sturgess Architecture, "Bridgeland Community Centre."



Top
10 // Superlofts Blok Y by Marc Koehler Architects in Utrecht, The Netherlands, 2017



Bottom
11 // Superlofts Blok Y by Marc Koehler Architects in Utrecht, The Netherlands, 2017



Top
12 // New Housing on Briesestraße by EM2N in Berlin, Germany, 2020

Bottom
13 // New Housing on Briesestraße by EM2N in Berlin, Germany, 2020

Superlofts Blok Y by Marc Koehler Architects (MKA) [10, 11] in Utrecht, the Netherlands, was designed as an open building that focuses on flexibility, inhabitant participation, and adaptability.⁴⁴ The majority of this project's flexibility is seemingly provided to future inhabitants prior to the construction of their dwellings, providing them with the ability to customize or design and build their apartments according to their needs. The building is made of a fixed concrete frame that is infilled by the inhabitants and their modular dwellings. Although the flexibility of this project is found prior to construction, it is noted that many of the dwellings can be adapted later on (either by the inhabitant or with an architect or builder) through flexible partitions.⁴⁵ This adaptability to the inhabitant's specific needs and tastes provides a collective character to the building that's ever-changing. The ability to have greater control over one's dwelling through adaptation can be applied to this thesis.

New Housing on Briesestraße by EM2N in Berlin, Germany takes this idea of adaptability on a less-architectural level, where the housing itself is not adaptable or flexible, but the exterior circulation conditions extending from the dwellings are extensive enough to allow for some appropriation by the inhabitants [12, 13]. These spaces can be adapted to be social spaces, storage, gardens, or anything else that suits the inhabitants' needs, similar to the flexibility of a front porch.⁴⁶ Although this is the lighter take on adaptability compared to previous two precedents, designing spaces for appropriation outside the units, in the common spaces and circulation, over architectural adaptability can still be effective at supporting the inhabitant's and interdependence between people and their homes.

44. ArchDaily, "Superlofts Blok Y / Marc Koehler Architects."
45. Ibid.
46. ArchDaily, "New Housing on Briesestraße / EM2N."

8 House by Bjarke Ingels Group (BIG) has been praised for its community-minded design that allows for interaction between residents by connecting dwellings through a continuous public path [14].⁴⁷ This fosters interdependence between people, with most dwellings having a small front yard condition that faces the public path, in addition to two courtyards and other community amenities for use by all inhabitants. 8 House's form, the shape of a sloping 8 in plan, connects residents together three-dimensionally (throughout the building) rather than at the street level as in most multi-residential housing projects.⁴⁸ Although there are several apparent flaws within the final built product that I witnessed when I visited, the fostering of interdependence is impressive and continues to support the quality of life of its inhabitants and can be applied to this thesis.

YouCUBE by 5468796 Architects explores density and affordability on a narrow urban lot in Winnipeg, Manitoba [15, 16].⁴⁹ Like other projects by 5468796, the form of the building(s) is similar to a village typology and reimagines the positive qualities of the suburban single family home while providing a mix of extensive outdoor spaces. These negative spaces between the buildings form a central courtyard for inhabitants to use, catalyzing interdependence between people. Different from other projects, the outdoor spaces are raised up to provide the practicality of parking but also suggests privacy without completely disengaging the street.⁵⁰ The design of the central courtyard supports resident activities and fosters life between buildings, concepts that this thesis is also embracing.

47. Minner, "8 House / BIG."
48. Ibid.
49. ArchDaily, "YouCUBE / 5468796 Architecture."
50. Ibid.



Full House by Leckie Studio in Vancouver accommodates multiple adult generations of a family through one house [17]. There are many benefits that come along with multigenerational living environments, including in-house childcare, aging-care, decreased isolation, and emotional bonding between generations to name a few.⁵¹ The house has several volumes that can connect or disconnect through the opening or closing of a series of doors, offering three various housing configurations.⁵² This project's flexibility to allow for these different modes of living over time is one to take note of.

51. Studio North, "The Goodweather."
52. Leckie Studio, "Full House."

All of these case studies are humanistic in their approaches to architecture. These case studies shine some light on potential inspiring ideas for the architectural application of the people-oriented guidelines from section 2.0. They are good examples for how interdependence and adaptability can potentially impact the lives of the inhabitants and will be useful when designing this thesis' infill framework and infill projects.

Above
14 // 8 House by Bjarke Ingels Group (BIG), Copenhagen, Denmark, 2010



Top-left
15 // youCUBE by 5468796 Architects in Winnipeg, Manitoba, 2015

Top-right
16 // youCUBE by 5468796 Architects in Winnipeg, Manitoba, 2015

Bottom
17 // Full House by Leckie Studio in Vancouver, British Columbia, 2017

4.0 Sudburbanism

This section discusses Sudburbanism, which is the inevitable portmanteau of the words Sudbury and Urbanism. Sudburbanism is all of Sudbury's urban history, including its successes, many faults, and its urban presence today, along with its distinct architectural identity. This section also asks the question: ***how do you make a building feel like a Sudburian building?*** The findings will be applied to the creation of identity-based guidelines.

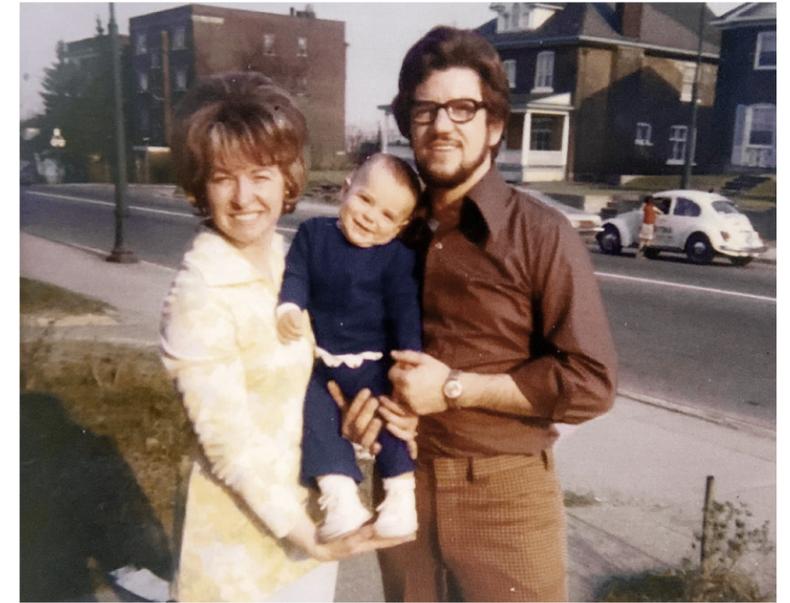
4.1 Sudbury's Urban History

After the end of WWII, there were drastic changes in Canada's urban landscapes with the popularization of the automobile, which was incredibly evident in Sudbury. Sudbury's built environment saw a sudden change in scale as our need to be within walking or street-car distance to basic necessities diminished, allowing us to take up as much land as we desired, which led to the creation of the suburbs, such as in other North American cities. Prior to this suburban movement, the majority of Sudbury's population lived either within the Downtown or in the peri-urban neighbourhoods around the Downtown. The expansion of Sudbury's boundaries for the suburbs pulled inhabitants outwards, away from the Downtown. This expansion outwards, coupled with a new-found societal perception of the city being undesirable, led to the collapse of the Downtown. These new types of suburban neighbourhoods also affected our living environments, as this lack of constraint in distance, coupled with increased

revenues for the new thriving middle-class, led to the popularization and mass production of the large suburban single-family home, designed for the nuclear family.⁵³

This dream of suburban life and aversion towards cities is inevitably embedded in Sudburian culture, even today, as an overwhelming 99.6% of Sudburians live outside of the Downtown.⁵⁴ My paternal family was part of this culture, as my grandmother and grandfather initially lived in the peri-urban neighbourhood of the West End [18], just outside of the Downtown and later moved to the suburbs in New Sudbury when my father, aunt, and uncle were young children and they wanted more space for the whole family [19]. Currently, this suburban culture in Sudbury lives on strong. My entire paternal secondary family in

53. Saarinen, *From Meteorite Impact to Constellation City*, 200.
54. City of Greater Sudbury, *ArcGIS Demographic Data* (Sudbury, 2016).



Top

18 // My grandmother, father, and grandfather on Elm Street near Downtown Sudbury, 1966

Bottom

19 // My uncle, father, and aunt in the suburbs of New Sudbury, dressed up for church, 1969



Top
20 // The newly completed New Sudbury Centre, c. 1957

Bottom
21 // The destruction of the Borgia neighbourhood, 1970



Above
22 // A busy Elm Street, Downtown Sudbury, c. 1969

Sudbury (with the exception of my Grandmother) still live in New Sudbury, in their single-family homes with large backyards and multiple cars. This is the case for many Sudburians, with little desire for other ways of living as the negative perception of the Downtown continues to be present.

This way of living is familiar to Sudburians and has seemingly suited them well for decades, but has come with its many setbacks, including but not limited to, the destruction of the Downtown. Prior to suburban development, Downtown Sudbury was a lively 'people's place' where inhabitants knew their neighbours by name [22]. The peri-urban neighbourhoods surrounding the Downtown were within walking distance, so diverse businesses all thrived, and it was a haven for high-school students who would flock to the Downtown for their fix of

French fries.⁵⁵ Unfortunately, this was not the case for much longer. In 1957, the New Sudbury Shopping Centre was developed [20], which moved the commercial hub of the city from the Downtown to the newly developing suburbs, aiding in the growth of these suburbs and attracting the Downtown's population outwards.⁵⁶

This sparked the creation of the Sudbury Urban Renewal Joint Committee, which in 1966 proposed the Borgia Urban Renewal Scheme, leading to the demolition of 24 hectares of the Borgia street neighbourhood for the now Elm Place mall in attempt to compete with the New Sudbury Centre and attract more commercial activity back to the Downtown [21]. Unfortunately, this was not uncommon at this time in other cities, as Mail St-Roch in Quebec City attempted

55. Saarinen, 189.
56. Ibid, 191.



Above
23 // Aerial photograph of Downtown Sudbury, clockwise from top-left: 1956, 1970, 1988, 2016



Above
24 // The empty corner of Elm and Durham in Downtown Sudbury, 2013

to also cover a Downtown street to transform it into an indoor shopping mall that ultimately failed as well, and was demolished decades later. The devastating demolition of the Borgia neighbourhood can be seen in the 1970 aerial photograph [23], in addition to further removal of several other buildings spotted throughout the Downtown. Although the Borgia Urban Renewal Scheme was deemed successful at the time, it did not deter shoppers from the New Sudbury Centre for very long, where free parking was plentiful (a trend that, 40 years later, is still going strong).⁵⁷ In retrospect, this only created a massive eyesore that hindered the Downtown's future vitality, and in my own opinion, was the death of Downtown Sudbury [24].

As time progressed, with the suburban sprawl and Sudbury's partial need for densification and affordable housing arose, came the introduction of high-rise 'silo' apartment buildings, where dwellings are simply copied and stacked one on top of the other. Specific to Sudbury, another typology to rise out of a desire for densification are the patched-together, owner-adapted houses to supply multiple dwellings

57. Ibid, 204.

in a purpose-built single-family home, usually in the peri-urban neighbourhoods. These are also a result of inhabitants of the peri-urban neighbourhoods moving to suburban houses. These were then transformed into apartments for lower-income tenants. Although visually contrasting, the suburban single-family home, adapted single-family homes in the peri-urban neighbourhoods, and 'silos' share the same unhumanistic qualities of having little regard for inhabitants well-being. Sudbury's vessels for living have not seen much change, as we are continually taking on more land for suburbs, and this is still the preferred environment for the majority of families to reside.

Although this urban history of Sudbury is shared in a negative light, it must be respected and understood as part of Sudbury's identity and culture. This history, although disheartening, is what made Downtown Sudbury what it is today, and is the base for which this thesis is built on. The Downtown has an immense amount of potential, and with careful urban renewal, could return to its glory days.

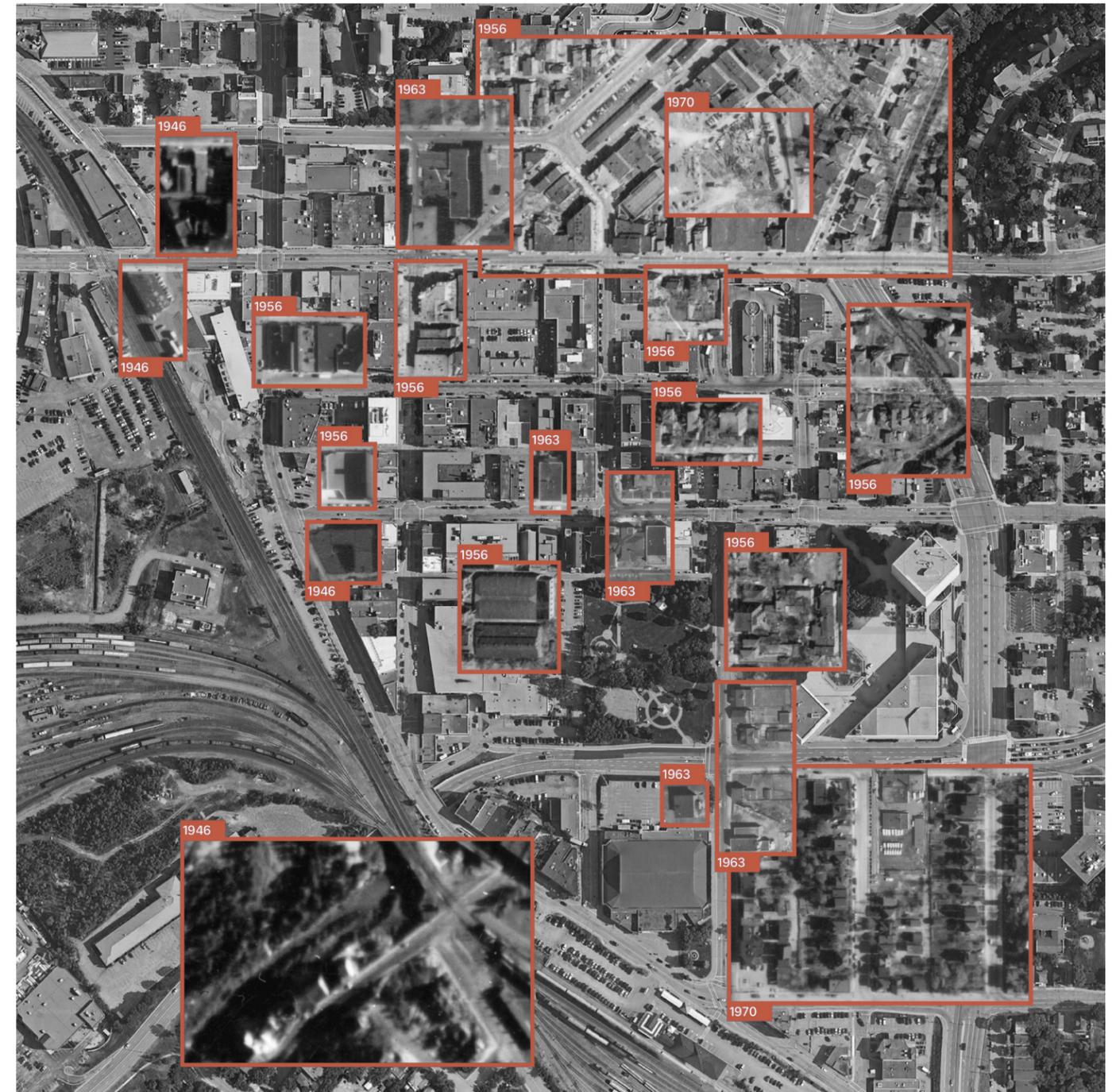
4.2 Downtown Sudbury, in Need of Urban Renewal

Downtown Sudbury has continued to change since the 1980s with steady demolitions and a few additions of new buildings (notably the YMCA, GOVA Transit Centre, and McEwen School of Architecture) spotted throughout the Downtown [25]. This repeated and continued destruction of the built environment has resulted in negative impacts on our urban fabric and its livability. What we are left with is a Downtown lacking in density and diversity, unable to support continuous quality public life and well-being for its few inhabitants.

In addition to the decreasing density and lack of urban life, the housing that currently exists in the Downtown is primarily geared towards students, older adults, and those who can't afford a large, suburban single family house. Looking at the demographics of Downtown Sudbury in comparison to the rest of Greater Sudbury, the population of the Downtown core (bounded by Elm, Elgin, and Paris streets),

accounts for approximately 0.4% of Greater Sudbury's population.⁵⁸ With respect to age demographics, less than 2% of the Downtown's population are those under the age of 14, highlighting the fact that very few families live in this area, as stated before.⁵⁹ With this we can draw that there are three gaps within the downtown: one being the gap within the built densities, a housing gap or lack of housing given the shockingly small population of the city's core, and a gap in demographics, given that there are nearly no children, and therefore families, living within the Downtown. These gaps ultimately point out the Downtown's lack of diversity, which is a crucial concept in creating a thriving urban environment, as discussed in section 2.3.

58. City of Greater Sudbury, *ArcGIS Demographic Data*.
59. *Ibid.*



25 // Collage of Downtown Sudbury's urban history, inspired by Above
Richard McGuire's Here



Above
26 // The lively intersection of Larch and Durham street in Downtown Sudbury, 1960

Since the major changes to the Downtown urban landscape in the 1980s, an abundance of revitalization efforts have occurred, including the Elgin Greenway Plan, several Downtown Master Plans, Community Improvement Plans, Up Here Festival, Sudbury 2050 Ideas Competition, and the McEwen School of Architecture, but even though these efforts are all positive, almost none of them address the issue of lack of inhabitants in the Downtown. Indeed, until people are actively inhabiting the neighbourhood, these revitalization efforts will not be as successful as intended [26, 27, 28]. As Jane Jacobs states, “You can’t rely on bringing people downtown, you have to put them there.”⁶⁰ This clear need for housing in Sudbury’s core led to the prioritization of residential development in the 2017 Downtown Sudbury Community Improvement Plan.⁶¹ This provides the

60. Jacobs, *The Death and Life of Great American Cities*, 238.
61. City of Greater Sudbury, “Downtown Sudbury Community Improvement Plan.”

“You can’t rely on bringing people downtown, you have to put them there.”

// Jane Jacobs

opportunity to revitalize the Downtown with the people-oriented concepts discussed in section 2.0, such as gently densifying the Downtown with buildings that are under 6 stories and pushed to the site’s boundaries, designing a diversity of housing types to support a range of inhabitants, and designing quality public space. Additionally, it is crucial for potential infill development to be identity-based in order to preserve Sudbury’s unique character. This will be addressed further in section 4.4.



Top
27 // The empty intersection of Larch and Durham street in Downtown Sudbury, 1982



Bottom
28 // The intersection of Larch and Durham street in Downtown Sudbury, 2021, still void of city life

4.3 Walking as Process

Since this thesis is strongly rooted in Downtown Sudbury, it is important for the methodology to support the understanding of Sudbury's identity. To achieve this, the methodology consisted of walking and immersing myself in the urban fabric, both in and around the Downtown. Through these daily walks, I carefully noted and documented my surroundings. [29].^{62, 63} This methodology has allowed me to gather information on the urban fabric and architecture I otherwise would not have understood well, if not for exploring as a slow pedestrian at the human scale.

This walking process was originally inspired by the belief to stop, look, and analyze the place prior to designing, as Jan Gehl says in his foreword of David Sim's *Soft City*, "look out of your windows, look at the people, look at life before you plan and design".⁶⁴ I was

62. 360 Degree City, "City Builder Series: The Citizen."

63. Solnit, *Wanderlust: A History of Walking*.

64. Gehl, "Foreword," 17.

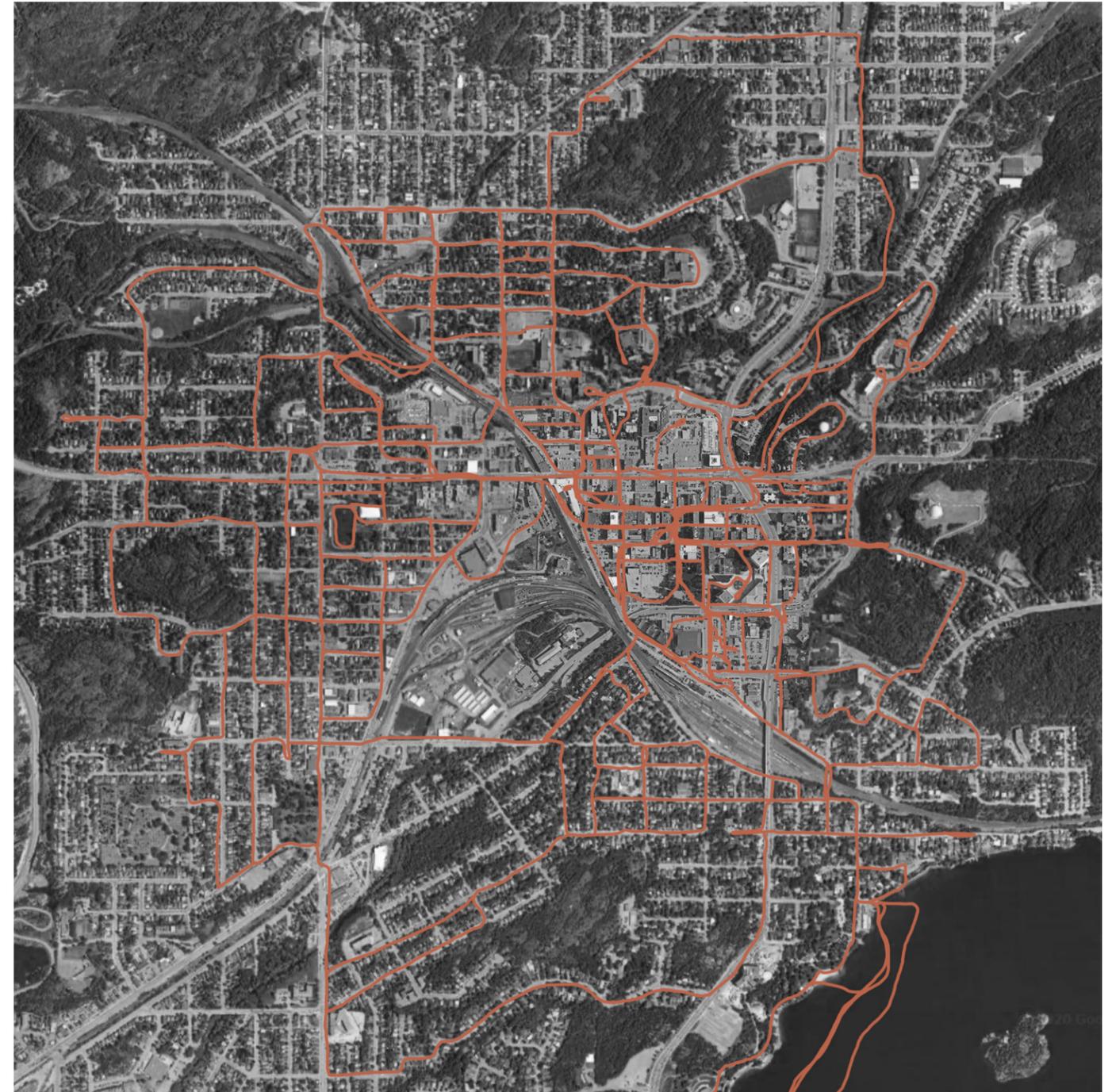
"Look out of your windows, look at the people, look at life before you plan and design"

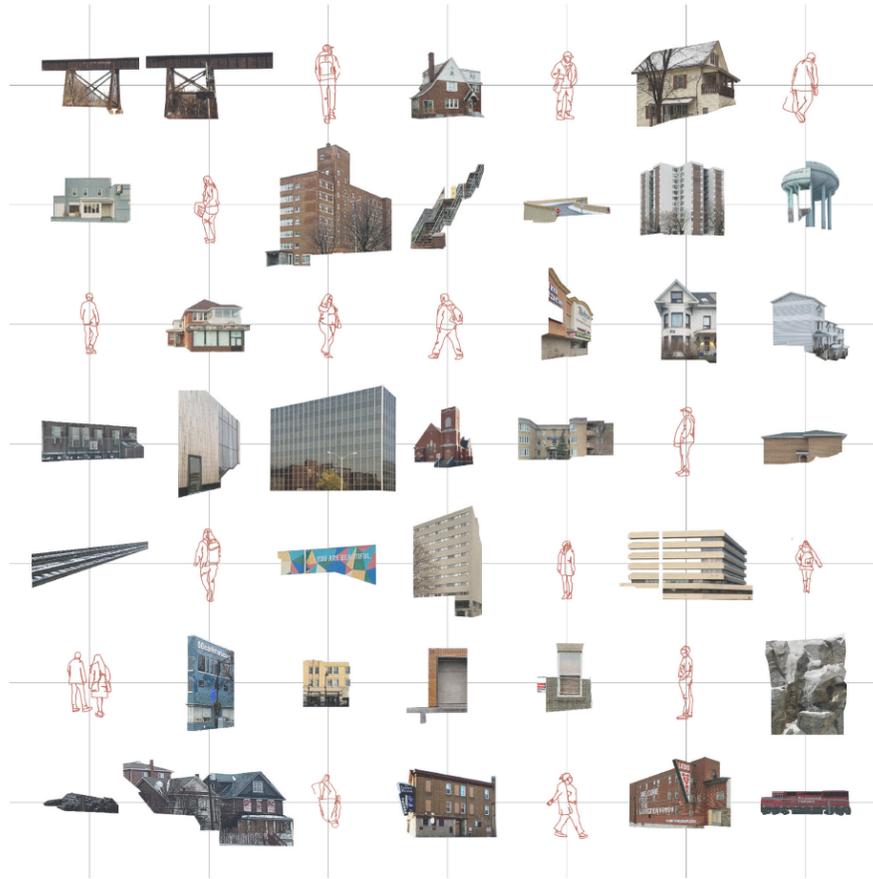
// Jan Gehl

also inspired by Carole Lévesque's *La précision du vague*, as she also employed a similar methodology of wandering, photographing, and drawing to analyze and represent vacant lots on the Island of Montreal.⁶⁵

These walks took me to many parts of Sudbury's peri-urban neighbourhoods I had not been to before, and to places I knew, seeing them in a new light. While on these walks, I have employed photographic documentation of things like the Downtown's architectural styles, forms, materiality and details, as well as people that make up the urban fabric to

65. Charlotte Lheureux, "La Précision Du Vague," *Vie Des Arts*, 2019.





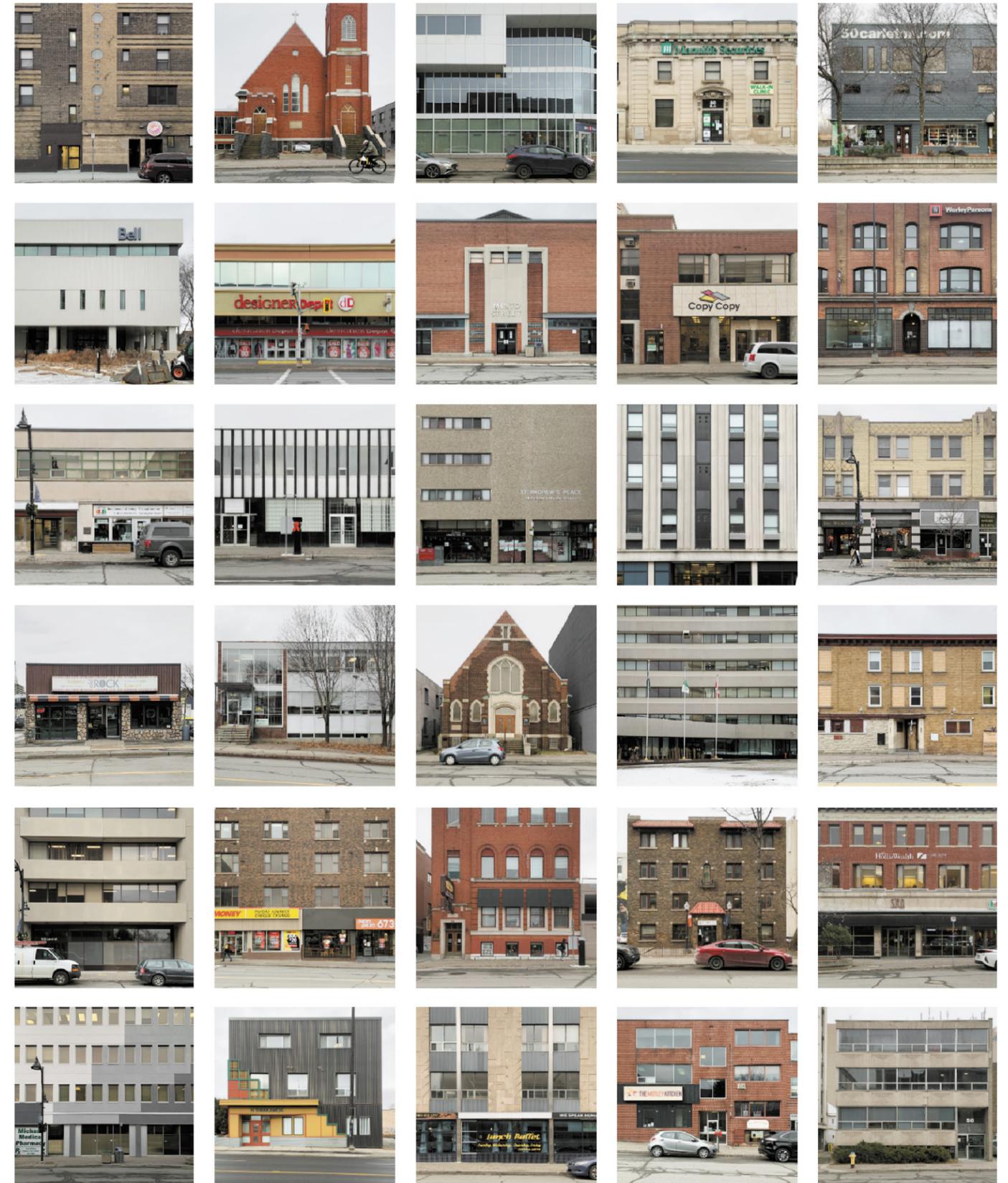
better understand the characters and human pieces of the city and their interdependence with the urban fabric. I then expanded my walking boundary and started out on a planned walk through the peri-urban neighbourhoods. In addition to normal photographs to document the place, I used elevational photographs of domestic buildings to gather more information on the housing typologies found around Sudbury's Downtown [31]. I was then able to generate a large database of photos to better analyze and understand the built domestic identity of the place [32].

Aided by Dr. Aliko Economides' graduate seminar, Cartographic Epistemologies, I have also employed collage and map-making to synthesize the field information that I have gathered [30]. Although I have

lived here for the past five years, have paternal roots here, and frequently spent time here throughout my childhood, this provided me with a deeper understanding of the lived-experience and humanist qualities of the Downtown and the areas surrounding it, in order to best design for the unique identity of Sudbury and the Sudburians within it. My findings are further presented in the following section.

Above
30 // Collage-map of Downtown Sudbury

Right
31 // Elevational photographs of Downtown Sudbury's buildings





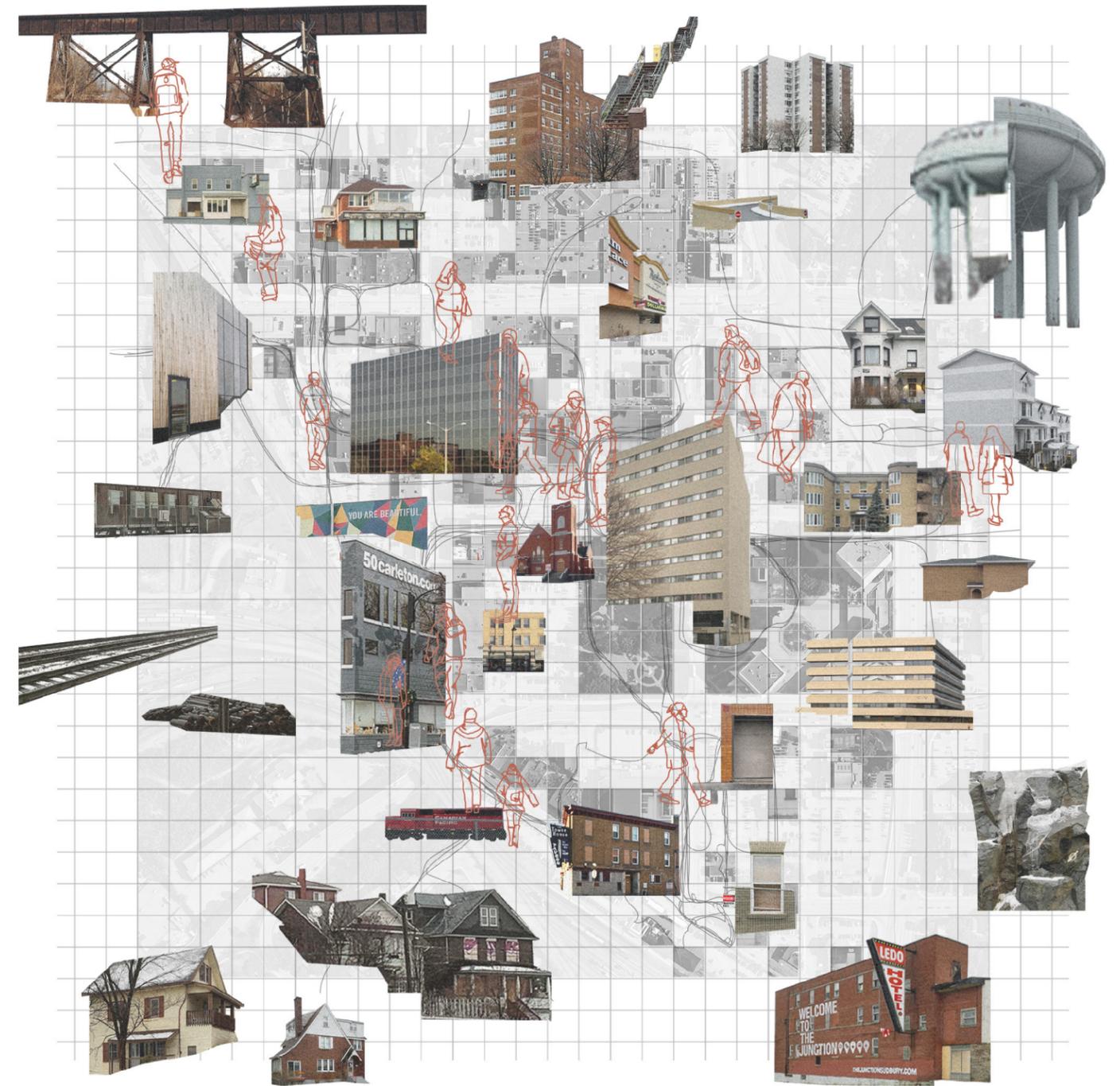
Above
32 // Elevational photographs of Sudbury's peri-urban neighbourhoods
and domestic architectural language

4.4 Understanding Sudbury's Identity

This methodology of extensive walking and submersion into Sudbury's built environment has allowed for a greater understanding of Sudbury's unique architectural identity [33]. This led to the question: *how do you make a building feel like a Sudburian building?*

Firstly, the housing typology findings confirm assumptions that were present prior to the extensive walks, such as the predominance of single-family houses, the presence of step-up apartment buildings, and purpose-built semi-detached townhouses spread around in the urban fabric, as well as the presence of some tall 'silos' of multi-residential housing, though these were more rare. A more surprising finding, however, was the very common occurrence of owner-adapted homes, quite unique and prevalent to Sudbury's peri-urban neighbourhoods, where the owner somewhat disorderly renovates and tacks on additions to the house to add extra dwellings [34].

Although less expected, the occurrence of these adapted housing typologies makes sense as the peri-urban neighbourhoods were abandoned by families in favour of the suburbs, leading to the houses' renovations into apartments for a lower-income demographic. These adapted typologies, along with the 'silos' of apartment buildings, led to the realization that there truly aren't any innovative multi-residential precedents for Sudbury. Nearly all multi-residential dwellings are either owner-adapted or developer-driven, both prioritizing profit over quality of life.



Above
33 // Collage-map of Sudbury's urban identity as a whole



34 // Collage of owner adaptation

With further respect to Sudbury's domestic identity, there are specific pieces of the aforementioned housing typologies that contribute to Sudburian identity. The first notable piece that is quite common here is the front porch, whether at the scale of the single-family home or the townhouse [35]. In addition to providing an extra barrier from the cold, these enclosed front balconies for the North are used in a variety of ways, from entrance spaces, to living room extensions, to storage spaces, and even bedrooms as my Grandfather experienced as a child. Another notable piece are the exterior staircases, providing an entrance door directly connected to the exterior for apartments built within older houses which now have multiple dwellings [36]. This was clearly done for cost-efficiency and easy access, but it also provides benefits from a well-being perspective with greater access to the outside. I also looked at the various roof forms, which notably often offer inhabitable space within the attic through the use of a dormer, which is



35 // Collage of front porches

not necessarily specific to Sudbury, but is part of its architectural identity [37]. For materiality, there are three distinct recurring materials: brick, vinyl siding, and stucco. More often than not, a combination of all of these materials are applied, likely as a result of renovations or adaptations, forming a patchwork [38]. Lastly, what is most contributing to Sudburian identity is the combination of materials and mismatching facade conditions creating a patchwork [39]. This sometimes seems to be the result of owner-adaptation and additions, but in other instances there are random facade details that seem to be without a purpose, adding to this idea of a patchwork.



36 // Collage of exterior circulation



38 // Collage of common materials



37 // Collage of inhabitable roof forms



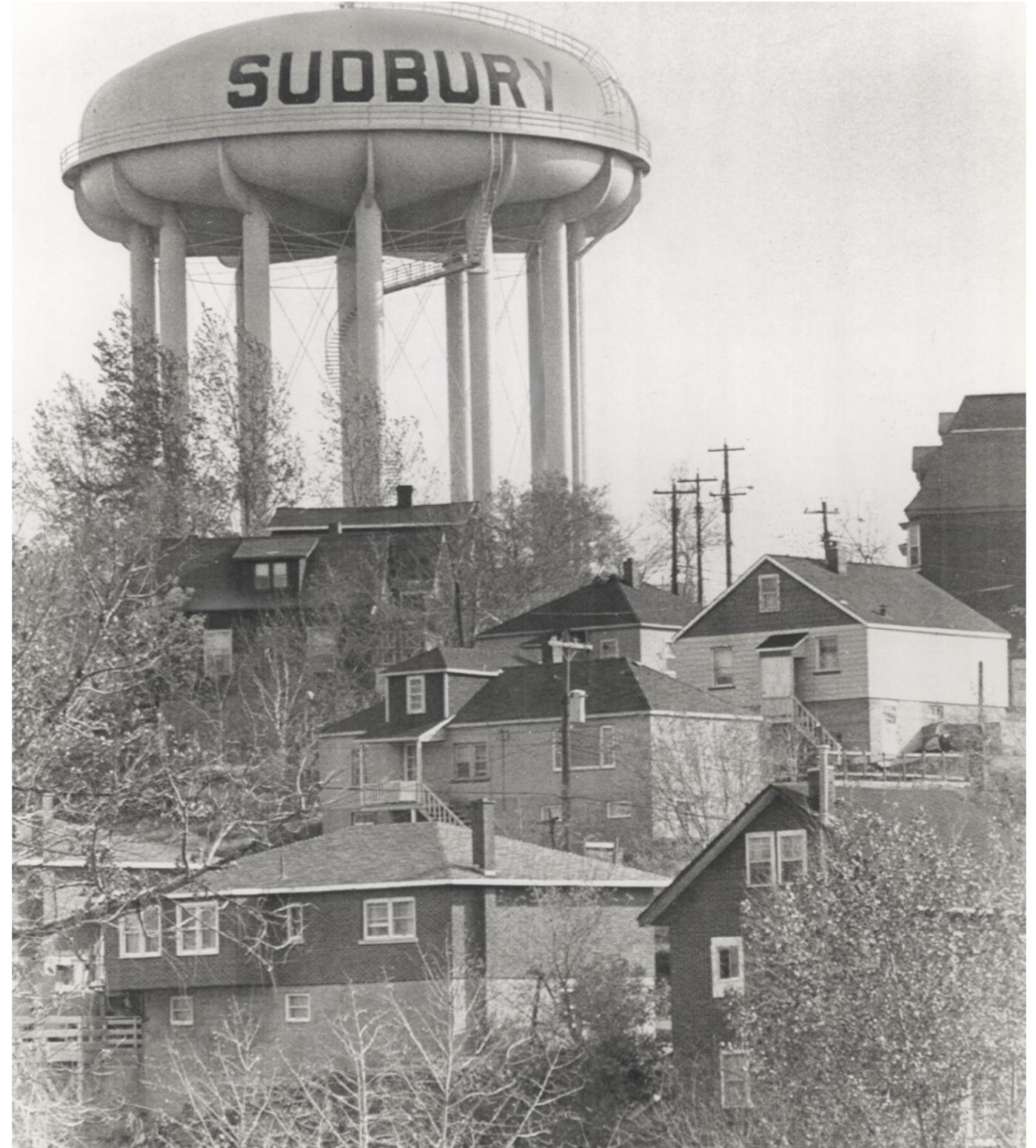
39 // Collage of patchworks



Above
40 // Railways crossing Regent street, 2018

It is also worth mentioning how Sudbury's urban environment clearly reflects the industrial mining town it embodies. The Canadian Shield landscape that Sudbury sits on, the reason for industry, protrudes these urban layers throughout the city, constantly reminding us of this unique landscape. These large rock-hills of the Canadian Shield often act as boundaries, as the city was built around them. The built infrastructure supporting the industry is also prevalent around Sudbury, as the Superstack, the second tallest freestanding structure in Canada, is highly visible throughout the city and a true reminder of place since 1972. The Sudbury water tower, unrelated to mining, sits tall near the Downtown despite not functioning for years and Sudbury's habit of tearing down the unnecessary [41]. There are also several rail lines that run throughout the city, most of

which are Downtown. Usually, around the rail lines, are discarded members of industry, from rail houses that are seemingly abandoned, to overhead rail lines that are no longer used, to tie plates thrown to the side [40]. The presence of Sudbury's industry is woven throughout the city and its urban identity without much thought in its appearance or implications on the human condition, and can be seen as a patchwork at the urban scale.



Above
41 // Sudbury water tower, 1977

4.5 Identity-Based Guidelines

This analysis of Sudbury's identity led to the creation of the identity-based guidelines in order for this thesis to be more contextual and respond to place. As previously mentioned, there are two sets of guidelines, one which is based on theory that can be applied to many cities, and the other set consists of these identity-based guidelines that are specific to Sudbury [42, 43, 44].

The guidelines are as follows:

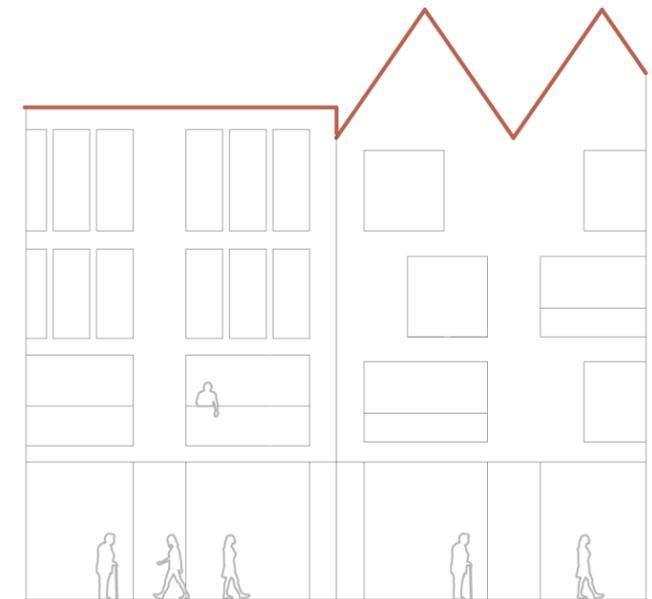
01 // Design spaces for adaptation

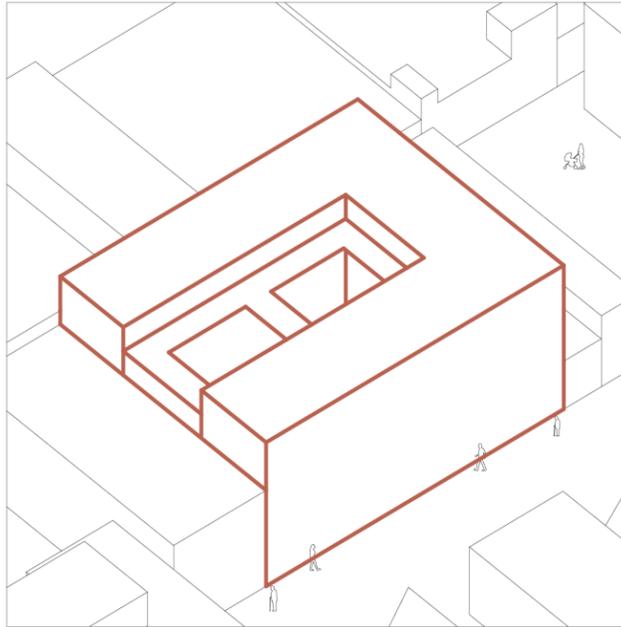
Designing spaces for adaptation allows the Sudburian character of adapting houses to continue even in a larger multi-residential and mixed-use project. For example, this could be done with flexible dwellings that allow inhabitants to adapt their dwellings to suit their changing needs over time, which also promotes tenure. This can be done at a range of scales, whether it is through flexible partitions, open space for physically built adaptations, or appropriations through furnishings.



02 // Implement various Sudburian roof forms and allow for living conditions within the roof structures

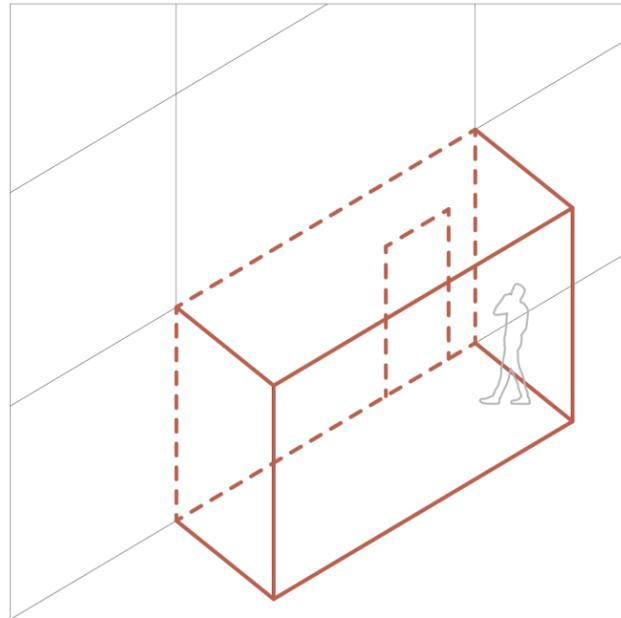
Through analyzing the roof forms that exist in Sudbury, a building can fit more into its surrounding context and feel more like a Sudburian building through the implementation of Sudburian roof forms. These often include gable roofs with dormers or with large windows.





03 // Implement exterior circulation

Exterior circulation creates direct access to the outdoors from one's dwelling entrance. A direct connection between dwellings and outdoor spaces (as opposed to an interior hallway) relates more to the suburban environment, where some inhabitants may be coming from. Exterior staircases are also included in this circulation. This can be beneficial as a greater access to exterior spaces creates a greater connection to the outdoors, which further improves the inhabitants' well-being.



04 // Design flexible porch conditions for appropriation

Porches can be used for a variety of functions, relating to the idea of adaptability. Porches in a larger multi-residential project can signify the entrance to a private dwelling and act as a buffer between public and private spaces. These are especially useful in buildings with exterior circulation to provide a vestibule at the main entrance. This also creates an additional semi-outdoor space for each dwelling, which would contribute to overall well-being.

Above
43 // Identity-based diagrams 03 and 04

Right
44 // Identity-based diagrams 05 and 06

05 // Use multiple materials per building to define sections

A layering of materiality further establishes a sense of place can help the users identify program types from the exterior of the building. It also contributes to the creation of a patchwork of materials.



06 // Create a patchwork of Sudburian facade details

To maintain the patchwork that exists in Sudbury, an intentional patchwork can be created on new facades by pulling from details in other Sudburian buildings. These Sudburian details could include anything from window details to brick patterns.



This study of Sudbury's identity strengthens this thesis' relationship to place. This set of identity-based guidelines compliment the people-oriented guidelines to start the implementation of contextual and humanistic urban renewal. The addition of the architectural framework in the following section will create a toolkit that can be applied systematically to various infill sites.

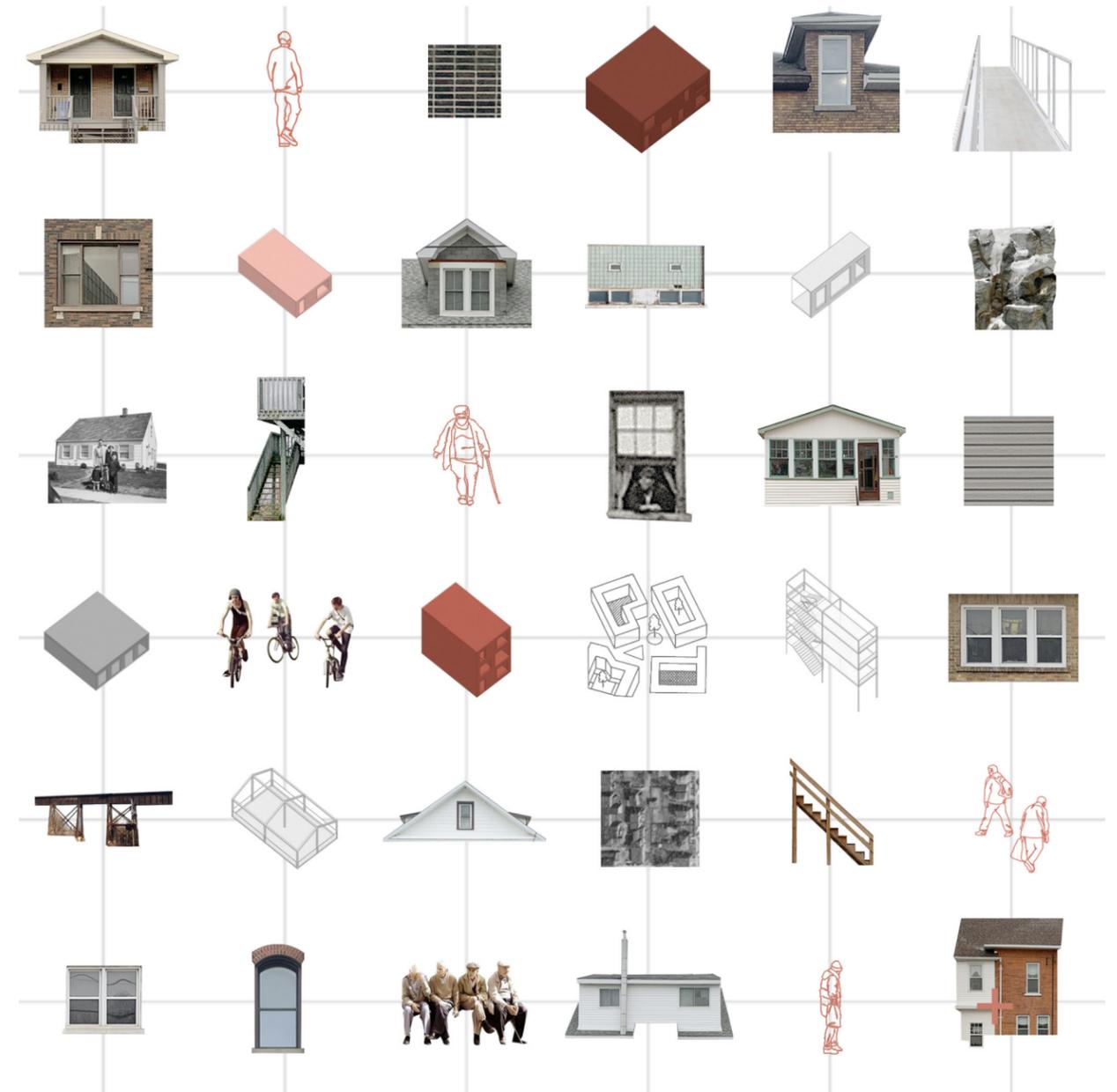
5.1 A Design Tool

As a response to Downtown Sudbury's dire need for densification, demographic diversity, and housing, this thesis proposes an identity-based infill framework. The identity based framework is separate from the people-oriented guidelines and identity-based guidelines, although they are designed to compliment each other and can be used in conjunction [45]. The idea behind developing a framework, as opposed to a single building, is for this thesis to potentially extend past its life in academia and to provide a tool for future designers of Downtown Sudbury to use on any given site. The framework can also aid in community engagement with members of the Downtown, as the framework has been designed for ease of understanding by non-designers as well, as a way to illustrate future possibilities within the Downtown.

The framework is intended to be applied in conjunction with the guidelines to existing void lots within the Downtown to densify existing conditions,

and not for use on a site with existing infrastructure on it that would require demolition prior to the application of the framework. In addition to filling Downtown Sudbury's physical gaps and densifying the many parking lots where now-demolished buildings use to stand, this infill framework aims to achieve this in a manner that will also improve the human and urban conditions of the Downtown, promote interdependence and well-being amongst inhabitants, and catalyze a flourishing public life, all while relating to place. In order to test the design of the infill framework and demonstrate its flexibility, it is applied to three sites within the Downtown, which are the architectural manifestations of this thesis.

The framework consists of a set of architectural program modules and a set of rules to maintain the core people-oriented and identity-based concepts of this thesis, which are influenced by the two sets of guidelines. In section 6.0, the framework is tested at



three sites that range in scale and context (named L, M, and S based on their sizes), within the Downtown, forming three different infill projects presented in complete detail. This allows me to play the role of the designer by utilizing the framework and the guidelines to create three different projects with different forms and materials, creating distinct atmospheres and conditions within the Downtown.

Above
45 // A conceptual collage of the framework and the guidelines: the modules, the details of Sudbury's identity, and the people-oriented approaches

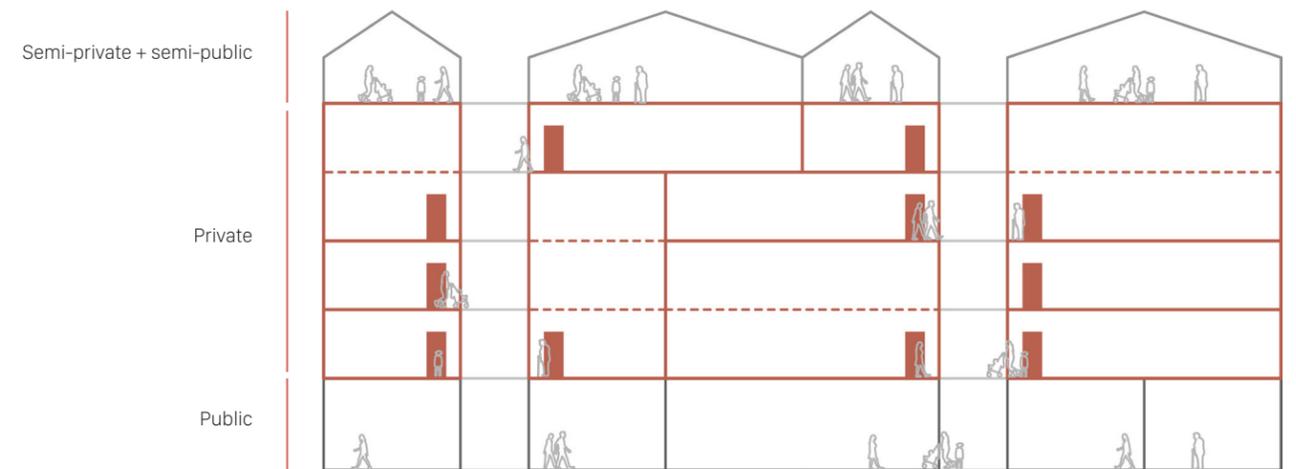
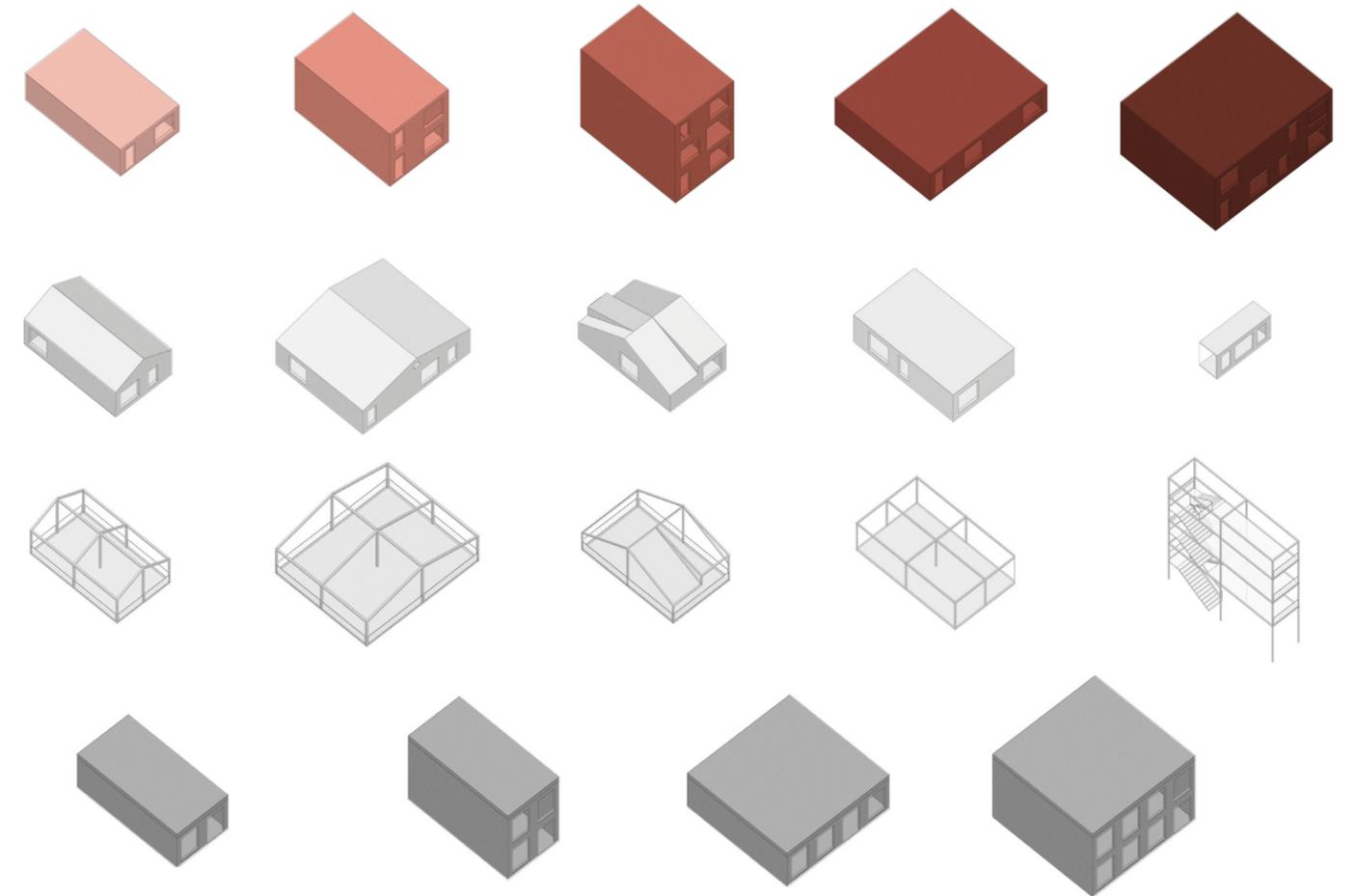
5.2 Modules + Program Overview

The modules of the framework are the architectural pieces of it, forming an infill project with different modules for different programs. The framework proposes a total of four types of modules: dwelling modules, community modules, commercial modules, a porch module, and a circulation module [46]. These modules all serve key functions within this thesis. The dwelling modules provide a diversity of housing. The community modules provide spaces for inhabitants to adapt and interact with each other. The commercial modules interact with the public on the ground floor, increasing pedestrianism and improving the concept of life between buildings. The porch module provides the dwelling modules with an identity-based vestibule and a buffer between public and private spaces. The circulation module provides exterior circulation with some added outdoor space for inhabitants, increasing interdependence between inhabitants. Within each type of module, there are several variations with respect to size and design. Having this range of

program types allows for an infill project designed with the framework to be mixed-use and diverse.

The set of modules are designed to be applied to virtually any site within the Downtown in various ways, flexible enough to create an endless amount of configurations and conditions. The dimensions of these modules are based on a 10 meter by 12 meter grid, allowing for an easy assembly and combination of various types of modules.

The framework establishes basic principles for the organization of modules, with the ground floor being reserved for public use (commercial or community modules), the top level reserved for semi-public or semi-private use (community modules), and with the intermediary levels reserved for private use (dwelling modules with porch modules). This conceptual pattern is designed to maximize inhabitant well-being and interdependence at all scales [47].



Top
46 // The modules of the framework

Bottom
47 // Conceptual diagram of how the modules are intended to be organized

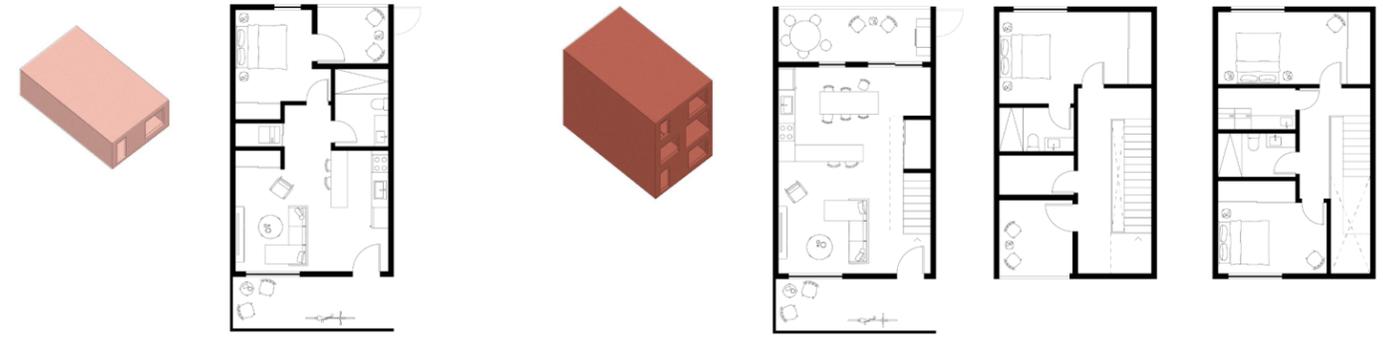
5.2.1 Dwelling Modules

The dwelling modules provide a variety of housing types, supplying housing for all demographics to contribute to the overall diversity of the Downtown and fostering a multigenerational environment in a building. Additionally, the dwelling modules provide room for adaptability, which further supports tenure and the multigenerational environment.

Altogether, there are five dwelling modules, ranging from a small one-bedroom dwelling to a large four-bedroom dwelling [48]. The dwelling modules have a range of vertical heights, from one story to three. This relates more to the suburban house that often has multiple levels, as this is where some potential inhabitants are likely to be moving from. This range in height can also create dwelling entrances on different levels, which increases interdependency and chance encounters. The dwellings are dual- or triple-aspect (windows on multiple faces) to provide a greater connection to their surrounding environments and

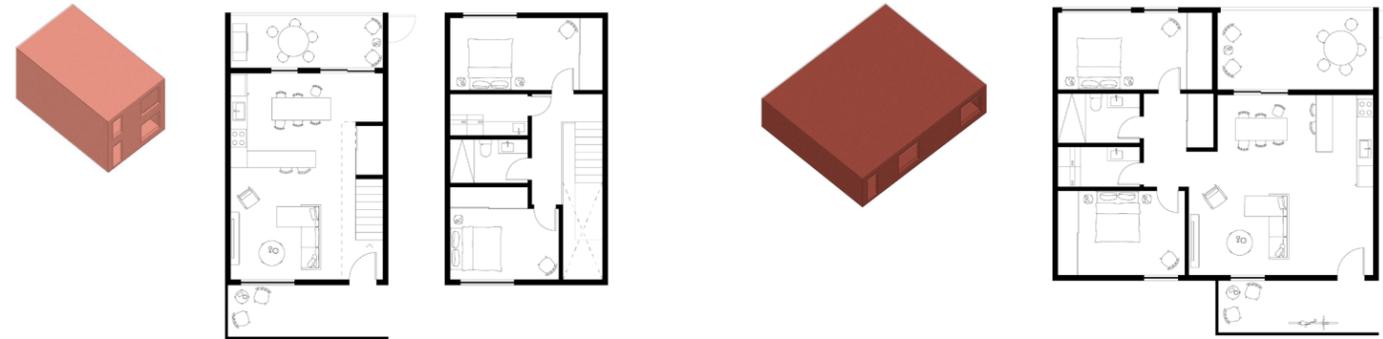
provide more natural lighting. Each dwelling has a kitchen, living area, laundry, and outdoor space. The layout proposes an open living area and kitchen, with an entrance at the front of the dwelling and outdoor space at the back. For the dwellings with multiple levels, the main living area, kitchen, and outdoor space are on the first level, with private bedrooms on the levels above.

To go into each dwelling in more detail, the smallest is a one-bedroom that is one level and 60 m² with a 6 m by 10 m footprint, catered towards older adults and adults without children. Since this dwelling is one level, it also has a version that is accessible. The first of the two-bedroom dwellings is two levels and 120 m² with a 6 m by 10 m footprint, catered towards young adults or small families. The three-bedroom dwelling is three levels and 180 m² with a 6 m by 10 m footprint, for families. The second of the two-bedroom dwellings is one level and 120 m² with a 12 m by 10 m footprint,



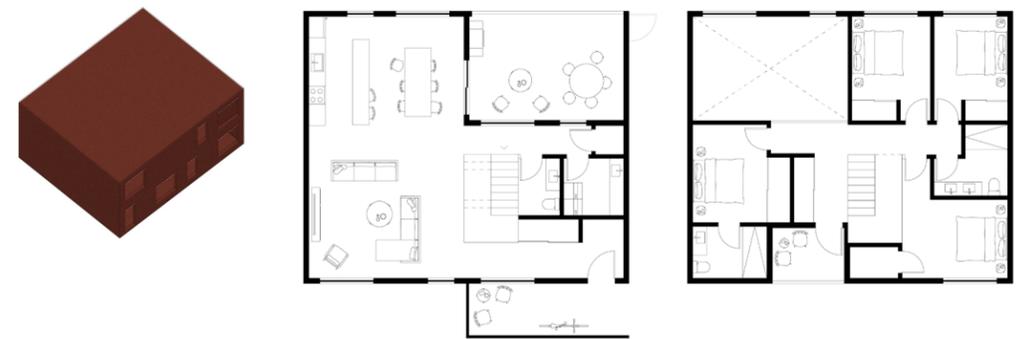
One-bedroom dwelling

Three-bedroom dwelling



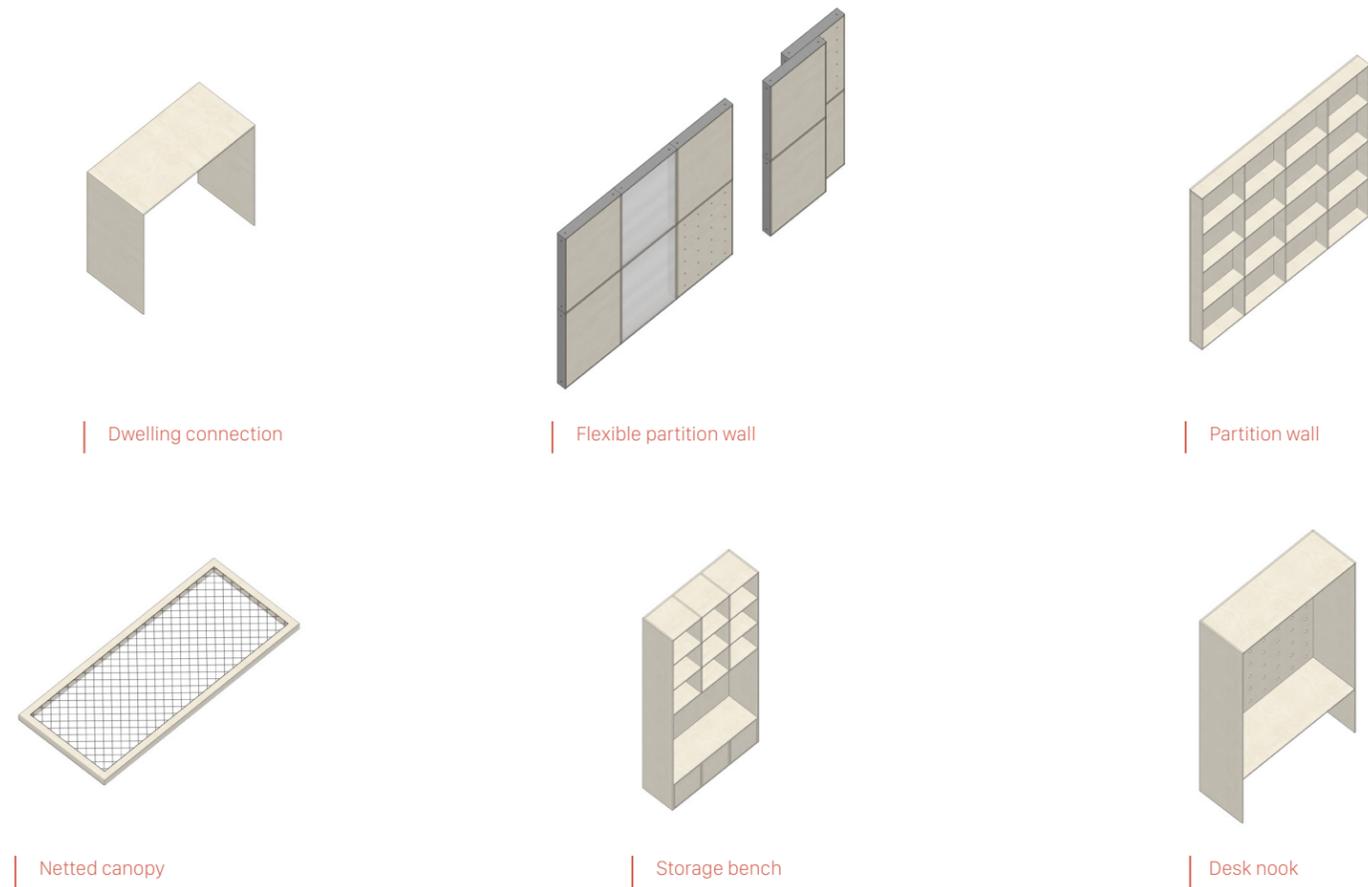
Two-bedroom dwelling

Two-bedroom dwelling



Four-bedroom dwelling

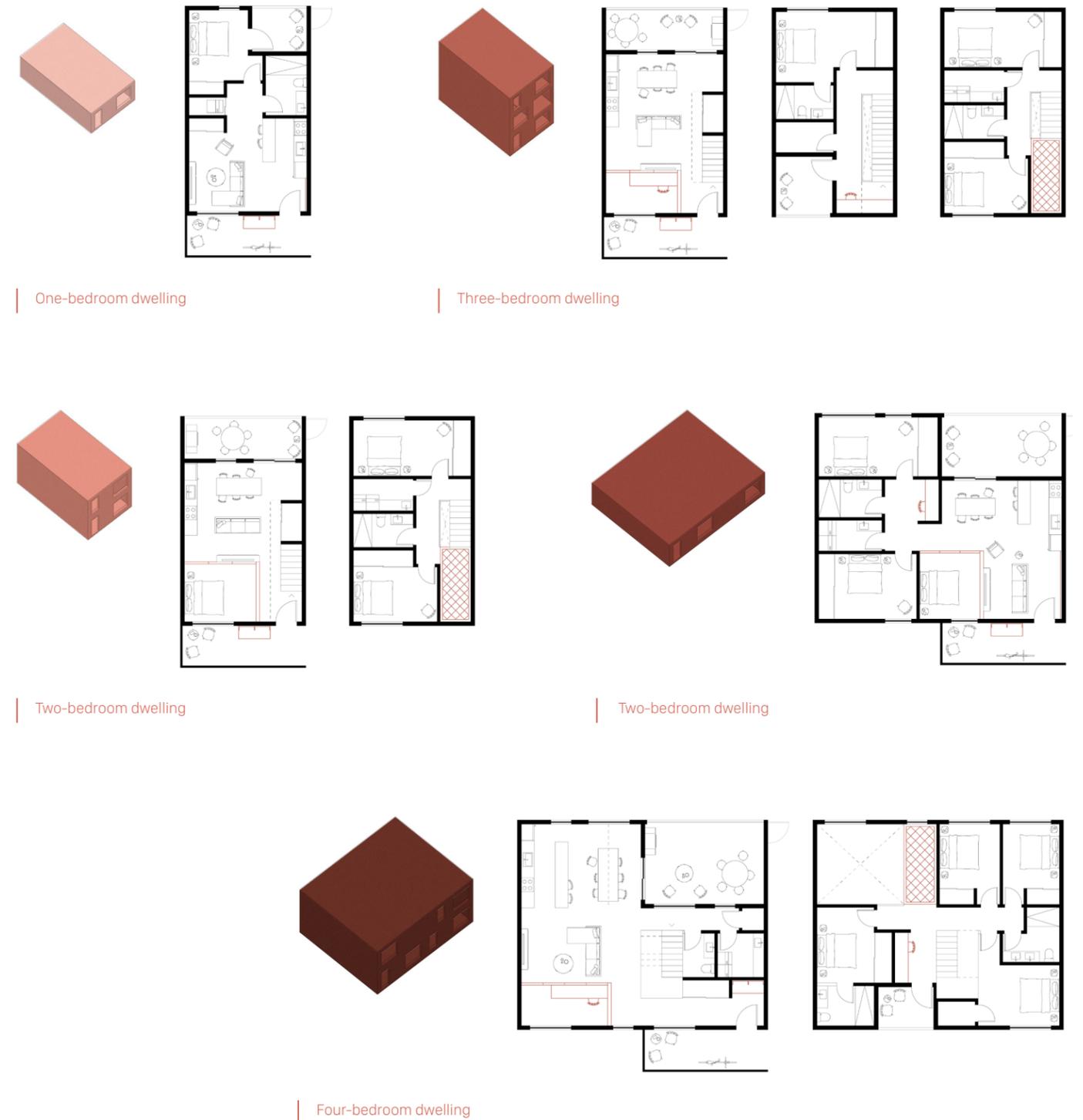
Above
48 // Dwellings modules with plans



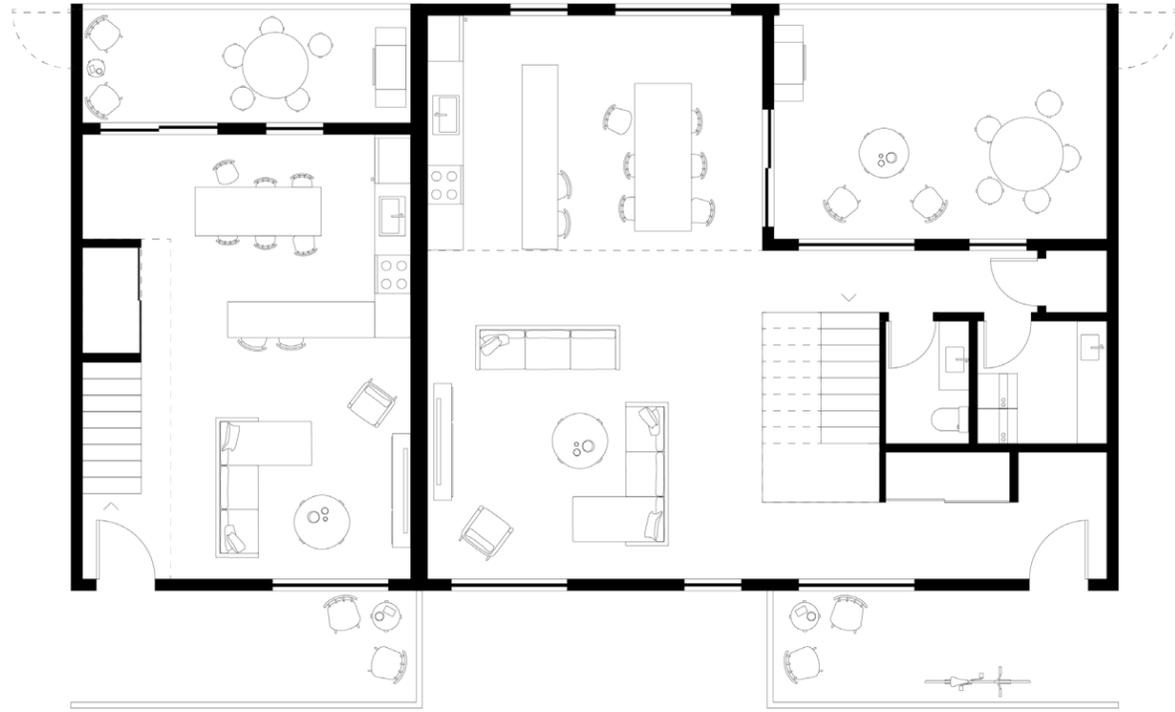
for small families. Since this dwelling is one level, it also has an accessible version. The four-bedroom dwelling is two levels and 240 m² with a 12 m by 10 m footprint, catered towards larger families.

With respect to adaptability in the dwelling modules, the layouts of the dwellings in their main living areas are kept open for greater flexibility [50]. This also allows adjacent dwellings to connect to each other through the living rooms for a typical multigenerational living arrangement [51]. Additionally, a series of modular furniture objects have been designed to be used in the dwellings and be placed or moved around as the needs of the inhabitants change through time [49]. These modular furniture objects include an object to connect two dwellings together, two flexible partition walls to divide rooms for an extra

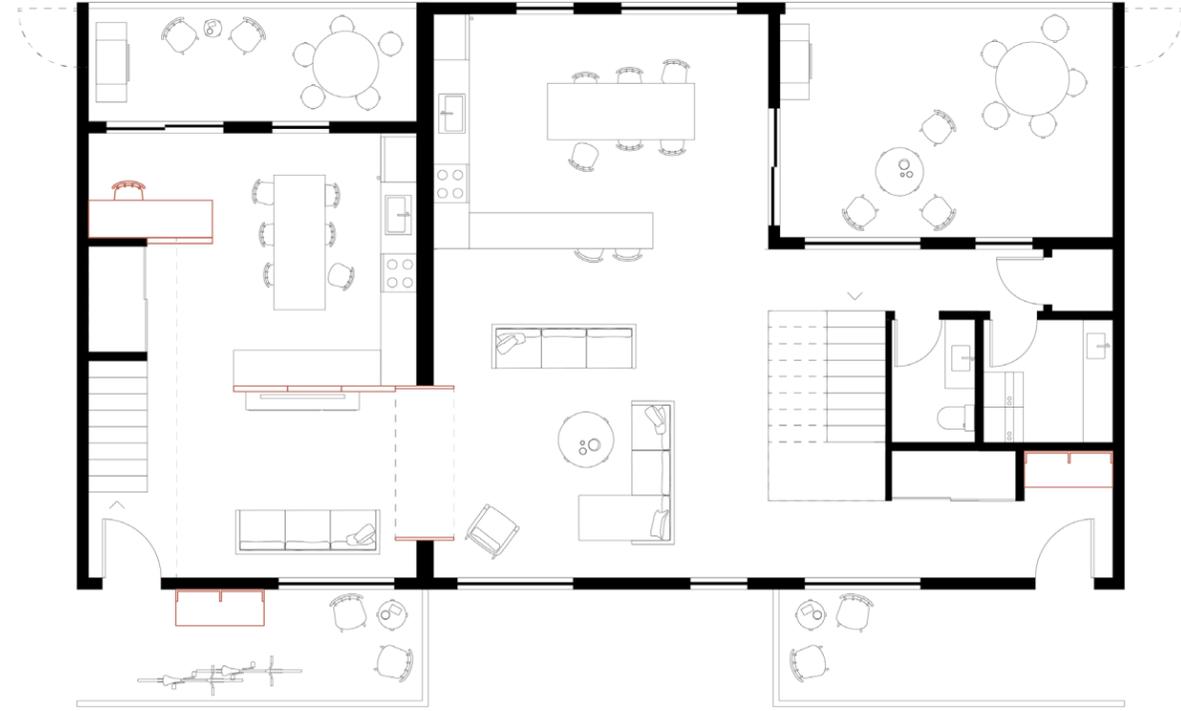
bedroom or office space, a storage bench, a peg wall, a desk nook to create a work space in a corridor, and a netted canopy for double-height spaces to add extra lounge space. These objects have been created in conjunction with Randall Kober's Fabrication II course, and are designed to be mostly fabricated out of local birch plywood and cut on the CNC (computer numerical control). When not in use, these objects can be flat-packed and stored away in a shared storage room in the building. This further allows the dwellings to adapt and change to their inhabitant's changing needs through time, promoting tenure and greater feelings of agency of their homes [52]. There are also smaller aspects to adaptability outside of these objects, like the design of the kitchen islands, which are all movable to create different layouts within the homes.



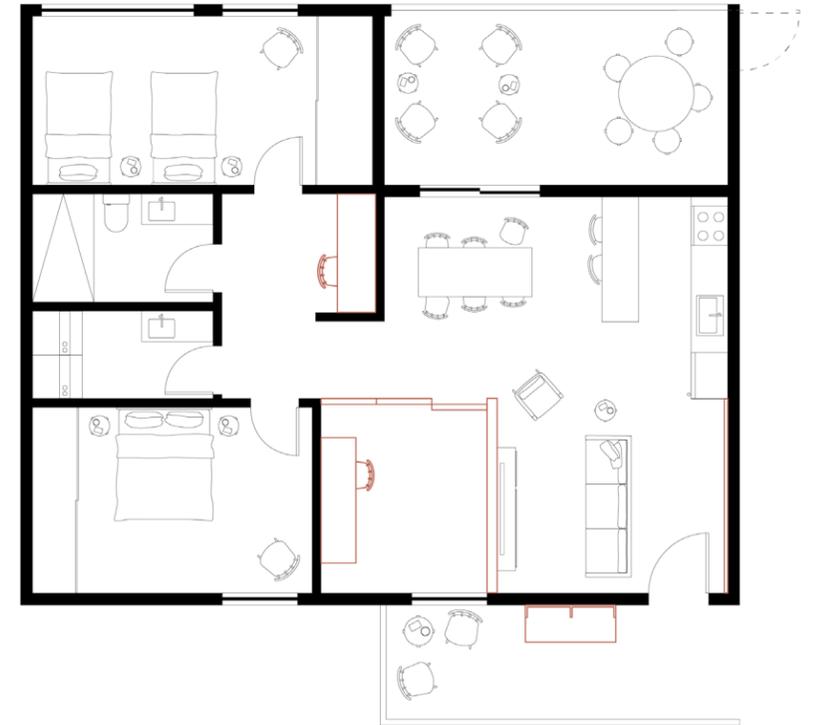
Left
 49 // Adaptable objects
 Right
 50 // Dwellings with adaptable objects



Above
51 // Two dwellings, before and after adaptation and connection together



Above
52 // Two dwellings, before and after adaptation

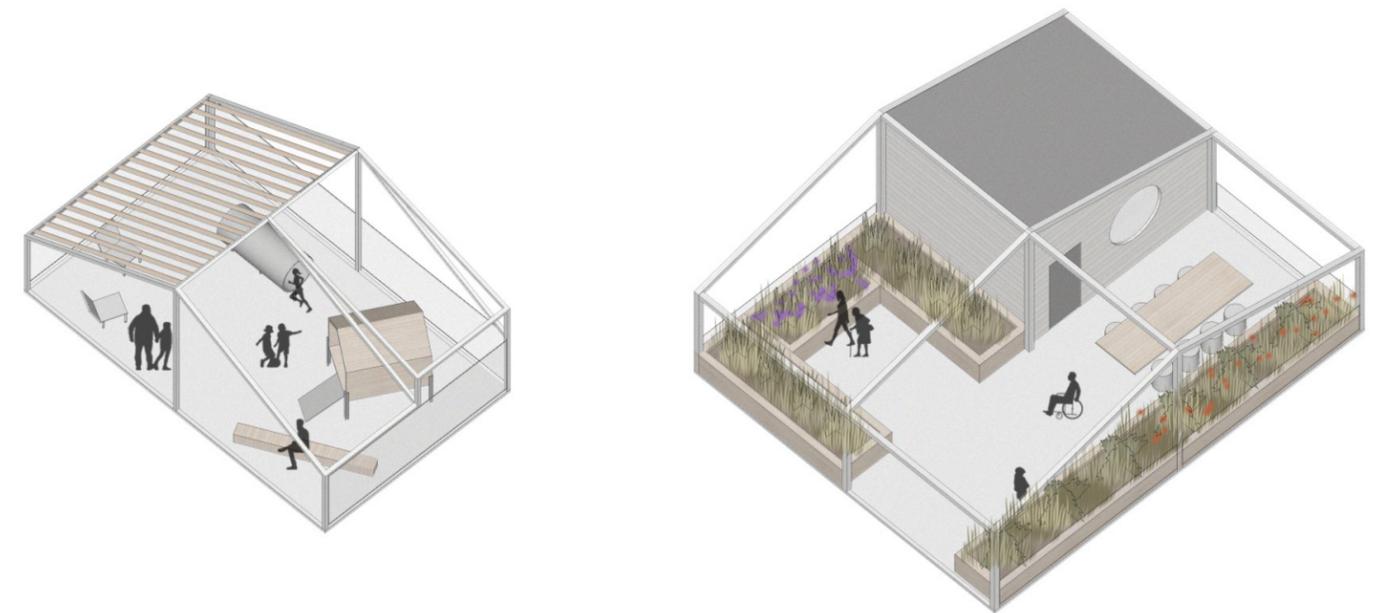
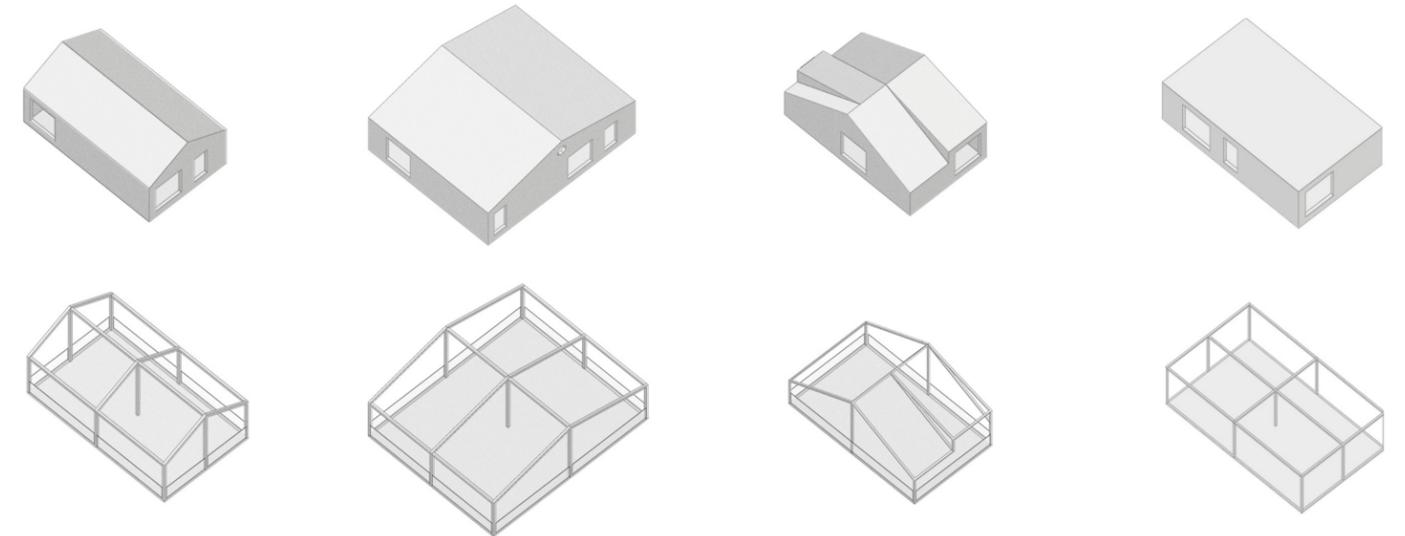


5.2.2 Community Modules

The community modules are designed to be open-ended to house a range of semi-public (for use by non-residents) and semi-private (for use by residents) programs that suit the needs of the users [53]. These modules function to create interdependence at the scale of the building and the city, along with neighbouring in order to increase well-being. Since the roofs of Sudburian houses can often be occupied by the inhabitants of the private dwelling, this framework has these spaces occupied by a community of inhabitants. These modules are located on the rooftop to draw people further into the projects and foster chance encounters. The semi-private programs could be used primarily by the inhabitants of the buildings (e.g. communal living rooms), while the semi-public programs could be used for the public, but are destination-based (e.g. daycares) as these modules are on the top level of the building, removed from the fully public realm of the ground level. These modules have both interior and

exterior versions, which increases the possibilities for potential programs. These programs include (but are not limited to) indoor and outdoor communal living rooms, building storage, playgrounds, sports courts, gardens, event spaces, shared work spaces, daycares, and shared studio spaces. The possibilities of these spaces are intentionally endless. Taking this flexible module a step further, the exterior community modules are left open as just a frame, and hold the potential for physically building up a space [54]. Since Sudburians are seen to have adapted their dwellings, this is an allocated space for them to do so in this urban setting.

These modules come in two sizes, one with a 6 m by 10 m footprint, and the other with a 12 m by 10 m footprint, similar to the dwellings, but can also be combined for a greater effect. Each of the four interior and four exterior modules are also based on either 6 m by 10 m or 12 m by 10 m dimensions to fit



with the other modules, and propose different roof line conditions for design freedom. These different roof line styles are inspired by the findings presented in section 4, utilizing the language of the sudburian roofs, including flat roofs, pitched roofs, as well as dormers.

Top
53 // Community modules

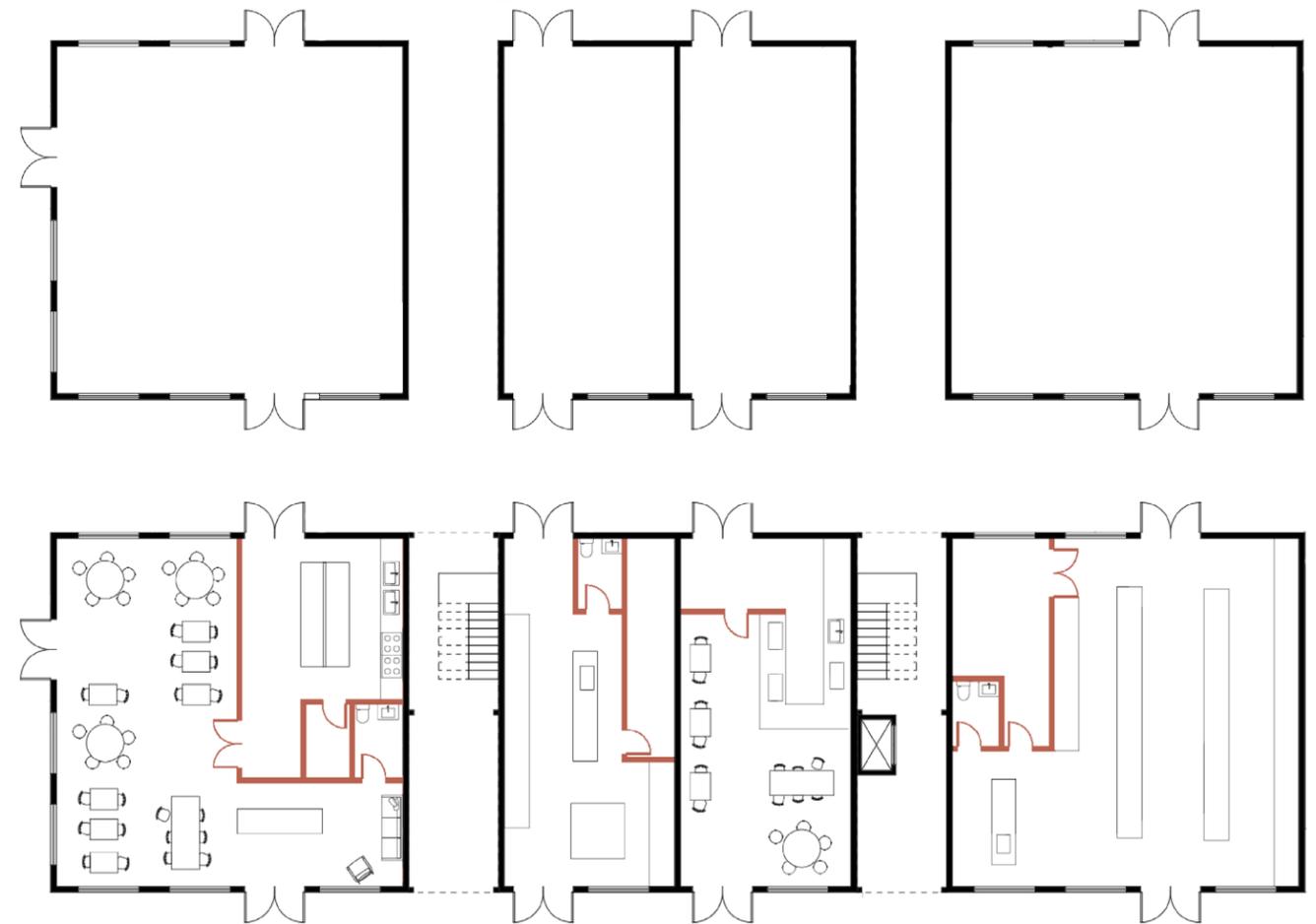
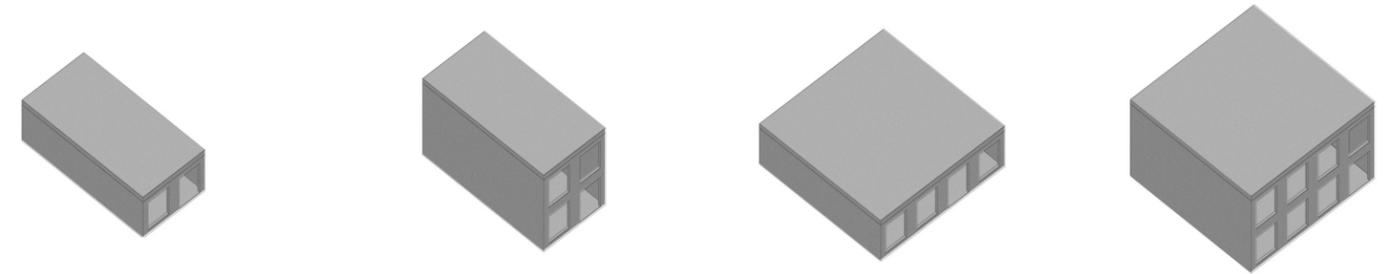
Bottom
54 // Open community modules with community adaptation

5.2.3 Commercial Modules

These commercial modules are the most public components of the framework, and are intended to occupy the base levels of the buildings for easier access to the public, contributing to a lively street front, life between buildings, and pedestrianism [55]. Similar to the community modules, they are designed to be open-ended and house various programs through the aid of movable partition walls [56]. The potential programs for these commercial modules include, but are not limited to, small markets or small grocery stores, restaurants, coffee shops, retail spaces, makerspaces, and community gathering spaces. Again, the possibilities of these spaces are intentionally endless and are thus designed as very flexible rectangular open spaces with multiple potential access points.

These commercial modules follow a 10 m by 12 m and 10 m by 6 m grid so they can fit together easily. The modules can be divided through the use

of movable partition walls, and in the event that one module is not large enough for a particular program, multiple modules can join together. These modules are dual-aspect (and sometimes triple-aspect) and generally back onto a courtyard space, providing easy access to back-of-house functions. Additionally, waste collection is intended to be kept inside their respective modules and put out onto the street or laneway on waste collection day. This keeps the exterior back-of-house and laneways, where waste would typically be stored, pleasant to passersby and users of these spaces.



Top
55 // Commercial modules

Bottom
56 // Commercial modules before and after adaptation through the use of modular walls (highlighted)

5.2.4 Porch + Circulation Modules

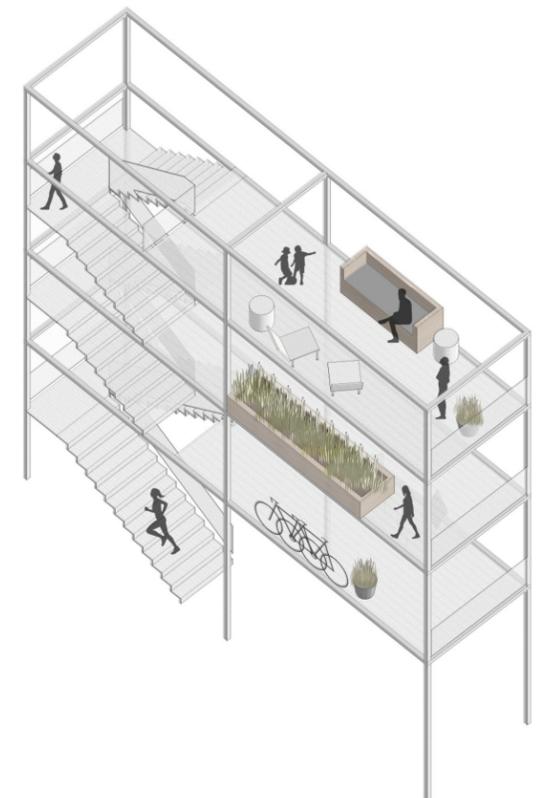
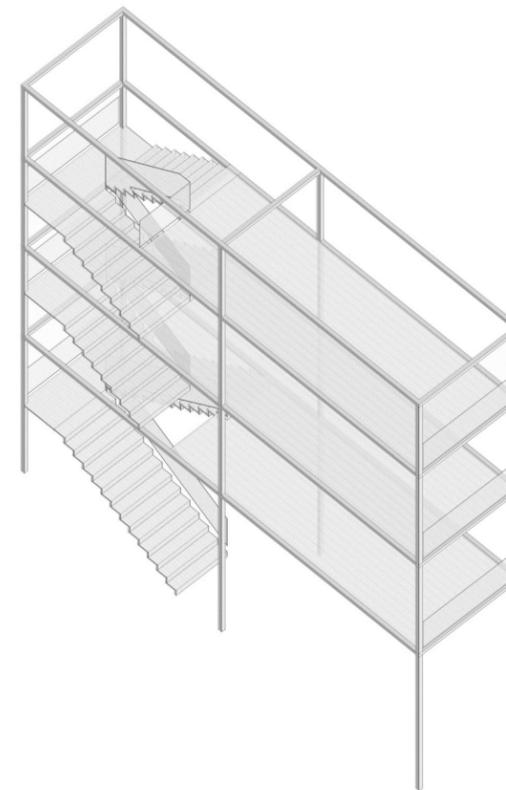
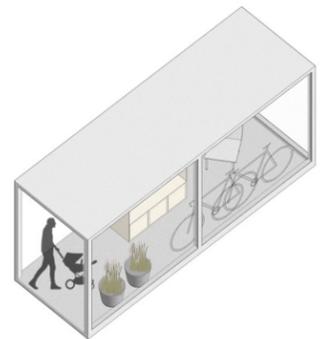
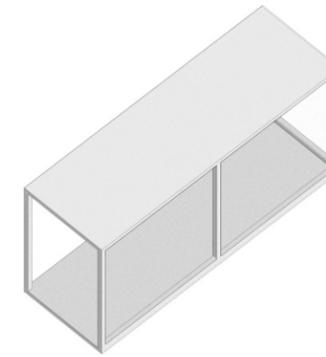
Aside from the three main types of modules for key programmatic components, there are two modules that serve more as functional modules. This includes a porch module and a vertical exterior circulation module, both resulting from Sudbury's identity studies.

The porch module originally comes from the ubiquitous nature of porches in Sudbury and the desire to maintain the architectural language of this place, but it also plays other roles in this framework [57]. The 2 m by 12 m porch attaches to the entrance of a dwelling module acting as a buffer between the semi-public nature of the circulation modules and the private nature of the dwellings. From the exterior, they provide a signifier of an individual dwelling and ease of identifying one's specific dwelling over another when in use. As with the other modules, these porches are designed to be fairly open for a variety of uses by the inhabitant. In Sudbury, these porches are seen to be

used for anything from extra exterior living space, to proper entrance rooms, to storage spaces, and the usage intent for these porch modules is the same.

The vertical circulation module is designed to be placed between the blocks of a building, directly connected to a maximum of two dwellings per level [58]. This module has a 3 m by 12 m footprint with a set of exterior stairs, and in some cases an elevator, to move inhabitants vertically. The material of the stairs and other horizontal surfaces is gridded steel to avoid precipitation build-up and keep this module open. The intended placement between buildings relates further to the idea of the suburbs as the spaces between houses. These in-between spaces are large enough to also be used as smaller outdoor spaces shared between two dwellings, further contributing to the concept of interdependence between people. This module's circulation system negates the need for horizontal circulation (hallways) on each floor, which

makes it possible for the dwelling modules to be dual-aspect, increasing cross-ventilation and access to daylight and views. Since circulation is fluid, the use of this circulation module in between blocks may not work for every site, and therefore, the use of this module is not always necessary.



Top
57 // Porch modules, before and after adaptation

Bottom
58 // Circulation modules, before and after adaptation

5.3 Courtyards

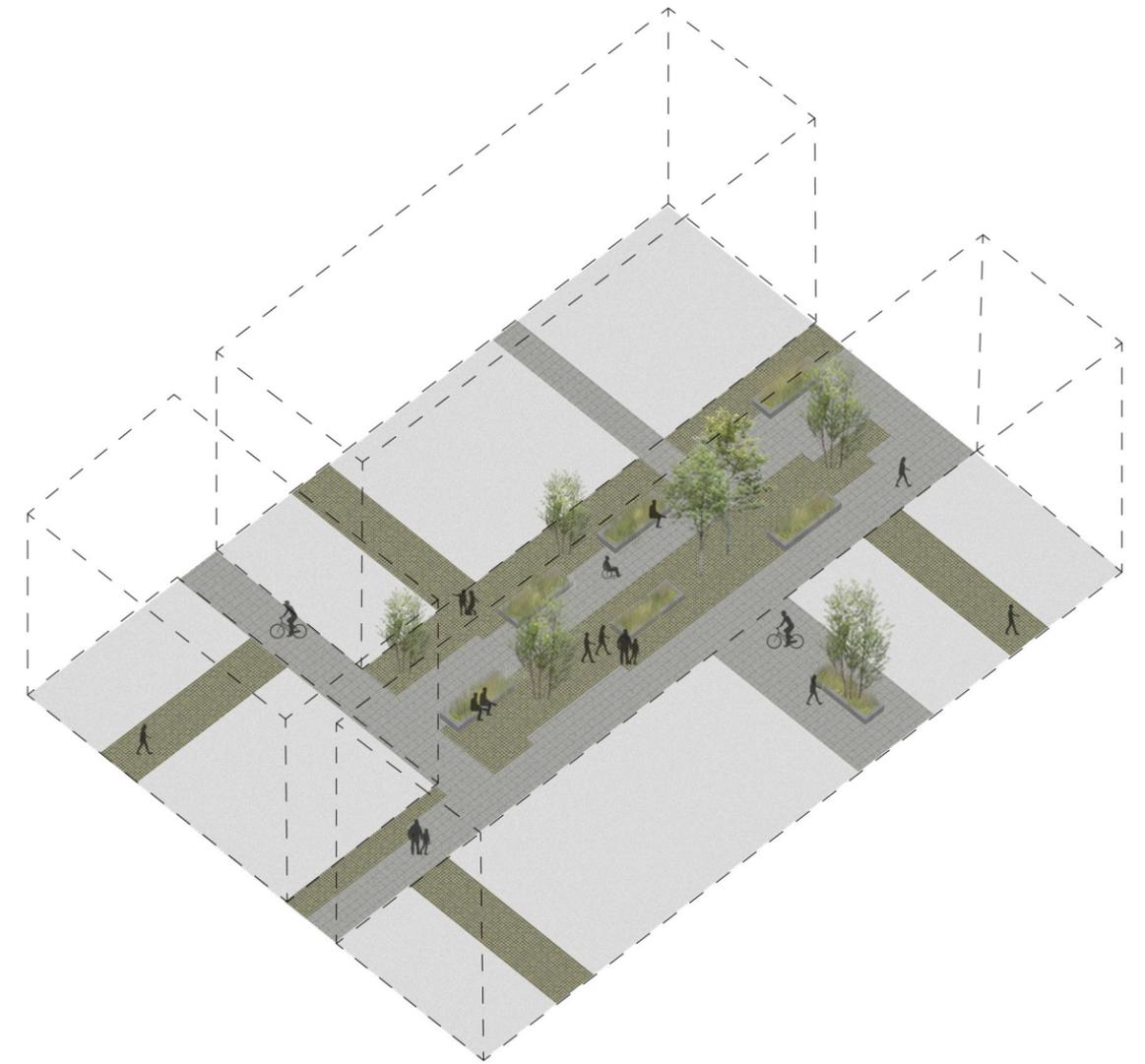
As a key part of this framework, the courtyards are not modules, but rather the negative spaces between the modules. These courtyards are open spaces on the ground level of a building, open for use by the public and for commercial modules to open onto, furthering the concepts of interdependence between people and their neighbourhood, life between buildings, and pedestrianism [59]. Courtyards are not typical to Sudbury, but they relate to the suburban house, extremely prevalent in Sudbury, as they can be used as a communal backyard, increasing desirability for people moving from the suburbs back into the downtown, especially for families with children.

The implementation of an outdoor courtyard space serves other functions, like allowing for the dwellings, community, and commercial module to be dual- or triple-aspect, which allows more light into these interior spaces and further connections to their surroundings. They also provide quality public spaces

that would be safe given their high visibility from people in dwellings and the other interior modules. As Jane Jacobs states quite well, “There must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street. The buildings on a street equipped to handle strangers, and to ensure the safety of both residents and strangers, must be oriented to the street. They cannot turn their backs or blank sides on it and leave it blind.”⁶⁶

Since the courtyards are not materialized as modules, they are embedded in the framework as part of the framework rules, to be presented in the following section.

⁶⁶ Jacobs, *The Death and Life of Great American Cities*, 35.



“There must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street. The buildings on a street equipped to handle strangers and to insure the safety of both residents and strangers, must be oriented to the street. They cannot turn their backs or blank sides on it and leave it blind.”

// Jane Jacobs

⁵⁹ // Diagrams of courtyards as public space in the negative spaces of the modules with access through various paths

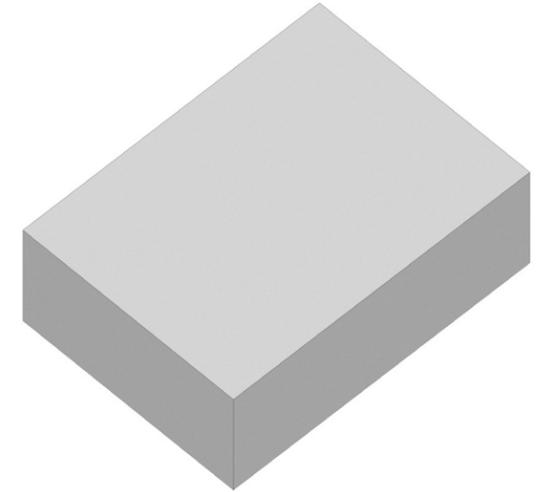
5.4 Framework Rules

With respect to how these modules can be used together to create a building, there is an endless amount of configurations that can be made to fit a range of sites within Downtown Sudbury. In addition to the people-oriented guidelines and identity-based guidelines, the framework proposes a set of rules to guide the designer on the best way to utilize the modules, which further reinforces the design of projects that meet the objectives of the guidelines that were based on best practices theory and local observations. The designer using the framework should also follow the guidelines as they then proceed to imbue the project with their own creative touch, which will hopefully lead to diverse designs. The three infill projects presented in section 6.0 demonstrate this flexibility [60, 61, 62].

The rules are as follows:

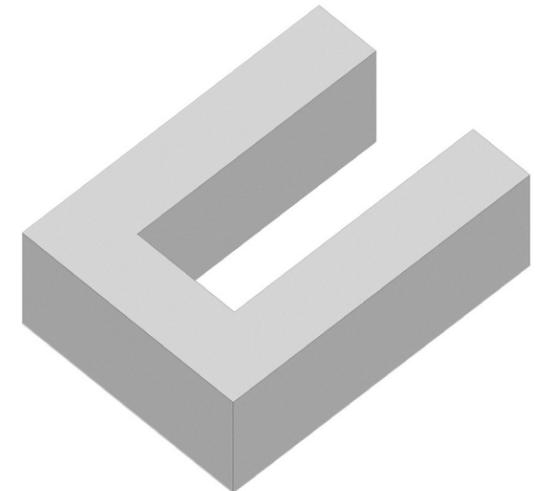
01 // Start with a large mass, building to the edges of the site and to a maximum of six stories

This initial step ensures the infill projects use the entirety of the site while maintaining the human-scale and connections to the street level with the height restriction.



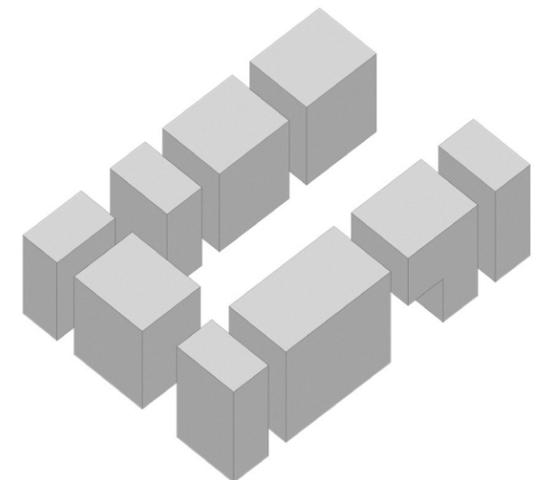
02 // Organize the mass to create a public courtyard space

As previously mentioned, the courtyard space is an open space in the middle of the infill project or as a shared outdoor space public space, similar to a communal backyard. This space fosters interdependence between people and their neighbourhood and people and people as it invites the public into the core of the infill project.



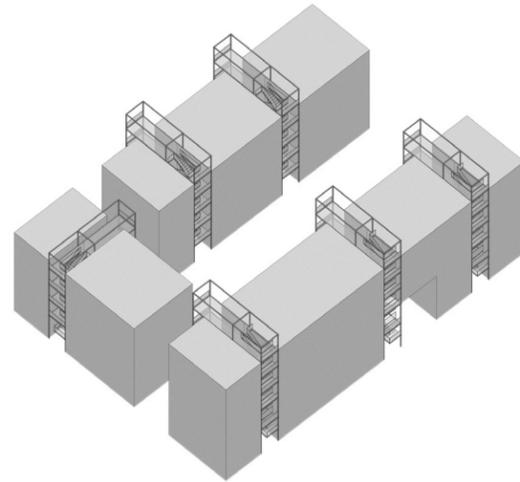
03 // Divide the mass into groups of dwellings to curate social connections and encourage smaller social circles

Dwellings should be divided into smaller groups for inhabitants to form closer connections with a smaller amount of neighbours. This also divides the infill project up into smaller blocks, adding paths for infiltration through the site and making it easier for the inhabitants to identify their home. A single block cannot be more than 30 m in width without a perforating path.



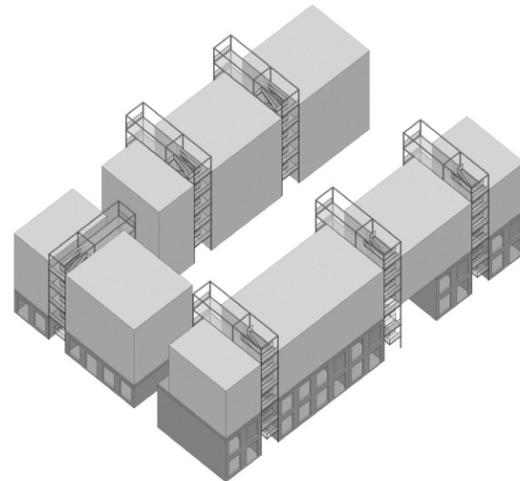
04 // Make all circulation exterior

This rule improves inhabitants' well-being by increasing connections to the outdoors, while also allowing for the dwellings to all be dual-aspect. Use of the provided circulation module is optional as circulation can be fluid and the module cannot apply to all sites.



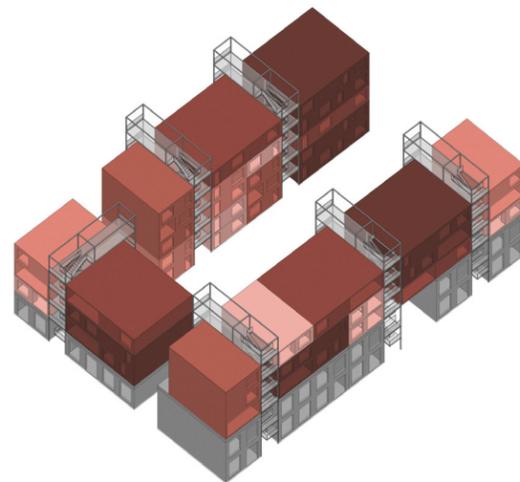
05 // Add commercial programs on the main level facing major streets, while keeping some dwellings on the ground level facing the laneways and courtyards

This creates the public main level of each infill project facing the street and a residential environment facing the laneway. This also creates a mixed-use environment, contributing to the rest of the neighbourhood by further inviting the public into the infill project.



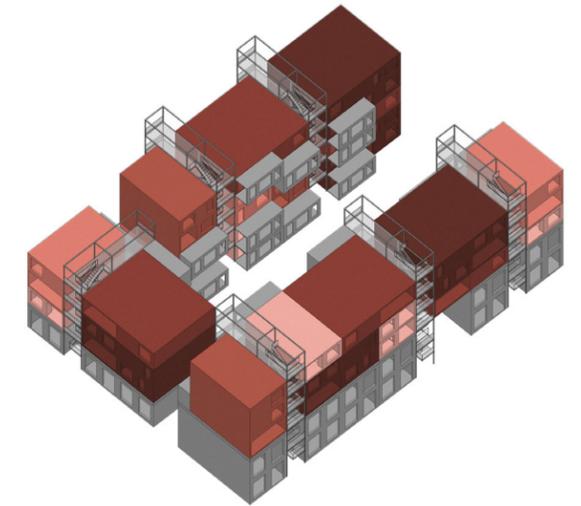
06 // Implement a combination of each dwelling module per block

This enforces the multigenerational and demographically diverse concept by mixing dwelling types around the infill project. Each block must have at least two different dwelling modules, and each block on a site must be different from another.



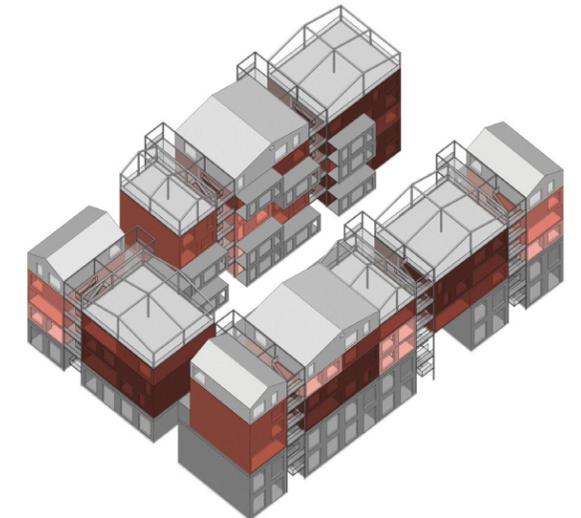
07 // Include the porch modules at dwelling entrances

These porches are adaptable outdoor spaces and clearly define the entrance to the private home.



08 // Employ the community modules on the roofs of each project

Making use of these community modules on the roofs creates a layer of semi-public and semi-private life for both the inhabitants of the building and the public, fostering interdependence and a greater sense of community. These community modules must cover at least 2/3 of the roof space, if not all.



This identity-based infill framework is a balance of flexibility with the range of modules and restriction with the guidelines and framework rules. The goal is that future Sudbury designers use this framework to create meaningful and people-oriented and identity-based infill projects for Downtown Sudbury, ultimately bettering the human condition.

Left
61 // Framework rules diagrams 04-06

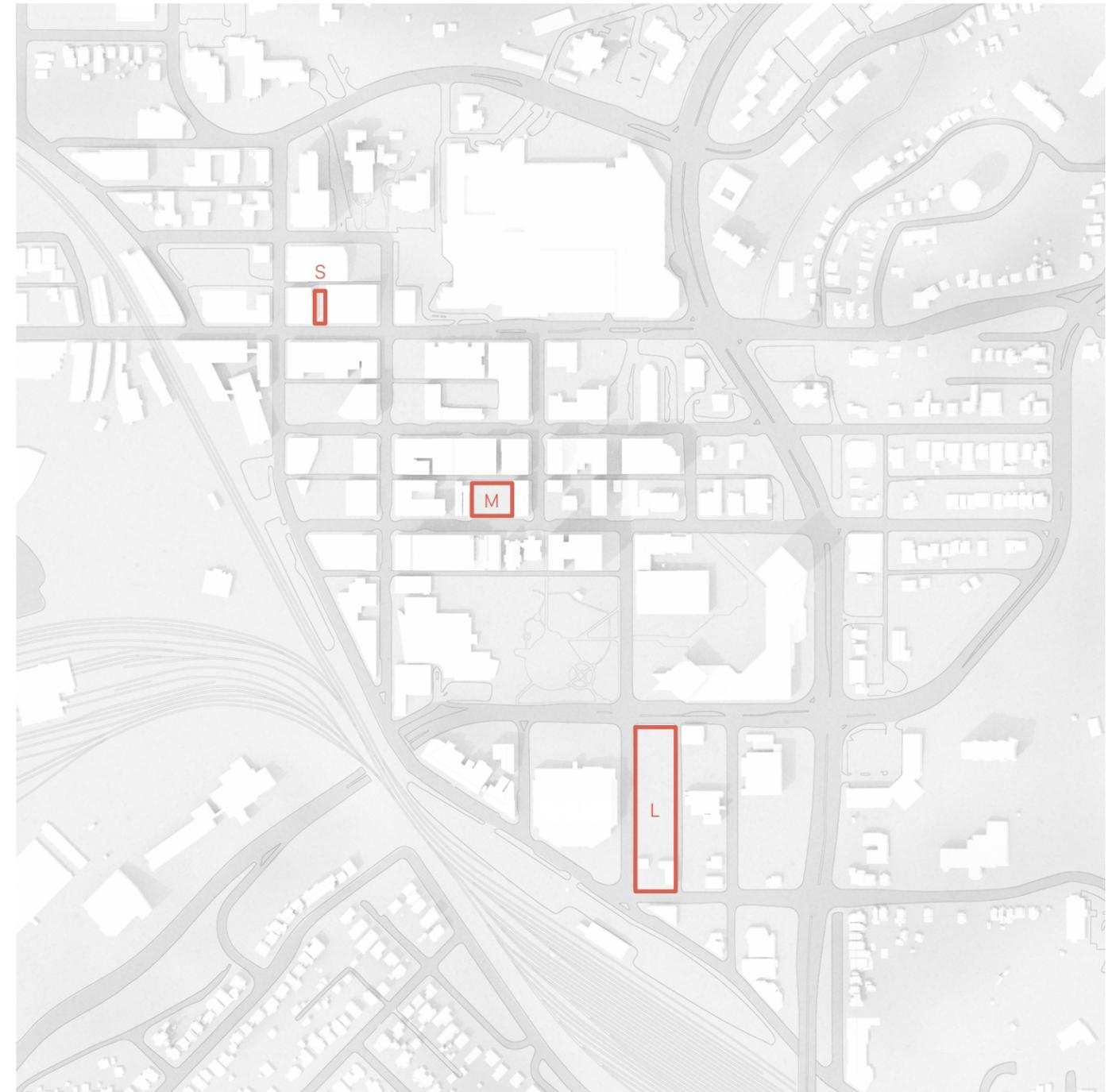
Above
62 // Framework rules diagrams 07 and 08

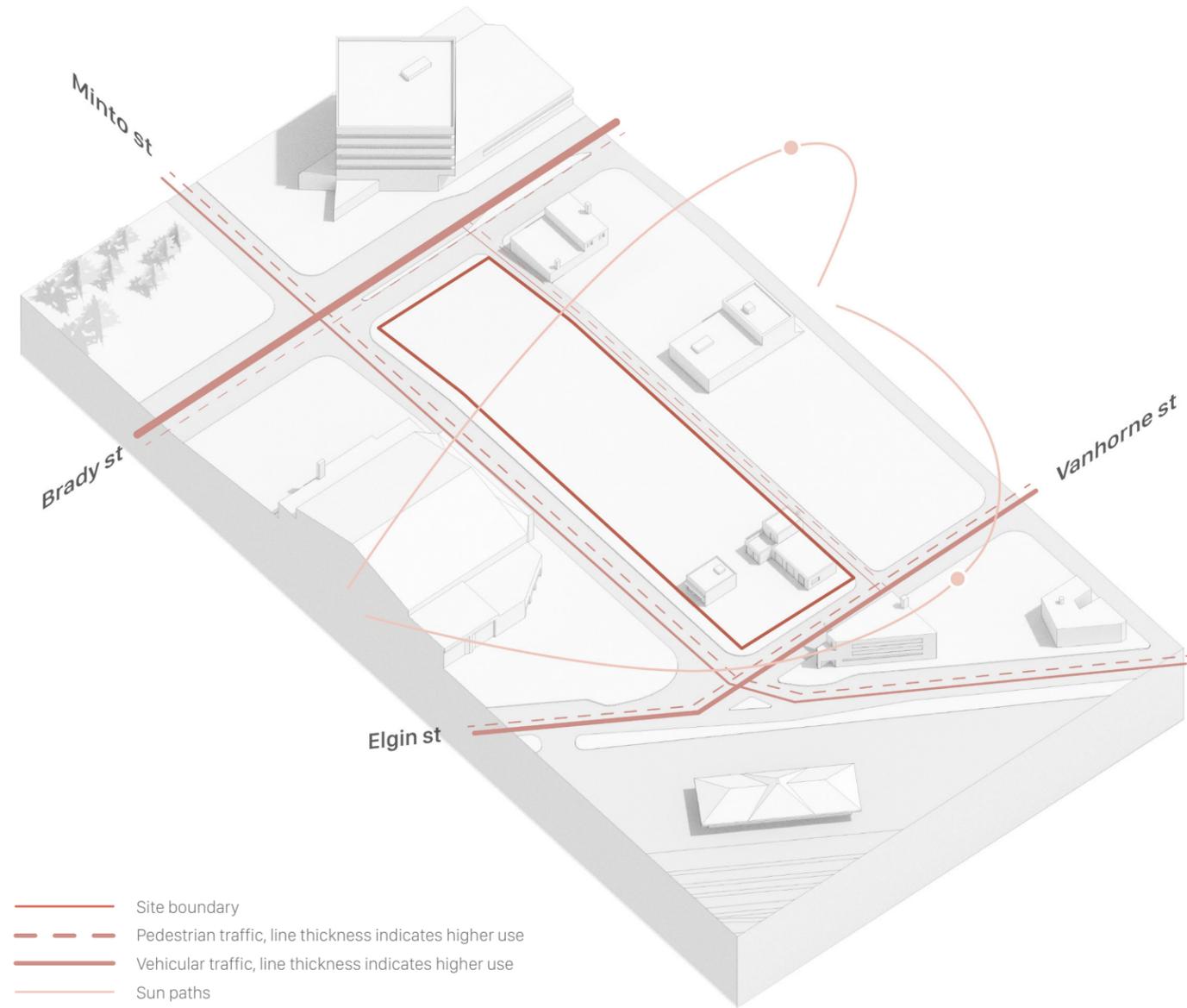
6.1 Chosen Sites, L / M / S

The identity-based framework is applied to three different sites to test its flexibility and illustrate its potential to generate varying design solutions. These three sites, which will house the infill projects, were carefully selected for their varying scale and context within Downtown Sudbury. They each have their own history. Today, they are all parking lots, but at some point in the past they used to house significant buildings that were unfortunately demolished. This sub-section will present each site in detail, and for the purposes of this thesis they were all given a name referring to their respective size: Large, Medium, and Small, stylized L / M / S [63].

The L site is the largest of the three sites at 40 m x 132 m (5 280 m²) [64]. It fronts onto Minto Street and is bounded by Minto Street to the west, Brady Street to the north, Van Horne and Elgin streets to the south, and Romanet laneway to the east. The area north of the site is generally busier with vehicular traffic,

with very little pedestrian traffic. The area south of the site typically has moderate vehicular traffic and little pedestrian traffic, although, when there is a farmer's market or an event at the arena, this area can get very busy with both types of traffic. Brady Street is the busiest of the surrounding streets, as it is a thoroughfare connecting Sudbury's main streets of the Kingsway and Lorne Street. Van Horne and Elgin streets have moderate vehicular traffic, and Minto Street and the laneway have very little. The site is almost entirely a parking lot, with the exception of the three small existing buildings at the south end of the site: Old Rock Coffee, The Dog House Sports Bar, and Advanced Details, a small car detailing service with their own parking lot of used cars at the south-west corner of the site. Additionally, the north third of the site is slightly sloped downwards towards Brady Street.

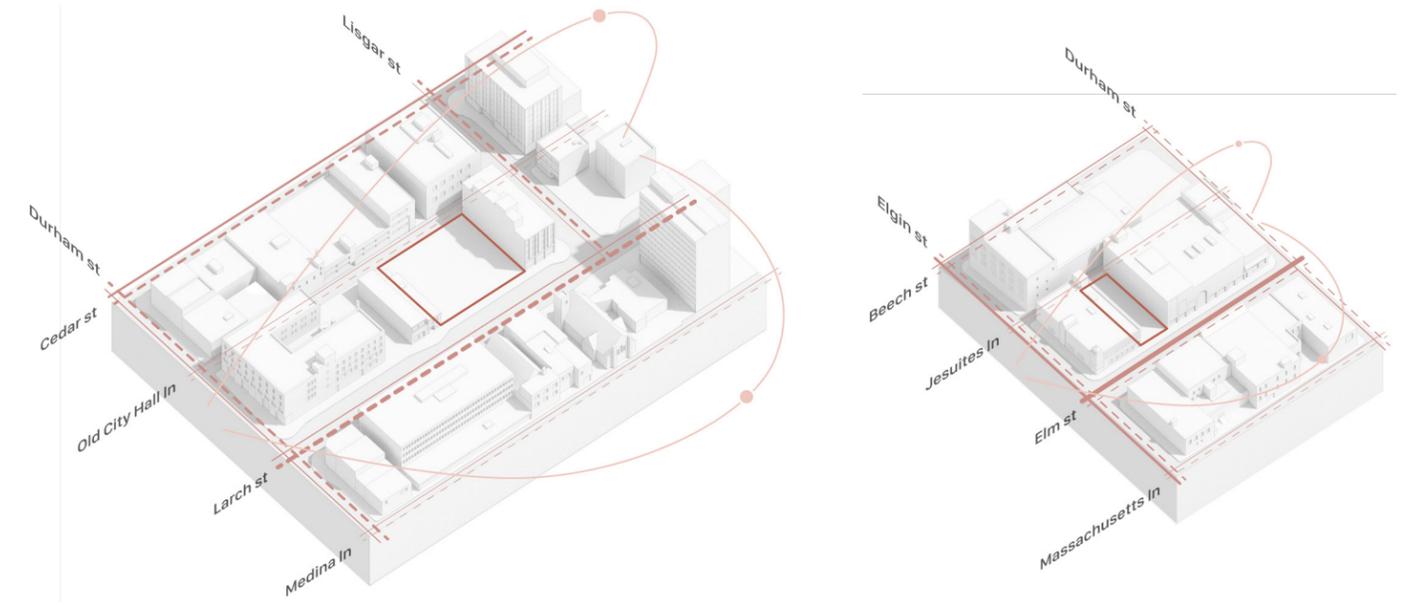




Above
64 // Axonometric of the L site showing the site boundaries, traffic patterns, and sun paths

Middle
65 // Axonometric of the M site showing the site boundaries, traffic patterns, and sun paths

Right
66 // Axonometric of the S site showing the site boundaries, traffic patterns, and sun paths



The L site's location is historically significant as the area used to be a residential neighbourhood of predominantly single family homes, all of which are now demolished mostly due to the construction of Paris Street and the decline of the Downtown [67].⁶⁷ The site is adjacent to the Sudbury Arena, the once-thriving Ledo Hotel, and most importantly, the CPR train station, near the south-west corner of the site, which used to be the entrance to the city before the car took over the train. The L site is also positioned near the Sudbury Theatre to the east, and Tom Davies Square (city government offices and police station) and Memorial Park (the Downtown's only park) to the north.

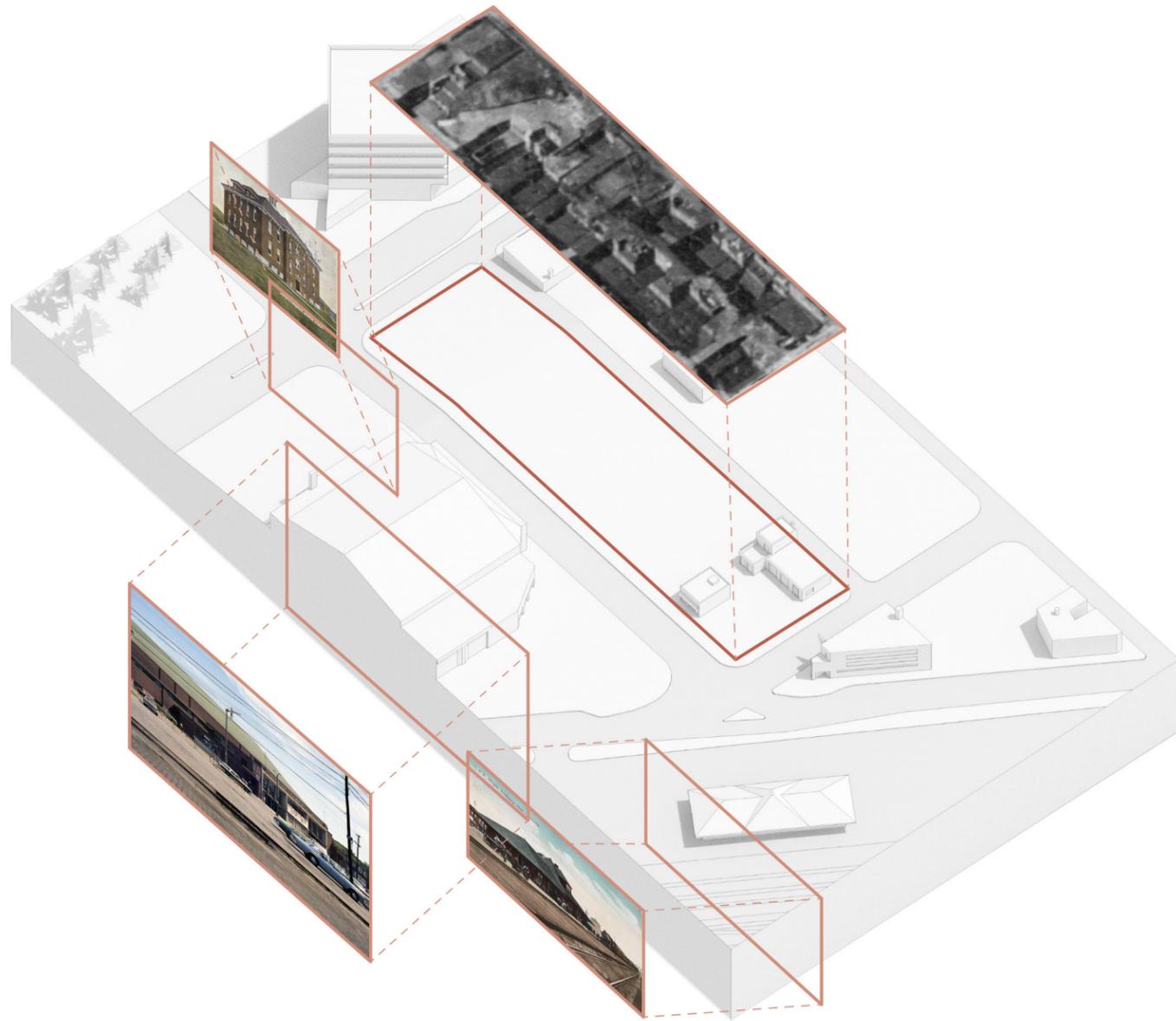
The M site measures 36 m by 45 m (1 620m²) [65]. It is bounded by Larch Street to the south, adjoining

67. City of Greater Sudbury Archives, "Aerial Photographs of Downtown Sudbury,"

buildings to the east and west, and Old City Hall laneway to the north. With respect to traffic, the area is generally busier with pedestrian traffic than vehicular. Larch Street is one of the busiest streets Downtown for pedestrian traffic, with a small amount of vehicular traffic moving one-way. The laneway has little traffic and is used for back-of-house services and access to parking. The entire site is a parking lot, with a large mural on the four-story building to the east of the site.

The site's location has held many different programs and buildings over the years [68]. The site used to house the Delioza Apartment building from the 1930s to 1950s, followed by another building for the City of Sudbury's urban planning department around the 1970s, and later a bank until the late 1990s before it was abandoned and later demolished around 2005.⁶⁸ The site is adjacent to several prominent

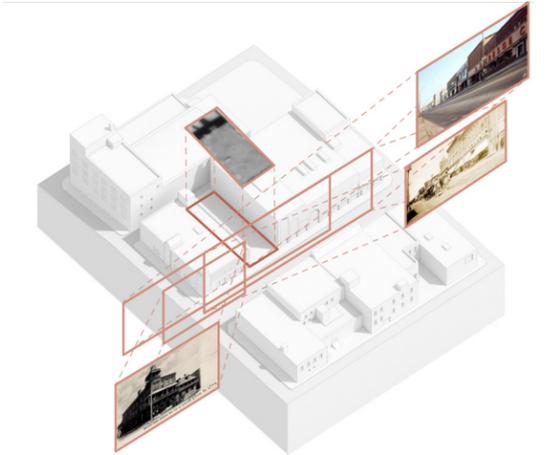
68. Various public authors, *Sudbury Then and Now*.



Above
67 // Axonometric of the L site with historic photographs

Middle
68 // Axonometric of the M site with historic photographs

Right
69 // Axonometric of the S site with historic photographs



churches, along with city hall and various boarding houses. Presently, it is bounded to the east by a four-story office building with restaurants on the ground level, and Rosery Florist to the west, a two-story narrow building. Other surrounding buildings include various office spaces, the historic Coulson Hotel (now apartments), and Larch Medical Centre.

The S site is the smallest of the three sites at 16 m x 40 m (640 m²) [66]. The site fronts onto Elm Street to the south and is bounded by adjoining buildings to the east and west, and Jesuits laneway to the north. Elm Street is typically very busy with vehicular and some pedestrian traffic as it is one of the main roads through the city, but the laneway and other streets nearby are very quiet. The entire site is a parking lot, with office buildings and small trades colleges directly to the east and west.

The site has had significant buildings on it over the years, including the Balmoral Boarding House and later a Zellers [69]. Immediately adjacent to the site are the historic Worley Parsons Building and The Grand Theatre, now apartments and a night club. Elm Street is significant to Downtown Sudbury. Historically, Elm Street has been a prominent street in Downtown Sudbury, home to significant buildings, like those part of the Borgia neighbourhood and later Elm Place mall, the old Post Office and later Woolworth's building, the Mackey building, the Balmoral Hotel and boarding house, the old Telegraph building and now the McEwen School of Architecture, and the now-demolished Nickel Range Hotel. Elm Street also had a lively street culture, with street cars and many pedestrians, along with parades. Now, Elm Street is more of a thoroughfare for cars than a place to enjoy walking as it once was.

6.2 L



As the three projects share some commonalities, the L project is firstly introduced in greater detail in this sub-section, and then the following shorter sub-sections will present the M and S projects, focusing on the most important specific aspects and differences. Considering the L site's history as home to a residential neighbourhood of primarily single-family homes that have since been demolished, the project is massed into nine groups in a village typology, similar to how the site once was [70]. The overall massing of the site is abiding by the intentions of the framework, with commercial modules on the ground level near the busy Brady Street (level 0 as this portion of the site is lower), near Minto Street (level 1 on the upper portion of the site), surrounding the central open courtyard. It also includes dwelling modules on the ground level near the quiet Romanet Laneway (level 1) [71]. Of course, most dwelling modules are located in the middle part of the buildings, with community modules (exterior and interior) on the roof, with the

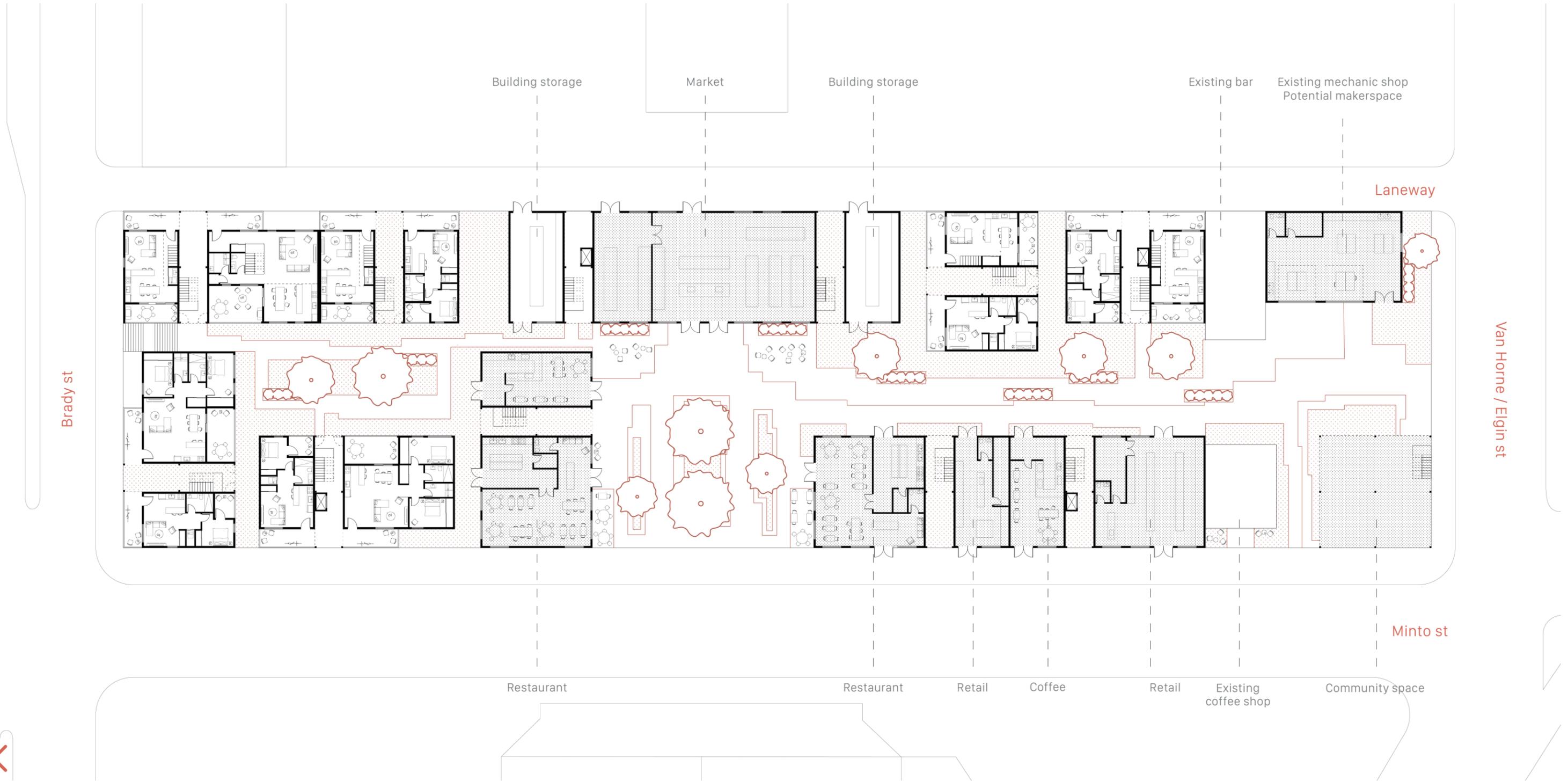
circulation modules dividing the blocks. This creates a lively street wall along Minto Street and invites people into the project, while also reintroducing residential spaces to the laneway [78]. Additionally, the sloped massing of the project in elevation responds to the site conditions and surrounding buildings. The sloping starts with two stories at the south end of the site and works its way up to six stories at the north end closest to Brady Street [73].

For the purpose of illustrating the potentials of this project, theoretical programs for the commercial modules are suggested on the plan [72], but as mentioned previously, these spaces are designed to be open frames for any program, which will allow the community to play an active role in defining these crucial program components.



Left
70 // Axonometric drawing of the modules applied to L

Above
71 // Rendered axonometric drawing of L



Above
72 // Ground plan (level 1) of L



The prominent street corner of Minto, Elgin, and Van Horne streets is community-oriented through the implementation of a two-story community module, open as just a frame for complete use and adaptation by the community. This is inspired by the case study of the Bridgeland Community Centre by Sturgess Architecture in Calgary, Alberta, as the architects and designers provide the frame and the life of the community fills it in. This further strengthens interdependence between people and their neighbourhood. The raised and open frame of the module also allows for the existing ICI mural on the Old Rock building to be shown, which greatly relates to this thesis as ICI means “here” in French and the mural highlights Sudburian culture [74].

The negative space of the village-like massing forms a small courtyard near the main street corner, an interior laneway, an open courtyard in line with the adjacent Sudbury arena, and a more enclosed

courtyard, creating quality public spaces on the ground level for use by the community [75]. A small courtyard is formed between the community module at the corner and the existing buildings on the site, where Old Rock and the Dog House are proposed to stay, and the car detailing shop is to be a community makerspace. The interior laneway connects the main street corner with the open courtyard space, while also providing a smaller area for the dwellings reaching the laneway and back-of-house access for the commercial modules on Minto Street [76]. The open courtyard opens itself up to the Sudbury Arena for potential gathering before and after events. The courtyard is also bounded by a two-story commercial module of a market and various restaurants to spill onto. The more enclosed courtyard is raised from the street level due to the sloping of the site, and acts as a communal backyard for the surrounding ground-level dwellings, with stairs connecting the project to Brady Street.



Top
73 // West elevation of L, fronting Minto street

Bottom
74 // Drawing of the prominent corner with the ICI mural



Top
75 // Lengthwise section through Van Horne street, the interior laneway, open courtyard, enclosed courtyard, and Brady street

Bottom
76 // Widthwise section through Minto street, a block with commercial modules on the ground, the interior laneway, a block with dwellings on the ground, and the laneway



Top left
77 // Open courtyard perspective



Top right
78 // Drawing of the dwellings interacting with the laneway

The landscaping of the public space is carefully designed with interdependence, accessibility, shading, and privacy in mind [77]. The ground treatment utilizes a combination of three permeable pavers, ranging in amount of permeability. The most permeable of the three is used for the more private areas of the project, around the dwelling modules that reach the ground and the circulation spaces without elevators, to signify a transition to areas that are not completely public. The least permeable of the pavers are for areas that are frequently used by the public, in the open courtyards and the interior laneway path. This paver also leads to circulation modules with elevators to keep these paths more accessible. This helps to guide the public users through the site. The middle permeable paver acts as a buffer between the least permeable and most permeable

pavers. Additionally, deciduous trees are strategically positioned throughout the site to offer shading and additional privacy for the dwellings in the summer months and less shading in the winter months. There are also seat-height concrete planters with native grasses that provides both added privacy and a place to sit.



Working upwards, above the commercial modules, are the dwelling modules located in the middle portion of the building blocks [81]. Each building block is made of two or three residential units per floor, which are all separated by exterior circulation modules, so that each circulation module is shared by two adjoining dwellings, providing a small shared space for the inhabitants to use. This maximizes intimacy as residents never have to use an horizontal exterior circulation, walking in front of a neighbour's windows, to reach their dwelling, as is often required in multi-residential buildings with exterior access to units.

The community modules on the roof utilize both interior and exterior modules to support a range of uses [82]. The uses proposed for this project includes several interior and exterior common spaces, a shared garden, an event space, several playgrounds, a shared workspace, a daycare, building storage, a basketball court, and a studio space. As previously mentioned,

these modules are designed to be open and adaptable to any use, and the proposed uses for this project are only theoretical in order to illustrate the potentials of these modules. In reality the community would have to play an active role in selecting the functions for these modules, based on their needs and desires [80].

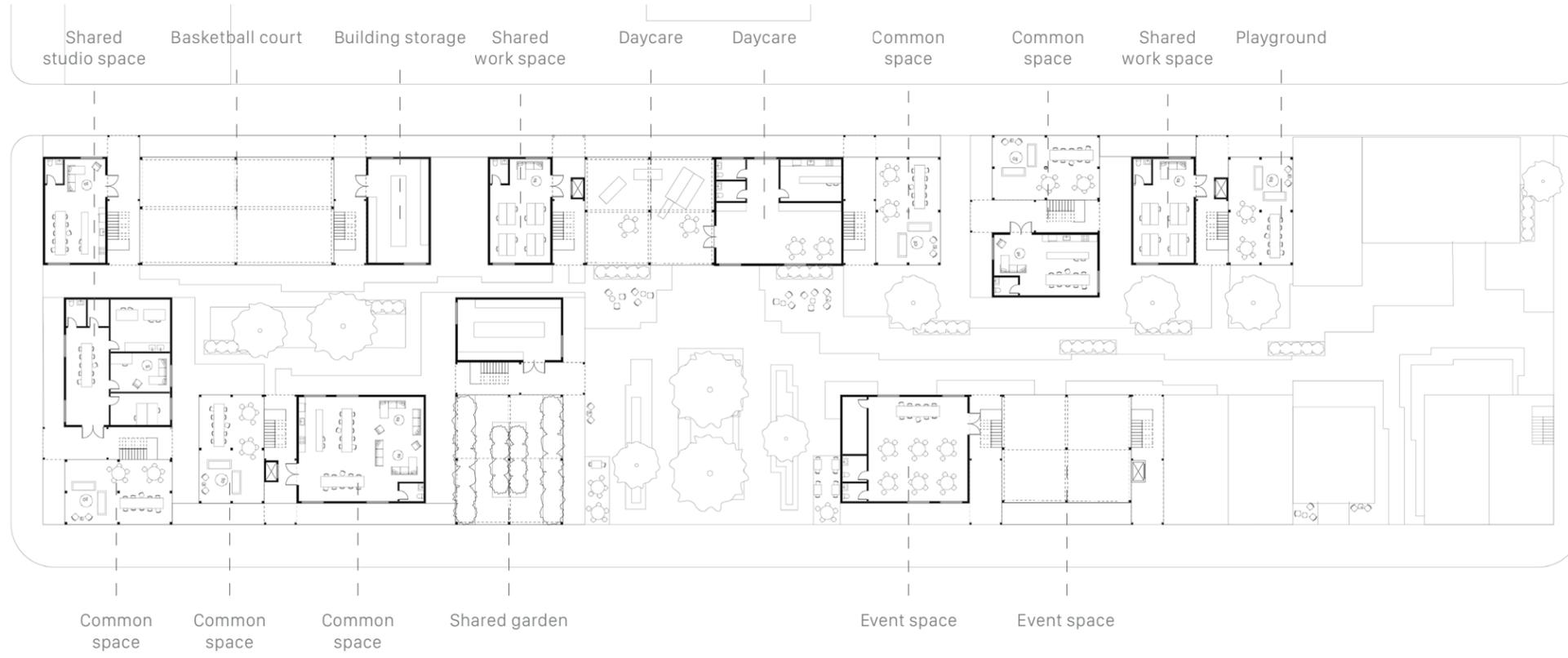
The materiality and façade details are inspired by the findings from the walks. Many of the façade details of this project are related to those of the Sudbury Arena across the street, as the Arena's façade embodies many Sudburian details and materials. The general window detail and the overall use of brick are pulled from the arena, but the stack bond (laid one on top of the other, not staggered) application of brick is another common detail in Sudbury. The concrete material of the commercial modules resemble the foundations of a house, as the commercial modules are at the base of the project. The more ornate application of the same brick on the



community modules is inspired by the brickwork on a townhouse in the Donovan neighbourhood. The octagon window comes from a specific house in the West End neighbourhood. There are also several small brick details randomly spotted throughout the façade, contributing to Sudbury's patchwork. The materiality of the porch is polycarbonate with a light steel frame, which is not a material that is part of Sudbury's identity, but the brick can be partially seen through it. Additionally, the form of the community modules comes from the common gable roof in Sudbury [79].

Left
79 // Diagram of L's materiality

Right
80 // Drawing of a community module adapted for a community garden



Top
81 // Typical middle plan of L

Bottom
82 // Top level plan of L

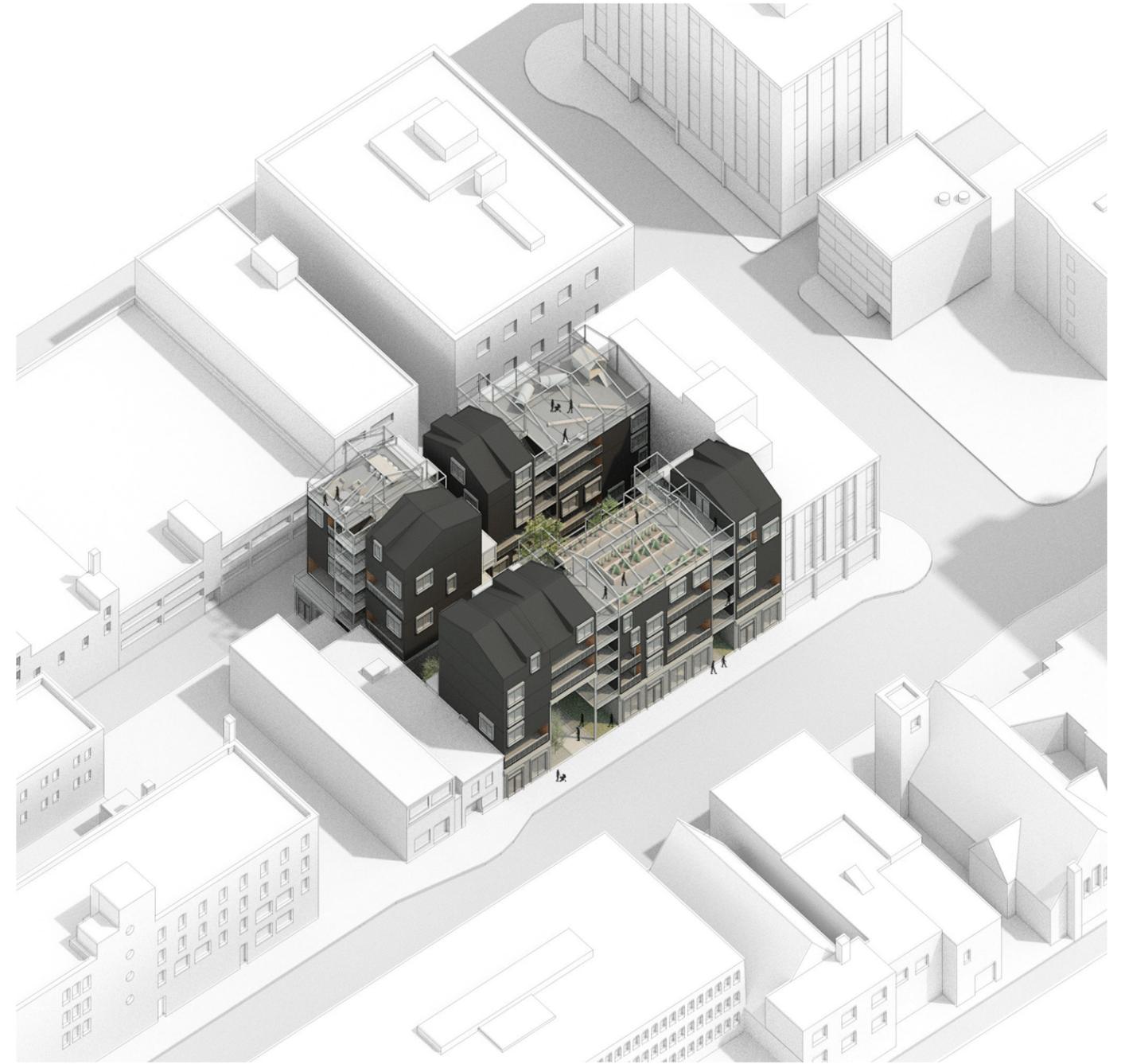
6.3 M



The M infill project is the medium of the three and is massed into three groups surrounding a courtyard based on the site conditions. The massing of the groups is similar to the L project, with commercial modules on the ground level on Larch Street, dwelling modules on the ground level backing onto the laneway, dwelling modules on the middle levels, community modules on the roof, with the circulation modules dividing the blocks [83]. The main group forms a continuous street wall on Larch Street to restitch the city, but it also includes a very large and inviting three-storey opening to draw people into the public courtyard [84]. The courtyard is smaller than the spacious courtyards of the L project, but large enough to let sunlight in year-round through the porosity of the street wall.

The ground level is organized with the proposed theoretical programs of a coffee shop, a restaurant, and a retail space on Larch Street, with a commercial

module of building storage on the north-west corner of the site near the laneway, and a group of dwelling modules on the northeast corner of the site meeting the laneway [85]. There are two main entrances to the site: the large opening on Larch Street, and a smaller gap between the two blocks on the laneway. This invites people to pass through the project and enjoy the courtyard [90]. The landscaping treatment of the ground condition is similar to the L project, with the three types of permeable pavers noting the more private areas of the site and the intended paths to move through it. There are also plantings of deciduous trees for added shading in the summer months and native grasses in the same concrete seat-height planters [87].



Left
83 // Axonometric massing of M

Right
84 // Rendered axonometric of M



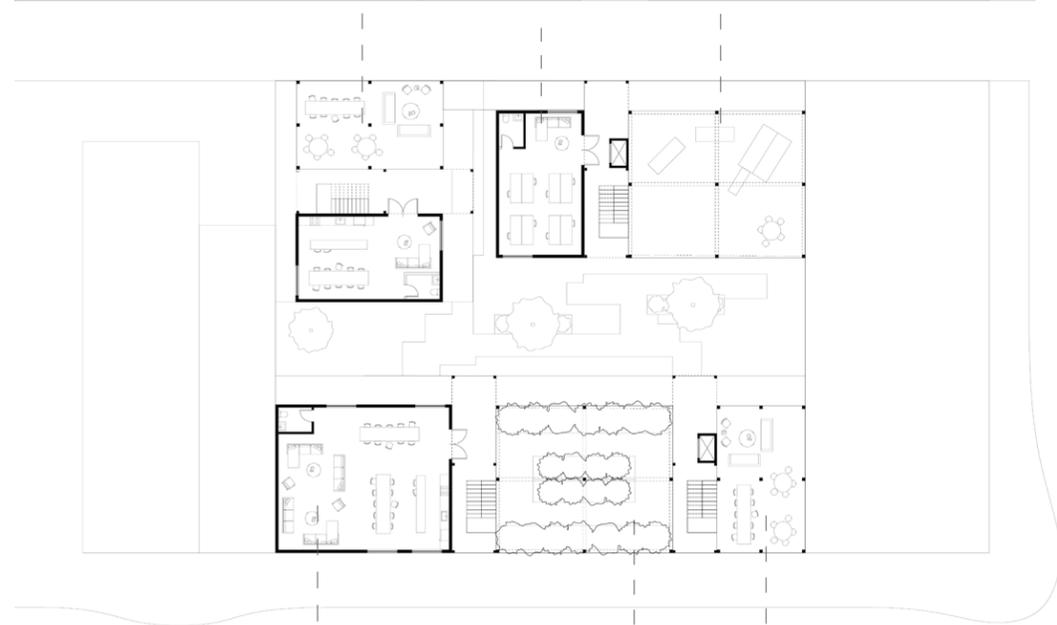
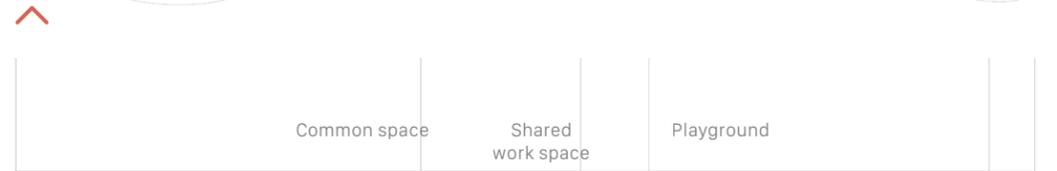
Above
85 // Ground plan of M



Moving upwards, there are four stories of dwelling modules above the commercial level and a level of both interior and exterior community modules on the roof [88, 89]. These intermediary levels utilize the same circulation as L, allowing the dwelling modules to be dual- and triple-aspect [86]. The proposed programs of the community modules for this project are interior and exterior common spaces, a shared workspace, a shared garden, and a playground. As previously mentioned, the community modules are designed to be open and adaptable to any use, and these proposed programs simply illustrate the potentials of the modules, before the community decides on their use.

Top
86 // Widthwise section cutting through Larch street, the three-story opening, dual-aspect dwelling modules, community modules, the courtyard, and Old City Hall laneway

Bottom
87 // Drawing of the courtyard in winter



Top left
88 // Typical intermediary plan of M

Bottom Left
89 // Top plan of M

Right
90 // Drawing of M on Larch street



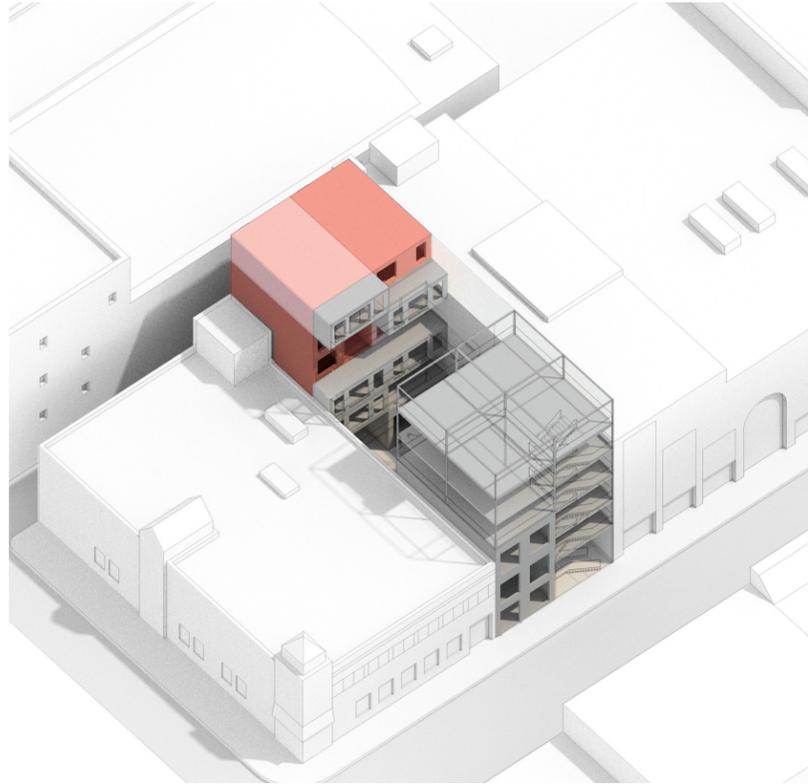
The materiality and façade details for this project also pull from various parts of Sudbury. The concrete base of the commercial modules reflect the concrete foundations of a house [91]. The dark standing seam relates to vinyl siding, and the standing seam is applied randomly in both horizontal and vertical fashions, similar to what is prevalent in Sudbury further adding to the idea of a patchwork. The porch is a more ornate white wooden porch that is prevalent on many of Sudbury's houses. The window detail mimics a common window apron detail, and the roof's dormer design pulls from dormers around Sudbury [92].

Top
91 // South elevation of M on Larch street

Bottom
92 // Materiality of M



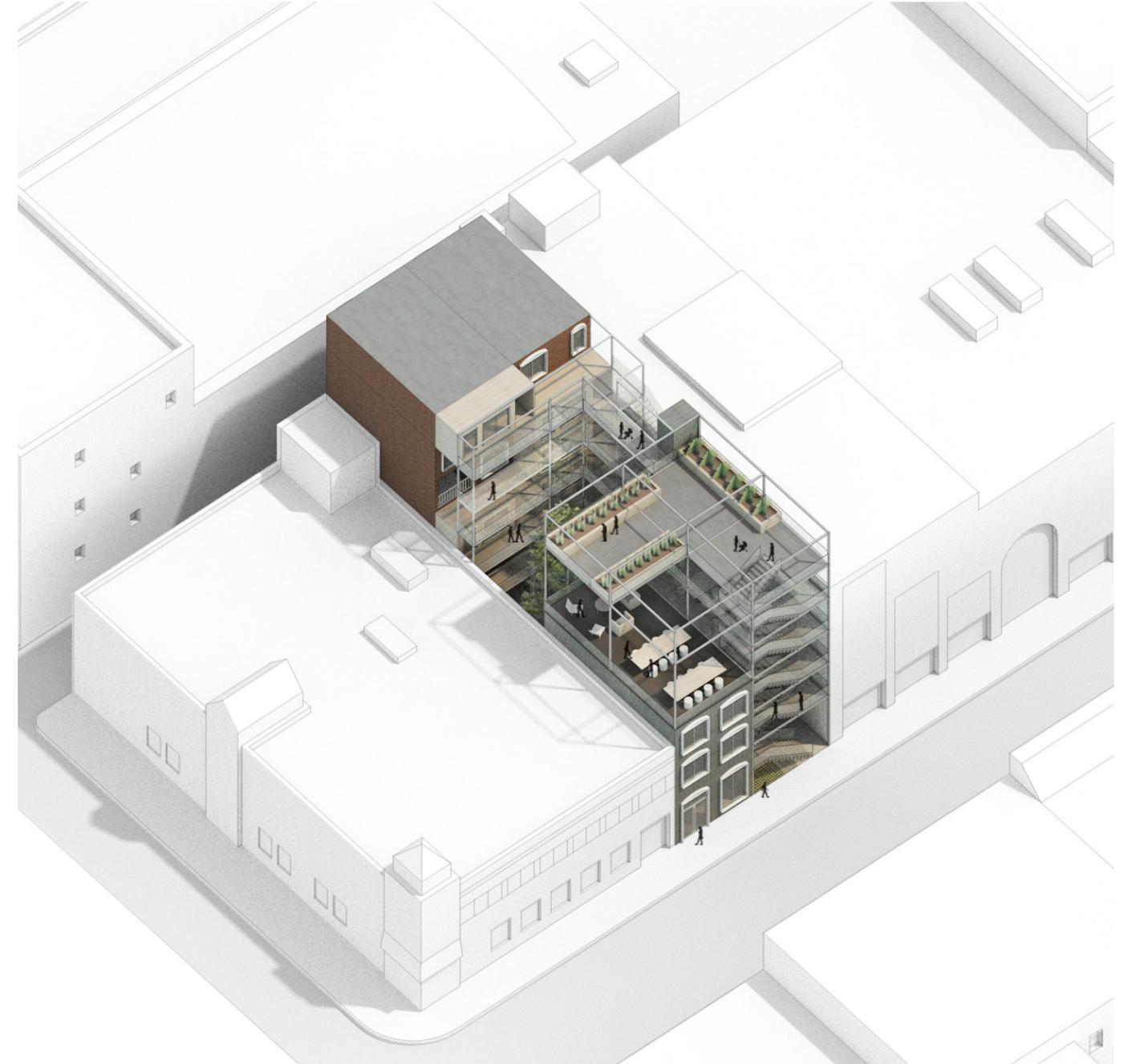
6.4 S



The S infill project is the smallest of the three projects and is massed into two blocks surrounding a central courtyard based on the site conditions [93]. The overall massing is different from the L and M projects and pushes the limits of the framework as it utilizes flat roofs and a more grid-like structure on the street front to create a more commercial and public feel [94]. The block to the north that backs onto the laneway has a single commercial module on the ground floor with five stories of dwelling modules on the top, as the front block is almost entirely dedicated to community modules [95]. The block to the south fronting Elm Street has a three-story commercial module and an open frame of community modules filling the rest of the block for public use and adaptation [96].

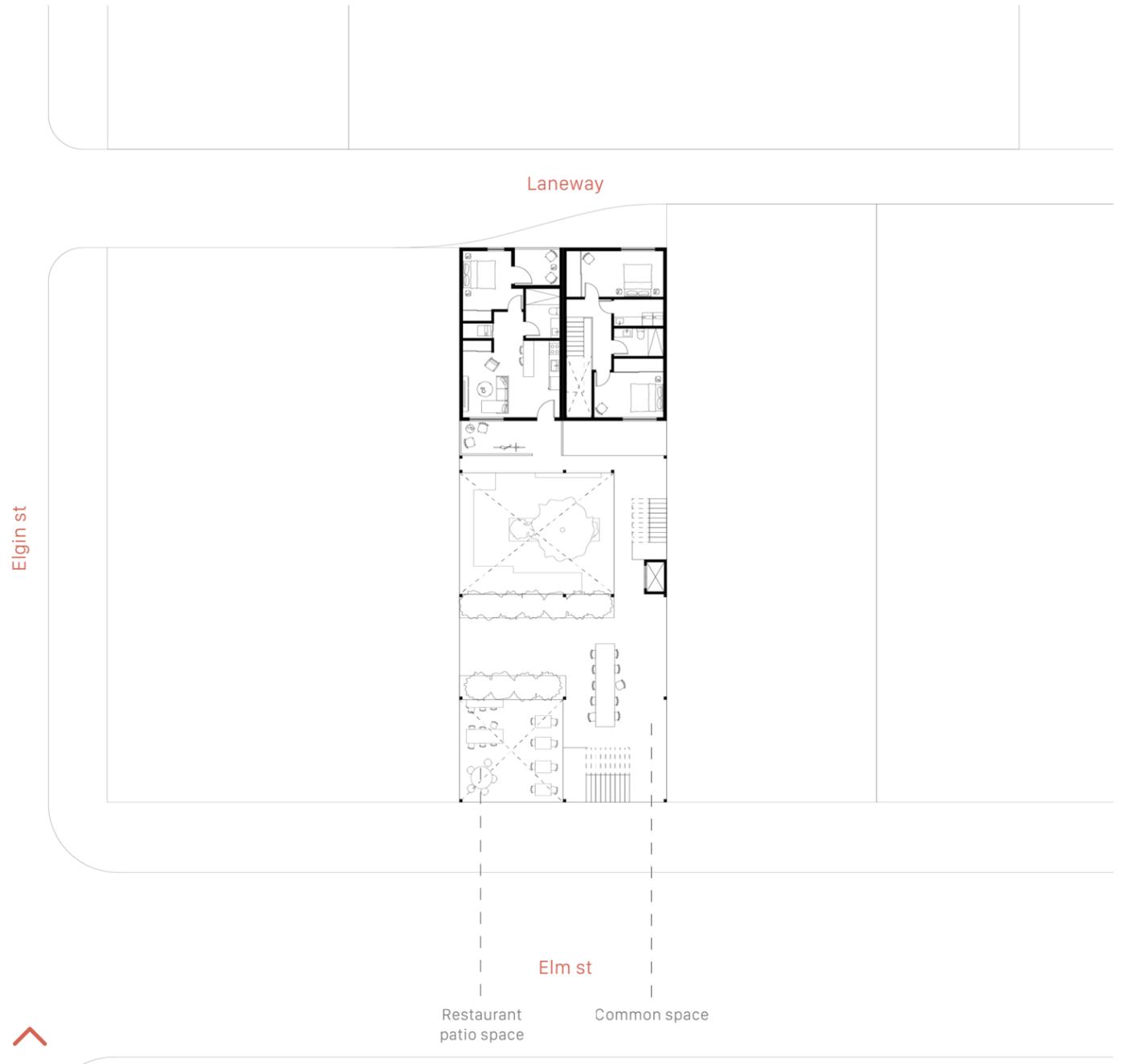
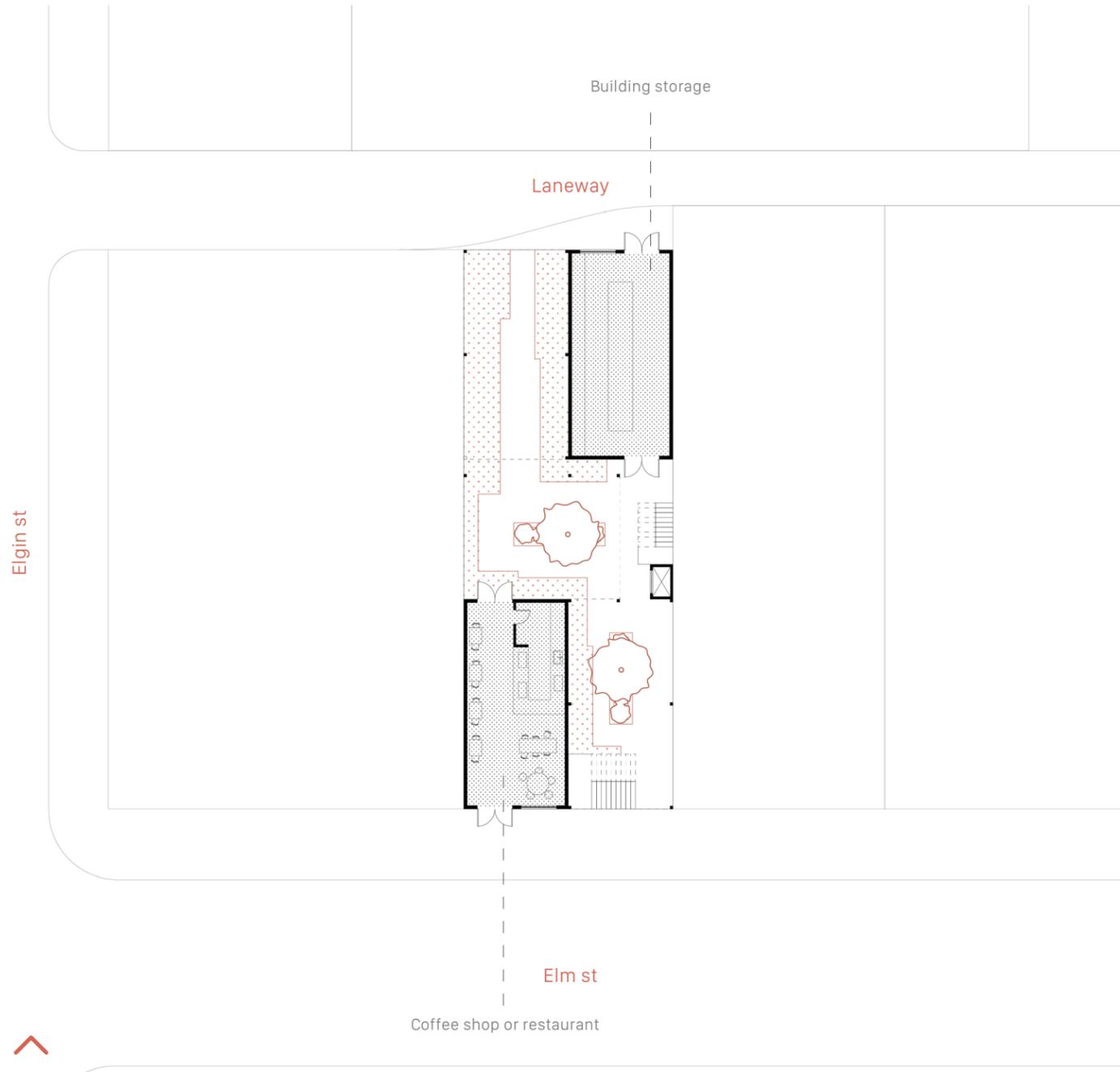
In order to carve out a public courtyard in the heart of the site and to provide access points to it from Elm Street and Jesuits Laneway, the commercial

modules on the ground floor only take up half of the site's width. The south module is truly commercial, while the north one, less visible, is perfect for locating building storage. As with the other two projects, the landscaping utilizes the three types of permeable pavers, along with several trees and seat-height planters with native grasses. The size of this site does not allow two blocks to be joined together as they do on the other projects, so the circulation module cannot be used, which is allowed by the framework rules. Instead, the circulation is more fluid and connects the two blocks through the courtyard space and is directly attached to the community modules stacked on the south side, providing access to both the private and the public components of the project.



Right
93 // Axonometric massing of S

Above
94 // Rendered axonometric of S



Left
 95 // Ground plan of S

Bottom
 96 // Top plan of S (similar to intermediary plan)



With respect to materiality and façade details for this project, the concrete of the bottom commercial modules pull from the foundations of a house, similar to the other projects. The brickwork and arched window details are influenced by the Worley-Parsons building across the street, with some small changes to the brickwork in parts of the building, contributing to the patchwork concept. The porches are clad in wood from the wooden porches around Sudbury [100].

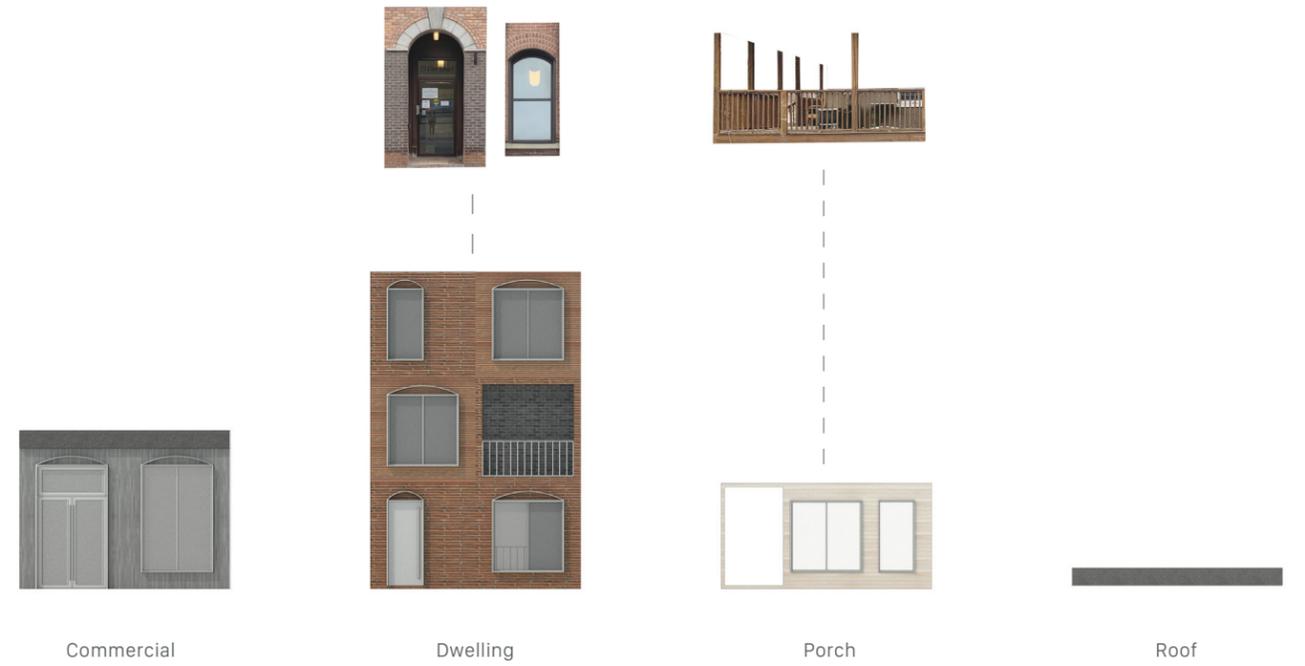
The entirely public block that fronts Elm Street has a three-story commercial module with an open, six-story frame of several community modules built up around it [98]. The stair circulation for this block is strategically placed at the very front of the block on Elm Street, inviting people upwards [99]. This

block pushes the limits of providing a space for public adaptability, as the exterior is completely open to the public, and the commercial module can be a vertical program that can support it. For example, the commercial module could be a restaurant or coffee shop with a patio that flows onto part of the community modules [97]. The possibilities for this block are intentionally endless and hope to bring pedestrian and public life back to Elm Street as it once was.

The L, M, and S infill projects aim to illustrate the potentials of this thesis' identity-based infill framework. It is important to point out that all of these projects were designed by myself, and there is an unconscious bias as to how I have adapted the

framework to these sites. L / M / S cannot show all the possible ways the framework could be used. When the flexible framework is passed onto another designer, there is confidence in saying the applications would be very different from L / M / S, as the influence of the designer is inevitable. The hope is for the manifestations of the framework to maintain the main people-oriented and identity-based concepts of the thesis, with the influence of the designer adding a creative personal touch to it [101].

Above
97 // Section cutting through Elm street, six-story adaptable community space, courtyard, circulation, block of commercial module and dwellings, and laneway



Left
98 // Drawing of S on Elm street

Top right
99 // South elevation on Elm street

Bottom right
100 // Materiality of S

Once a thriving urban environment, Downtown Sudbury is now a place the average Sudburian avoids. Sudbury's neglect of its Downtown is evident in its urban history and the current state of its built environment, one that resembles Swiss cheese or a smile with missing teeth – an urban fabric with nearly more spaces for parking than inhabitable buildings. This lack of density makes it difficult to sustain public life, and as a whole, a place to enjoy. The urban history that led to the Downtown's collapse is a combination of suburban development and expansion away from the Downtown, the failed urban renewal attempt of the Elm Place mall, and the demolition of much of the Downtown's historic buildings. After analysis of the Downtown, three gaps have been drawn: a gap within the built densities from the repeated pattern of demolition, a housing gap, given the small population of the city's core, and a gap in demographics, given that there are nearly no children, and therefore no families, living within the Downtown. This history, although disheartening, is what made Downtown Sudbury what it is today, and is the base for which this thesis is built on. The Downtown has an immense amount of potential and with careful urban renewal aimed to fill these gaps, it could return to its glory days.

To circle back to this thesis' intentions, it asked the question: ***how can we develop a flexible infill framework based on Sudbury's distinct identity to bring inhabitants back to the Downtown and foster interdependence and well-being at the architectural and urban scale?***

The first part of the answer to this question is rooted both in theory and place. This thesis thus studied people-oriented approaches to urbanism, focusing on concepts like well-being, our lives between buildings, density, pedestrianism,

neighbouring, interdependence, diversity, multigenerational living, and adaptability, in order to catalyze a healthy urban environment that can support the quality of life of its inhabitants. In addition to the theoretical research relative to architectural and urbanistic best practices, the thesis looked to Sudbury's unique architectural identity through extensive walking and photographic documentation of Downtown Sudbury and peri-urban neighbourhoods around the Downtown. As a result of this place-based research, the term Sudburbanism was coined, a portmanteau of the words Sudbury and urbanism, which proposes to learn from Sudburbanism as a contextual approach to urban renewal. This inspired the thesis title: ***Learning from Sudburbanism***. Both of these theory and place approaches have created their respective set of guidelines, people-oriented guidelines and identity-based guidelines, in order to facilitate the architectural application to Downtown Sudbury.

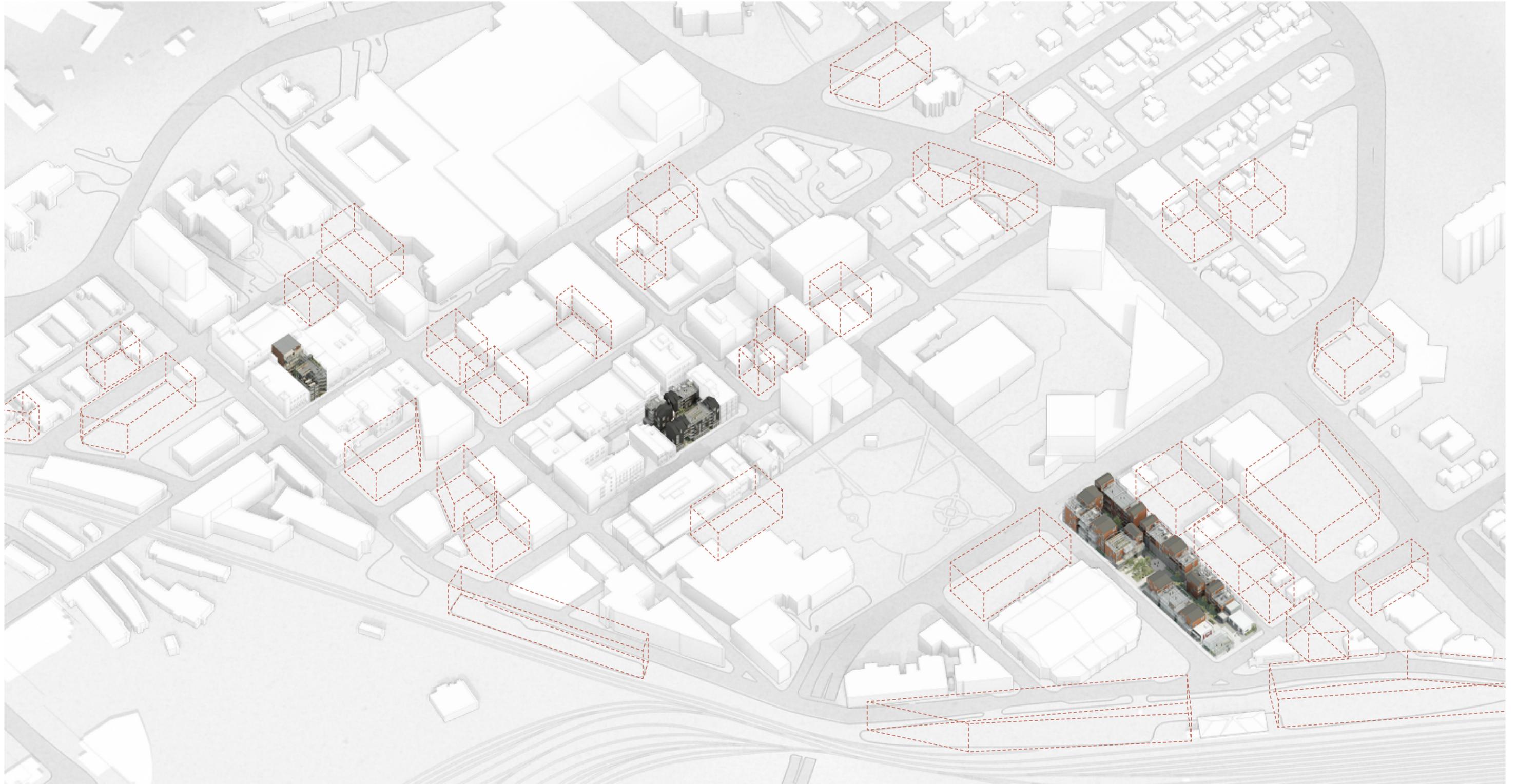
The second part of the answer to the thesis question is the actual architectural response to Downtown Sudbury's dire need for densification, diversity, and housing: the creation of an identity-based infill framework. The framework thus consists of a set of programmatic modules intended to be applied to existing void lots within the Downtown to densify existing conditions, along with a set of rules to further explain how to best utilize the modules with respect to the overall architectural and urban objectives. Indeed, in addition to filling Downtown Sudbury's physical gaps and densifying the many parking lots where now-demolished buildings use to stand, this infill framework aims to improve the human and urban conditions of the Downtown, promote interdependence and well-being amongst inhabitants, and catalyze a flourishing public life, all while relating to place. In order to test the infill

framework's ability to create a variety of designs within the Downtown through the use of the same modules, the framework was applied to three distinct sites within the Downtown, forming three different infill projects. The carefully selected sites range in size and context and are presently all parking lots where prominent buildings once lived. The sites and thus the infill projects have each been named based on their respective sizes; Large, Medium, and Small, stylized L / M / S. Now with the identity-based infill framework and L / M / S complete, the objectives of this thesis have been achieved. L / M / S, as illustrations of the potential framework outcomes, have created spaces that support public life, life between buildings, pedestrianism, adaptability, multigenerational living, and the densification and diversification of Downtown Sudbury. When looking back to the conceptual collages of Sudbury's identity made from documentation, there's a clear connection to L / M / S, as their buildings carefully preserve the unique architectural language of Sudbury while adding newer elements, thus making these projects feel like Sudburian buildings. As a whole, the detailed yet flexible framework allowed L / M / S to relate to place, while also fostering interdependence and well-being at the architectural and urban scale.

Although this thesis is strongly rooted in Sudbury, I realize that the broad strokes of Sudbury's urban history are not unique, and that this thesis could potentially be applied in part to other cities in need of urban renewal. Indeed, the people-oriented guidelines can apply to a vast number of urban environments, but the identity-based guidelines are contextual and designed from and for Sudburbanism, and therefore should not be directly applied to other cities. However, the actual walking and documentation process that led to the creation of the identity-based guidelines is a method that could and should be applied in

other cities by architects and urbanists as it can help understand and identify the unique traits of the place to make sure these are preserved and integrated into future architectural design, even if reinterpreted in a contemporary way. Indeed, preserving the sense of place is a crucial part to preserving our own identity and culture as a community. Moreover, since the identity-based infill framework is tied to both the people-oriented and identity-based approaches, the framework as a whole also cannot be transferred to another place. However, the overall methodology, based on theory and place, can once more be applied to other cities in order for them to generate their own place-specific infill framework. The following quote by Jan Gehl captures this transferable process and summarizes this entire thesis' approach: ***"look out of your windows, look at the people, look at life before you plan and design"***.⁶⁹

69. Gehl, "Foreword," 17.



Above
101 // Axonometric drawing of Downtown Sudbury, showing L / M / S
and potential future framework applications

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