


# MID RISE WOOD

Opportunities for Atlantic Canadian Urban Centres



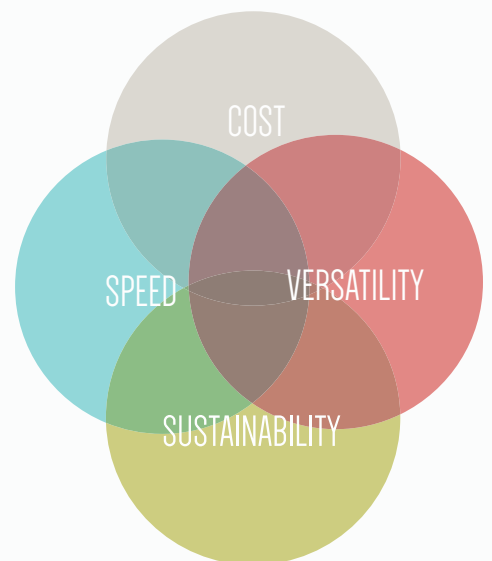
“ Today, already 75% of Canadians live in jurisdictions that allow 6 storey wood frame construction.”

## Introduction

Recent changes to the National Building Code (NBCC), and a trend towards more diversified housing options, have meant that many Canadian jurisdictions are acting quickly to capture the environmental, economic and social benefits of higher wood buildings. The NBCC now allows for the height restriction of light wood frame construction to be increased to 6 stories. Today, already 75% of Canadians live in jurisdictions that allow 6 storey wood frame construction.

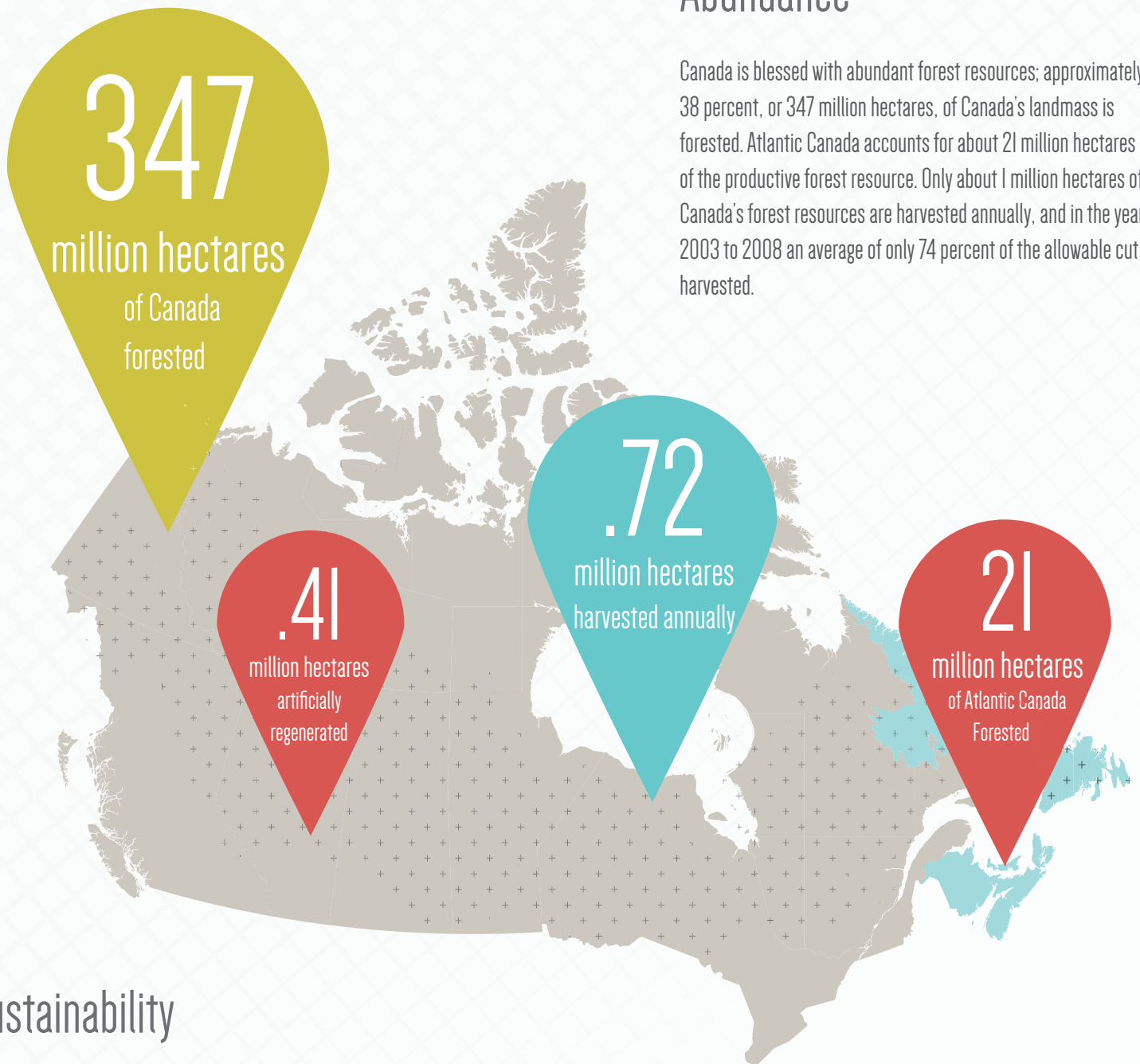
With the overall benefits of using wood as a building material well documented, Atlantic WoodWORKS! studied the opportunities for 6 storey wood construction in Atlantic Canadian Centres. The research included a comprehensive market study and projections for mid-rise demand in four major centres in Atlantic Canada, a review of recent and upcoming planning changes in major Atlantic Canadian cities and a full cost analysis, comparing wood construction to three other construction methods in use in the Atlantic market using a real-life, wood, mid-rise structure built by an experienced builder.

The full results of this study were consolidated into a comprehensive research report by UPLAND | Urban Planning and Design Inc. Please contact Atlantic WoodWORKS! for a complementary copy of this report.



## Abundance

Canada is blessed with abundant forest resources; approximately 38 percent, or 347 million hectares, of Canada's landmass is forested. Atlantic Canada accounts for about 21 million hectares of the productive forest resource. Only about 1 million hectares of Canada's forest resources are harvested annually, and in the years 2003 to 2008 an average of only 74 percent of the allowable cut was harvested.



## Sustainability

Wood from well managed sources is a sustainable building material. Wood is a renewable resource that captures carbon dioxide (CO<sub>2</sub>), a potent greenhouse gas, as it grows. The US Environmental Protection Agency (EPA) estimates that the production (harvesting, processing, and transportation) of one tonne of framing lumber requires only about 15 percent of the carbon emissions than the production of one tonne of recycled steel, and 12 percent of the carbon emissions than the production of one tonne of concrete. Green building certification systems, such as the Leadership in Energy and Environmental Design (LEED) program, often recognize the sustainability value of wood by allocating credits or points for using wood from managed sources.

## Urban Density

Municipal and provincial governments across Canada are increasingly aiming to reduce urban sprawl and to intensify the use of land in already built-up areas. As previously low-density areas are up-zoned to allow for mid-rise buildings, 4 to 6 storey wood construction can help cities meet their urban density targets and allow developers to build up these areas by leveraging the cost advantages of building with wood.



“These projections indicate a healthy demand for mid-rise buildings in Atlantic Canada over the next few years, particularly in Halifax, Charlottetown, and Fredericton.”

Fredericton

Charlottetown

Halifax

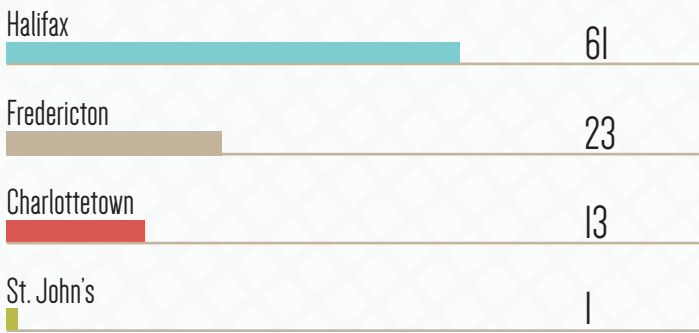
St. John's

## Mid-Rise Trends

Turner Drake & Partners prepared a comprehensive market study to determine the anticipated number of mid-rise mixed-use and residential buildings that will be constructed over the next five years in four major centres of Atlantic Canada. The projected future demand for mid-rise construction was calculated using past building permit trends, along with correlated economic projections for the Consumer Price Index, residential sales and rentals, population, and new housing prices. The past trends in building height and estimated future trends of the same highlight the potential demand for 4-6 storey wood frame construction. These projections were developed based on past trends, which only account for current zoning and building code rules; it is conceivable that changes to these rules will increase the proportion of permits issued for mid-rise construction in the future.

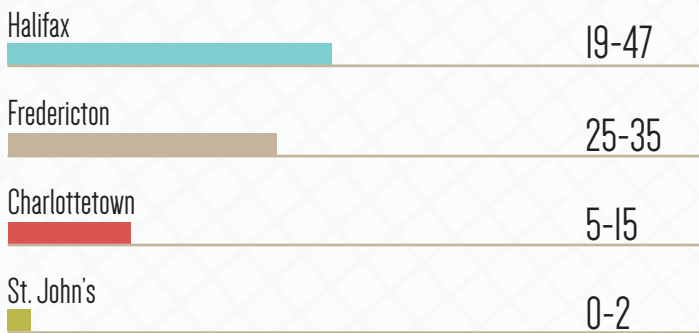
These projections indicate a healthy demand for mid-rise buildings in Atlantic Canada over the next few years, particularly in Halifax, Charlottetown, and Fredericton.

## Past Mid-Rise Building Permits 2011- 2015



## Projected Mid-Rise Building Permits 2016- 2020

(status quo - assuming current zoning and building code rules)



**“All told, approximately 90 hectares of land in Halifax’s core could gain new mid-rise development rights.”**

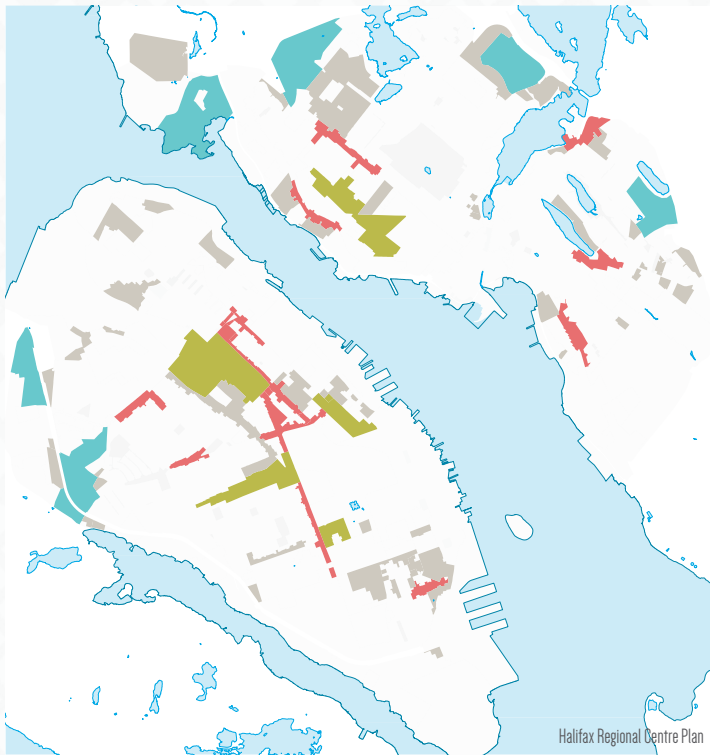
## Planning Changes

It is very important to note that the projected future demand for mid-rise construction presented above only indicates demand based on past conditions, and does not account for regulatory changes that might make mid-rise construction even more viable and desirable. Planning projects currently underway are likely to transition parts of these cities into areas tailored to mid-rise development. More importantly, changes to the National Building Code of Canada to enable mid-rise wood construction may improve the viability of mid-rise construction and increase the number of these buildings constructed.

What exact impact the changes to the National Building Code will have on mid-rise construction rates is difficult to quantify. However, the experiences in British Columbia and Ontario offer case studies on how building code changes can drive construction. In 2009, British Columbia increased the permitted height for wood frame construction to 18 metres, or six storeys. This spurred a wave of mid-rise construction; by early 2016, the Canadian Mortgage and Housing Corporation counted more than 250 wood frame, mid-rise buildings constructed or nearing construction.

Ontario amended its building code in January of 2015 to increase the height limit for wood construction to six storeys. By March, the city of Hamilton had issued the first permit in Ontario for such a building. One year later, 15 mid-rise wood buildings were under construction in Ontario. As Ontario builders, engineers, and architects familiarize themselves with the design and construction of wood mid-rise buildings, this number will only increase.

# Halifax Regional Centre Plan



- Corridors
- Future Growth Nodes
- Centres
- Higher Order Residential

Halifax is currently updating its plan for the Regional Centre, a 33 square kilometre area encompassing the downtowns of Halifax and Dartmouth, and their respective inner suburbs. The final plan is expected to be adopted in 2017. However, consultations to date suggest that 21 percent of new growth in the next 15 years could occur on 14 mid-rise corridors. These corridors are currently lower in density, with buildings typically not exceeding three storeys tall. Under the new Centre Plan, as proposed to date, permitted heights on these corridors could be updated to six storeys.

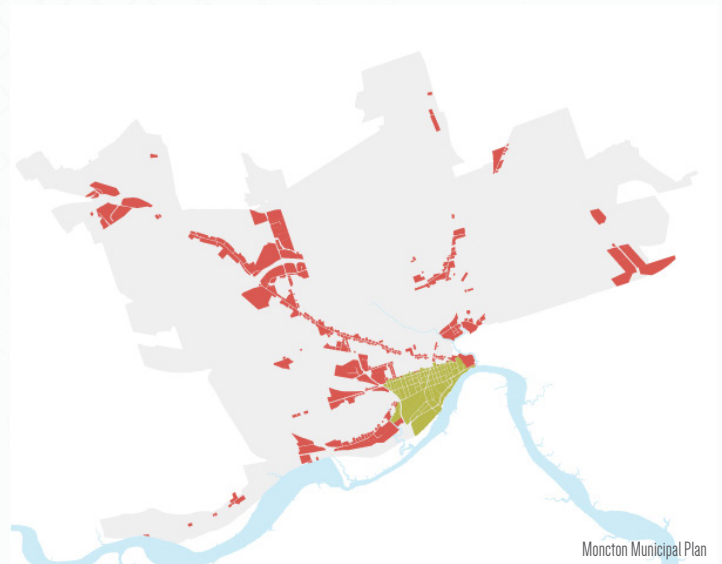
## Envision St. John's

Envision St. John's Draft Municipal Plan will, when adopted, become the city's principle planning document. It was developed as a result of a comprehensive and intensive consultation process and is based on a new understanding of how St. John's should grow and develop over the next decade. While the plan continues to limit the overall building height in the downtown to four stories, it also identifies areas across the city for future intensification through

redevelopment of vacant or underutilized sites where mid-rise buildings are deemed appropriate and desirable. In particular, the plan identifies eight areas as having potential for future redevelopment and intensification for a mix of commercial, residential and other uses. These areas are typically commercial areas located on transit-served roadways that are characterized by vacant and underutilized sites, including large parking areas.

## PlanMoncton

The 2014 Municipal Plan for the City of Moncton established a new Mixed Use Centres and Corridors Designation and applied it to four distinct areas and to collector and arterial streets that link the city's mixed use centres to the downtown. The goal for these areas is to eventually transition these existing commercial nodes and corridors to mix use residential/commercial. For those parts of the city identified as mixed use centres or corridors, the Plan recommends the preparation of neighbourhood or secondary planning strategies. Even though the City can currently only prepare one Secondary/Master Plan per year due to limited resources, medium to high density residential growth will likely occur within identified neighborhoods, along commercial corridors and in the downtown.



- Mixed Use Centres & Corridors
- Downtown
- Urban Boundary

# Charlottetown's Official Plan

The City of Charlottetown is currently undertaking a review of its Official Plan and Zoning & Development Bylaw. New planning policy for the Plan will be informed by neighbourhood planning exercises and by several comprehensive planning studies which have been prepared in recent years. The more recent plans, the 500 Lot Plan and Waterfront Plan, have already been adopted into the City's Official Plan. A third plan, the Eastern Gateway Waterfront Master Plan is in the process of being adopted as a part of the Official Plan. Together, these three planning studies allocate significant lands to mid-rise development. Recently adopted policy of the Official Plan directs the location of medium rise multiple dwelling unit buildings to the downtown core area and the waterfront. Even though much of the current as-of-right zoning in Charlottetown's core remains limited to 3 storeys, new density bonusing provisions allow for discretionary 2-3 additional storeys in many parts of the downtown. Additionally, much of Charlottetown's waterfront is now zoned for 6-storey buildings.

# Fredericton City Centre Plan

The City Centre Plan, last updated in 1997, was completely rewritten in 2015 and lays the foundation for the transformation and enrichment of Fredericton's downtown over the coming decades. The City is currently working on adopting the City Centre Plan into the statutory regulatory planning framework. The Plan defines a hierarchy of built form character areas that guides appropriate uses and building typologies for development that is consistent with the character and surrounding context. Three of those character areas, Downtown Mix-Use, Downtown Core and Downtown High Street, which together comprise about 70% of the city centre's developable landmass will allow for mid-rise buildings between 5 and 6 storeys high once the City Centre Plan is adopted into Fredericton's Municipal Plan.

## Planning Rationale for Mid-Rise

Mid-rise construction, when developed appropriately to the context, can contribute to the vitality and success of cities by increasing the density of people in a neighbourhood. Density itself is not the end goal, but rather the benefits that density can bring. These include:

Increase in Municipal Tax Base

Efficient Use of Infrastructure

Availability of Affordable Housing

Diverse Housing Options

Mixed Uses and Commercial Success

More Mobility Options

Integration with Existing Neighbourhoods

Comfortable Streetscapes

Revitalization of Corridors



# Cost Comparison

QS Online Cost Consultants Inc. from Halifax performed a Class C cost estimate for a six storey building that is currently being built in Kamloops, British Columbia. The purpose of this estimate was to analyze a real-life wood mid-rise structure built by an experienced builder, apply Atlantic Canadian cost and structural engineering conditions and to generate a comparative cost analysis for four different construction methods.

All models are 6 storeys and estimates were performed for the following configurations:

- one base model that is comprised of 1 level of concrete construction and 5 levels of wood construction above;
- one model with all wood construction;
- one model with all concrete construction; and
- and one model with all structural steel construction.

Tri-City Contracting from Kamloops, B.C. has provided a base model, described below. This was the basis for considering costs for three additional structural configurations at the maximum allowable area limits for Group C, NBCC sprinklered combustible construction. BMR Engineering from Halifax provided high level structural interpretations of the models as applicable to the Halifax area, and these directives were included in the logic of the cost estimates. Bluegreen Architecture Inc., from Vernon and Kamloops, BC, provided the architectural drawings. G.L. Bevan Pritchard Engineering Ltd., from Vancouver, BC, provided the structural drawings.

All models are based on a 4-foot-deep frost foundation, without basement, slab on grade (SOG). The ground floor is considered as vacant shell space for commercial tenants, while the upper five floors are residential.

The cost analysis findings indicate that wood construction models are the least expensive to build.

There are a number of minor cost differences between the Kamloops region and Halifax in regards to material supply and labour costs. This estimate does not provide a detailed breakdown of these differences. Specialty lumber such as mass timber is less expensive in the Kamloops area, while standard dimensional lumber, depending on grade and species, such as Douglas Fir versus SPF #1 & #2, is without significant cost variations as it is available in each respective region.

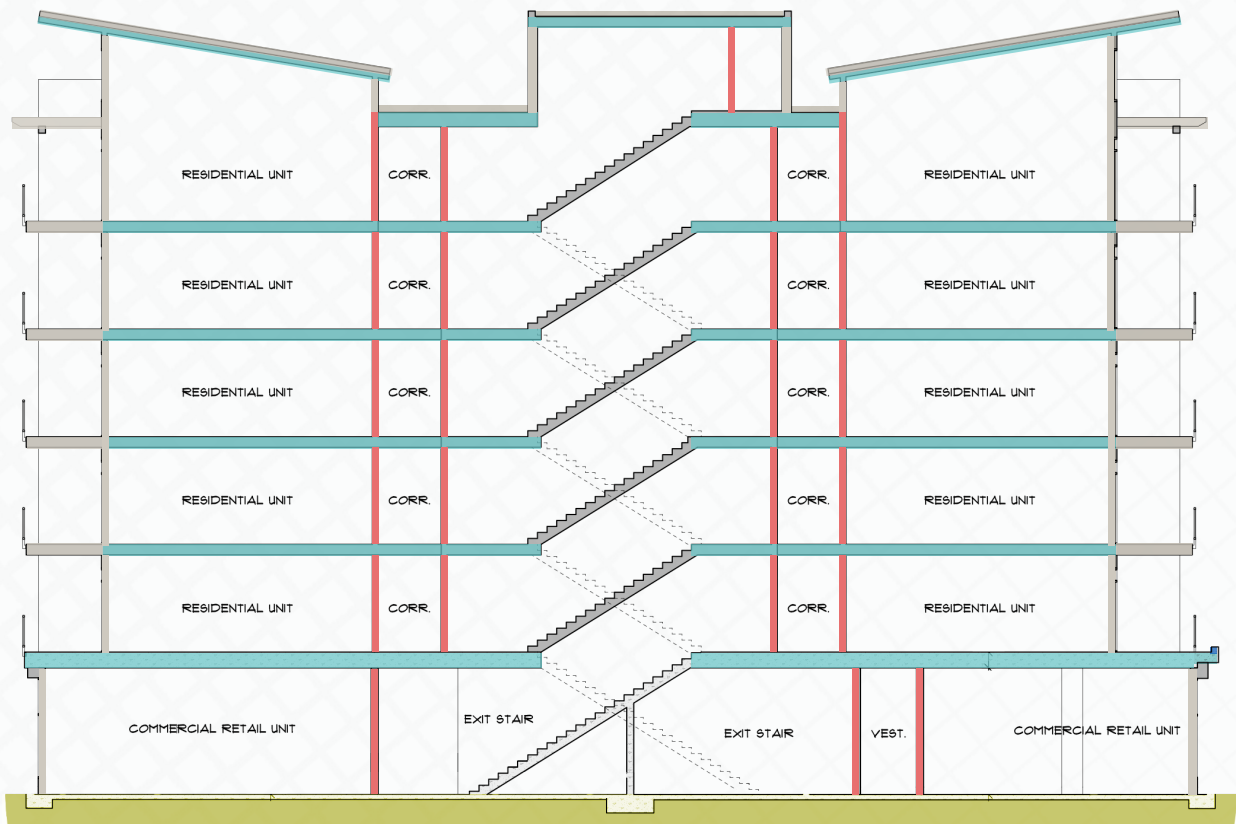
The fixed price differences of the materials can be off-set in both regions by various levels of crewing, productivity, and payroll levels. Construction cost differences in this type of construction are within a range that could be considered generally congruent to each region. Further detailed analysis would be required to determine specifics.

The cost estimate is based on an initial capital cost perspective and has not included any impacts from a detailed life cycle costing analysis. Also excluded are soft costs, demolition of any existing items and site costs including landscaping and hook up of services for M&E.

**“The cost analysis findings indicate that wood construction models are the least expensive to build.”**







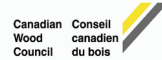
	6 Levels Steel	6 Levels Concrete	1 Level Concrete 5 Levels Wood	6 Levels Wood
	GFA : 113,380 SF*	GFA : 113,380 SF*	GFA : 113,380 SF*	GFA : 113,380 SF*
	\$/SF GFA	\$/SF GFA	\$/SF GFA	\$/SF GFA
Sub-Structure	3.23	3.88	3.37	3.11
Structure	33.88	29.76	32.29	31.49
Exterior Enclosure	32.01	32.45	31.97	31.50
Partition & Doors	13.61	13.61	4.22	4.54
Total Unit Rate	165.23	160.49	148.75	147.28
Total Building Cost	18,733,499	18,196,575	16,864,845	16,515,400

\* The building design used for this cost comparison analysis exceeds the maximum allowable gross floor area of 96,875 square feet as defined by the National Building Code. The larger building floor area was achieved by adding additional fire walls.



Atlantic WoodWORKS! is a program of the Maritime Lumber Bureau (MLB) and is part of an industry-led initiative of the Canadian Wood Council (CWC) to help increase the use of wood in construction in the Atlantic Region.

The project is supported by:



For more information and to learn how our program can assist you visit:  
[www.atlanticwoodworks.ca](http://www.atlanticwoodworks.ca)

Atlantic WoodWORKS!  
c/o Maritime Lumber Bureau  
PO Box 459 Amherst  
Nova Scotia B4H 4A1  
(902) 667-3889

Published in November 2016

The brochure was prepared by:

**UPLAND**

Turner Drake & Partners  
TriCity Contracting  
BMR Engineering  
QS Online Cost Consultants Inc.