*Building a Community: A Vernacular Strategy For Mixed Income Residential Housing In St.
John's Newfoundland*

By

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Abstract

This thesis is concerned with the theory and practice of urban housing. The ideas exposed constitute a basis for the planning of higher density housing in forms that could be shaped to suit the social habits and environmental conditions of St. John's, generating a powerful impact on lower-income communities. It examines the question: *what medium to higher density forms of housing will meet the needs of householders in St. John's in the twenty-first century?*

Through architectural design, this research project explores a vernacular strategy for mixed income, medium-density residential housing as a new place of community and dwelling. This thesis will investigate the urban condition of the existing residential typologies, as well as the potential for the addition of people to a downtown core which has experienced a steady population decline over the past 50 years. Focusing on downtown St. John's, Newfoundland, this thesis considers options to design innovative living spaces that foster a more affordable and sustainable community. The analysis of the existing building fabric and precedents of residential developments will be used as tools to explore various facets and the opportunities of living in an urban, compact milieu. In that respect, alternatives to urban sprawl are explored. Finally, this thesis assesses options to adapt to existing communities responding to the range of income of the residents, while also allowing for an increase in density and a better accommodation of an increasingly diverse population.

The underpinning theme behind this thesis is the exploration of ways to revitalize the inner residential neighbourhoods while preserving its innate identity and fostering the development of the unique cultural imprint of St. John's.

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Thank you.

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Like a spider, I aim to attach a thread to tradition, and beginning with that, to weave my own web.

—Jo

k, Architect, 1872-1957

Chapter 1: Introduction

Hypothesis

St. John's Newfoundland has an urban character that is unique in Canada. This character is being challenged by cultural and economic forces that are calling for expanded density in the urban core due to increases in population with diverse levels of income. In order to address these challenges and to maintain the unique character of the city, a new typology will need to be developed that accommodates change while maintaining the qualities that distinguish St. John's.

The key question addressed in this thesis is:

In a context of densification, what type of housing will meet the needs of the households in St. John's in the twenty-first century?

The project strives to develop a new approach to the planning and design of housing in St. John's. The approach is grounded on an understanding of the meaning and values portrayed by the urban and architectural forms present in the older residential areas of

St-John's. The intent is to understand how these would be adapted to contemporary needs for greater density. The proposed alternative intends to recapture the spirit of

what was once an exceptional city: a harbour city whose painted wooden houses cluster together for warmth on a crazy-quilt pattern of streets, a city where the identity and well-being of the residents was strongly linked to the commerce, industry, buildings and landmarks of its neighborhoods.

Chapter 2: City Context

2.1 History

City Structure in 1892

For most of its history, St. John's harbour was a major service and supply center for the island of Newfoundland. Merchants involved in the fish trade did much of their business from the waterfront, where wharves and warehouses handled most of the island's imports. The harbor thus became the focal point and economic heart of the city.¹

¹ Harvey. The Great Fire of 8 July, 1892. 117.

Diagrammatic maps showing the location of St. John's, within Newfoundland and Canada

Aerial views of St. John's downtown area

St. John's harbor circa 1750 and 1950

By the late nineteenth century, the population of St. John's rapidly increased as people were drawn away from the fishery to work for the railway or in city offices and factories. People lived within walking distance of their workplaces, and within reach of shops and services.² The town was mostly confined to the area surrounding the harbour, between the Battery in the east, Riverhead (where the Waterford River enters the harbour) in the west, and Military Road in the north.³ The city consisted of narrow streets, row houses, and attached businesses, most of the latter concentrated on Water and Duckworth streets. The surrounding land, today comprising most of the city's area, was farmland; with summer homes and large private estates. Businesses were established around both sides of the harbour to take advantage of valuable waterside space.⁴

The Great Fire

The Great Fire of 1892 destroyed over half of the city of St. John's, and left approximately 11,000 people without a home.⁶ In the immediate aftermath, the most pressing need was to feed and shelter the homeless. The colonial government appointed a Relief Committee to provide food, clothing, and building materials. It was largely due to donations from Canada, Great Britain, and the United States, that the

²Harvey. *The Great Fire of 8 July, 1892*. 117.

³ Ibid.

⁴ Cadigan, Sean T. *Newfoundland and Labrador: A History*. 46.

⁶ Lewis and Shrimpton. *Policymaking in Newfoundland During the 1940s: The Case of the St. John's Housing Corporation*. 1984. p. 209-39.

city was able to rehouse its citizens so quickly.⁷ Donations included nails, shingles, felt, glass and lumber. About 400 new houses were under construction within a few months, and over the next year the Committee provided supplies for 1,037 new houses containing 1,540 tenements, on condition that the owners would house some of the homeless for one year.⁸ Although the fire risks of wood construction were clear, the pressing need to build new houses before winter set in worked against the establishment of new building regulations in residential areas. Using brick and stone would have greatly increased the time and expense involved.⁹

1892 Reconstruction Act

After the fire of 1892, which destroyed the greater part of the town, a law was introduced to regulate reconstruction. The legislation passed after the fire required buildings on Water St. to be built of stone or brick with slate roofs, and provided for firebreaks. The authorities proclaimed that the town be rebuilt with stone. However, the requirements of the laws were ignored, and wood was used to build houses. Though the number of stone and brick structures increased after the 1892 fire, tradition prevailed and the city was mostly rebuilt using wood. To this day, St. John's remains essentially a wooden city.

7 Baker. *The St. John's Fire of July 8, 1892: The Politics of Rebuilding, 1892-1893*. 1984 p. 6-9

8 O'Flaherty. *The Rock Observed: Literary Responses to Newfoundland and Its People*. 1979 p.22

9 Baker. *The St. John's Fire of July 8, 1892: The Politics of Rebuilding, 1892-1893*. 1984 p. 6-9

GIS map showing all three fires

Urban Improvements

It is noteworthy, that despite the urgency associated with rebuilding, street layouts were somewhat improved. Several streets were widened, straightened, or otherwise realigned, but the Government rejected any large-scale redesign of the city on a grid plan. Prime Minister William Whiteway argued that *"perfectly straight streets running parallel and at right angles to each other were not the most beautiful"*¹¹ and that curved streets gave "a greater means of shelter to pedestrians on a stormy day, and that the curvilinear qualities should be maintained".¹² At the time, there was also a problem with absentee landlords, who owned large amounts of property in St. John's but lived abroad, often in England. In many of cases they had inherited their property and rarely visited Newfoundland. This made significant changes impossible, and the city generally

¹¹ Baker. *The St. John's Fire of July 8, 1892: The Politics of Rebuilding, 1892-1893*. 1984 p. 6-9

¹² Lewis and Shrimpton, *Policymaking in Newfoundland during the 1940s: The Case of the St. John's Housing Corporation*. 1984. p.59-61

retained its land use patterns, with commercial buildings concentrated around the harbour and residential areas climbing the hill. The reconstruction did bring about some changes, however. While the western portion of the city survived, rebuilding the eastern half introduced new architectural styles and accelerated the installation of sewerage and electricity.

2.2 St. John's vernacular: Simplicity and Survival

Generally, the term vernacular architecture refers to building methods that are particular or indigenous to a time and place, using localized styles and materials. Influenced but not defined by a particular style, vernacular buildings are made from easily available materials and exhibit local design characteristics. *Folk* architecture is usually employed to describe practices or structures which are the products of persons not professionally trained in building arts, but who produce structures or follow techniques which have been accepted by a society as the correct or *best* way to build".¹⁴ Unlike other parts of North America, the Newfoundland community did not rely on specialized craftspeople to create forms of vernacular arts; rather, much was made by ordinary fishermen. "A man would build his own house, boat, and furniture; a woman would knit clothing, stitch quilts, bake bread".¹⁵ Many Newfoundland vernacular

¹⁴ Noble, 2007, p. 7

¹⁵ Lewis and Shrimpton, *Policymaking in Newfoundland during the 1940s: The Case of the St. John's Housing Corporation*. 1984. 209-239

arts produced unique forms not found in other regions. This, largely, was because creators could combine their own local design concepts with ideas copied from objects carried into a community.¹⁶

*Drawing of fishing stage*¹⁷

In *Traditional Buildings: A Global Survey of Structural Forms and Cultural Functions*, Allan Noble characterizes folk architecture as “the architecture of habit”.¹⁸ Although vernacular constructions are rarely identical to one another, they follow conventions accepted by their society and passed down orally. The houses took a variety of forms according to the styles and means available to build the structures, but the recurring typology was the row house. The houses were typically laid out in straight, monotonous

¹⁶ Ibid.

¹⁷ Gerald Pocius. Department of Folklore Memorial University of Newfoundland

¹⁸ Noble. *Traditional Buildings: A Global Survey of Structural Forms and Cultural Functions*. 2007. P.17

streets sharing a wall with the houses next to them or only a small gap between houses and erected by local builders employing local methods and materials.

View of the Battery area in 1970¹⁹

View of the Battery area in 2015²⁰

In St. John's, the architects were the carpenters: "*We simply went around from house to house and asked: what would you like?*".²¹ Once the family had decided on the extent of the work, the carpenter, with the assistance of the older boys, started a process of articulation of the embryonic house. This entailed the location of the stairs, from the main floor to the attic, from the outside to the inside. It meant also working out of the window details, which changed from house to house, the placement of the entrance, the addition of a balcony, a bay window, or maybe a roof dormer. Finally, the outhouses were built, and the stove put in the room assigned to serve as a kitchen. The

¹⁹ Newfoundland Historic Trust

²⁰ *Ibid.*

²¹ Prowse. *History of Newfoundland*. 528-29

process of articulating each family's personal desires too varying lengths of time,
adding element to element or changing one element for another according to style and
changing needs.

Recurrent Row house Declinations²²

Examples of modified row houses in Downtown St. John's²⁷

²² Plans and elevations of the recurring row house types still found in downtown St. John's based on Mellin. *A city of towns : alternatives for the planning and design of housing in St. John's, Newfoundland. 1996*

²⁷ Newfoundland Historic Trust

Most of the houses in the downtown residential area conform to the two-thirds Georgian plan: a front room flanked by a hallway containing a stair.²⁸ Acceptance of irregularities was evident in the extensive use of cantilevered second floors. "One could speculate on the acceptance in the minds of the builders and city authorities of the concept of 'aerial rights': the possibility of building over sidewalks (cantilevered bay windows and projections over corners, over alleys, over lanes, and nearly over property lines)".²⁹

In St. John's, prior to Confederation, there was no such thing as a mortgage. First, a core house was built, and over time, additions were informally clustered at the back of the house depending on the needs and budget of the family. Additional bedrooms, back kitchens, back porches, side porches, pantries and general stores were eventually added to the houses if needed. The front of the house was the formal, public side – identified by special details and ornament on the house façade. The core house was egalitarian: it strengthened bonds between neighbors because it gave the impression that the residents of the community had basically the same standard of living. Although the core houses were nearly all the same, individual expression was possible through house siting: ornamentation, use of colors, landscaping, and additions.³⁰

²⁸ Mellin, Robert. *A city of towns : alternatives for the planning and design of housing in St. John's, Newfoundland*. 1996. P16.

²⁹ O'Neill. *The Oldest City: The Story of St. John's, Newfoundland*. 1976. p.23

³⁰ Halpert. *Folktales of Newfoundland: The Resilience of the Oral Tradition*. 1996. p.252.

Nowadays, visitors to Newfoundland often remark on the brilliantly painted houses and outbuildings. Traditionally, however, the colour palette in use in the province was very limited. Stages, stores and netlofts were painted with homemade ochre paint, with trim usually painted white. By the early twentieth century, commercially made paints became available. Urban revitalization in St. John's in the 1970s and the more widespread use of two-colour and three-colour paint schemes. The "jelly bean row" image of Newfoundland is a fairly recent phenomenon, given the long history of painted structures in the province.³¹

Colour palette of St. John's downtown area

One advantage of row housing is the congenial mixture of residents with different income levels: "as in the anonymous front of the oriental courtyard house, the row house façade acts as a screen for the material wealth of the occupants".³²

³¹ O'Neill. *The Oldest City: The Story of St. John's, Newfoundland*. 1976. P.23

³² Halpert. *Folktales of Newfoundland: The Resilience of the Oral Tradition*. 1996. p.252.

On Cookstown road, there are two small, extremely narrow row houses. These provide historical evidence of the lower limit of house size in downtown residential neighborhoods. The presence of these houses is an indicator that at one time, the city was more tolerant to low-income families and their housing needs. Allowing residents to build small houses and later make additions enabled the residents to establish equity over the long term and to participate as stakeholders in the affairs of their neighborhoods and city. The discovery of these two houses is what led me to develop interest in other housing possibilities than the standardized row house. This practice could in fact be adapted to address St. John's current housing crisis by allowing a greater variety and flexibility in dwelling types.

Cookstown houses photos

Most of the houses in downtown St. John's downtown area were constructed prior to the introduction of the automobile. That allowed a closer relationship with the street (or "the eyes on the street" as Jane Jacob would call it), since the living-rooms were just a little higher than the sidewalk and the houses all had bay windows that would allow the neighbors to see each other. This increased the sense of community and safety.

Section through a typical row house showing the relationship with the street

"Nearness was once felt when walking down Atlantic Avenue or Power Street, where residents would sit in the bay windows of the ground-floor rooms waiting to see who will walk down the street. Neighbors out for a stroll would occasionally catch a glimpse of the fire in the living room coal grate, the view delicately filtered by sheer curtains. Access to houses was inviting and direct, with no barriers between the sidewalk and the entrance. There was a feeling of intimacy and charm on these streets." ³⁴

The prominence of the front bay had a curious effect on the position of the front door of larger mid-Victorian row houses: it was sometimes found relegated to a less prominent position - even a to sidewall. ³⁵

³⁴ Mellin, Robert. *A city of towns : alternatives for the planning and design of housing in St. John's, Newfoundland*. 1996. P16.

³⁵ Halpert. *Folktales of Newfoundland: The Resilience of the Oral Tradition*. 1996. p.254.

Row houses are very much part of the St. John's Metropolitan area's urban and cultural landscapes, as they are the most recurrent housing typology, contrasting with the rest of the country.

Housing chart⁴⁰

Map of typologies⁴¹

40 Folklore Studies Association of Canada, Canadian Folklore, Volume 17,N. 2 1995

41 GIS basemap from OpenData Newfoundland and Labrador. 2015

Design Influences

The factors which have influenced the choice of wood as the prime building material in St. John's are the result of sociological, economic and political circumstances which span three centuries. Because of these circumstances, timber construction developed as a tradition that prevails throughout Newfoundland to this day. When the first settlers arrived from England in the seventeenth century, they built their houses of wood as had been the custom in their homeland. Houses in England were primarily built of wood up until the sixteenth century when the demand for lumber in ship building and other industries depleted forest stocks and raised the price of wood. As a result, homebuilders switched to other materials such as stone or brick. In the new colony, shortages of timber never posed a problem. Though there are few, if any, mature evergreen trees remaining on the Avalon Peninsula today, geographical research indicates that spruce, fir and pine trees abounded there up until the nineteenth century. Charles Bennet, Prime Minister of Newfoundland in 1870, notes in reference to his first impressions of St. John's in 1807:

*"...the South Side Hills were covered with timber down to the entrance of the Narrows as was Signal Hill and the ground lying between Quidi Vidi Lake and Signal Hill."*⁴²

⁴² O'Neill, 2014. p.56.

It is also interesting to note that Sir Cavendish Boyle, in his famous Ode to Newfoundland, makes poetic reference to "pine-clad hills" suggesting once again that there was a sufficient supply of lumber for construction. Availability of wood was not the only reason the new colony chose it as its prime building material. Wood also suited the needs and means of settlers better than stone or brick. Building a house of stone or brick not only required a great deal of money but also special skills, tools, and at least four months of dry, warm weather. Since the clay needed for the making of bricks was not available in the immediate St. John's area, brick had to be imported from England or from the American colonies. In the case of stone, one had to locate an accessible quarry and if no suitable stone could be found then it too had to be imported. Once in possession of the stone, the prospective housebuilder had then to seek the services of a stonemason and a stonecutter with the necessary skills and tools. In the seventeenth and eighteenth centuries in Newfoundland, most men of trade were fishermen. Stone masons and stonecutters were few.

Even if one succeeded in locating the proper labour and materials, one still had to contend with building conditions and climate. A stone house could be completed in three or four months providing the weather was warm and dry and that all other conditions were favourable. Due to its slow curing process, lime mortar is particularly vulnerable to destruction by rain and frost. While rain will wash away the fresh mortar, frost will cause water crystals in the mortar to expand thus breaking it up. The wet climate of Newfoundland is not suited to a type of construction requiring long stretches

of dry weather and this factor combined with the fact that wood has greater insulating properties undoubtedly influenced many a settler's decision to build with wood.

Balloon Framing

Beginning in the 1830s, once popular when long lumber was plentiful, balloon framing superseded timber framing in America. Although lumber was plentiful in 19th-century America, skilled labour was not. The advent of cheap machine-made nails, along with water-powered sawmills in the early 19th century made balloon framing highly attractive, because it did not require highly skilled carpenters, as did the dovetail joints, mortises and tenons required by post-and-beam construction. For the first time, anyone could build his own buildings without a time-consuming learning curve.

Balloon framing was made up of many lightweight wall members called studs rather than using fewer, heavier supports called posts, which were nailed together rather than using joinery. The studs in a balloon frame extend two stories from sill to plate. Using a technique suspending floors from the walls was common until the late 1940s⁴³. This technique uses long continuous framing members (studs) that run from the sill plate to the top plate, with intermediate floor structures let into and nailed to them.

⁴³ O'Flaherty, *The Rock Observed: Literary Responses to Newfoundland and Its People*. 122

Permanent Wood Foundation – Crawl Space

Diagrammatical models showing the row houses' framing

Components of a balloon frame row house

Relationship to the landscape

The tradition of minimizing the impact on the land and building in a sensitive way, respecting the environment, might also come from the typology that persisted of building “tilt houses”. Discovered in 1497, it was not until eighty years later that Newfoundland officially became a British colony and not until 1811 was settlement (i.e., erection of permanent dwellings) tolerated in what is now the island's capital. During the sixteenth and early seventeenth centuries, fishermen did not so much inhabit as frequent St. John's. Business would be conducted around the seaport during the summer months so that most people returned to their homeland for the winter. The type of houses that were built were very basic structures designed for shelter rather

than permanent dwellings. These first dwellings were called tilts, a Newfoundland version of the pioneer log cabin. Made of logs arranged side by side in a vertical position, the tilts were of a temporary character and often had to undergo major repairs every summer. By the end of the eighteenth century, there were approximately 10,000 people living in the city on a year-round basis so that the tilts gave way to more proper houses. Though built to last longer than the tilts, the latter houses were still of a temporary nature.

Diagram showing the clearance between earth and floor framing

For the first two centuries of permanent settlement in Newfoundland, dating from the seventeenth century, residents were more concerned with functional attributes, governed by a conservative sense of economy and tradition rather than by the aesthetics of their buildings. Consequently, the various styles of architecture were slow

to develop.⁴⁴ Old forms persisted long after an available technology made them obsolete and style was never crucial, except perhaps in the larger towns where it was somewhat outmoded when applied.⁴⁵

Post-fire reconstruction brought along new architectural styles. The work of John Thomas Southcott after the Great fire of 1892 is most notable. He studied architecture in England and brought the Second Empire style to St. John's on his return around 1887. Many of the homes rebuilt after the 1892 fire, whether designed by Southcott or not, contained Second Empire design elements.⁴⁸ This style was so widely associated with the Southcott firm that it became known locally as the "Southcott Style." Its distinguishing features are hooded dormer windows, ground floor bay windows and especially the mansard roof. The Southcott style became the dominant architectural style in St. John's in the aftermath of the 1892 Great Fire, and to a certain extent, it is even possible to discern the boundaries of the fire by the presence of this style in the downtown.

44 O'Dea. *The Domestic Architecture of Old St. John's*. 1974.

45 O'Dea. 1998 p. 23

48 O'Neill, 2014. p.44

The Second Empire Style (1870-1890)⁴⁹

- Characterized by asymmetric massing of forms and details
- Contrasts of varied materials, colors, and textures
- Eccentric details, often with Classical or Renaissance precedents and often mixed with Romanesque Revival style forms
- Three-sided projecting bay windows
- Whimsical juxtaposition of window pane size, usually double-hung windows with small paned upper sash
- Wrought iron used at doorways and railings
- L-shaped stoops or straight stoops
- Multi-paneled wood doors; and
- Gable roofs covered with tiles or flat roofs and featuring dormers and chimneys.

This view of homes on Cochrane Street shows how many of the houses built after the Great Fire of 1892 were in the Southcott or Second Empire style. The mansard roof and hooded dormer windows are evident in this row of houses.

49 O'Dea. *The architectural heritage of St. John's: an evaluative inventory*. 1976. p.5.

There were, of course, many simpler homes designed and built in the years after the Great Fire. Common features included flat roofs (quick and easy to build) with some decorative additions, usually roof brackets and sometimes dentils. This style was quite common in St. John's, and in the outports, well into the 20th century. Today, many houses (especially row or attached houses) have flat or mansard roofs.⁵⁰

An interesting comparison can be observed at the intersection of Beck's Cove and Water St., which marks the western boundary of the 1892 fire. Buildings west of the intersection have saddle (steeply angled) roofs and stone walls containing chimneys, typical of pre-fire construction. Those east of the intersection, along Water St., tend to have flat roofs, which were cheaper and easier to construct and common in the post-fire buildings.

*Water St., 2015*⁵²

⁵⁰ O'Dea. *The architectural heritage of St. John's: an evaluative inventory*. 1976. p.5.

⁵² Ibid.

There were major changes to buildings and to the locations and widths of streets and paths. The 1889 map shows a very irregular block geometry, with variations in building setbacks from the street. These setbacks are irregular to the extent that the width and geometry of the street space is constantly varied. For example, along Queen's road, the street space is sometimes narrow, and at other times wide, and there is a funneling or spatial compression effect at the approach of various intersections.

Excerpt of the 1889 municipal Bulley map showing the irregular block layouts

Diagram showing the varying set-backs

The 1907 Bulley Street map shows many post-Great Fire changes: the blocks are larger and there are fewer blocks, the houses are larger, the streets are wider, the buildings have more uniform setbacks from the street, there is less variation in street width with along the lengths of particular streets. The essence of the character of the old St. John's (pre-Great Fire) does not solely depend of the irregular grid pattern. What I noted that was particularly characteristic was the previously very complex distribution of houses, public buildings, landmarks and streets. St. John's resembled European cities in the way residents oriented themselves in space. Aldo Rossi describes the European city in terms of urban artifacts and monuments residing in the collective memory of the inhabitants. His analogy relates well to St. John's – a city destroyed more than once by fire

*The analogy of the value of monuments in destroyed cities serves mainly to clarify two points: first, that it is not the context or some illusionistic quality that enables us to understand a monument; and second, that only by comprehending the monument as a singular urban artifact, or by contrasting it with other urban artifacts, can we attain a sense of the architecture of the city.*⁵⁴

The downtown residential grid is also linked with pedestrian traffic. All streets have sidewalks, the streets are not wide, the curb radius is not large, and there are many pedestrian paths that provide short-cuts or alternatives to the use of main streets. The

⁵⁴ Rossi. *The Architecture of the City*. 1982. P.48.

small curb radius makes it safer to cross the street at intersections.⁵⁵ The link between the St. John's grid and topography has been studied by architect Jow Carter:

Long 'contour' streets ranged themselves like a giant staircase up the slopes at approximately 15-meter vertical intervals. These roughly parallel 'contour' streets were joined one to another by shorter 'ladder' streets. The attack of the 'ladder' street up the slope was in the optimum location (balanced between time and energy) for foot power to negotiate the 1:12 slope. The irregular quadrangles that irritate modern traffic engineers were not random at all but were the logical outcome of energy-conscious people and animals.⁵⁶

Bond Street

The downtown urban fabric is also typical for the recurrence of courtyards within the residential blocks. These open spaces located at the back of the houses are used as places for community gathering, but also for sheltering from the natural elements

⁵⁵ Mellin. *A city of towns : alternatives for the planning and design of housing in St. John's, Newfoundland*. 1996. P.16.

⁵⁶ Ibid.

characteristic of St. John's: heavy rain and snowfalls.

Nolli map of recurrent typologies of courtyards

2.3 Place Identity

A place can embody a clear identity by encompassing a set of features that guarantee the place's distinctiveness and continuity in time. The concept of '*genius loci*', used to describe the impalpable but generally agreed upon unique character of a place, reflects this meaning of 'place identity'".⁶⁰ Place exerts its influence through "physical features and symbolic meanings, with the former often being a cue to the latter"⁶¹ defines these place-based meanings as "the nonmaterial properties of the physical milieu – the socio-

⁶⁰ Lewicka. *Ways to make people active: Role of place attachment, cultural capital and neighborhood ties*. 2005. 381–395

⁶¹ *Ibid.*

cultural 'residue' (or residual meaning) that becomes attached to places as a result of their continuous association with group activities".⁶²

"[P]lace is space endowed with meaning"⁶³, while identity involves two things: sameness, or continuity; and distinctiveness, or uniqueness⁶⁴. Place identity in the built environment arises from both continuity and "distinctive characteristics"⁶⁵, and concerns the meaning and significance of places for their inhabitants and users.

The process of how a place has achieved and retains its sameness and unity and how a place's distinctiveness is perceived and interpreted by its inhabitants and users is multi-layered and evolving. The process of identity formation, it is argued, "*can never start from scratch; it always builds upon a pre-existing set of symbolic materials which form the bedrock of identity*".⁶⁶ Numerous studies have been conducted to establish what forms the bedrock of identity for specific communities. In an architectural sense, however, it is possible to define the fundamental, material components of place identity, which all observers of place can recognize: shape, or form; texture; material; colour. Each of these elements is resolved and manifested in architectural details. In the architectural

62 Lewicka. *Ways to make people active: Role of place attachment, cultural capital and neighborhood ties*. 2005. 381–395

63 *Ibid.*

64 Jacobson-Widding. *Identity: Personal and socio-cultural*. 1983. P.4

65 Gustafson. *Meanings of place: Everyday experience and theoretical conceptualizations*. 2001. P.5-16

66 *Ibid.*

sense, place identity is the sum of specific material components and features, which provoke non-material symbolic meanings for collective groups of inhabitants and users.⁶⁷

Architecture and urban design are stable environmental symbols because they are harder and slower to change, which means that significant shifts and evolution in place identity can occur relatively slowly over years or even generations. This allows for a balance between change and the continuity of the particular set of features that guarantee the place's distinctiveness.⁶⁸

As a result of the existence and essential role of these material components and features, the generally agreed upon distinct identity of a place can be literally perceived and defined. Environmental psychologists have pointed out the importance of belonging to or in a certain place. There is widespread agreement that the primary function of place is to "engender a sense of belonging and attachment".⁶⁹ The results of studies have encouraged the development of practices that promote and exploit place identity "and hence encourage (or at least do not discourage) people's psychological investment in their local, physical communities".⁷⁰ These theories for counteracting

67 Gustafson. *Meanings of place: Everyday experience and theoretical conceptualizations*. 2001. P.5-16

68 *Ibid.*

69 Proshansky. *The city and self-identity*. 1978 p.147–169

70 *Ibid.*

alienation and homogeneity in a globalised world have also found support in UNESCO's 2001 Universal Declaration on Cultural Diversity, which states that "*cultural diversity is as necessary for humankind as biological diversity*".⁷¹

Character-Defining Elements (that contribute to a sense of place)

When viewed in light of those concepts, St. John's downtown area has many defining elements that relate to its value as an organically developed and well-preserved commercial harbour town; an area of architectural interest and an important centre for marine-related industries. Due to St. John's being the oldest English settlement in North America to have grown into a city, many of its buildings have been designated by either the Minister of the Environment or the Heritage Foundation of Newfoundland and Labrador) as historic places. As of 2012, St. John's contains 21 of Canada's National Historic Sites. Some of the character defining elements include:

- the dense concentration of historic architecture ranging in age from the eighteenth to early twentieth century, and creating cohesive streetscapes. The main types of buildings include waterfront industrial buildings in the Maritime Vernacular warehouse style, commercial buildings in the late Victorian and Edwardian styles, and a variety of homes in Georgian, Gothic Revival, Classical Revival and Second Empire styles, accentuated with vernacular architectural elements;
- all elements that are typical of a longstanding building tradition particular to the St. John's area, including the sturdy wooden construction of the majority of the buildings, with narrow clapboard or shingle cladding and wooden trim elements;
- the distinction between the industrial, commercial, institutional and residential areas of the downtown area reflecting the original town plans.
- all original elements reflecting the fishing and shipbuilding industries, especially the inter-related warehouses and wharves, outbuildings, parking and loading areas, all located on or close to the waterfront. Also, all elements contributing to the visual character and related harbour views of the area, without constricting its function.

71 Blake. International Cultural Heritage Law. 2015

In terms of residential architecture, the key elements contributing to the heritage value of this site include:

Form

- Villages (a city of towns) with an regular grid pattern
- the consistent scale of the buildings (square massing, two to three-and-a-half storey heights)
- consistent lot sizes and set-backs of houses from the street;
- the continuity of the streetscape without any major gaps;
- the relationship of the buildings to each other and to the open spaces between and around them (siting of most buildings flush to the sidewalk and abutting each other);
- the mixture of single and double houses;

Structure

- front-sloping gable or flat roofs;
- Foundations on rocks
- Adaptability: additions to the original house over the time
- the predominance of wooden architecture (and some brick and stone construction with timber framing or surviving brick infill);
- Fragility of the structures (leaving no traces on the landscapes);

Esthetics

- Wood shingles or clapboards
- Coloured facades
- the unadorned rear elevations;
- Windows are the “eyes on the street” that extend invitation to come in
- the Second Empire houses designed by J.T. Southcott, with their bellcast mansard roofs, round-headed dormers, bay windows on the front facade, side entranceway, fine detailing and interior ground floor hallway running parallel to the main facade;

⁷² Saltbox: an architectural form of a house, developed from a one-and-a-half story house with a linhay, the shape is said to resemble an eighteenth century salt box.

The creation or preservation of sense of place is important in maintaining the quality of the environment as well as the integrity of human life within it. Studies reveal that places not only are important elements in developing and maintaining self and group identity but that they play a significant role in human behavior and their mental health.

In *The meaning of the built environment: a nonverbal that places*, Amos Rapoport argued that places, in addition to physical features, include messages and meanings that people perceive and decode based on their roles, experiences, expectation and motivations.⁸⁰ Therefore, sense of place refers to the particular experience of a person

⁷³ Bay windows: a division of space that is repeated within a building, a three bay house would have three spaces repeated along one side as in two rooms and a hall.

⁷⁴ Gable: the triangular end of a wall above the eaves with a peak roof.

⁷⁵ Linhay: local terminology referring to an addition to the rear of a structure; either one story with a shed roof (single-slope) or two stories with a flat roof.

⁷⁶ Bonneted: a dormer with a semicircular roof line, normally containing an arched window.

⁷⁷ Mortise & tenon: a joint made between two pieces of wood where the projecting part of one piece fits into a corresponding cutout on another.

⁷⁸ Dormer: a vertical window and window box that projects from a sloping roof, has its own roof, most commonly a pedimental or gable roof.

⁷⁹ Large vertical planks or studs that are rough sawn or planed are placed next to each other on a sill at the bottom and either extends to a plate at the top or continues to the roof.

⁸⁰ Rapoport. *The meaning of the built environment: a nonverbal communication approach*. 1990

in a particular setting. It is a general way someone feels about a place, and is an important factor in maintaining the quality of the environment.

Environmental psychologists also argue that the experience of place--through the actual experience of meaningful events--has become one of the most important factors in creating a sense of place. The experience is felt through all the senses (sight, hearing, smell, taste, and touch), and the place experience is in fact a total sensual experience.⁸¹ Thus, a relationship forms between person and place: in other words, messages interact between person and place inside a particular locality.

Sense of place is also an important aspect in integrating user and place. It contributes to better use, satisfaction and attachment to places. In parallel, Lynch suggested that sense of place provides for a good relationship between human and place. He reasoned that a place must be recognizable and should have an identity in order to create the sense of place that could lead to place attachment.⁸²

However, changes in people's lifestyles and the development of technological advances have resulted in people suffering from the sense of placelessness. Relph explained that *placelessness* refers to the settings, which do not have any distinctive personality or

81 Relph. *Place and placelessness*. 1976

82 Lynch. *Good City Form*. 1998

sense of place.⁸³ Therefore, placelessness can be explained as the physical characteristics of nonplace, which is culturally unidentifiable environments that are similar anywhere. In this regard, Relph argued that designers who ignore the meanings that places bring to people's mind, in fact destroy authentic places and make inauthentic ones.⁸⁵ Furthermore, scholars advance that since one of the main goals of urban design is creating a sense of place, architects, designers and planners should pay more attention to the quality of places and built environments. As a result,, the role of design as a tool to answer human needs and expectations is more significant.

2.4 City Growth Expansion

During the Second World War, the process of suburbanization started transforming St. John's from a compact town centered on its harbour to a city that is today spread out over more than 400 square kilometers. The installation of water and sewer mains as well as roads, allowed for major construction projects, and eventually the area encompassed not only suburban residential areas, but also large public housing tracts, shopping complexes, office buildings, Memorial University and the Health Sciences Centre. Confederation Building, and the new seat of the provincial government, opened just north of Churchill Park in 1960.¹⁰⁰

83 Relph. *Place and placelessness*. 1976

85 Gustafson. *Meanings of place: Everyday experience and theoretical conceptualizations*. 2001

100 Statistics Canada. Government of Canada *CMA and CA: Detailed definition*. 2011.

The development of Churchill Park signalled the beginning of a period of rapid expansion, which took place in two ways. Initially, the City planned for expansion and growth. While earlier expansion (such as that in the Circular Road and Georgestown areas) took place mostly on an ad hoc basis, expansion after the 1940s was largely in the form of deliberately planned suburban developments, built to house the city's growing population.¹⁰¹

*Churchill Park in 1960*¹⁰²

This was the second way that expansion took place – nearby communities were folded into the City of St. John's. Blackhead Road (later renamed Shea Heights), a community settled mostly during the 1930s by St. John's residents who could not find or afford housing within city limits, was one such area. It had a reputation for unemployment and

101 Statistics Canada. Government of Canada *CMA and CA: Detailed definition*. 2011.

102 Newfoundland Historic Trust

poor housing, but a 1963 federal-provincial Urban Renewal Project improved conditions and services, and the area of Shea Heights was added to the St. John's Metropolitan Area the same year. (A Metropolitan Area is defined by Statistics Canada as an urban area, having a population of at least 100,000, consisting of the urban core and surrounding urban fringe). However, Shea Heights did not officially become part of St. John's until 1984, and even today, the area retains the place identity of a distinct community.

The growth of commuter towns presents a growing problem to St John's. These towns, such as Paradise, Torbay, St. Phillips, Portugal Cove, Conception Bay South, and Mount Pearl, increase the population base served by the city of St. John's although not being part of the city. While such towns have many attractions for residents, such as increased space, cheaper property, and lower population density, they are often criticized for inefficient use of space, monotonous architecture, and lack of locally available services. Separate municipal government also complicates the process of regional planning.

One of the major factors driving amalgamation and the growth of suburbs and commuter towns was the rise of the automobile as the primary transportation method in St. John's (and most of North America). When it became feasible for most families to own at least one car, it was much easier for people to commute to jobs elsewhere in the city or in another town: they no longer needed to live within walking distance of their

workplaces. This allowed for greater city expansion than was previously possible, while maintaining low population density and developing transportation infrastructure dependent on privately owned vehicles.

Comparison of St. John's and the city of Paradise¹⁰⁵

While this style of living is popular, the environmental impacts of such low population density are coming under increasing scrutiny. The bus service provides service to most of the city, but low population density and a lack of major thoroughfares makes public transportation difficult. As suburbs and towns expand, large swaths of forests and marshes are replaced with houses, which can be damaging to local ecosystems. Replacing farmland with housing also reduces local food production and increases reliance on food imports, further increasing the high carbon footprint of transportation

105 Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13 2007

networks overwhelmingly dependent on cars and trucks.¹⁰⁶ Indeed, the development of private automobiles has led to a separation of the connection between home, places of work, schooling, leisure, recreation, and shopping.¹⁰⁷

In the past 60 years, St. John's has grown from a compact city of about 35,000 people limited to a relatively small area around the harbour, to a city of over 100,000 people, many of whom live in suburbs and depend on automobiles to get around.¹⁰⁸ The St. John's Metropolitan Area, which consists of most of northeast Avalon Peninsula, has over 200,000 people, or about 40 percent of the island's population, and in many ways, northeast Avalon comprises one large interdependent community. The population density has remained relatively low, at about 829 people per square kilometer in the urban areas of the city (defined by Statistics Canada as an area with more than 1,000 people and a density of 400/km² or more). Compared to the urban area density of Toronto (almost 4,000/km²), Vancouver (over 5,300/km²), or even Halifax (almost 1,100/km²), this is significantly lower.¹⁰⁹

106 Fincher and Iveson. *Planning and Diversity in the City: Redistribution, Recognition and Encounter*. Houndmills. 2008. P.36

107 Gleeson and Sipe *Creating Child Friendly Cities: Reinstating kids in the City*. 2006, 72

¹⁰⁸ R. Mellin: "Vernacular Architecture and Urban Design: A Strategy for Place-Making in St. John's, Newfoundland, 1995, pages 125-138.

109 Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13 2007

2.5 Sprawl

During the early 20th century, innovations in transportation and communication made possible what Lewis Mumford called “urbanization at any point in a region¹¹⁰”.

Interaction could now be attained with the automobile, and this resulted in the fragmentation of the urban fabric. As a result, the city centre, homes, factories, offices, and stores could spread and merge with the landscape.¹¹¹ This is what we now call urban sprawl—the horizontal growth of cities away from the urban core, which create multiple loci of commerce and amenity, farther apart.

The idea of intentionally de-centralizing the city originated in the 19th century.

Ebenezer Howard, wrote about town planning in his book *Garden Cities of Tomorrow*, published in 1898. Howard saw cities as unsanitary and an evil affront to nature. His prescription was the Garden City. This idea sought to re-populate the countryside, so the poor could live close to nature. The aim was to create self-sufficient small towns. Industrial; commercial and cultural centers were to be separated from schools, housing and green space. This was an alternative to the city, and a solution to its problems.

Howard’s ideas were widely adopted in the 1920s. His ideals resulted in the realization of several projects in England in the early 20th century, including Letchworth Garden

110 Critchley. *Lewis Mumford and the Search for the Harmonious City* 2004 p.110

111 *Ibid.*

City, north of London, and Welwyn Garden City. The result was decentralized cities, and dispersed populations into smaller separated cities and towns.¹¹³

Decentralization is a major component of sprawl, but there is not one universally accepted definition and measurement of urban sprawl. However, different interpretations of the term help to unveil its causes, and perceived impacts. Urban sprawl has been defined as the “unregulated growth expressed as careless new use of land and other resources as well as abandonment of older built areas”.¹¹⁴

The impacts of sprawl

As the oil industry continues to drive urban growth and increase the population in St. John's and the surrounding communities, the city and its residents are now facing many challenges and decisions about the development of the city. These design challenges are compounded by rising energy costs and concerns about the environmental impacts of urban sprawl.

The convergence of these trends has limited the housing options of many people with low and moderate incomes. Many are forced to pay a larger and larger share of their income for housing; to crowd into shared apartments, townhouses, or single-family

¹¹³ Jacobs 1961, 17

¹¹⁴ Hayden 2004, 7

homes; or to find housing in distant suburbs located far from their jobs. Some are forced to combine all three options: in other words, to pay a lot to live in a crowded house in the suburbs.

But that doesn't have to be the norm. Communities can support the development of housing for people and families of a variety of income levels. And they should, in fact, because doing so makes sense from an economic development perspective. The availability of decent housing that is close to work and affordable for the jobholders upon which the proper functioning of the local economy depends is essential to the community's economic health.

Many suburbs are homogeneous in socioeconomic level simply because the housing stock was developed in the same era and similarly priced at the time, but the reality is that the market for affordable housing is diverse and does not correspond with many people's outdated stereotypes about who lives in affordable housing. People in all stages of the life cycle need such housing. The adult children of community residents who are just starting out in their careers need affordable housing options. The parents of residents, who may be on a fixed income, might need low-maintenance, affordable housing. People with disabilities, including war veterans who suffered injuries that have affected their ability to work, need and deserve safe and affordable housing. Having a variety of housing opportunities makes a community dynamic, lively, and, most importantly, sustainable. A mix of housing opportunities that accommodates a

demographically diverse population helps to create a sustainable community, a community with income and age diversity.

Urban sprawl creates homogenous communities and is correlated with adverse effects on mental health and with reduced physical activity.¹¹⁹ Studies have also shown that long commutes deprive a person of time for recreation, participation in voluntary associations, civic engagements, and self-care.¹²² The average Newfoundlander spends 443 hours per year driving a car, and commuters spend three to four times more hours driving than individuals living in dense areas.¹²³ Children in particular are highly prone to the effects of sprawl. It has also been suggested that movement to the suburbs is characterized by social fragmentation, isolation and loss of a rich social life.¹²⁴

Aerial perspective of the residential area of the city of Paradise, a suburban town.

¹¹⁹ Fincher and Iveson. *Planning and Diversity in the City: Redistribution, Recognition and Encounter*. Houndmills. 2008. P.39

¹²² Fincher and Iveson. *Planning and Diversity in the City: Redistribution, Recognition and Encounter*. Houndmills. 2008. P.47

¹²³ Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13 2007

¹²⁴ Gleeson and Sipe *Creating Child Friendly Cities: Reinstating kids in the City*. 2006, 72

Collages showing the conditions of isolation and social erosion

The shift from a dense harbour town to a sprawling suburban metropolitan area has undermined the sense of place in St John's. The density offered by row houses facilitated a form of human interaction that sprawl cannot replicate. These interactions contributed to St. John's unique sense of place. The change in buildings changed that sense of community.

Though change is a constant in any society, it is the rate at which a society is forced to absorb the new that determines whether it can retain its integrity.¹²⁷ As we all come from and reside in a place, to some extent everyone is able to recognize when a place has become unrecognizable as itself. This can occur when the continuity in time of the distinct material components of place identity – shape, texture, material, color, and detail – is overtaken or overwhelmed by broad societal change. Globalization is by

127 Carver, 1981, p.27

nature a homogenizing force in economics, politics, culture, and consequently in architecture, and has presented a challenge to the perceivable and definable uniqueness of place.

Despite globalization's many obvious and significant benefits, it also threatens to replace local distinctiveness with global sameness. That being said, many sociologists, scholars, and historians have observed that globalization, rather than homogenizing society, has been an agent of fragmentation.¹²⁸ It would appear that the processes of globalization and localization are "inextricably bound together": the doubts and anxieties that the inherent complexities of globalization engender precipitate "the desire to remain in a bounded locality or return to some notion of 'home'". The connection between globalization and localization stems in part from the increased collective awareness of place identity and bonds to place that occurs when "sense of place is threatened". This threat has psychological impacts.

¹²⁸ Proshansky. *The city and self-identity*. 1978. 147–169

Collages comparing St. John's and the suburban communities' sense of place

There is some comfort in the original row house design. When the psychological stress of an uncertain future becomes unbearable, one may seek out familiar images of a known past that gives a sense of stability, security and clear choices. Change that does not come naturally can be frightening, even if it is longed for, so there can be hesitancy for innovation and a desire to keep the existing environmental and customs as they are. Since signs of age and human use are always capable of reaching an emotional nerve, we can be motivated by the properties of the old buildings and the uses and actions that they once sheltered.¹³¹ In this context, if the present environment gives stress to the inhabitants, people prefer the charm and vitality of traditional forms. The unity of form and materials and harmony with the landscape, in traditional settings also generate an emotional response to newcomers.

131 Rossi. *The Architecture of the City*. 1982. P.68

Demographics

Social change is altering the concept of the family. The traditional family is no longer habitual. Singles, single-parent families, combined generations—all are searching for living arrangements that are no longer the alternative, but are becoming the norm.

Yet, change in the way we plan, design and build human shelter, or housing, has been slow coming. While household numbers have been declining, we have seen only small changes in the last decade or two in the sizes of homes. Meanwhile, people have seen their lifestyles transform and are seeking alternatives to housing types, tenure and size. The demand for smaller forms of housing, or alternative housing design, isn't driven just by the desire for more affordable housing, although that is one objective that can be achieved with housing forms we have yet to embrace. Some want to live in a different, smaller kind of house because they have different lifestyle priorities that have been shaped by the societal change. Many people have come to understand the simple reality that our houses have become too large over the last few decades. In the case at hand, despite the rise in suburban and exurban developments outside St John's over the past 10 years, other people are fleeing suburban areas and returning to inner-city neighborhoods.

*Forecasted Population Growth*¹³⁵

Increasing environmental awareness, financial pressures and demographic changes are shifting housing preferences. Large detached houses in car-centric communities that once typified the Canadian dream are losing followers to households seeking smaller homes in 'location-efficient' neighborhoods. These new consumers are looking for neighborhoods that are walkable and well served by transit. They are seeking communities where amenities like stores, shops, parks, community centers and office space are accessible by buses and trains or human-powered travel (e.g. walking, cycling and running).

Renters and owners are also looking for affordable housing in an increasingly expensive housing market and they are willing to sacrifice square footage to access communities that are more desirable. Additionally, households are getting smaller and traditional housing forms are not meeting the needs of empty nesters, one-parent families, singles

135 Statistic Canada

and multi-generational families. Municipalities and developers have begun to respond to these changes and are slowly introducing small housing options that reflect consumer preferences, as well as environmental and financial pressures. British Columbia has been a leader in many of these initiatives, championing laneway housing, lock-off suites and micro-suites, to name a few. However, market penetration of small housing forms is still relatively small, even as consumer demand grows.

Statistics Canada forecasts that the number of households will increase at a greater rate than the population. That is especially so in the commuter towns. The number of households in the St. John's CMA (census metropolitan area) has risen steadily over the past 27 years. This can be partially attributed to the fact that the portion of the population-heading households (known as the headship rate) tends to rise with an aging population. Thus, the growth in the population aged 45 to 64 from 1986 to 2013 contributed to an increase in the number of households, while the decline in younger population, which has very low household headship rates, exerted a small drag on household formation. From 1986 to 2013, the number of households in the St. John's CMA increased from 47,905 to approximately 83,200 (or 73.6 per cent), even as the overall population in the region only increased from 164,806 to 202,533 (or 26.4 per cent).¹³⁶

136 Statistic Canada

As construction outpaces population growth, there is a natural decline in average household size. This decline in households size occurs as the incidence of one-person and two-person households increases in the community. As the baby boomers continue to age and their children mature and leave home, two-person households become more common. In addition, the death of a spouse in an older household will result in more one-person households as the population ages.

Population projection by age for St. John's (%)¹³⁷

In St. John's, the current tendency is that the portion of the population aged 65 and over grows, while the 20-64 age group declines. As the population ages, the distribution of population gains will change. Between 1986 and 2011, the largest population gains were in the 45 to 54 and 55 to 64 year age groups, while those under 25 showed the sharpest decline.

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Diagram showing comparing St. John's demographics to its commuter towns ²

² Statistics Canada

Chapter 3: Case Studies

Lessons from the past are useful guides to plan and implement plans. To that end, I have chosen topical precedents and will later adapt to this project the principles emanating from those precedents. In this section I review four case studies that inform theoretical and practical aspects of my project. I trace the evolution of the plug-in concept, from Le Corbusier's Unité d'Habitation to Moshe Safdie's Habitat 67, and contrast the former's rigid, brutalist elements with the latter's spontaneity. These two case studies lay the foundation for a harbour town development that grows and adapts with the needs of its inhabitants.

Turning to more local examples, I adopt the model of prefabricated construction that fits its environment from Todd Saunders' Fogo Island and draw on the imaginative elements of that island project. Along with Philip Pratt's The Rooms in St John's, Fogo Island respects its site's environment and history by relying on local construction expertise.

These four case studies offer several lessons that I have attempted to integrate into my proposal. First, my proposal allows residents to adapt and modify their units over time, which echoes the flexibility familiar to St John's architectural history. Because I create a housing typology that combines local architectural tradition with a view toward increasing density and diversity, I rely on case studies that not only densify, but also do

so in a way that contributes to community building, safety, and civic pride. Diversity means many things; one of which is age, another is physical ability. My designs encourage older people and people with mobility issues to continue living independently, for everyone's benefit.

Unité d' Habitation, Le Corbusier

The Unité d'Habitation was the first case study that I turned myself to when wanting to find new forms of housing that would re-create, in a high-density environment, the relationships and the amenities of the house and the village.

After World War II, the need for housing was at an unprecedented high. The Unité d'Habitation in Southern France was the first large scale project for the famed architect, Le Corbusier (1887-1965). In 1947, when Europe was still feeling the effects of the Second World War, Le Corbusier was commissioned to design a multi-family residential housing project for the people of Marseille that had to be relocated after the bombings on France.¹⁴⁰ Le Corbusier's famous "city in the sky" implemented the modular proportional system, and produced a new idea of family living to complete his vision of the modern city. This project was a response to the typical Garden City pattern of development and sought to densify patterns of dwelling through the vertical

¹⁴⁰ Frampton, 2001. p. 156

arrangement of its units.¹⁴¹ *The "plug-in" concept offered a simple solution: put up a frame and plug things into it.*¹⁴² It was the obvious solution to mass production, because the plug-in units are all identical. It is the simplest solution, conceptually, because structure is separated from the shell of the house. It is therefore possible to consider the optimum structure separately and to develop geometry for it.

Completed in 1952, the Unité d'Habitation was the first of a new housing project series for Le Corbusier that focused on communal living for all its inhabitants. The form of communal living enabled inhabitants to shop, play, live, and come together in a "vertical garden city". Le Corbusier was a major proponent of the habitable roof. He described utilizing the rooftop as "re-conquering" the ground level, while gaining a new space on the crown of the building, a place that is green for "relaxation and for contact with nature".¹⁴³ Here, the roof garden turns the exhaust chimneys into sculptures and incorporates a kindergarten, a shallow pool, an outdoor theatre and a playground for the community's children.¹⁴⁴ With nearly 1,600 residents divided among eighteen floors, the design requires an innovative approach toward spatial organization to accommodate the living spaces, as well as the public, communal spaces.¹⁴⁵

141 Mitchell RE

142 Safdie, *Beyond Habitat*. 1970. p.78

143 Andres 2005, p.121.

144 Jenkins, David. *Unité d'habitation, Marseilles: Le Corbusier*. 1993. P.45

145 *Ibid*.

The Unité d'Habitation is an 18-storey block with 337 apartments of 23 different types. The standard apartments, (two-storey units) are L-shaped in section and interlocked in pairs around a central access corridor. They were designed for families with two children. The bedroom sizes are kept to a minimum in order to maximize the space available for communal areas such as the kitchen, living and dining spaces. Although the apartments are only 98sqm, they extend through the full depth of the building and have windows and balconies to both elevations, which allows natural sunlight and cross ventilation. Variations of unit type includes the addition of side units for the provision of extra sleeping accommodation for larger families, single aspect two person apartments, as well as studios.¹⁴⁷

Unlike Corbusier's usual employment of a starry, white façade, Unité d'Habitation is constructed from reinforced beton-brut concrete (rough cast concrete), which was the least costly in post-war Europe. However, it could also be interpreted as materialistic implementation aimed at characterizing the conditional state of life after the war—rough, worn, unforgiving. The use of reinforced beton-brut prevented the need for a steel frame, making it the most cost-efficient solution. Even though the Unité d'Habitation does not take on the same materialistic qualities as most of Corbusier's works, there is still a sense of mechanistic influence, in addition to the Five Points

¹⁴⁷ Jenkins, David. *Unité d'Habitation, Marseilles: Le Corbusier*. 1993. P.53

developed by Corbusier in the 1920s. For example, the building's large volume is supported on massive pilotis that allow for circulation, gardens, and gathering spaces below the building; the roof garden/terrace creates the largest communal space within the entire building, and the incorporated patio into the façade system minimizes the perception of the building's height, so as to create an abstract ribbon window that emphasizes the horizontality of such a large building.

The Unité proposed a new way for families to live together, yet sufficiently apart to ensure privacy. They illustrate how proximity could be an asset to family life. The Unité is a brilliant example on how a successful high-rise housing typology could accommodate various types of households.

Ventilation scheme in standard houses for workers. Le Corbusier.¹⁵⁰

Habitat 67, Moshe Safdie

Habitat 67 evolved from the plug-in concept developed by Le Corbusier, and aimed to propose new architectural forms of housing in a context of high density. Moshe Safdie's main intention for this building was to be an experimental solution for high-quality housing in an urban environment. Comprising a three-dimensional landscape of 354 stacked concrete "boxes" (920x40x10), Habitat 67 pioneered the combination of two major housing typologies – the urban garden residence and the modular high-rise apartment building. Safdie, who himself believes the project is "a reaction against brutalism", described his design as an attempt at a city within a city—a way of upsizing from a micro to a mega scale. The public recognized in Habitat the possibility that high-rise living could be more like living in a village and have the quality of life of a house

¹⁵⁰ Jenkins, David. *Unit d'habitation*, Marseilles: Le Corbusier. 1993. P.45

than what they associated with the negatives of apartment housing¹⁵³. Habitat constitutes an urban vision of building economically but humanely, expressing individuality, but committed to solving enduring communal needs, which is also a characteristic specific to St. John's.

3D diagrams showing the terraces and circulation strategy

The original master plan for Habitat involved over 1,000 residences, alongside shops and a school. This was scaled down to just 158 homes, forming a 12-storey complex located beside the Saint Lawrence River near the centre of the city. By utilizing a variety of geometric arrangements, making use of both setbacks and voids, Safdie aimed to create a series of properties with their own identities. Each one featured its own roof garden and could be accessed from an external "street" – one of brutalism's key ideals.

Three elevator cores direct vertical circulation throughout the complex, with elevators stopping at every fourth floor to serve pedestrian streets. Every part of the building, including the units, the pedestrian streets, and the elevator cores, participate as load-bearing members. To allow the prefabricated construction process to take place on site, a factory was built beside the site to produce the concrete modules, which were to

¹⁵³ Safie, *Beyond Habitat*, 1970 p.73

be connected by high-tension rods, steel cables and welding. Unlike Le Corbusier's elemental, powerful Brutalist monuments, Safdie's Habitat suggests a spontaneous orchestration: *"Economics and luck dictated its singularity, but Safdie's subsequent designs for desert, tropical, and compact urban Habitats around the world suggest its aspiration to multiply, adapt, and mutate, rather than stand rooted."*¹⁵⁸ Moshe Safdie's intention was to design a city that would be of a fairly low density to begin with, and as it grew in size and land value rose, would be able to accommodate higher densities without destroying the initial low density development. He developed a plan form in which increased density evolves naturally without the destruction of what has been built in the earlier stage. This project demonstrates that a single primitive shape can be strategically accumulated and organized to create a dynamic set of unique private spaces while simultaneously allowing for circulation and social public spaces.

The Rooms, St. John's NL

I examined the Rooms project for its application of place identity in St. John's. It is an example of critical regionalism that establishes a connection to the city in which it has been built through architectural references. The Rooms is a cultural facility housing an art gallery, the provincial archives, and the provincial museum for Newfoundland and Labrador. The building's name and its architecture reference the simple gable-roofed

¹⁵⁸ Safdie, *Beyond Habitat*. 1970. P.43

sheds, or 'fishing rooms', which were used historically by Newfoundlanders in outports communities to process their catch. Fishing rooms were a common sight in these outport communities prior to the steep decline in fishing that followed the 1992 moratorium on catching northern cod. Many former residents of outports now reside in St John's, and The Rooms, visible from almost any point in the city, is designed as a larger-than-life reminder of their former way of living. The biggest critic for the project was that St. John's place identity has been literally defined, and because of the scale of the project, it does not appear to be a natural expression of its context.

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Philip Pratt explained The Rooms' design "is very much an abstraction of Newfoundland vernacular forms, abstracted in scale and material." At the center of the debate is the question of the proper balance to strike between continuity and difference when

159 Photo of the Rooms, view from Signal Hill, Philip Pratt

adding new work to old. Should new elements be obviously distinct from the pre-existing construction or attempt to harmonize with them and so conceal their newness? What consequences come from either an excessive distinction or an excessive imitation?

Fogo Island

Fogo Island, a small, secluded island off the coast of Newfoundland, is an elemental place of subtle and abiding beauty, a place where time is not obliterated by mass circulation. On Fogo Island, the Shorefast Foundation works with the people of Fogo Island to find ways to preserve this unique place and this special culture. One of the projects that the foundation took on was the creation of a series of studios that are used by artists around the world during artists' residencies.

The architect Todd Saunders was chosen and commissioned to create bold geometric structures to starkly contrast, yet lay silently in the striking natural environment. The main concept behind the layout of the artist studios was to observe the surrounding environment during its transition through the various seasons in which the studios were to be in use: spring, summer and fall. The wood-framed studios are all placed on pillars oriented towards the sea and elevated above the ground to provide the artist in residence with a feeling of being unobstructed and unbound. It achieves a beauty found in proportion, modesty, honesty of materials and the sustainable balance between community and nature.

While the entrance area has a small concrete foundation, the studios can be placed in almost any place on the island. In addition, this allows the studios to be pre-fabricated in a local workshop during the winter months, and then placed in the landscape in the spring. The studios can be described as "strangely familiar, because they are in fact built with very familiar methods.

I find inspiring the way that the studios can respect the environment (location and culture) in which they are built, and how they dignify the landscape that surrounds them that is so fragile yet so fearsome. It seems like the structures are imaginative while at the same maintaining a connection between the past and the future.¹⁶⁴ I also think that Saunders was very clever in the way that he was able to balance traditional craftsmanship and local construction knowledge with contemporary technologies such as prefabricated components and panels, that allow to build structures that are easier and quicker to assemble.

163 From left to right, the Long Studio, the Squash studio and the Bridge studio. Photo: Todd Saunders

164 Cobb, Zita. Interview by Paul Kennedy. Ideas. CBC, Toronto: April 5th. 2013. Radio.

Chapter 5: Design

The goal of the thesis is to design a new type of dwelling suited for twenty-first century living for a variety of households that would incorporate responsive design on sociological, economical, and environmental levels, setting a positive example for living collectively. I am proposing a housing concept that can be developed and modified over time. Having a variety of housing opportunities makes a community dynamic, lively, and, most importantly, sustainable. A mix of housing opportunities that accommodates a demographically diverse population helps to create a sustainable community, a community with income and age diversity.

Density

The starting point of my proposal was increased density, to respond to the current and growing urban sprawl problems, including socio-spatial divisions and degradation of surroundings on the edge of urban centers. In his paper “Let’s Cram More into the City” from *Cities for the New Millennium*, Richard Rogers argues for population density relying on the inherent attractiveness of the city.¹⁶⁸ He advocates for cities that offer strong public space, higher density and the creation of ecologically strong and socially

¹⁶⁸ Rogers. *Let’s cram more into the city*. 2001 p. 9-13

inclusive urban fabrics.¹⁶⁹ Rogers states: “*we are devouring our countryside at an alarming rate*”. He adds that high-density environments provide the critical mass to make public service work more effectively. Density brings a sense of cohesion and community that contributes to safety and civic pride. Rogers believes that density will “*help generate the mix of uses, the sense of security and the quality of public spaces that make urban living attractive, with shops lining the streets and homes overlooking landscaped spaces, parks and playgrounds*”.¹⁷⁰

In *The Death and Life of Great American Cities*, Jane Jacobs points out the need for mixed-use development within North American cities. The importance of time spent on city sidewalks, meaning people appearing at different times of the day throughout a day, is thought to be a necessary condition because it fuels commercial activity.¹⁷¹

Streets or districts, which have good primary mixtures and sufficient concentrations of dwellings, are successful at generating diversity.¹⁷² Dense concentrations of people are necessary for flourishing city diversity. Medium and high density cities promote a sense of social equity by providing opportunities for the economically underprivileged. In societal terms, compact cities and mixed uses are connected with diversity, social unity and cultural growth. There are indications that more concentrated neighborhoods have a greater sense of kinship, cooperative spirit and vivacity; that is fundamentally

¹⁶⁹ *Ibid.*

¹⁷⁰ Rogers. *Let's cram more into the city*. 2001 p. 9-13

¹⁷¹ Jacobs. 1961. p.152

¹⁷² Jacobs. 1961.p.176

because a wide range of people with a different set of beliefs and values are in closer contact with one other.¹⁷³ The manner in which high density is perceived and how it affects urban dwellers is one of the main issues that we face. The experience of living in high density environments is much more complex than living in lower density environments.

Due to the urban way of life in which large populations of people live in built areas, much of their behavior is thought to be influenced and guided by the architectural character of spaces and the qualities of the physical environment.¹⁷⁴ The built physical environment manifests a direct influence on our behavior, on the social systems that govern our social group interactions and on our individual experience and behavior.¹⁷⁵

People are in permanent contact, and they constantly exchange with their environment. In *Architecture and Social Behavior*, Andrew Baum and Stuart Valins explain that "*our behavior can be conceptualized as a dynamic sequence of adjustments and readjustments to our physical and social environment*".¹⁷⁶

Architecture influences our experiences and behaviors. Inappropriate distance to certain objects, physical or social conditions of the built environment, spatial or functional distances between social groups can influence individuals, and their social

¹⁷³ Rogers. *Let's cram more into the city*. 2001 p. 9-13

¹⁷⁴ *Ibid.*

¹⁷⁵ Andrew Baum and Stuart Valins

¹⁷⁶ Andrew Baum and Stuart Valins

behaviour. Studies have shown that the variables of a configuration (like crowding) influence the psychological and sociological processes, suggesting that some properties of the built environment affect social contact and its regulation, thus playing a key role in defining living conditions.¹⁷⁷

The psychologist Jonathan Freedman conducted a lab research on people based on performing different tasks under different density and crowding conditions. He demonstrates that it is not density that determines the degenerative behavior of populations, but crowding. Crowding in his opinion supports excessive social interaction and a lack of control over unwanted social contacts.¹⁷⁹ Freedman makes an important distinction between crowding in physical terms, as defined by lack of space and the perceived crowding, defined as the "sensation of being crowded", a feeling distinct from that of having very little space. He elaborates the theory of density-intensity, which supports the idea that crowding increases the importance of other people to the situation, as "[...] crowding by itself has neither good effects nor bad effects on people but rather serves to intensify the individual's typical reactions to the situation"¹⁸⁰. His findings support the fact that density does not generally have negative effects on humans, but it intensifies the typical reactions towards other people

¹⁷⁷ Freedman

¹⁷⁹ Mitchell Some *Social Implications of High Density Housing*. 1971. P.34

¹⁸⁰ *Ibid.*

involved in crowding situation.¹⁸¹ Density itself is not unpleasant, but its perception depends on the situation, by the fact that the situation might be pleasant or unpleasant for the person experiencing it.

Diversity

Mixed income housing is one of two primary mechanisms to eliminate neighbourhoods of concentrated poverty, combat residential segregation, and avoid the building of public housing that offers 100% of its housing units to those living in poverty.

The ability to attract higher income households is contingent on such issues as the location, size, design, and condition of the development; the racial and ethnic composition of the development and the surrounding neighborhood; and the state of the regional housing market. The combination of physical characteristics and market conditions shapes the feasibility of any mixed-income housing development. Middle and moderate-income households obviously have many more housing options than the poor. When subsidized housing becomes available, it is usually much easier to rent units to low-income households than to eligible households with higher incomes¹⁸³. Unless the regional housing market is extremely tight and there is a severe scarcity of affordable units, middle-income households can easily opt not to reside in mixed-income housing. Moreover, they will decline to do so unless the development is

181 Mitchell *Some Social Implications of High Density Housing*. 1971. P.34

183 Davis. *The Architecture of Affordable Housing*. 1995. P.23.

appealing in some way—perhaps more appealing than conventional middle-income housing. Therefore, the size, design, condition, location, and cost of the housing (and perhaps the demographic characteristics of its occupants) are extremely important in attracting higher income households.

Determining Where to Build: Site

As with all real estate, the location of mixed-income housing is a critical determinant of market appeal. Other things being equal, mixed-income housing in desirable neighborhoods will be more attractive to moderate and middle-income households than with poorly located developments. Housing located in areas with abandoned buildings, street crime, limited transportation access, and poor services is less attractive to higher income residents than developments situated in desirable neighborhoods.¹⁸⁵ In the past, mixed-income housing projects typically have been relegated to the most disadvantaged neighborhoods of the municipality.¹⁸⁸ Isolating affordable housing in distressed neighborhoods with less privileged schools and substandard social services severely limits opportunities for upward mobility among residents and breeds a culture

185 Davis. *The Architecture of Affordable Housing*. 1995. P.25.

188 *Ibid.*

of endemic poverty, hopelessness, and despair.¹⁸⁹ It is therefore reasonable to conclude that the mixed-income housing production should be an important component of infill and revitalization strategies.

Concretely applying those principles to my thesis, it should be noted that the shores of the St. John's harbor hold a great potential to become the foundation of a layer that could accommodate new or returning urban dwellers and bring diversity by offering a variety of housing typologies for the variety of households. The site/area of Shea Heights has never been developed because of the previously commercial and industrial use and the potential contaminants that have not been remediated. Most of the industries along the shore are no longer in operation; industrial areas are left with empty buildings. Shea Heights is still strongly linked to the existing urban fabric. Developing the mirroring side of the harbour would maximize the transit options : roads, and utilities are already in place. It would be possible to build on existing but underused development rather than starting fresh on green land; that would present an opportunity to reduce the environmental impact on communities. This course of action would also help to reclaim the harbour as a crucial component of the local identity.

¹⁸⁹ *Ibid.*

Conceptual site diagrams

Christopher Alexander discusses this idea in his seminal “Pattern Language” with pattern number 104 Site Repair. *“Buildings must always be built on those parts of the land which are in the worst condition, not the best¹⁹².”* He discusses how difficult it can be for owners and planners to resist building on “the best piece of land” with the loveliest view, best soil, most even slope etc.

Site model showing how the proposed project sits on the site

Determining What to Build: Program

The housing program is informed by the physical and programmatic qualities of the row houses and downtown neighbourhoods, which are re-interpreted in a denser form. The

¹⁹² Alexander, *A Pattern Language: Towns, Buildings, Construction*. 1977. P.35.

historical precedents of the Unité d'Habitation and of Habitat 67 also inform the program. These elements of the program are derived from deconstructing the single family home and amenities of a residential neighbourhood. The program reinterprets the traditionally private amenities in order to densify the site and begin the process of redirecting suburban sprawl.

Conceptual model exploring the possibilities of increase and decrease

Definition of mixed-income housing

Mixed-income housing and neighborhoods have been put forth as a strategy for addressing the problems associated with poverty since at least the early 1960s.¹⁹³ The sociologists Brophy and Smith defined mixed income as the “deliberate effort to construct and/or own a multifamily development that has the mixing of income groups as a fundamental part of its financial and operational plans.”¹⁹⁴ Other definitions encompass both developments and neighborhoods. The Mixed-Income Research Design Group uses the phrase to mean “all intentional efforts to generate socioeconomic diversity in a targeted geographic area”.¹⁹⁵ Galster, Booza, and Cutsinger referred to the broad range of communities that are characterized by a diversity of household incomes as “income-diverse areas”. Using two terms distinguishes low-poverty neighborhoods into which low-income families move—whether via a mobility program or independently, that are not the target of mixed-income efforts per se—from developments designed as mixed-income housing.

193 Davis. *The Architecture of Affordable Housing*. 1995. P.23.

194 *Ibid.*

195 Briggs et al., 2009. p.10

What counts as mixed income varies considerably. Depending on the development, relatively higher income households have been defined as those earning anywhere from 51 to 200 percent of the Area Median Income.¹⁹⁶ Developments might have only two income tiers or three or more income tiers and might include both rental and homeownership tenures. The percentage of units targeted to low-income families also ranges from a small percentage of all units to more than one-half.¹⁹⁷ Developments also vary in the extent to which they design the exterior and interior of subsidized and market-rate units to be indistinguishable from one another and in the degree of spatial integration of subsidized and unsubsidized units.¹⁹⁸ Some developments mix income groups on the same floor of a multifamily building, whereas others segregate income tiers by floor or building. Further, some developments vary the quality of units based on income, whereas others simply subsidize market-rate-quality units for low-income families.¹⁹⁹

Model exploring the spatial relationship between floors

Benefits of Mixed-Income Living

The hypothesized benefits associated with a place-oriented goal for mixed-income developments, or at least their lower income residents, include better quality housing, improved services, increased neighborhood amenities, and a safer environment relative to what is available in most homogeneously poor areas. Poverty alleviation is expected to benefit lower income households most directly as their economic circumstances improve through neighboring with higher income households and living in less segregated areas. The benefits associated with this people-oriented goal (behavior modeling) have included access to more instrumentally valuable networks and to behavior and lifestyle alternatives as modeled by higher income neighbors. The benefits associated with a place-oriented goal for areas in and around mixed-income developments have included increased safety; the development of more or improved amenities, such as stores, parks, and playgrounds; and, possibly, improvements to transit access and schools (buildings and instructional quality). Revitalization might also increase a jurisdiction's tax revenues from increased property values and new businesses.

196 Galster, Booza & Cutsinger. *Income diversity within neighborhoods and very low-income families*. 2008. 257-300

197 Brophy 1997 p.25

198 Schubert and Thresher. 2009. p.67

199 Schwartz and Tajbakhsh, 1997. p.34

Determining How to Build: Strategy

The key to sustainable future high-density architectures lies in generating (a) built environment(s) capable of adapting to change(s). I am of the view that the best way to obtain a better result is to follow a system within a system, a city within a city, a large-scale object constructed of many small sub-units. The systemization of the whole is what generates spatial quality as well as quality of use, enabling the adaptation to context. A possible future scenario includes large-scale spatial organizations made up of multiple parts that can interact in complex ways and generate simultaneous responses to the challenges of context. Their adaptation can be achieved either by changing the inhabitants and the use, either by physical regeneration done by removing or grafting new subunits according to needs.

Site model showing the relationship between St. John's and Shea Height

Proposal

Site design

Having laid the groundwork to this proposal, I now turn to the Shea Heights neighborhood in St. John's, applying the principles learned and discussed previously. Shea Heights has the potential to become a *destination*. It's location on the mirroring side of the harbour can be a driving factor to the development of a residential community, but also to a new hub of activities that will contribute to a more dynamic mixed-uses area that will attract residents and tourists. Commuting to and from work, either by car, by public transports (ferry or buses) or by active transportation could be short and enjoyable for the Shea Heights dwellers as for the visitors.

A limited number of parking places will be accommodated close to the units. A close-by retrofitted warehouse will be used as the main parking garage for the residents of the housing project. A boardwalk links the housing community to the ferry terminal, parking garage; it will also serve as a ferry terminal for the residents who wish to commute to the city using a municipal shuttle. Some restaurants, shops and a plaza will contribute to make Shea Heights a new destination and a dynamic community.

Site plan showing transit options

Using the traditional stilts heritage, the project is composed of an exoskeleton where different types of living and working units could be plugged-in, recreating spatial qualities of the vernacular downtown area of the city. Each unit is designed with a specific program in mind – from small ones for single families to large ones for recreational areas such as parks and sports facilities, taking its inspiration from the Unité d’Habitation. Terraces are used for agriculture and rainwater collection. The vernacular spatial and formal qualities of the city will be recreated in a flexible manner so the current needs and cultural traditions of the dwellers can still be met. I am proposing a housing concept that can be developed and modified over time.

North Elevation of Proposed project

The structure is made of local wood like the traditional houses in St. John's. The structure itself derives from the traditional wooden stilts used by fishermen to build stages and housing along the rocky shores and the post and beam row houses' structural characteristics. The finishes of the housing are made of local wooden clapboard. The possibility of increasing and decreasing the size of the units comes from a long tradition of building flexibility with which Newfoundlanders are familiar. The tubes are used as a structure; some of them serve as vertical circulations systems; they

can provide the housing project with bio-gas, water and electricity from underground holes. Talk about the local tradition of sheltering from the elements that is pursued here when harvesting the rain and wind.

Wind Harvesting

The ending of the tubes have wind turbines that can generate electricity from winds and provide it to all units of the housing project. The concept consists of carbon fiber reinforced resin poles located within some of the glulam columns, that stand 25 meters high and are anchored to the ground in concrete. The stilts, which measure 45cm in diameter are packed with a stack of piezoelectric ceramic discs. Between the discs are electrodes that are connected by cables that run the length of each wind turbines. So, instead of relying on the wind to turn a turbine to generate electricity, when the wind turbines sway in the wind, the stack of piezoelectric discs are compressed, generating a current through the electrodes. Because the electricity generation capabilities of the turbines would depend on the wind, the collected energy would have to be stored into chambers at the foundation of the poles so electricity could be used on days during which there is not as much wind.

wind direction distribution (% per year)²⁰⁶

Site plan showing location of stilts, water collectors and wind turbines

Model of the wind turbine system

Cyanotype of a study model of the location of the stilts

²⁰⁶ Stats Can

Average Precipitations in the St. John's Area per year²⁰
Below: west elevation showing the location of stilts

Diagrammatic section showing the proposed building system

A fabric of courtyard

The housing units are laid out in a way to replicate the conditions of the vernacular fabric. The most important characteristics that were considered were the varying setbacks from the facades and the street, and the courtyards within housing blocks that were used as community spaces.

Diagram showing increasing and decreasing possibilities

Diagram showing how a bike path was creating using the existing topographical qualities

Units

The units are that are initially proposed are all declinations from the traditional row houses. Composed of various numbers of cubes, the units square footage ranges from 18m² to 100m². Fifteen main types were developed using 3m x 3m cubes, assuming that the creation of new housing typologies would allow for an increased market and would have an impact the currently high cost of housing within the downtown area.

Diagram showing all unit types and possibilities of increase and decrease

Diagram showing the possibilities of increase and decrease for the smallest unit

Diagrams showing the method of assembly
Below :typical detail of assembly

Assembly

This proposal is using laminated solid wood panel walls and glulam columns wood-on-wood connections- capitalizing on wood's vertical dimensional stability. Interlocking Cross Laminated Timber (ICLT) is a prefabricated cross-laminated solid wood wall and roof panel. Similar to Cross-Laminated Timber (CLT) developed in Europe, ICLT is fabricated from 2-7 layers of alternating direction 3" x 6" to 3" x 8" wood stock milled from waste wood. Unlike other solid wood panel systems, however, ICLT utilizes no fasteners and no adhesives, removing the reliance on volatile organic compound (toxic) adhesives, allowing the panel to be disassembled at end of life to be repurposed in the building material supply chain.

The exposed wood on the interior provides a thermal mass and humidity regulation factor. Utilizing no fasteners or glues also reduces overall capital cost for either stainless fastener purchase and install or press purchase and set up associated with glue lamination. Layering gives the panel strength, allowing low grade wood to be used in a high value structural condition, estimated to last upwards of 100 years.

Compared to the 30-50 year life of most light frame construction, ICLT provides a strong outer structure and enclosure that is durable, meeting the needs of a more sustainable building industry, economically and environmentally. ICLT panels range in size from 6" – 21" in thickness and up to 10' wide and 25' in length. ICLT structures can be built up to nine stories in some cases, efficient in speed of construction, and given the availability of material, potentially affordable for both

production home building and large commercial structures.

Below: short section

Layout

For the design of the housing units, I followed design guidelines that would aim for general accessibility and that would allow residents to age in place, since independent living leads to both a positive mental and improved health of the occupants, but also society at large. Ageing in place is a design concept that seeks to create barrier-free spaces that simplify daily tasks for those with reduced mobility and poor vision. Senior citizen-friendly homes allow occupants to live on their own for longer, thereby reducing the need for costly support from families and the government.²⁰⁹ It has been demonstrated that successful designs for ageing in place can allow senior citizens to remain autonomous, improve their self-esteem, sense of purpose, community contribution and health²¹⁰.

Site plan showing planned paths and local amenities

209 Salomon and Golant. 2008. p.56

²¹⁰ *Ibid.*

Typical floorplan showing possibilities of increase

One way to provide for a flexible layout is to design a structure that requires little or no internal load-bearing support.²¹¹ In this project, flexibility was achieved by designing narrow housing units with floor joists that span the entire space between the two exterior longitudinal walls or by using products such as I- or open web wooden joists, which allow greater spanning distances. I created large, open floor spaces that could permit maximum adaptability. When the structure would require structural supports, I located the columns/stilts adjacent to permanent functions, such as the bathroom and the kitchen, which are unlikely to be moved in a scenario of increase or decrease of a unit size. Within the housing units, I grouped the wet functions, however, since they are difficult and expensive to relocate.

Aerial perspective showing the roof as a community space

I designed wider doorframes to accommodate the future use of walkers and wheelchairs, which is less costly if done early on. Housing needs to adapt easily and cheaply as the occupants' requirements change. The placement of doors was made to allow further adaptability. Doors located near the corners of a room, for example, permit the space to be potentially divided in two because another door can easily be added elsewhere when needed. This arrangement also increases efficiency because it does not interrupt circulation. Large, well-placed windows are used in the housing units to enhance the quality of life for the occupants as they can reduce feelings of isolation by enabling street view of people and nature. Balconies allow occupants to get out in the fresh air and be in touch with others. Direct contact with nature, visual and physical proximity improves mental health.²¹² Design intended to accommodate several ageing stages, building initially for later adaptation.

Sketch of interior layout

212 Berman, Jonides, and Kaplan. 2008. p.12

Interior perspective of a typical unit

Exterior perspective showing the relationship between units and the surrounding environment

Community life

The opportunities for social interactions have been multiplied all through the housing project. On each floor, different spaces of various degrees of privacy were planned to let the unplanned happens. Some spaces have specific programs and some not. For instance, there are some program specific spaces (community garden, community rooms, day care centre, etc.), while some other spaces are open and can be interpreted and used the way the users want (boardwalk, plaza, and nooks).

Perspective of the community life on the building rooftop

Chapter 5: Conclusion

St. John's enjoys a compelling and unique sense of place thanks to its location at Canada's most eastern point and its layering of cultures and building traditions. However, the city's identity is rapidly being challenged by urban sprawl--visionless design that fails to reflect the city's history and the needs of people who live there.

The ideas exposed in this thesis constitute a basis for the planning of higher density housing in forms that could be shaped to suit the social habits and environmental conditions of St. John's, thus enhancing the development of lower income communities.

The suburban model - as it is currently known - is at risk of becoming obsolete. Vacant land within cities is becoming increasingly scarce, and with this scarcity comes a desire to increase density on currently occupied properties. The previously prominent phenomena of the "American Dream" has lost its appeal and has been replaced by the concept of complete and sustainable communities. Areas within and near urban centres are the most vulnerable to the changing environment. Consequently, the introduction of high density models within the urban fabric will become synonymous of an extension thereof, and the concept of the suburb will cease to exist within this context and will have to evolve to meet today's needs.

The new housing typologies and their implementation devised in this thesis have shown that an increase in density and diversification can be achieved through urban renewal while maintaining and enhancing the character of the existing city even in those places that bear a strong heritage tradition. This thesis demonstrates that it is possible for new housing developments to be built in harmony with the natural environment, in a language that is respectful of and responsive to the architectural fabric of St. John's.

There are a number of observations that I have made over the past year while working on this project. First and foremost, there is the importance of drawing upon your personal experiences and travels and to select the ones that resonate with you, while following your intuition. Personal experience and a keen sense of observation, as well as an open mind, are invaluable tools that devise solutions to urban issues. There is also great value in studying successful urban centres and the works of others before bringing together those qualities of space which allow to create a place for people.

This thesis found inspiration in the streets of St. John's, Halifax, Montreal, Ottawa, Toronto, Amsterdam, Lisbon, and largely in the works of others. I sought to build on these valuable existing ideas, adapting them to propose a concept that could allow St. John's to continue to be a prosperous inner centre, while

preserving the city's unique character and heritage. St. John's will thus continue to be a significant part of Canada's heritage.

Through the entire design process, I found motivation in realizing that the environment that we create has potential to enhance the lives of the inhabitants, and, as a result, improve the world we live in. As designers, we must strive to create spaces which inspire people to interact and explore. The spaces we design must act as facilitators by encouraging the free flow of ideas and information.

A big challenge would be to bring all the specialists from various fields to collaborate on a large-scale project, so the design intentions are reflected at the various scales of the projects i.e. in the creation of a lively housing community, the public spaces such as the courtyards and interior streets, but also in the making of the building structure and weather harvesting building system.

The value of bringing together multiple disciplines, or of working at the intersections of disciplines, is that each brings to the table a unique and distinct set of tools and approaches. Disciplines remain important because, as we realized long ago, training people as renaissance scientists - as individuals who know it all and can do it all - is not viable. Too much needs to be known and maintained within any area of science for an individual to achieve a high degree of skill in more than one (or perhaps two).

The challenge, I think, is in training solid disciplinary scientists so that they are capable of working with colleagues in other fields. When problems demand working across, between, and beyond disciplines, scientists should be ready, willing, and able. I know this adds to the training burden, but teaching ourselves how to play in a larger sandbox will be important to the future of our discipline.

Yet, we must always keep at the center of our attention the distinct disciplines. We need to recognize them, nurture them, support them, and celebrate them. Our future may indeed depend on getting along with others, but we will get nowhere if we lose the capacity for individuals to become expert in their chosen disciplines.

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