

Suite Dreams: Tools to Expand the Supply of Affordable Housing in Northern Canada

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Abstract

There is a severe shortage of affordable housing, as well as a demonstrated demand for such options. Unique cultural, regional and resource-based concerns specific to the North increase the complexity of building new housing in the regions. This study examined housing supply expansion challenges in the North. A proforma analysis of a sample affordable housing project was presented to show where the bulk of construction and development costs are concentrated. Three case studies were conducted to present successful and innovative financing, partnership and design housing expansion tools. The purpose of this case study is to gain insight into other tools that might be applicable to a rural context in northern regions. Following this, three policy options are analyzed for their applicability to the North. Based on this analysis, offsite construction, including both modular and prefabricated housing, coupled with a pilot program are recommended to address the lag in supply side housing expansion in the North.

Keywords: Social Housing; Northern Canada; Financing; Construction; Procurement

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List of Terms and Acronyms

CMHC	Canadian Housing and Mortgage Corporation
NHA	National Housing Act
NHC	Nunavut Housing Corporation
Public Housing	Defined as housing delivered by a government and almost always charges rent geared to income
Non-Market Rental:	Housing for low and moderate income households who cannot afford to pay market rents (Government of Yukon, 2015). Nonmarket rent has been used interchangeably with social and affordable housing. These can include any dwelling type.
Core Housing Need:	A household is in core housing need when households spend 30% or more of total before-tax income to rent.
Affordable Housing:	Often used interchangeably with social housing or public housing. Beyond direct subsidization, this form of housing can include rent supplements, rent controls and regulations that protect the existing stock of rental housing or promote subsidizing the development of additional stock.
Social Housing:	In a rental context, the rents do not exceed 30% of household income for low and moderate income households. Defined as traditional public, non-profit and co-op housing developed using federal, provincial or territorial funding sources.

Executive Summary

A history of inadequate government funding to affordable housing in the North has largely contributed to the extreme housing need exhibited in the territories today. Though Nunavut is the most affected by core need and a shortage of income appropriate housing options, the other regions are also feeling the housing supply issue. The policy problem arises when existing funding is not enough to cover the enormous cost of construction further inflated by northern specific conditions.

Overall, there are many factors that make it difficult to address the issue at hand considering the involvement of many different organizations, differing mandates and timelines, and differences in conditions and cultures across the territories. However, several possible changes to policy, design and governance structures were identified to improve the ability and efficiency of delivering new housing.

The policy problem is examined through a proforma analysis of the core costs of constructing additional units in the northern regions. With this information, the key cost components which require policy intervention to be decreased are identified. The case study portion looks at innovative financing and partnership strategies that have reduced both the hard and soft costs of constructing, thereby developing more units with the allotted government funding provided.

Four policy options are provided to address the issue. The first is offsite construction, including modular and prefabricated housing types. The second is a territorial land leverage initiative which provides territorial or city owned land for free or at a substantial discount to developers and non-profit housing authorities interested in building on the site and maintain operation in the long term (25 to 30-year period). The final option is a housing committee or umbrella organization consisting of groups from across the territories, including housing authorities, non-profit housing managers, developers (private and non-profit) and various levels of government

Chapter 1. Introduction

This study explores the provision of affordable and public housing in Nunavut, Northwest Territories and Yukon. More specifically, it will investigate the challenges associated with expanding the supply of housing in these regions, namely the cost of construction and speed of delivery, and explore potential policies to alleviate design and financing challenges. It is worth noting this report will be looking solely at off-reserve housing.

The North, by definition, includes the northernmost regions of the country as defined by geography. The North, including the regions of Yukon, Northwest Territories, Nunavut, Nunavik, Labrador and Nunatsiavut, encompass nearly 40% of the country's total land mass, but less than 1% of the total population (Canadian Housing and Renewal Association, 2014). For the purposes of this paper, the north will solely be referring to the three territories: Yukon, Nunavut and the Northwest Territories. The territories have the highest proportion of Indigenous peoples in Canada; more than half of the population across the North is either Inuit (including Inuvialuit), First Nations (including Innu), or Metis (Christensen, Davidson, Levac, 2012). The unique ethnic composition, exceptional environment and historic tribulations that exist within the northern regions of the country which makes it impossible to implement a one-style fits all housing solution in the region

The region also encompasses unique natural landscapes and incredibly varied communities with deeply rooted Indigenous history and culture. Such varied landscapes are comprised of hinterlands which are fairly sparse, both population and location wise. This unique remote geographic composition contributes immensely to construction difficulties in the region, namely high land and development costs, freight costs, labour shortages, land zoning regulations and additional locational complexities. Additionally, the remoteness of the region with poor roads and infrastructure makes delivery of material twice as expensive as non-remote regions, thereby raising hard cost functions beyond traditional affordable housing levels. The high cost of land and limited labour in the North combined with the need for specialized mold resistant material able to withstand harsh climates pose drive development prices up and poses challenges not apparent in other regions in the country.

The existing stock of housing operated by the Canadian Mortgage and Housing Corporation (CMHC), non-profit groups and the private sector in the territories were designed with an inherent assumption that the single family, owner occupied home model in the South would also work for the population in the North. With the majority of the northern population being Aboriginal, these communities require culturally sensitive designs and housing options with sliding scales for eligibility and rent-geared-to-income options (Pulla, 2012) appropriate for their demographic. Such culturally sensitive housing must encompass

The long-term consequences of failing to provide adequate, affordable housing results in significant increases in other societal costs such as welfare, criminal justice, health and mental health services. These costs can be linked to the need for additional health and safety services linked to rampant respiratory illness, infectious diseases and family violence as a result of inadequate living conditions, as well as negative effects on children's ability to learn and build social relationships (Dyck & Patterson, 2017). In fact, many empirical research studies have found a strong correlation between housing condition and determinants of health, family stability, employment and overall safety (Pomeroy and Marquis-Bissonnette, 2016). Though none of these accompanying issues is sole justification for the need for government or private intervention in expanding stock, they serve to reflect the importance of providing additional services and tools beyond the current work being done.

One of the major challenges for the territories is that demand far exceeds supply of new affordable housing units. From the mid-1960s to the mid-1990s the federal government was the largest partner in providing funding for new public and social housing programs both in the territories and across the country (Klein and Copas, 2010). However, with federal funding withdrawals in 1993 to present, there has been both a shortage of government intervention and significant change in the type of investments made in the territories, thereby resulting in virtually little to no additional affordable housing options being built. Alternative financing and construction solutions must be reviewed to aid in new project delivery at quicker speeds.

Using a policy-oriented approach, the paper is providing a summary of the past and current state of northern housing challenges, policy, programs and funding initiatives in the territories. The capstone addresses possible innovative changes that can be made

to funding and construction strategies to increase the stock of housing, speed of construction and quality of build. Chapter 2 provides a history of affordable housing in the country and delineates affordable housing from other forms of tenure. Chapter 3 identifies the roles and responsibilities of various actors. Chapter 4 looks specifically at Northern demographics. Chapter 5 looks at the supply and demand gaps. Chapter 6 describes barriers to construction. Chapter 7 presents the primary analytical methodology of a financial analysis through a proforma breakdown. The secondary methodology of a case study is undertaken in Chapter 8.

Chapter 2. Affordable Housing in Canada

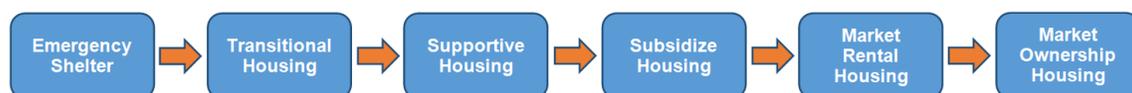
This section serves to define the affordable housing context in Canada, including the history, significance and role of key actors in the realm. Though the focus of this paper is solely on expanding affordable housing supply in the territories, this cannot be done without understanding the history of affordable and social housing history in Canada and conceptually defining and differentiating affordable housing from other housing types. The focus of this paper will be on affordable housing, defined as housing which costs less than 30% of household before-tax income.

2.1. Defining Affordable Housing

Although the term “affordable housing” is used interchangeably with other housing terms such as “rental” and “social” housing, for the purposes of this paper, affordable housing refers to any form of government, private sector and non-profits supplied housing at below market rents. In Canada, housing is deemed “affordable” if it costs no more than 30% of household before-tax income (Canadian Housing and Mortgage Corporation, 2018). Rental housing is an overarching term referring to non-ownership forms of housing on the housing continuum, this includes public and market rental housing

Affordable housing does not solely refer to rental housing subsidized by the government, rather can include a variety of different housing types including but not limited to the following: rental, ownership and co-operative units, as well as temporary housing, as depicted in the continuum in figure 1 below. Northern residents require improved housing access across the entire continuum; however, this paper will be focussing its attention on housing rents costing less than 30% of median community income, including government subsidized housing

Figure 1. Traditional Housing Continuum



Source: Continuum adapted from the CMHC housing model

Rental and public housing are often considered to be synonymous with one another. Public housing is defined as those which are provided and managed by

government departments for low income individuals and families. Such housing may include tenants with rent-gear-to income or market rents. Individuals paying market rent can be living in public or market rental housing.

The role of the government is the key distinguisher between affordable and social housing delivery. Traditionally the delivery of affordable and social housing in the country has been done through collaborative partnerships between community organizations, non-profits, co-operatives and varying levels of government (Canadian Mortgage and Housing Corporation, 2018). Affordable housing refers to programs whereby operating costs are not covered by the government. Meanwhile, the development and operation of social housing units are fully subsidized by governments (typically through cross collaboration with private and non-profit sectors) and subject to long-term operating or rental subsidies which provide rental assistance to low-income households, as defined by the regional housing authority (Housing Services Corporation, 2014).

Funding mechanisms are targeted at vulnerable populations by providing units at below market price in their respective area to those who cannot afford to participate in the private market. The target population for affordable housing has traditionally been households earning 80% or less of the area median income on housing, as compared to a target income level of below 50% of regional median income for social housing units, though these thresholds vary depending on provincial or territorial housing authority benchmark incomes which are often defined by regional median income.

2.2. History of Affordable Housing in Canada

Throughout the years, all levels of government have largely been involved in housing development and assistance to aid individuals in securing rental units or entering the ownership market. However, decades of involvement by federal, municipal and territorial intervention have plagued the overall housing market, effectively making it one of the most heavily regulated sectors of the national economy. Such regulation has largely increased housing corporation and non-profit dependency on the government, thereby limiting innovation and free market interference.

Social and affordable housing development in Canada began before World War II, though much of Canada's existing stock was built between 1946 and 1993. Though all

levels of government have and continue to be involved in social housing, the federal government played a major role in shaping housing policy action in the country. The first Canadian affordable housing legislation, coined the National Housing Act (NHA), was introduced in 1938 to provide federal funding for the construction of low-rent housing in the country (Mcafee, 2017). The legislation was later expanded in 1949 to include federal-provincial programs and, in few cases, city participation to manage publicly owned and provincially managed housing for low-income and senior Canadians (Mcafee, 2017). With only a miniscule portion of government funding being allocated to housing lower-income residents, the existing NHA underwent a stringent funding revaluation. The National Housing Authority was later broadened in 1949 to include federal-provincial programs targeted at funding housing for lower income individuals, seniors and the disabled.

Between 1974 and 1986 the NHA was amended to ensure that existing social housing would continue to provide housing for lower income households and added provisions for remote and First Nations programs (Mcafee, 2017). Moreover, the legislation mandated that new affordable housing units be built by municipalities, non-profit groups and cooperatives, thereby separating federal responsibilities from future social housing proposals and developments. Though the federal government continued to aid in both the private and public housing realms with various investment incentives and funding, the provincial and territorial governments began to assume a larger role in the operation and management of projects.

Meanwhile, starting in the 1970's private sector firms began shifting investment away from developing new affordable and public housing towards profitable market units. Non-profit housing providers also saw their money dwindle as federal and provincial/territorial government funding came to a halt. Private funders also became increasingly unwilling to lend to non-market housing developers given the uncertainty and unprofitability stemming from such investments (Shapcott, 2004).

In 1996, the federal government announced management and operation of existing units would be transferred to the provinces and territories (Mcafee, 2017). Since then, very few provinces and territories have had sufficient funds to create additional units in line with demonstrated demand. In fact, British Columbia and Quebec have been the only two provinces funding additional social housing. With the federal government withdrawing funding assisting the development of new social and affordable housing, responsibly was

further downloaded to other levels of government for providing affordable rental housing through rezoning policies, secondary units and bonus density to developers to encourage building affordable housing. It is worth noting, however, that much of these local level policies to expand supply are largely inapplicable to a remote context.

Post 1990's until present day, the main focus has been on redevelopment to increase existing stock and improving existing units through renovations and changes in project design, though mainly in urban settings. Prior to the National Housing Strategy, the Investment in Affordable Housing (IAH) was the main federal financing source for housing in the province and territories. This funding totalled over \$1.9 billion over 8 years and was cost-matched by provinces and territories (Government of Canada, 2019).

With the recent introduction of the National Housing Strategy in 2018, the federal government has re-entered the affordable housing arena after largely handing over the reins to provincial and territorial governments in previous decades. As such, the government has committed to a 10-year, \$40 billion plan to address housing affordability in the country and respond to the growing list of expiring funding agreements. The strategy has committed to investing \$20.5 billion to help provinces and territories “build more affordable housing, reduce homelessness and create better outcomes for all Canadians” (CMHC, n.d). The strategy, though well intentioned, has several shortcomings with respect to expanding rural housing stock for Indigenous populations. The strategy includes a dedicated focus on creating housing specifically for Inuit, Metis and First Nations people, though further analysis in this paper will show that the \$40 billion allocation is merely a minor financial contribution given the substantial cost of housing development in many rural regions. Moreover, the strategy and all of its predecessors failed to enable the territories to tailor programs to their individual needs, rather than an overarching national strategy.

Generally, the history of social housing intervention in Canada has shown limitations in government funds, as well as deep competition for said funding across the entire housing continuum. While territorial housing corporations and local housing non-profits have been driving partnership and design innovations, there is considerable support needed by all levels of government and private partners to addressing the stock issue. Overall, affordable housing design and delivery is “not about intrepid local groups doing a project here or there, with disjointed layers of public funding at different periods”

(Suttor, 2017), rather it is about implementing sustainable capital financing and support services that minimize the fiscal burden on provinces and territories, as well as local governments. The remainder of this paper will look at the government shortfall in addressing a growing housing affordability concern in the North, the specific needs of the northern region and alternative financing, partnership and construction methods to alleviate some of the federal responsibility in this domain and expanding stock to the level of need.

Chapter 3. Roles and Responsibilities

The most common approach to providing affordable and social housing is through municipal, federal and non-profit funded housing. Canada as a federation adjudicates management and financing responsibility regarding social housing to both the federal, provincial and territorial governments. In fact, a majority of the existing stock in the territories is government run, by federal, territorial and First Nations governments. This section will be looking at the roles and responsibilities of key actors in creating affordable housing.

3.1. Role of the Federal Government

The Canadian federal constitution assigns responsibility for monetary policy, including money supply, interest rates and control over mortgage lending to the federal government. The federal government, as previously mentioned, is also responsible for mortgage insurance under CMHC, a federal crown corporation and Canada's national housing agency. The federal government (not through CMHC) partners with provincial and territorial governments to invest in affordable housing by providing funds to governments, non-profits and organizations to deliver programs and services to homeless and low income individuals under the National Homelessness Initiative.

Prior to the 1990's the federal government under CMHC managed administrative and funding responsibilities for social and public housing, and provided funds to provinces and territories under cost sharing agreements determined by program agreements. Following the 1990's the federal government downloaded much of the administrative, design and funding responsibilities to the provinces and territories, however they maintained responsibility for managing existing co-op housing agreements, as well as on-reserve housing (Housing Services Corporation, 2014). CMHC transfers roughly \$1 billion annually to provinces and territories who have signed a Canada Social Housing Agreement. The agreement transfers federal administrative and financing roles previously with non-profits and municipal housing organizations, to a province or territory who has signed the agreement (Housing Services Corporation, 2014). It is entirely up to the province or territory to manage and distribute the funds according to identified priorities. Finally, the federal government through CMHC is responsible for data collection and

dissemination based on Statistics Canada and provincial and territorial reported data, aiding in policy creation and analysis.

3.2. Role of Territorial Governments

Much of the land use and housing responsibilities concerning housing rests on the territorial and provincial governments who control “natural resources, including land use planning, building codes and housing development” (Housing Services Corporation, 2014). Such government run housing is very expensive and dips heavily into territorial budgets. The territorial government budget, even with federal support through the National Housing Strategy, is not sufficient enough to both build additional stock and maintaining existing housing in deplorable conditions. CMHC has warned certain territories, namely the NWT, that operational funding for rent geared income housing units will cease by 2038 at the latest (Brant & Gibson, 2019). As such, future budgets for housing will come from the overall territorial budget, thereby eroding the funding to other essential territorial services.

The provinces and territories are responsible for administering 80% of the agreement with social housing providers, while the federal government administers the remaining 20% (Canadian Housing and Mortgage Corporation, 2018). Under bilateral agreements with CMHC, provinces and territories have historically matched federal investments with their own contributions. However, the housing system has traditionally exhibited an unequal fiscal burden whereby the provinces and territories have been assuming an increased share of subsidy expenditures in the face of dramatically declining federal funding (Pomeroy, 2017).

In addition to a directly managed portfolio, the provinces and territories are responsible for providing funding and support to non-profit groups to build and operate shelters and safe houses, as well as independent non-market housing. Moreover, since power devolution, provinces and territories have developed their own individual data collection and dissemination, with no requirement for standardized public reporting. Though some provinces and territories have reported regularly to CMHC, the lack of standardization has resulted in immense data gaps, especially apparent in the territories.

3.3. Role of Regional Housing Authorities and Non-Profits

Regional housing authorities are organizations that are responsible for financing and administrating housing programs in their particular region (Government of Canada, 2019). These groups will receive funding through CMHC to address identified regional priorities and programs in their respective regions working in partnership with local housing organizations, municipal and Aboriginal groups to expand housing delivery options. Territorial housing authorities operating in the North and receiving federal funding through CHMC include the following:

- Nunavut Housing Corporation (NHC)
- Northwest Territories Housing Corporation (NWTHC)
- Yukon Housing Corporation (YHC)

Non-profit housing organizations provide supportive housing, social housing and affordable housing units to those that cannot afford market rents. They often partner with local housing authorities and district offices to provide financial resources and professional support to expand the portfolio, unit allocations, rental assessments and collections, and maintenance and repairs depending on the arrangement.

An additional complexity to the overlapping roles and responsibilities in the territories is Self-Governance agreements signed in many regions in the North. There are a total of 66 First Nation band governments in the three territories with distinct power over land titles and varying housing investment structures. In the Yukon, 11 out of 14 First Nations have signed Self-Governance agreements providing them with care and control of their housing and the ability to make their own agreements (SOURCE). Public data was not available for the purposes of this report on the number of housing projects operated by First Nations governments, therefore adding to the complexity in analyzing the shortage.

3.4. Role of the Private Sector

Private developers finance construction projects with the sole intention of selling or renting the project or individual units. For those in developed countries who choose to invest in affordable housing, they often see it as an opportunity to diversify an investment

portfolio, rather than a primal opportunity for high market returns (World Economic Forum, 2019). In some key hot spot markets, such as Vancouver and Toronto, affordable housing may act as high performing investment tools given the high value of land and development potential, however the same cannot be said for investments in the North. Given that public housing units do not have presale options, investor's equity remains tied up for nearly the entire duration of project construction, thereby increasing risks borne by investors and posing a form of market failure with respect to financing. Affordable housing rents in traditional cases will need to be higher than current rental rates in the North for investors to see a reasonable return on investment to fully offset the risk of investment and all upfront costs. Affordable mortgage loans are difficult to obtain by private sector borrowers and often are accompanied by high interest rates. Often projects rely on longer term rental cash flow to service the debt and pay back the invested equity. However, the low rent nature of affordable and social housing projects, which often generate minimal returns after operated costs are accounted for, make it less desirable for lenders to invest in such projects. The ability to build lower cost projects by developers will allow for greater income leverage and equity capital.

This section outlines the roles and responsibilities of key actors in the delivery of affordable and social housing, including financing, land use and development initiatives. Given the exhibited complexities of centralized operational and financing power in the territories, as well as self-governance control of lands by individual First Nations, it is imperative to have housing development options to that extend beyond solely reliance on additional federal funding.

Chapter 4. Northern Housing Demographics

Individual demographics of each territory are unique and reflective of the cultures and customs in that particular area. Each territory presents a unique challenge regarding affordable housing, so an appropriate combination of housing tools must be used to provide affordable housing for all territorial residents. This section will be providing a breakdown of demographics and housing need in each territory in an effort to better understand the need for additional affordable housing provisions. Per capita spending values on housing and community amenities in table 1, 2 and 3 include the following: housing development, community development, water supply, street lighting, research and developing housing and community amenities, and housing and community amenities

4.1. Yukon

Of the 35,874 residents residing in Yukon, 23.3% self-identified as First Nations (Statistics Canada, 2016). First Nations residents also compose between 30 and 40% of all tenants residing in Yukon Housing Corporation social housing (Canadian Housing and Renewal Association, 2014). The average cost of shelter in the region is \$1,084 with an average household income of \$92,906.

Yukon is unique in that it has 14 First Nations governments, 11 of which have constitutionally entrenched land claims (Canadian Housing and Renewal Association, 2014). Many of these First Nations groups have autonomous decision-making powers over the fate of housing on their lands, thereby limiting and nearly eliminating the role of traditional governments in housing decision making in these areas. Additionally, the Yukon First Nations are owners of 41, 439 sq kilometers of land primed for housing development, though few groups are in positions whereby they have the financial means to construct independently (Canadian Housing and Renewal Association, 2014). Nearly half (45%) of the existing housing in the territory were constructed prior to 1980, while 38% of the dwellings were built between 1991 and 2011 (Government of Yukon, 2015).

Table 1. Yukon Housing Summary

Housing Authority	Yukon Housing Authority
Per capita spending on housing and community amenities (2016)	\$1,238
Average monthly rent of social and affordable housing units	\$627
Percentage of households in 'core housing need'	15.2%
Rent control	No
Number of social housing units	698

Data source: Statistics Canada, 2016 Census of Population

4.2. Nunavut

The Nunavut Housing Corporation (NHC) is responsible for caring for the delivery of the 5,153 public housing units in the province including allocation of units, rental assessments/collections and maintenance and repairs. Over half of all residents in Nunavut live in social housing, with nearly 32% of those tenants living in overcrowded dwellings (though this number is as high as 72% in some communities) (Nunavut Housing Corporation, 2016).

Of the total housing stock in the province, slightly more than half of all dwellings were public house units. About 3,780, or 1 in 5 people, ages 15 and over in Nunavut reported they were on a public housing wait list. Of those on the wait list, about 1,330 people reported being on the wait list for one to three years, meanwhile another 550 people reported being on the wait list for five years or more (Nunavut Housing Corporation, 2013). The NHC predicts the stock of public housing needs to increase by 35% or 186 units in Iqaluit and 51% in Cambridge Bay (CMHC Housing Market Outlook, 2019).

With housing shortage conditions continuing to worsen, the province has maintained a above adequate funding levels to attempt to improve dire conditions. However, the NHC is currently \$29 million in arrears in rent and, as such, is unable to put rental revenues towards operating, maintenance and new developments (Dyck & Patterson, 2017), hence why alternative financing methods beyond solely territorial and federal funding must be explored.

Overall, the Government of Nunavut has spent over 13 times more (as a function of total revenues) on total housing expenditures than any other province or territory, spending on average between \$400,000 and \$550,000 to build each unit (Nunavut

Housing Corporation, 2016). In the fiscal year 2013-2014, government funding for both revitalization and construction was largely received on a territorial level. Transfers from the Government of Nunavut accounted to \$196,975, while federal government funding amounted to merely \$30,256 (Nunavut Housing Corporation, 2013). This account provides insight into the trend towards decreased federal government reliance for housing funding and larger provincial and territorial funding responsibility.

Table 2. Nunavut Housing Summary

Housing Authority	Nunavut Housing Authority
Per capita spending on housing and community amenities (2016)	\$4,416
Average monthly rent of social and affordable housing units	\$302
Percentage of households in 'core housing need'	36.5%
Rent control	No
Number of public housing units	5,153

Data source: Statistics Canada, 2016 Census of Population, CMHC

4.3. Northwest Territories

There is a population of 41,786 in the Northwest Territories, of which half (50.7%) identified as First Nations (Statistics Canada, 2016). As of 2011, there were 14,150 households in the Northwest Territories, roughly 75.8% of which are located in six market communities (Yellowknife, Inuvik, Hay River, Fort Smith, Fort Simpson and Norman Wells) (NWT Housing Corporation, 2012). The remaining 24.2% of homes are dispersed across 27 smaller non-market communities in the territory.

Table 3. Northwest Territories Housing Summary

Housing Authority	Northwest Territories Housing Corporation
Per capita spending on housing and community amenities (2016)	\$1,679
Percentage of households in 'core housing need'	15.5%
Rent control	No

Data source: Statistics Canada, 2016 Census of Population

Chapter 5. Regional Gap Analysis

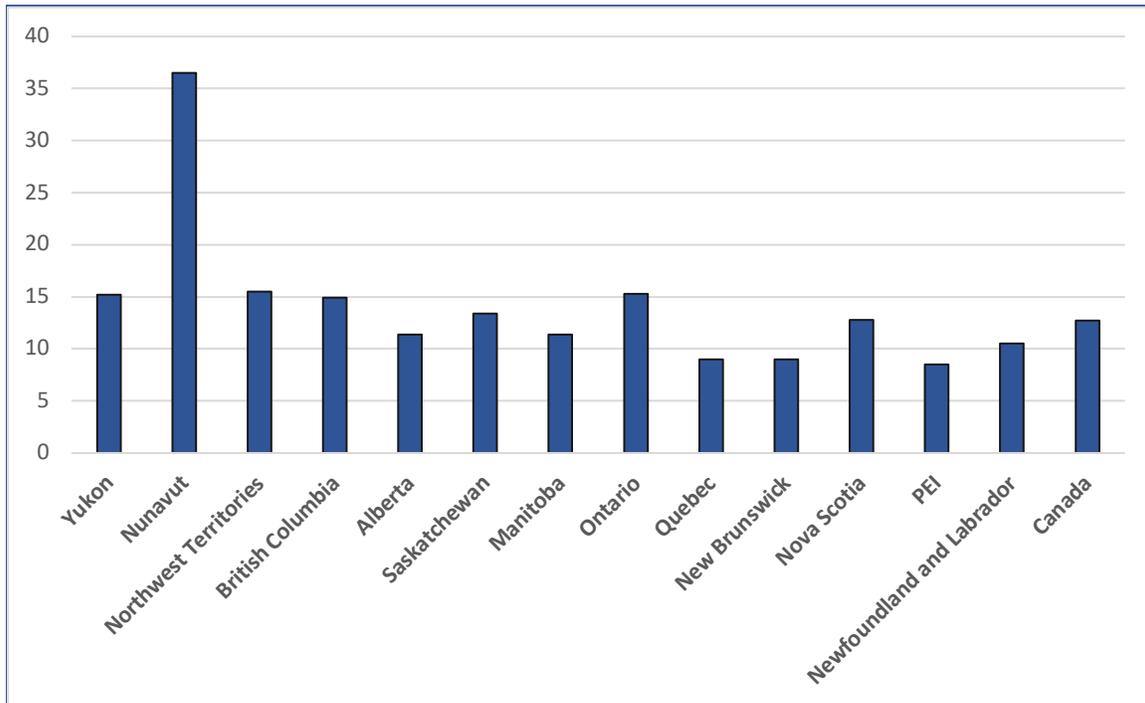
Housing in the territories is amongst the most expensive and poorly managed in the country. Communities in the region are living in the midst of a housing crisis, both in terms of alarming quantity and quality of housing.

This section will provide a gap analysis summarizing the current and future expected need for housing in a community and assess priorities to be addressed based on visible need. This section will be looking at community demographics and housing inventory, including number of households in core need, number of affordable and social rental units, and rental rates in the territories.

5.1. Core Housing Need

Core housing need serves as an indicator of insufficient housing quality or availability. A household in core housing need is one where a dwelling is considered unsuitable, inadequate or unaffordable and income levels are such that households could not afford alternative suitable alternatives in their community (Statistics Canada, 2017). Nunavut exhibits the highest incidence of core housing need in the country at 36.5%, nearly three times the national average of 12.7%, as represented graphically in figure 2. Both Yukon and the Northwest Territories have a core housing need of 15.2% and 15.5% respectively, both of which are higher than all other provinces (with the exception of Ontario). The enormous disparity in core housing need in Nunavut compared to the other two regions (and the rest of the country) cannot be attributed to a single factor. However the Iqaluit is ranked as the most expensive city in the country largely due to logistic factors, thereby making it difficult to produce suitable and adequate housing, both in terms of size in quality, compared to the rest of the country.

Figure 2. Core Housing Need (%) by Population and Territory, Canada, 2016



Data source: Statistics Canada, 2016 Census of Population

5.2. Supply Analysis

The territories as a whole are home to 107,326 individuals (Statistics Canada, 2018) and a total of 40,235 dwellings (both private and collective). Table 4 provides a breakdown of the total dwellings in each respective territory.

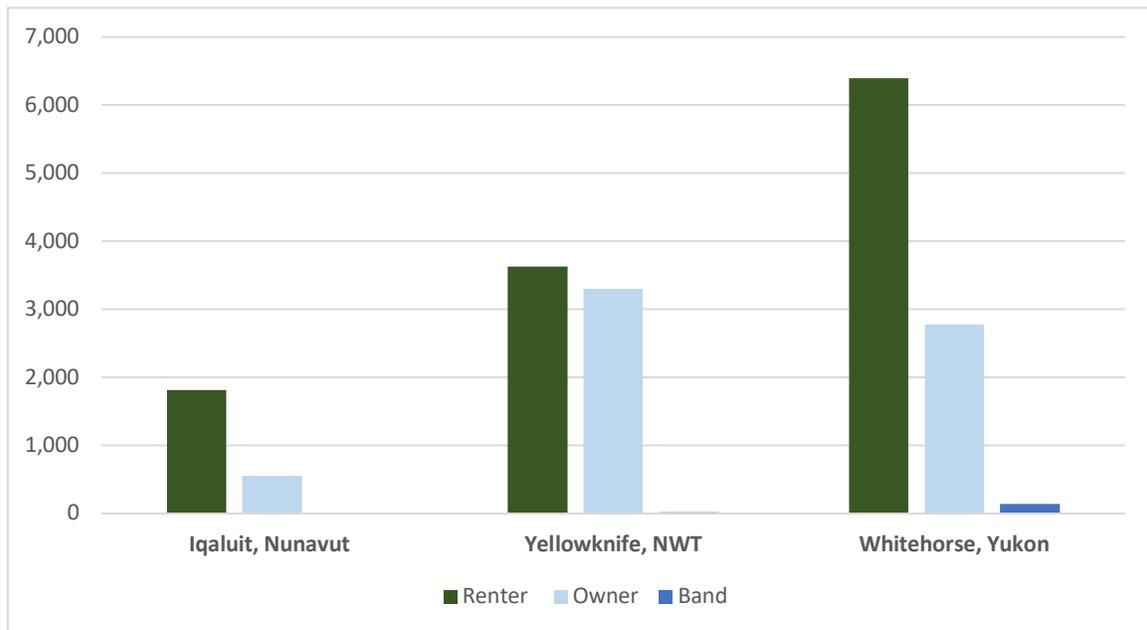
Table 4. Total Dwellings in the Territories, 2016

Territories	Number of Dwellings
Yukon	15,320
Nunavut	9,870
Northwest Territories	15,045

Data source: Statistics Canada, 2016 Census of Population

Overall, more residents in the North are living in rented dwellings (including both market and subsidized housing), than those that own their properties or live on band provided housing, as reflected in figure 3. Yukon has the highest share of renters across the three major northern cities examined.

Figure 3. Renter, Ownership and Band Housing Rates, Nunavut, NWT and Yukon, 2016

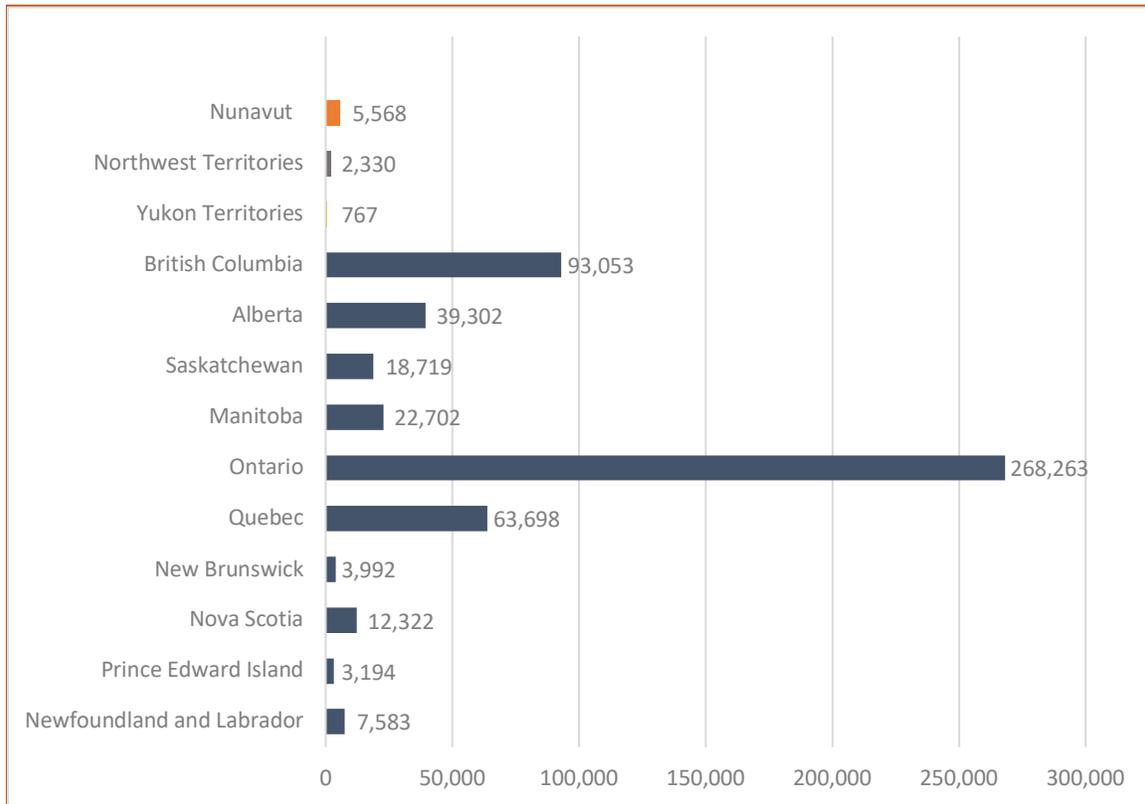


Data source: Statistics Canada, 2016 Census of Population

Though Yukon has the highest proportion of renters, Nunavut has the most residents living in subsidized housing units. Of the total tenants living in non-private housing in Nunavut, Northwest Territories and Yukon, 83%, 41% and 25% respectively live in subsidized units. Meanwhile only 13% of the total Canadian population living in non-private housing reside in subsidized units. This depicts the sheer magnitude of residents reliant on public and affordable subsidized units in the North, relative to the southern population.

Figure 4 below provides a comparison of the inventory of social and affordable housing in Canadian provinces and territories. Nunavut exhibits a higher number of affordable rental units proportional to the population, while the other two territories (namely Yukon) have a much lower number of units, despite higher percentage of renters (as evident in figure 3) than Nunavut.

Figure 4. Social and Affordable Rental Units, Provinces and Territories, 2019



Data source: Statistics Canada, 2019

As previously mentioned, with the federal government limiting their involvement in affordable and public housing delivery in the early 1990's there have been minor increases in housing construction in the territories. In fact, the territories remain the only regions of the country who have seen an increase in affordable and social housing construction activity from 1990 onwards, with all other provinces and territories seeing a dramatic decline in activity as depicted in table 5. The increase in the territories, as contrasted to a reduction in activity in other regions of the country, can be attributed the sheer reliance on affordable and social housing in the regions, compared to the rest of the country. With a majority of the population living in social and affordable units and increasingly deteriorating condition of units form the 1970's onwards, increased construction activity in the territories was inevitable. Despite this increase in construction activity, rates of construction are not decreasing the gap between supply and demand for affordable housing options. In fact, the gap, identified by increasing waitlist numbers depicted in the demand analysis is widening.

Overall, building and maintaining affordable housing units are proving to be costly for the budget books in all three regions. In fact, Yukon Housing Corporation's annual budget in 2017 shows the agency running a \$10 million deficit, which is \$10,000 per year for each of the 943 affordable and staff housing units it owns (Halliday, 2018). Such costliness to government acts as a key incentive for territories to experiment with alternative housing delivery options beyond the status quo, further examined in this paper.

Table 5. Number of Social and Affordable Rental Units by Year of Construction, 2019

	Pre 1970's	Between 1970 and 1989	1990 or later	Total
Newfoundland and Labrador	1,772	4,869	942	7,583
Prince Edward Island	438	2,245	511	3,194
Nova Scotia	1,416	9,959	947	12,322
New Brunswick	1,024	2,968	--	3,992
Quebec	18,801	26,942	17,903	63,698
Ontario	41,463	161,466	63,822	268,263
Manitoba	1,925	17,387	3,144	22,702
Saskatchewan	1,702	14,933	1,481	18,719
Alberta	3,008	27,623	8,624	39,302
British Columbia	9,520	51,483	30,788	93,053
Yukon Territories	16	385	366	767
Northwest Territories	103	1,085	1,142	2,330
Nunavut	135	2,641	2,792	5,568
Canada	81,321	323,987	132,464	541,491

Data source: CMHC, 2019

5.3. Demand Analysis

Nunavut exhibits the highest demand for affordable and social housing in the country, with the exception of Nunavik in northern Quebec. The following table compiled from Statistics Canada depicts a total of 1,800 people on housing waitlists in Nunavut, substantially higher than the demand in the two other territories. The territories have a combined unmet need of 2,500 households and 10,700 individuals on waitlists. Such long wait times, especially in Nunavut and Northwest Territories, points to an urgency in construction additional low-cost rental housing and a need to fast track building timelines.

Table 6. Social and Affordable Housing Waitlist Status, Including Length of Time, 2019

Territory	Number of persons	% persons on a waiting list for two years or longer	Number of households	% of Households
Yukon	100	3.8	200	4.9
NWT	1,200	16.1	500	11.5
Nunavut	9,400	39	1,800	30
Canada	177,500	13.8	57,700	9.2

Data Source: Statistics Canada, 2019

In summary, the trends in this section exhibit a heavy dependence on affordable housing in the North, as depicted in the high percentage of tenants living in subsidized housing units compared to the rest of the country. Meanwhile, the existing stock of public housing fails to meet the present and projected demand in the regions. There is significant pressure on provinces and territories to reallocate existing spending and reevaluate existing financing and design options to meet additional housing infrastructure need which will be addressed in further chapters.

Chapter 6. Barriers to Housing Construction

Conditions in the North vary by province and territory due to the differing availability of materials, transportation and weather patterns. Although rents are beyond reach for many northern residents and governments of all levels are attempting to address the shortage through direct transfers to the territories and targeted programs, there continues to remain several severe challenges that make it difficult to make new rental construction “work” financially.

Overall, expanding affordable housing in Canada is contingent on the following three factors: access to financing and capital, securing land to build and developing the organizational capacity to execute. This section elaborates on these challenges of expanding supply side stock and how they act as significant cost barriers to both the private and non-profit sectors.

6.1. High Cost of Construction and Materials

Constructing in the North poses greater challenges than those in other regions due to delivery of goods and infrastructure in the regions, labour shortages, weather constraints and high cost of land. In the western Arctic, the environment is more conducive to the use of local resources, road networks and longer construction seasons (Government of Canada, 2019). However, the eastern Arctic relies on materials transported by ship or plane, constrained by limited building seasons and limited populations. Projects are more expensive to build; most redevelopment and regeneration projects typically take two or more years for the planning phase of redevelopment and three or more years for implementation (Canadian Mortgage and Housing Corporation, 2011). Lot development and foundation preparation must be prepared in advance given limited construction periods constrained by harsh arctic climates.

Materials transported to Nunavut often ship from the following areas, depending on final shipping destination: Delta, BC, Valleyfield, QC and St. Catharines, QC (Nunavut Housing Corporation, 2013). A lack of existing community infrastructure also raises the cost of construction since roadways may not be serviceable for a large portion of the year or may not have the infrastructure for goods transportation. Many of the units in the North were not built with harsh climate considerations in mind and built with low cost materials

that are not suitable to withstand northern winter conditions. In many cases housing providers contract to the lowest cost provider, failing to take a full procurement analysis that takes culture, environment and local labour availability into account. Many homes were built with wood, which often sags and leaks in freezing temperatures, and lack much needed wind barriers which prevent snow accumulation (Dyck & Patterson, 2017). Inconsistent understanding across the construction industry in northern regions results in a lack of understanding or compliance with northern construction rules and regulations, thereby further intensifying existing and emerging challenges (Government of Canada, 2019).

6.2. Land Use and Supply

It is often a challenge for lenders to appraise the value of land or property in the regions given the lack of relevant land valuation and sales data. Given that land is the largest expense in real estate development, land valuation uncertainty acts as a major hindrance to developer investment in the region. Though there may be crown or private land available to municipalities, the servicing of these lots with water, sewage and power is an immense cost in rural areas. Such costs outweigh any hard cost calculation, therefore making limited serviceable land option highly desirable and expensive to acquire.

Differing land ownership regulations and land tenure agreements in each province also impact the availability of land. In Yukon, land tenure requires loan guarantees and tripartite agreements between the federal government, provincial government and First Nation. Such multigovernmental coordination delays the title registration process. Updates to land use regulations granted First Nations the ability to issue tenures and leases on settlement lands when leases are for 15-year periods, thereby expediting the mortgage and finance securitization process (Polar Knowledge Canada, 2019).

The Northwest Territories have two separate acts which govern land use. The Commissioner's Land Act and the Northwest Territories Land Act regulate land used for commercial, community and recreational purposes in the region. The Commissioner's Land Act deals with the authorization to sell or lease land for the purposes of recreational or community land use (Polar Knowledge Canada, 2019). The Northwest Territories Land Act responds to land uses for the purposes of large-scale commercial activity or resource development.

Nunavut land administration is regulated by the Nunavut Land Claims agreement (Article 14), which is regulated under four separate land policies: Commissioner's Land Lease Pricing Policy, Municipal Boundary, Land Development Policy and the Municipal Land Administration Policy (Government of Canada, 2019).

6.3. Housing Monopoly

In addition to enormous costs of constructing and land uncertainty, the housing market is further strained by monopolisation by a single private landlord for rental accommodations (Christensen & Freeman, 2018). Yellowknife has a single housing property management company which provides much of the existing market rental housing and ultimately has price and supply monopoly power in the region. The group manages a variety of apartments and townhomes which are often out of reach for lower income individuals who require government subsidization. Similarly, in the affordable public housing realm, the NWT Housing Corporation also has a form of monopoly as they supply all the public housing and operate the support programs in the region (Christensen & Freeman, 2018). Similarly, the rental housing market is also dominated by a single player in Nunavut. Northview Apartment Real Estate Investment Trust held 914, or about 45 percent, of all rental units in the territory (Rohner, 2016). Such monopolization creates significant obstacles and constraints to keeping rental prices down and the ability to expand existing stock.

6.4. Greater Financial Risk

There are several factors which act as critical challenges in developing new social housing acting as deterrents for non-profits, private sector and even housing authorities to meet supply needs. Few companies decide to develop for rental purposes given the difficulty in making a sufficient return on investment, especially in northern markets where land costs are high and steady streams of rental revenues may not be fully accrued. This section will provide an illustration of the financial barriers to building a rental housing project and the accompanying relationship between incomes and rents needed to make a project valuable for investors and developers.

The financial challenges that constrain rental housing construction (purpose built and social housing) for non-government entities include high construction and land costs,

and the limited availability of development sites hindered by land use, zoning and competition from developers of strata title housing (Coriolis Consulting, 2017). Affordable housing development is seen as a greater risk to investors given the lack of financial risk return, therefore many lenders are hesitant to lend funding or will do so at a very high interest rate. Smaller developers finance projects through informal sources, revenue-sharing agreements or partnerships. Midscale and larger developers work on projects with substantial economies of scale.

Rental housing will only be developed when a project generates enough return to cover the servicing of debt. The key elements of rental production costs are land construction costs and related soft costs (ie. professional fees for architects, engineers, legal, interest and taxes during construction, various permit and development fees) (Pomeroy, 2017). The main limitation in developing non-market homes is ensuring sufficient profitability to investors while maintaining low and affordable rents. Though the main purpose of affordable and social housing is to keep housing rents low, such projects often do not generate sufficient return on invested equity.

Neither PT affordable housing programs nor lenders will advance financing funds until project approvals are completed and building permits are issued (Pomeroy, 2017). As such, developers often must fund the pre-development expenses included in the hard cost component including professional fees (such as consultants and engineers), legal fees and often land costs (Pomeroy, 2017). By reducing the costs associated with borrowing, through the reduction of the cost of mortgage financing and the expedition of the permitting process, governments can ease the financial burden faced by developers.

6.5. Inconsistent Funding and Regulations

There is inconsistent funding across and within territories, a lack of human resources and absence of procedures that support affordable housing initiatives in the North (Government of Canada, 2019). Federal funding is largely sporadic and uncoordinated, often failing to incorporate a long-term policy initiative. Moreover, enforcement of building regulations, codes and standards are not routinely implemented and regulated across the regions, especially in smaller communities whereby agencies and city planning departments may not be understaffed, and often personal relationships influence the enforcement of regulatory protocol.

To summarize this section, northern communities are by definition rural communities with only the capital cities of Yukon, Nunavut and the Northwest Territories serving as minor metropolitan hubs. Such remoteness poses challenges not traditionally present in urban contexts, including a lack of comprehensive services, poor infrastructure and limited labour. Limited enticements currently exist to incentivize developers, including private, non-profit and First Nations, to build affordable housing. Financial risks are high, and as the following sections will depict, costs to construct are beyond profitable margins. Currently, territorial governments are doing little to innovate their financing, regulatory and development strategies. These, amongst other challenges, decrease the incentive for developers to build low cost and affordable housing. Some degree of free market intervention, risk sharing, and innovative trial and error might aid in fast tracking project delivery.

6.6. Limited Financial Capital

Typically, the risk to cost profile of a development project, whether market or non-market, changes over time. The risk of project failure is large in the beginning stages of a project, thereby making lower financial investment in a project riskier for developers and funders. Once a project moves forward in confirming land, zoning and other aspects, the overall risk profile decreases and financial investment assumingly becomes more appealing (Canadian Housing and Renewal Association, 2014). As such, earlier stage higher risk projects are often done in coordination with larger capital rich stakeholders such as CMHC who can bear higher risk investments.

Financers of public or partnership housing projects bare greater risk, have higher borrowing costs on these projects, are required to purchase mortgage insurance and often have delayed financing process as compared to a market-based project (Federation of Rental-housing Providers of Ontario, 2015). As such, developers will want to leverage their investment by minimizing their fiscal contribution and maximizing borrowing capacity. Rental income cash flow is crucial to financing the debt accrued from development and garnering some form of return on initial investment

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present in urban contexts, including a lack of comprehensive services, poor infrastructure and limited labour. These, amongst other challenges, decrease the incentive for developers to build low cost and affordable housing.

Chapter 7. Policy Problem and Stakeholders

The policy problem present is that there are far too many northern residents on wait lists for affordable housing units and too few units being built in the territories to accommodate the demand. As such, there appears to be a supply side lag in developing units. As noted previously, the cost of constructing and maintaining housing in the North is generally more expensive than southern counterparts. Not only does the remoteness of the region make it difficult and costly to transport construction materials, but it also means constructions is confined to an isolated time window due to weather conditions. Permafrost and freezing also poses a problem when it comes to land levelling and conditioning. Moreover, a shortage of skilled labour in the construction industry in the region also raises total project costs and acts as a hindrance to continuing projects.

There are numerous stakeholders involved in the development and financing of new affordable housing. These stakeholders can be categorized into four categories. The first is the private sector, namely the development community which includes development and private construction companies who vary given project target delivery and procurement approaches taken by the government. The private sector plays a strong role in providing a broad range of housing types along the continuum. Additional private sector involvement from property developers, suppliers, landowners and financiers is crucial. These stakeholders play a key role in both the financing and construction of physical units.

The public sector is another key stakeholder. This includes the federal, territorial and municipal governments. Moreover, provincial and territorial housing providers including local housing authorities and local community associations are involved in the investment and construction of housing. The non-profit sector, including non-government organizations and service providers are responsible for capacity building and non-profit housing asset management. These organizations also have specialized skills and experience in managing funding agreements, fostering capacity building relations with the community, and project design and construction processes. National non-profit housing associations are represented by the Canadian Housing and Renewal Association (CHRA).

Indigenous housing providers also have distinct priorities that must align with First Nations cultural and social needs to ensure affordable housing is built with cultural and locational sensitivity in mind. Based on 2016 survey results, Indigenous populations

comprise 23% of the total population of Yukon, 86% in Nunavut and 52% in the Northwest Territories. As such, Indigenous populations (including self-identified Aboriginal, Metis and Inuit) are key to designing functional, practical and culturally sensitive housing which addresses many deeply rooted issues in these communities. Indigenous government, bands and leadership input are vital to building culturally sustainable communities.

The final, though arguably most important, stakeholder is residents living in the northern regions. This can include both residents occupying affordable housing units, individuals on wait lists or those who are living in proximity to land primed for affordable housing potential. These stakeholders define the characteristics of housing to be built, including number of units and design features, and the pace at which housing should be built to accommodate expected demand.

All of the aforementioned stakeholders have a vested interest in the building of additional units of social housing and the accompanying finance methods. As a result, these stakeholders each have a degree of influence in the policy design process and the eventual effectiveness of the policy outcome.

Chapter 8. Primary Analytical Methodology: Development Financial Analysis

In this study two methodologies are used to analyze the policy problem. The primary methodology is a development financial analysis. The second methodology is a case study of successful tools and approaches to address supply shortages and construction lags. The supply side lag is exemplified by data analysis in previous sections. A financing barrier is exemplified through a sample financial analysis model in Chapter 7. Alternative methods of financing and design beyond the traditional government funded model are provided through case studies from across Canada in Chapter 8. A set of existing policies are evaluated using a criteria and measures matrix to evaluate the most appropriate actions to address the shortage of affordable housing options in the North. These options are then further analyzed in the evaluation section.

8.1. Development Financial Analysis Archetype

Analysis of the costs components to delivering housing in the North is needed to improve the understanding of the contributing factors to procurement and construction, this will be done through a financial analysis in the following section.

Table 7 presents design characteristics for the design and cost of constructing a medium density multi-attached residential project with a site area of 67,826 square feet (sf) and 124 units in total for a community in the North. This building archetype was chosen given the consistency in design with other northern regions, making it an ideal comparator of elements, including material and labor needs, to a general non-market housing developing acts. Bedroom square footage is derived from the BC Housing Social Housing Development Cost Target Framework. The financial model is based on a 6-storey wood framed project archetype. Data is derived from an affordable housing project in northern British Columbia (i.e. the Stikine Region in British Columbia) and indexed at 2 times the value of Vancouver rates to proxy for limited Northern data. It is important to note substantial cost variations will likely exist between the three territories depending on the exact location of a project, however a lack of geographic location factor data makes it difficult to address such variances. As such, it is assumed the values derived can be applied to most northern communities.

Table 7. Archetype for a 6-Storey Project in the North

Summary of archetype details for a 6-storey wood framed project in a northern community	
Number of units	124
Unit Mix	1-bedroom units – 109 2-bedroom units – 13 Accessible unit (1 bedroom) – 2 + 12%
Net size per unit (sf)	1 bedroom – 525 sf 2 bedroom – 725 sf Accessible units – 588
Total Net Unit Area	1 bedroom – 57,225 sf 2 bedroom – 9,425 sf Accessible units – 1,176 sf Total Unit Areas: 67,826
Net-to-Gross Ratio	85%

Development land values are modelled using presently empty lots in Yellowknife, capturing building elements, including lot sizes and valuation price generalizations. The Niven Lake Phase V and Diamond Ridge lots in Yellowknife, zoned for medium density duplex, multi-attached and multi-family residential construction is ideally located minutes from downtown Yellowknife. Lot sizes and location in this project are comparable to land and locational settings for affordable and rental housing projects in the area.

8.2. Limitations

Several limitations exist in the identification and evaluation of conditions in a remote context. The subject of housing in the North is extremely complex in its history, actors and impacts on indigenous and non-indigenous populations. The methods used in this paper cannot fully capture the complexity and impact of historical events on populations.

A lack of comprehensive data on housing, funding and initiatives in the North was the biggest challenge in analyzing and addressing the problem. Data collection in many regions in the North is difficult given the sparse spread of communities, lack of enumerators and limited fiscal resources. As such, this report relies heavily on secondary data and proxy values in an attempt to address the shortcomings. Moreover, the use of unprecise data proxies make cost comparisons to other regions of the country difficult and largely ineffective, given the inexact and unprecise nature. As such, such analysis was not undertaken.

Connecting with northern governments, planning authorities and non-government experts are challenging given the limited staff employed in the regions. As such, this report would largely benefit from further expert and lived experience interviews in the regions. Given research ethics reasons and the remoteness of the populations in these communities, the research was unable to interview populations affected by the problem directly. This study is also limited by the researcher being a non-Indigenous person working on a rural policy problem from an urban context without direct experience or connection with the Indigenous communities studied.

Moreover, traditional financing and procurement options applicable to other regions may not necessarily be appropriate for the North given the complex populations and conditions acting as a large limitation to finding appropriate policy solutions. However, this paper is not claiming to address the entire housing problem in all regions in the north, rather providing aiming to fill the existing research and literature gap on northern issues. It is also worth noting traditional funding and financing analysis of rental housing looks at both the cost of constructing and the net operating income of a project as a basis for loan repayment, however given data limitations, this report will be looking solely at constructing costs.

8.3. Development Analysis

The following section provides a general cost guide for constructing varying multi-unit residential affordable and social housing units in the North through a financial analysis in an attempt to show where the bulk of development costs are concentrated and propose appropriate policy options to aid in minimizing these costs. The financial analysis will model the potential financial performance of a proposed development project which allows a developer to model the financial performance and fiscal feasibility of a project. The analysis can also help inform policymakers on how policy changes can affect the economics of development within a local housing market and also help decision makers identify the most appropriate policies and tools to achieve desired production, affordability and locational dispersion of units.

The following tables provide a financial analysis of the capital costs for a sample affordable housing project built by a non-profit developer, who is assumed to have access to more favourable long-term financing, in a community assumed to be representative of one in the territories. It is worth noting that costs, such as land area, building design and labour costs, may exhibit large variations between regions in the North depending on the exact location. Such differences in construction costs between cities result from differences in costs based on local material pricing and labour rates. Given that maximum return potential on debt is not possible in most non-market housing projects, this analysis aims to conduct a baseline analysis to determine possible adjustments needed in the cost structure to meet a developers (non-profit or for preferred return or minimize overall loss. This will allow policy makers to target tools and incentives to encourage the necessary and desired housing outcome.

Tables 8 and 9 will be looking at the two main components of development costs – hard costs and soft costs. Hard costs are the bricks and mortar costs, such as physical construction costs, and all associated labour and materials costs (Webber, 2017). Soft costs are the professional services, including planners, lawyers, engineers and project managers. This cost component also includes permits, fees, property taxes and financing costs (Webber, 2017). The model can also be used by housing agencies, governments and financiers to provide estimates for required financing costs and revenue potential. The model can will likely be used with a “turnkey” approach whereby a for-profit developer is responsible for construction and turns over the property to a non-profit entity upon completion, though such a model reaps minimal returns to developers and may not be feasible in a northern context. It may also be used by territorial governments to decide grant funding levels. Figure 8 and 9 provide a cost breakdown of the hard and soft costs of constructing a wood framed, 6 storey building with below grade parking. In the absence of costing data on affordable housing in northern regions, the geographic location and site factors are modelled off the Niven Lake V project in Yellowknife as previously mentioned.

Table 8. Hard Costs of Construction

Project Hard Cost (Construction Cost)		Target Hard Cost Calculation	
\$/sq.ft.		Area	Cost
Base Hard Construction Costs (including below grade parking) ¹	\$228	82,514.7	\$18,813,347
Adjustments			
Durability	\$5.00		\$412,573
Design Factors	\$6.00		\$495,088
Shipping ²	\$4.03		\$355,263
Hard Costs/ Sq.Ft.	\$483		
Total Hard Construction Costs/ GLA	\$471		\$38,889,613

Data source: Wilson (2012) and BC Housing Social Housing Development Cost Target Framework template

Table 9. Soft Costs of Construction

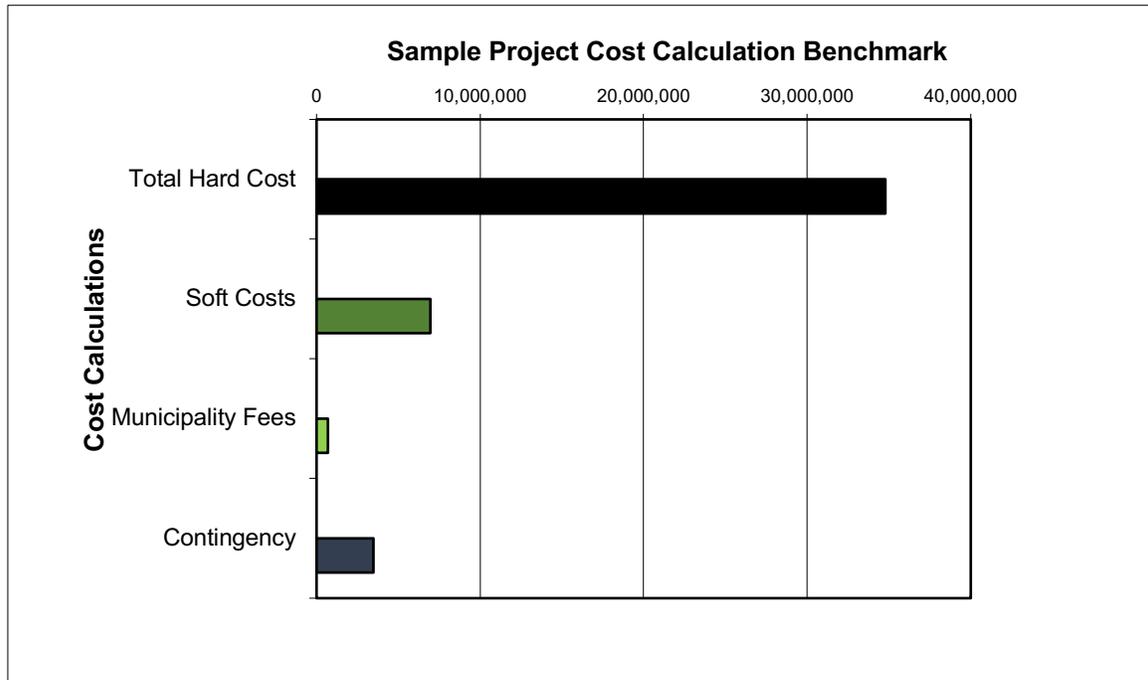
Project Soft Costs		Target Soft Cost Calculation
Utility Fees	1%	\$385,344
Design Consultants	11%	\$4,238,779
Consultants	5%	\$1,926,718
Misc. Soft Costs	2%	\$770,687
Building Start Up/Commissioning	1%	\$385,344
Net Municipal Fees	2%	\$770,687
Net Acquisition and Servicing	2%	\$770,687
Project Contingency	10%	\$3,853,436
Total Project Soft Cost	34%	\$13,101,681
Net Project Cost		\$51,636,036

Data source: Wilson (2012) and BC Housing Social Housing Development Cost Target Framework template

¹ Base hard cost calculations are indexed at 1.45 off Vancouver costs. Geographic location costs account for 45% of total cost additions in hard cost calculations.

² Authors calculations assume 900 cubic meters of building material are being shipped. Calculations are derived from the following costing: shipping 190 cubic meters of material from Edmonton to Yellowknife = \$7,500.

Figure 5. Sample Project Cost Calculation Benchmark



Source : Authors calculations and BC Housing Social Housing Development Cost Target Framework template

8.4. Summary of the Analysis

The emerging desire to build distinct, amenity rich and environmentally conscious affordable and public housing units has limited the reach of public government funding, limiting the number of units that can be built. The financial analysis allows for developers to compare building size, material and efficiency between affordable housing projects across the territories. Overall analysis depicts real estate development in the North as a costly and capital-intensive business with the bulk of the cost appearing to be hard cost factors pertaining to design, construction materials and labour. As such, larger scale development of new affordable housing units for those in the low-income bracket (making below \$50,000 annually) will only be developed if the following hard cost conditions are addressed:

- 1) Construction costs per unit are decreased
- 2) Land is provided for free or at a very low rate by local and territorial governments
- 3) Build with housing developers (either public or private) who are content to receive a project management fee, while the investor is

willing to accept a relatively low return on investment and are not compensated for risk to the same extent private lenders are used to (Coriolis Consulting, 2017).

Changes to construction practices, such as prefabrication and modular design, as well as financing strategies can disperse financial benefits and extend financial contributions by developers and funders to create more units. Freeing up surplus government land and allowing for less expensive low-rise construction projects could substantially reduce the hard costs. Another possible cost saving measure could include off site or prefabricated construction which would reduce the construction cost component of hard costs. The evidence shows that delivering affordable rental housing requires a combination of free land, favourable financing rates, innovative construction and possibly other assistance mechanisms such as grants or investing CAC revenue to offset housing costs (Coriolis Consulting, 2019). Total values should be compared with non-rural region for cost comparisons, however given the estimative nature of the figures in the analysis, a valid and accurate comparison is not possible.

Following sections of the paper will review case study options used by non-profits, local governments and the private sector to minimize both hard and soft constructing costs, particularly land, labour and capital, in order to incentivize further build and extend the reach of existing fiscal capital in the region.

Chapter 9. Secondary Methodology: Case Study

The sections to follow will be looking at several innovative cases of financing and construction used to address the existing design, regulatory and financing challenges which act as hindrances to housing development, as confirmed by the financial analysis of a project in this section.

Currently the public sector alone does not have the capacity to build affordable housing for low-income households given limited existing federal and territorial non-profit housing programs. Financing from banks and other lenders for high risk rural project are hard to come by for non-government backed entities. Similarly, the private sector will not be incentivized to build given the substantial barriers contributing to high construction costs, as evident in analysis conducted in previous sections. Therefore, the situation created by government withdrawals requires the need for innovative solutions. The following case studies are reviewing available public and private social housing supply side expansion tools, including innovative construction and financing approaches, and providing a successful case study for each method which may be applied to a remote context.

The purpose of these case studies is to gain insight into the range of innovative financing, partnership and construction approaches that could be viable to expand the supply of affordable housing in the territories. Table 10 summarizes the profile of housing identified in the case study review. It is worth noting a major limitation with design and financial arrangements is the difficulty in replication from one jurisdiction or program to another given the variability in application and absence of a standard structuring formula. Although financing poses one of the most significant barriers in addressing the difficulty to develop housing, little to no alternatives beyond government backed lending and financing exist, therefore the issue was not addressed in the case studies. For that matter, the case study analysis looked at design alternatives to minimize cost under the existing finance structure available to borrowers.

Table 10. Housing Projects and Initiatives Profiled in Case Study

Initiative	Challenge Addressed	Project/ Program Name	Location	Actors	Number of Units	Tools Used
Off-site construction	Labour shortage High land costs Shortened construction timeline	Sustainable Northern Shelter	Anaktuvuk Pass, Alaska, United States	Federal government, non-profit sector	2-unit prototype	Design and operational savings, community labour
Rural Umbrella Organization	Asset management Capital availability Regulatory coordination	Lower Columbia Affordable Housing Society	Trail, British Columbia, Canada	Non-profit organizations, local gov	9 units	Fiscal partnership, education, community labour
Land Leverage Initiative	High land costs	Federal Government Land Bank	Canada	Federal gov, developers (private and non-profit)	Varies	Fiscal partnership, community labour and education

9.1. Off-site Construction

Modular or prefabricated construction options are manufactured in factory-controlled conditions and shipped to the construction land site as individual sections or a whole to be installed and completed in the final destination (CMHC, 2018). This construction option includes a host of cost saving measures, particularly prime for a remote context. With construction cost to profit ratios being incredibly high in the North and significant Northern specific barriers raising costs, such as weather conditions, labour and infrastructure gaps, off site construction options increase both cost effectiveness and sustainability, which have both proven to be large hard cost factors.

Firstly, modular and prefab projects can be constructed year wide, thereby potentially compressing construction periods and reducing fees associated with weather delays and extreme temperature conditions. In fact, recent modular projects have been successful in accelerating project timelines by 20 to 50 percent by enabling year-round construction (Bertman et al., 2019). A modular construction project eliminates site restoration and building construction times within a traditional construction project. It is worth noting there are varying degrees of prefabrication, with some modular projects not requiring any building construction and can be simply tethered to the lot, while others may need partial labour-built construction. Regardless, this option decreases construction schedules exponentially.

Another significant benefit of this approach is the specialized labour cost saving potential compared to traditional construction activity. The outsourcing of labour and material procurement may address the difficulty in acquiring appropriate labour in the northern regions, thereby speeding project delivery times and also minimizing costs. Meanwhile, though transportation and logistics costs increase with this method, cost saving measures outweigh the potential cost increases. Modular projects tend to deliver the greatest savings to projects that have a high proportion of labour-intensive activity and greatest level of repeatability (Bertram et al., 2019). As such, student accommodations, hotels and affordable housing provide the greatest cost savings from this method, while high end apartments and office buildings provide low cost savings (Bertram et al, 2019). Should real estate developers be ready to optimize for scale, they could realize more than 20 percent construction cost savings (Bertram et al., 2019) specifically in rural communities.

A successful example of this design delivery applicable to a rural context is the Sustainable Northern Shelter project designed and constructed by The Cold Climate Housing Research Center (CCHRC), an industry based non-profit operating in Fairbanks, Alaska. The organization is mainly focused on facilitating development, use and testing of cost-effective buildings and technologies for people living in the circumpolar regions.

This project produced a prototype home in Anaktuvuk Pass, a community in northern Alaska. A test module made with steel framed flooring was constructed in four weeks during the summer of 2009 (Cold Climate Housing Research Center (CCHRC), n.d). The pre-assembled steel framing is a form of offsite construction whereby frame components are prefabricated and delivered to sites to be constructed in a short period of time ranging from days to several weeks. Project labour was accrued from Illisagvik College and trained by the organization's staff and local northern college instructors, thereby decreasing labour costs while increasing specialized local training in remote northern communities. The total construction costs were roughly \$250,000, costing less than half of conventional construction costs for the area (Cold Climate Housing Research Center (CCHRC), n.d).

9.2. Rural Housing Umbrella Organization

A housing umbrella organization is a non-profit and non-partisan entity comprised of a variety of stakeholders, including agencies, groups committed to housing, local bands and Indigenous individuals. The organization may serve to create affordable housing units through direct financing, as well as property management and analysis services. It may also provide support services to members to undertake education, advocacy and action through a variety of forms (ie. Meetings, newsletters, workshops, website etc.) (Lutherwood, 2020). The pooling of resources offers organization members the opportunity to achieve an economy of scale typically available to larger organizations by pooling investment funds to achieve higher returns or participate in bulk purchasing networks (Svedova, 2009).

Currently, a single umbrella organization exists in the territories. The Tunngavik Federation of Nunavut directly represents the Inuit population in Nunavut. Though the group originally began with the sole purpose of land negotiations and treaty settlements, the organization's services have largely expanded since. They have recently begun consulting the idea of dipping in their financial reserve to build affordable housing in Nunavut, though this would not solve the overarching Northern wide housing crisis.

In most cases, affordable housing is most likely to be produced by or in conjunction with a non-profit group who hold funds and monitors the development and rental processes (BC Housing, 2019). These organizations, however, are extremely costly and require many years of inter-governmental and community support to break ground. Often smaller communities are unable to support such larger scale initiatives, however a housing umbrella organization serving several communities in a region may be a feasible option as they would be better equipped to generate capital from multiple community projects. There must be extensive work with local governments to secure seed funding to begin the financing of projects and generate a form of income from rentals.

An example of a rural housing umbrella organization is the Lower Columbia Affordable Housing Society based in the rural communities of Trail and Rossland, BC. The Society was created in 2013 as part of an Attainable Housing Committee of the Lower Columbia Community Development Team Society. Funding is access through non-profit groups (such as Columbia Basin Trust), housing organizations (BC Housing), federal government

funding and some funding from financial organizations (Kootenay Savings Credit Union) and the private sector (Teck Metals) (BC Housing, 2019). The society currently owns 9 units of affordable rental housing (and one unit rented at market rents), with additional projects in the process of being developed (BC Housing, 2019). The group recently began undertaking a new project, which is lower scale in terms of development capacity but remains within the small-scale scope of the rural or remote organization. The group purchased a lot near a walking route, set to host a home with two single bedrooms and two two-bedroom apartments (BC Housing, 2019). A total of 9 additional rental dwellings will be available. It is worth mentioning this case study differs in applicability to the North given the overall lack of Indigenous involvement in consultation, design and financing aspects in the proposed case study.

9.3. Land Leverage Initiative

Another hard cost saving solution might be a land leveraging program operated by a territorial government which makes government land available to housing developers at little to no cost. Land leveraging programs transfer the ownership of federal, provincial, territorial or municipal developable lands to small and mid-sized non-profits and developers who will then leverage existing assets to redevelop new housing. Several similar programs already exist on a provincial level across the country, including the transferring of city-owned land as part of British Columbia's Non-Profit Asset Transfer program and Toronto's 'Housing First' policy. Though the price of land in the North is not as high as markets such as Vancouver or Toronto, it would still take enormous capital investments to buy land at market value and make it available as affordable housing. As such, this initiative would remove the land cost component in the model while putting underutilized land to use.

Most projects, even when land costs are assumed at zero, exhibit a negative 10-year return on investment (CMHC, 2017). However, analysis found investment in purpose-built project to be most attractive if they are small investors willing to build small projects using their own labour or if the project is a site that can be intensified (e.g. excess land on an existing rental site) (CMHC, 2017).

A successful example of land leveraging on a larger scale is the federal governments Federal Land Initiative, introduced by the Government of Canada as part of

the 2018 National Housing Strategy. The \$200 million strategy supports the transfer of surplus federal properties across the country to applicants at little to no cost to encourage further development. Surplus locations are evaluated in a thorough cost benefit analysis with location, suitability and proximity to services being key variables compared. Properties available for sale or offer are advertised on the CMHC website open for applications by affordable housing providers, including for and not-for-profit developers and housing corporations, with the condition that lands are exclusively used for social and affordable housing development.

To summarize, this chapter outlines several case studies from within Canada that can be adapted to a Northern context to individually minimize the three main hard cost components prevalent in the prof-forma, labour, locational and financing complexities. An understanding of the various innovative design and financing approaches is key to understanding barriers to further development and opportunities for advancement. The aforementioned financing and design options may not be long term solutions to the existing problem, however, may act as a minor solution in the case of long waitlists and overcrowding as people wait for additional public housing units. These options can act as an intermediary solution between current deplorable housing conditions and future anticipated public housing under construction. It is worth noting however, these options do not entirely encompass the importance of culturally sensitive design given that they may differ by community and accompanying culture and traditions. Moreover, the cost and architectural design of such culturally appropriate housing is beyond a policy framework and better encompasses structural design analysis. Nonetheless, all initiatives must be considered in consultation with Indigenous bands to ensure cultural conformity.

Chapter 10. Policy Options and Evaluation Criteria

The short-term policy goal is to decrease land, material and labour input costs. While this paper is not advocating for the complete downloading of housing responsibility to the municipalities, territories and private sector, alternative tools or incentives should be considered to prioritize building new housing. The long-term goal is to facilitate partnership strategies to standardize regulatory, financial and design tools across the North. This chapter presents three policy options considered for analysis, as well as accompanying evaluation criteria and measures.

10.1. Policy Options

Though affordable housing build is already typically of fairly modest quality, there is limited potential to decrease costs of key inputs – land, material and labour (Pomeroy, 2017). The policies suggested are not solving the housing supply shortage but rather improving unit delivery mechanisms by private sector developers and public and non-profit sectors. The policies are aiming to 1) bring down the cost of construction (particularly hard costs) to build more units within the existing budgetary allocation, rather than just subsidizing additional unit construction and 2) provide a more coordinated approach to public and non-profit housing delivery which replaces the currently decentralized approach currently in play.

As always, a successful policy should be ratified by Indigenous Chiefs and Councils, as well as community members. Effective consultation with community and Indigenous groups ensures successful implementation and compliance with policies.

10.1.1. Option 1. Off-site Construction

The first policy option is off-site construction housing design options. This policy would address the land, labour and capital cost components raising the hard construction costs in the North, as depicted in the development analysis, while increasing the speed of construction to address the shortage quicker. The two main off-site construction models, modular and prefabricated housing, differ marginally in terms of costing break down, however ultimately both will reduce the costs of construction and the construction schedule in an already compressed timeline.

Although most construction in the North is done on-site, off-site construction options, such as manufactured homes, modular construction and prefabrication of housing frames and walls present opportunities to reduce hard construction costs. Off-site construction can result in quicker construction, higher quality control, greater hard cost estimation certainty and easier project management. Lot servicing and construction can also be done simultaneously with an off-site construction method, thereby decreasing overall project construction timelines (as depicted in figure 7), which is particularly advantageous in a Northern community where climates limit construction periods and labour is both costly and difficult to acquire. In fact, modular construction may decrease construction times by 30 to 50 percent with no reduction in building quality (Horizon North, 2019).

This option is particularly prime for reducing costs in remote and rural regions, though they introduce challenges in terms of shifting economic benefits pertaining to labour outsourcing as prefabricated and partially complete modular projects are largely built off-site outside of the territories. The option also does not remove the hard costs of material transportation; transportation of units are done via flat-bed trucks and require serviced roads, thereby requiring substantial infrastructure investments to bring safety and accessibility improvements to rural and remote communities prior to unit delivery.

Some regions in the North have begun experimenting with innovative unit design beyond the traditional approaches used through pilot studies and contract proposals. The Northwest Territories, for example, have already put out contracts for 11 duplexes, some modular and others stick built. The Nunavut Housing Organization has also begun conducting a pilot study into the construction of affordable housing options beyond the traditional methods of build and finance that have been used in the territory for decades, however Nunavut, Yukon and Northwest Territories Housing Organizations have not yet conducted any studies or financing pilots to measure the effectiveness of such options economically and socially. Therefore, should this option be undertaken, it should be accompanied by a territory wide pilot study with input by each individual housing organization on the cost effectiveness of constructing affordable modular and prefabricated housing.

Moreover, for this policy to be fully successful in terms of minimizing speed and cost, there must also be revisions done to municipal coding regulations. Many provincial

and territorial building codes do not have building codes specific to modular and prefabricated housing, therefore the building code standard process must be revised to accelerate modular housing construction and building code inspections. Preapprovals and provincial/territorial policies minimize unforeseen cost overruns and some of the bureaucratic and financial hurdles faced by developers (Thompson, 2019). As such, these projects would also be amenable to public-private partnerships. Pilot studies and contracts for this option in individual regions have begun to become common place in certain northern regions, thus making this a short term option.

10.1.2. Option 2. Creation of a Rural Housing Umbrella Organization

The second option is to create a rural housing committee or umbrella organization with equal representation by all territorial governments and housing authorities.

A housing umbrella organization or committee is a non-profit entity purposed to provide and manage non-market rental housing for qualifying individuals (BC Housing, 2017) and can include several non-profits and housing providers. Umbrella organizations, like housing committees, are provincial or territorial organizations comprised of non-profit housing authorities, businesses, individuals, partners and stakeholders. These differ from housing agencies and other housing organizations in that they are made up of community stakeholders, including a combination of public, private and non-profit, who are coordinated by the city and report to council and Indigenous bands. Umbrella organizations have been found to increase collaboration, communication and advocacy with governments (Carroll and Jones, 2000), while larger umbrella organizations also provide skill building opportunities pertaining to financing and construction to members and applicants.

Affordable housing developments are often stalled in communities due to the spreading of responsibility of creating units across far too many stakeholders. Therefore, by unifying the stakeholders under a single umbrella organization, this option would concentrate responsibility under one entity dedicated to the production and protection of housing stock in the territory with the efforts of all stakeholders coordinated under that entity. These organizations or committees must secure seed funding prior to plan conception. Once seed funding is acquired, typically from a level of government or regional

housing organization (ie. CMHC, NWTHC, YHC or NHC), the group must develop a business plan and acquire units and properties accordingly. Beyond the initial grant funding, the group will not require ongoing subsidization or funding and will ideally achieve self-sufficiency in a few years. In smaller communities in the territories, smaller organizations may not be feasible, therefore an overarching regional organization serving several northern communities might be more feasible. Rental fees in the case of the Trail project case study covered mortgage debt, fund property management and capital replacement reserves (BC Housing, 2017). This option does not increase supply directly and will be long term given the need for collaboration across all regions, therefore is a long run solution.

The City of Yellowknife and key stakeholders in the region have already recognized the need for collaboration on the creation of an affordable housing organization in a roundtable conducted in 2015. If implemented, this option would be an “arm’s length stand-alone non-profit organization” (City of Yellowknife, 2009) possibly owned or partnered with the city but independent of any departments. The group would be required to create non-market housing without the aid of government subsidies and administer restrictions, thereby keeping homes affordable over time.

10.1.3. Option 3. Territorial Land Leveraging Initiative

The current Federal Lands Initiative reviewed in the case study could be expanded to create a similar initiative on a territorial level. This option would release underutilized and surplus Commissioners land and municipal land parcels owned by territories and cities on 99-year leaseholds. Land would be sold to private or non-profit developers at below market value rates in exchange for a promise to build non-market housing, thereby reducing the land component of the base hard cost component of the financial model.

A similar initiative to the federal program presented in the case study has been undertaken by the provinces of Ontario and British Columbia. Land undergoes an eight-step evaluation process, including Indigenous consultations, environmental/physical condition assessments and pre-zoning, before being released to developers to build and maintain affordable housing for no less than 25 years.

This option recommends the territories and major cities in the region, who are the largest landowners in the territories, take stock of the government and city owned housing in the regions. This option will be long term given the time needed to accumulate land stock and devise a distribution strategy, including the land bid evaluation rubric.

10.2. Evaluation Criteria

This section provides an analytical framework used to evaluate each policy option in order to determine the most appropriate course of action. Despite the differences in each proposed option, a consistent assessment criterion helps evaluate the trade-offs and limitations. Table 12 outlines six equally weighted criteria that have been identified. The weights of the different objectives are considered to be equal when ranking policy options. The time frame for evaluation is in the short term.

Table 11. Evaluation Criteria and Measures

Objective	Criteria	Measure	Rating
Effectiveness	Will the policy address unmet affordable housing supply needs in the short run?	Projected impact on decreasing construction factor costs and increase speed of housing delivery	Low unit cost and high-speed supply delivery = HIGH (3)
	Does the decrease factor costs related to constructing?		Moderate unit cost and supply delivery = MEDIUM (2) High unit cost and no impact on supply delivery = LOW (1)
Effectiveness Total/2= Score			
Ease of Implementation	What is the ease of implementation?	Degree of change required to existing private and public management and building practices	Minimal complexity (little to no changes) = HIGH (3) Moderately complex (some changes) = MEDIUM (2) Highly complex (many changes) = LOW (1)
	Would private and public actors require additional training?	Degree of public training required	No additional training required = HIGH (3) Some additional training required = MEDIUM (2) Significant additional training required = LOW (1)
Ease of Implementation Total/2 =Score			

Objective	Criteria	Measure	Rating
Cost	What is the impact on public and private budgets?	Change to project building financial analysis and agency operating costs	Proven substantial savings in building analysis or total operating costs = HIGH (3) Some savings in building analysis or total operating costs = MEDIUM (2) Little to no savings in building analysis or total operating costs = LOW (1)
Stakeholder Acceptance	Is this policy acceptable to relevant stakeholders? Different levels of government For profit and non-profit housing developers Residents in the territories	Extent to which stakeholders will accept the selected policy practice	Strong support from key stakeholders = HIGH (3) Moderate support from key stakeholders = MEDIUM (2) No support from key stakeholders = LOW (1)
OVERALL TOTAL: /15			

10.2.1. Effectiveness

As mentioned throughout this report, existing policies are not increasing the stock of housing at levels needed to address substantial unmet need. The first criteria, effectiveness, measures the impact of policy options on expanding affordable housing stock using existing fiscal resources. The potential policies effectiveness would consider results and financial analysis from other jurisdictions, including the implementation process (policy changes and enforcement) and cost framework.

There are two criteria considered in this objective. The first criterion assesses the degree to which the policy implements innovate financing or construction solutions which can be effective in expanding stock in the short run and reducing core housing need. The second is the projected impact of the option on reducing factor costs related to construction. Policies can be measured by assessing the unit costs, number of units delivered and delivery timeline.

A policy that received a “low” ranking is predicted to have high unit cost and no effect on minimizing supply delivery, a “medium” ranking is expected to have a moderate

impact on price and speed, and a “high” ranking is predicted to produce units at low costs with high speed supply delivery.

10.2.2. Ease of Implementation

This criterion assesses the ease of implementation to implement or administer each policy option. Two criteria were considered in this objective. The first criterion evaluated the ease and speed of administration as measured through the degree of change required to existing building and management practices. A policy receiving a “low” ranking is expected to have require many changes to management practices, a “medium” ranking is expected to require some changes, and a “high” ranking is expected to require little to no changes.

The second measure is the degree of additional training required to implement new design or programs by both the private and public sectors. A policy receiving a “low” ranking is predicted to require significant additional training, a “medium” ranking require some additional training, and a “high” ranking is considered not to require any additional training.

10.2.3. Cost

Cost is central to this report, with the minimization of factor costs being key to addressing the policy problem, however determining exact cost considerations for all levels of government is not possible for this research. This policy assesses the upfront hard and soft capital costs savings from implementing the options and administrative costs required to start the new organizations and programs. This option assumed at the degree to which the policy reduces public administration fees and delivery costs based on existing budgetary non-market housing allocations in each respective territory.

A policy receiving a “low” ranking is predicted to have little to no savings in pro-forma or total operating costs, a “medium” ranking is expected to exhibit some savings in pro-forma or total operating costs moderate impact, and a “high” ranking depicts substantial soft and hard cost savings in pro-forma or total operational costs.

10.2.4. Stakeholder Acceptance

This criterion estimates the acceptance of the policy by relevant major stakeholders. Stakeholders for each option may differ given the policy problem. Findings from the literature will aid in informing the measurement and degree of acceptability by key stakeholders, namely renters, for profit and non-profit developers and all three levels of government.

A policy receiving a “low” ranking predicts no support from key stakeholders, a “medium” ranking predicts moderate support or acceptability by key stakeholders, and a “high” ranking predicts strong support by stakeholders.

Chapter 11. Evaluation of Policy Options

This chapter covers the analysis of three policy options with evaluation of the criteria. Results of the analysis are summarized and ranked in table 13.

11.1. Analysis of Policy Option 1: Off-site Construction

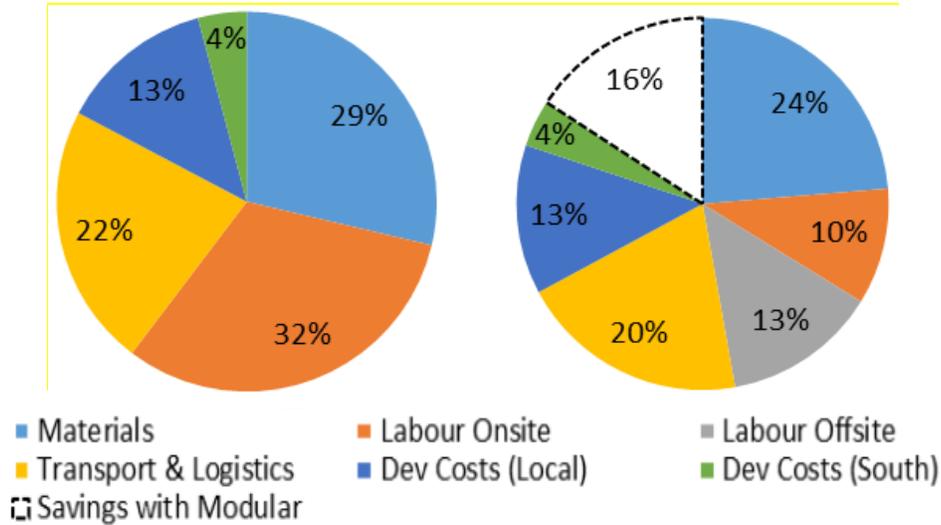
Off-site construction options, such as modular and prefab, have proven to be effective in combining a high level of quality, sustainability and innovative techniques as a means of delivering new housing. Though the case study option in Alaska is not an isolated case of off-site construction, it is a unique application of the strategy to a cold climate with -32-degree weather and innovative use of local labour to reduce soft costs while increasing speed of delivery and lowering rural shipping costs. Given the similarity in weather conditions, this option would be effective in addressing the climate related issues pertaining to building in the North within existing housing agency and government budgets.

In terms of costs, off-site construction has been ranked as high with respect to working within existing government budgetary impacts due to the modest reduction in land, labour and capital costs. Modular construction can encompass a variety of design approaches from individual unit completions to fully complete structures. Such projects present an opportunity for up to 20% cost savings by decreasing design, site overhead and material costs (Bertram et al, 2019). When applied to remote contexts in the North, CMHC found modular construction would result in 16% hard construction cost savings. As depicted in figure 8, much of this construction cost savings comes from a reduction in onsite labour and partially shifting some of the construction activity offsite. There is also a minor decline of 5% in development costs which is a soft cost component.

Moreover, this option could allow for private and public developers to partner with local educational institutions to incorporate local student labour in the development process, including institutions such as the Nunavut Arctic College, Aurora College and Yukon College. This serves the main purpose of decreasing labour costs, while also aiding in advancing educational opportunities in local communities and incorporating local Indigenous labour in projects. This may, however, add to administrative complexity and

require a degree of additional training on the part of local city staff and local educational institutes.

Figure 6. Modular Housing Construction, Site vs. Remote Community, 2019



Data source: CMHC, 2019

Currently, financing for these projects is done at a higher rate given the perception of risk, compared to traditional on-site building options. Further government adoption of off-site manufacturing in public projects will help alleviate the perception of risk by lenders (Bertram et al, 2019). Local governments can also aid in cost reductions by pre-zoning portions of cities for prefab and modular housing purposes and modernizing existing building codes. This would not only incentivize further construction but would also expedite the approval process and reduce inspection related costs.

This option ranks as medium for ease of implementation. Several rural construction and development companies have analyzed the different methods of offsite construction and have begun using these projects for their customers across western and northern Canada. Though none of these projects are multi-unit residential projects, they have been approved by city councils for zoning approval in certain jurisdictions, thereby making it rather simple to replicate in similar geographic and cultural contexts.

In terms of stakeholder acceptance, there appears to be no steady consensus by territorial and municipal governments in the territories regarding fiscal benefits off-site construction. Certain governments have been vocal regarding their opposition; the Nunavut government has voiced its opposition to prefabricated government projects given

the loss of local labour. With government contracts in Nunavut and the Northwest Territories stipulating the need for Inuit employment in contracts to build any government facilities, this option would substantially diminish the need for local employment in construction (Brown, 2019). On a federal level, CMHC, a core affordable housing funder, has advocated for the advantages of prefabrication and modular for rural communities specifically. Other municipalities, such as the City of Yellowknife, have begun undertaking pilot studies on the applicability of modular and prefabricated housing in their cities.

Horizon North, one of the largest developers in the northern regions, has also advocated for the quality assurance, cost certainty and suitability of modular construction over site-built (Horizon North, 2018). Moreover, Nunavut Qikiqtaaluk Corporations construction management company, Bird Construction, has shown their indirect support for modular housing by owning shares in Canadian based Stack Modular. Overall, it appears the private sector is supportive of this innovative approach.

The creation of a territorial wide pilot study reviewing the implementation methods, needs and constructing of modular housing can supplement the off-site construction option. Such a study may also take a longer period of time, though current pilot study work has begun by the Nunavut Housing Corporation. However, based on limited previous examples of modular and prefabricated housing in both rural and remote regions, this option is expected to significantly address unmet need sheer number of units that can be built at a discount compared to traditional building, as such stakeholders responsible for construction can put the savings into further construction or management.

11.2. Analysis of Policy Option 2: Territorial Land Leverage Initiative

The second policy option is a territory wide land leverage initiative. The initiative, modelled after the federal example, would require several steps before releasing land to be used by developers. Firstly, property that is no longer needed would need to be identified by the city or territorial government. Next, respective property owners would need to perform due diligence on the property (Indigenous consultations, environmental/physical condition assessments etc) (CMHC, 2018) prior to release. The land would then need to undergo a cost benefit review, as well as rezoning or pre-development work done by the territorial or municipal governments. At this point, land

would be available for sale through the database and applications would be accepted and rewarded. Given the lengthiness of this process, which could take years, this does not act as a short-term solution to the supply shortage. This option could be used for a longer-term remedy (given the 25 years condition provided to developers and managers) but would not be effective in the short run.

In terms of costs, the territorial land initiative is ranked medium in the criteria due to the ability to decrease the land portion of factors related to hard costs. This initiative would provide land at little to no cost to developers and housing agencies, thereby decrease the hard cost component of the financial model. This option is also best suitable for smaller communities whereby land is less valuable than urban regions. Currently, the federal equivalent to this program has a government budget of \$200 million over a 10-year period. Based on a generalized calculation, barring any hard calculation data, I would assume an implementation of this option in a Northern context would be a fourth of the cost. For the aforementioned reasons, I found this to be a moderate option in decreasing costs to funders and developers to further incentivize builds.

Regarding ease of implementation, the option can be operated by the territorial governments using the existing resources and would not require additional actors or partnerships; however, it would require extensive partnership between the existing land use departments across the territories. These groups have proven to be extremely underfunded and staffed, as such this option may not be feasible given limited existing resources. Moreover, a territorial land initiative would require government land pricing policies to be revised to include the transferring of land to non-profits and other territorial government which may not be accepted by government entities, nor possible under legally binding land agreements with certain Indigenous groups and the territories. This option requires legal expertise and consultation to ensure conditions for land transfer are clear and resilient to changes (BC Housing, 2018), thereby prolonging project delivery timelines.

Stakeholder acceptance wise, a territorial land initiative ranks medium for this criterion. Currently, decision making by governments and organizations responsible for land use management and construction are largely disconnected. This option, as well as the housing committee, would require cross-jurisdictional and cross-governmental collaboration that extends beyond territories borders which prioritizes local government commitment and cultural practices in constructing new housing options.

The government of the NWT has already engaged in many initiatives that support the modernization of the management and sustainability of land pricing policies (Government of Northwest Territories, 2017). As such, it is assumed other territorial and local governments would be responsive to a land initiative so long as lot pricing recovers government costs and does not disrupt existing markets. A key concern to residents, particularly Indigenous groups, would be the impact of land division and pricing on future land claim or treaty land entitlement agreements. This policy is ranked as medium due to the lack of support amongst residents and Indigenous groups, despite the support expressed by government stakeholders and developers.

11.3. Analysis of Option 3: Rural Housing Umbrella Organization

The third policy option is a territory wide umbrella organization. Currently variations of a housing umbrella or committee have already been proposed by some regions in the North experiencing a housing crisis, namely Yellowknife. An affordable housing umbrella organization would consolidate existing stakeholders who will manage the production of non-market housing, with funding and decision-making being concentrated in a single entity.

In terms of cost reduction, by bring together community partners from across the northern region to assist in the servicing of debt by providing equity to purchase land and buildings outright. Given the limited supply of staff in many government departments in the North, this option would also allow for the pooling of resources where appropriate, thereby decreasing administrative costs.

With respect to implementation complexity, the organization could be created using existing seed funding options through the City of Yellowknife and City of Whitehorse, as well as CMHC and territorial housing corporations (City of Yellowknife, 2009). Given the complexity in acquiring seed funding and coordinating resources between cross-jurisdictional members of the housing committee, this option has been ranked as medium complexity to implement. Housing committee or umbrella organization would also need to include consistent training for all staff and organizations involved in the new partnership to ensure consistency in the approval, financing and design process across all regions.

This option would require securing seed funding to create the organization and a business model which outlines ongoing organization funding. Given that there are existing housing organizations across the territories, this would require a board appointment from each region and shared funding model. Given that many of the stakeholders required for this option are already active and committed to expanding housing options (including housing authorities and non-profits), this option could be coordinated in a timely manner. However, implementation is dependent on collaboration of several cities and councils across the North to create a single housing committee.

This option would require extensive collaboration from various levels of government across major areas in the North with housing need. This would also require coordinated research, inter-agency collaboration and overall pooling of resources and expertise which would be difficult and would be done in the long term. This option would also require municipalities and affordable housing agencies to establish clear and consistent methodologies for assessing anticipated supply and demand, as well as agreed upon targets and projections.

Developers would appreciate a housing committee given the consistency in funding and land use assessment methodologies. However, this option would likely require monetary contributions by developers to cover remaining costs that cannot be covered by non-profits and housing organizations on the committee board (such as the Teck monetary donation in the Trail, BC case study). This could be feasible given the private geologic resource industry groups concentrated in the region who may partner on organization boards. Moreover, it is likely that housing authorities would support this option. Such an option could provide housing groups who may have the land but not the expertise or resources to build (ie. Indigenous bands) with capacity building training and education tools through coordinated partnerships and training resources, including workshops and resource guides, thereby increasing acceptability. This policy is ranked as medium for stakeholder acceptance given the difficulty in coordinating resources, including staffing and finances, within the organization and with donors.

Table 12. Policy Option Evaluation

Objectives	Criteria	Option 1: Off-site Construction	Option 2: Territorial Land Initiative	Option 3: Rural Housing Umbrella Organization
Effectiveness	Will the policy address unmet affordable housing supply needs in the short run?	High (3)	Medium (2)	Low (1)
	Does the decrease factor costs related to constructing?	High (3)	Medium (2)	Medium (2)
Total/2		3	2	1.5
Ease of Implementation	What is the ease of implementing the policy?	Medium (2)	Low (1)	Medium (2)
	Would private and public actors require additional training?	Low (1)	Medium (2)	Medium (2)
Total/2		1.5	1.5	2
Cost	Can the policy be easily implemented within the existing structure of government actors and partners?	High (3)	Medium (2)	Medium (2)
Stakeholder Acceptance	Is this policy acceptable to relevant stakeholders? Different levels of government For profit and non-profit housing developers Residents in the territories	Medium (2)	Low (1)	Medium (2)
Total/15		9.5	7.5	7.5

11.4. Recommendation

Analysis of the three options in table 13 indicates that overall off-site construction has the greatest advantages when compared to the other two options. Off-site construction excels in budgetary impacts and effectiveness. The option approves to decrease construction cost and can easily be implemented within the existing governance and partnership structure. A key weakness of off-site construction is the need for additional training by local educational institutes for labour and local city staff with respect to zoning and regulatory approval for this relatively novel idea.

The territorial land initiative and umbrella organization were equal in terms of ranking. The main issue with the two options is the longer-term nature of addressing the issue and the difficulty in implementing given the need for support from various stakeholders.

Based on the analysis, I recommend the implementation of off-site construction as a key design priority for housing organizations and developers, beginning with a territory wide pilot study by each housing authority. To truly be effective in the short-term, this option must be accompanied by policies and regulations which pre-zone high demand areas for modular and prefabricated construction and coordinate with local education institutes to ensure maximum cost reduction opportunities and maintenance of cultural integrity in northern regions. This option saw minor opposition by territorial governments due to the concern in local labour loss, however initiatives in partnership with local colleges and universities focusing on trade could remedy this concern. It is worth noting this option does not fully address the funding concern, therefore this option would be best implemented under the existing status quo funding mechanisms through CHMC and territorial governments.

All three policy choices assessed could be done collaboratively. Overall, a housing committee would also be a solid option to accompany off-site construction. A housing committee, despite being on the radar of some territorial governments, would require strong public and private sector collaboration which would not be done in the short run. As such, this would be a long-term solution. Similarly, a territorial land initiative would require consolidation of resources which also be in the long term. In the short run, off-site construction would be the most effective, both in terms of cost and achieving the supply concern.

To reiterate, the problem that motivated the research is the severe shortage of affordable housing options in the territories. Analysis of housing supply and demand depict a severe shortage of affordable housing. Moreover, financial cost analysis shows that hard costs are the largest factor in new housing development. With government funding shortfalls, there is a need for innovative construction and financing methods to reduce overall costs, particularly the hard costs of constructing in the North, reduce dependency on government funding and incentivize innovative development methods.

Chapter 12. Conclusion

In this report I outline that the current supply of affordable housing is not meeting the current demand in the territories. There are long waitlists with substantial proportions of the Northern population reliant on market and public rental housing.

The development financial analysis indicates that hard construction costs, mainly land, labour and capital components, are exponentially higher than those in other regions due to several region-specific factors. I then review case studies of programs and design options across the country that may minimize hard cost components, specifically in a Northern context. I analyze policy options based on applicability to the territories and find modular housing would be the most appropriate for private and public developers to reduce both hard and soft cost components. The other two options explored, a territorial land initiative and housing umbrella organization, can also act as options to reduce the long-term construction cost challenge posed to governments, developers, non-profits and Indigenous bands. The three policy options examined in this paper are by no means perfect solutions to the housing shortage in the region, however they act as a starting ground for some form of action to expand housing stock in the regions.

Housing concerns in the territories have seldom been researched by academics and governments alike, resulting in very little change in the nature of housing need in the regions. Future research must be done to fill the existing data gap in the territories, as well as evaluation of existing non-market housing conditions.

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Appendix. Alternative Policy Options Explored

These additional policy options were explored but ultimately not included in the analysis given the lack of applicability to a northern context.

Land Trusts

Land trusts present a primal opportunity for local governments to allow for lower cost land to be used for affordable housing. Local governments may take direct action in providing additional housing options in their community instead of waiting for federal and provincial governments to intervene. Parcels of underutilized land, whether private infill, larger parcels of brownfield, are donated by a municipality or provincial government and acquired by non-profits or other organizations. In addition to alleviating the land cost problem (which though minimal is still a concern in the North), land donated may be serviced or accessed easily for servicing (BC Housing, 2019). Such ownership models allow for long term leases to non-profit housing authorities, thereby ensuring the housing is preserved and maintained for longer term use. A landlord of a lot can include the following actors (FCSNA, n.d) :

- Municipal
- Regional district
- First Nation
- Developer
- University
- Other public institution

Though the specifics of the land bank model differ based on the municipality, the purpose and model structure are typically similar. Generally, the land or capital in both cases are acquired through taxation or regulation which allows a landlord of a strata lot on leased land to sell or transfer the property to a housing trust or co-op making them the owner of the leasehold.

This investment method may benefit investors by acting as a vehicle to aggregate assets which provide more leverage and security (REFBC, 2016). Risk to investors may

be reduced by investing in this form of housing given that they are owned and managed by a non-profit group combined with the overall governance model of land trusts which are inherently based on community accountability mechanisms.

Case Study – Champlain Housing Trust, Vermont

The Champlain Housing Trust is a membership-based non-profit created in 1984 and has since become the largest community land trust in the United States. It has created and managed 1,500 affordable apartment units, and 1,000 affordable single-family homes (which receive down payment grants and shared equity financing) in their 25 of operation.

Private Public Partnerships (PPP)

Public private partnerships (PPP) are defined as a “cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards” (Moskalyk, 2008). PPPs are not merely a funding source, but rather a form of raising funds and dispersing risk and financing between the private, public and nonprofit sectors. The use of private-public partnership is advantageous in that the private partner is able to bear the high upfront capital costs, including architectural drawings, rezoning applications and environmental studies.

There are four types of partnership arrangements: consultative, contributory, community development and collaborative. The first, consultative arrangements, are partnerships whereby the government seeks advice on development from private sector and community agencies. Contributory partnerships are those where the government provides funding and a private organization is responsible for carrying out a project. The third, community development partnerships include the public and private sectors working collaboratively towards development with each partner sharing equal risks and rewards related to the project. Moreover, PPP’s can minimize the excessive delays and minimize bureaucracy given their ideal position to pressure governments (Moskalyk, 2008).

Canadian PPP projects have historically taken the Design-Build-Finance-Operate model where the private sector is responsible for designing, financing and constructing a project over a long-term period (Moskalyk, 2008). The model is able to minimize

bureaucratic and procedural delays. Existing projects so far have mainly been initiated by the non-profit sector with limited private intervention (Moskalyk, 2008). Though the private sector undoubtedly plays an important role in social housing funding and project delivery, very little research so far has been done on the role of partnerships in funding social and affordable housing. Despite limited research and case studies available, there is reason to believe private partnerships offer a way to keep pace with the growing demand for affordable housing and the diversified nature of such needs (Moskalyk, 2008).

Advocates of PPPs argue for the model's potential to deliver higher quality products and services than those provided solely through government funding sources. Higher quality housing options result from a pooling of existing resources from the public sector, coupled with those in the private sector. Working together also increases the effectiveness in the development process through the "pooling of expertise, resources and skills" (Moskalyk, 2008).

Unfortunately, federal limits on borrowing capacity, also known as "debt cap", acts as a barrier for territorial governments from participating extensively in public-private partnerships and limits borrowing capacity to build housing and other infrastructure projects. Moreover, PPPs are suited for larger, complex projects, therefore the scale of social housing projects and low population base in the North greatly limits the application of this model. The current housing financing model does not guarantee private sector value for monetary investment, risk transfers or other innovations that could stem from managing an asset over a long-term period (Conference Board of Canada, 2012).

The Bob Ward Residence is a three-story affordable housing residence located in the community of Glamorgan, Calgary. The project consists of suites containing bachelor, one-bedroom and two-bedroom units, as well a single four-bedroom unit. The project was estimated at \$4.9 million, with funding dispersed across a variety of sources including public funding from three levels of government, private donations and in-kind support from local developers (Housing Services Corporation, 2013).

The project leveraged substantial financing from the private sector minimized financial risks. In fact, over 150 private donors made contributions donate from \$1000 to \$500,000 (Moskalyk, 2008). Moreover, the construction industry donated substantial in-kind contributions donating materials for free or at cost. It is worth noting, however, this

construction project was during the onset of a public sector boom in Calgary credited to oil prosperity. Public sector companies accruing more than average revenue and desire to give back to the local community was at its peak in the province. Financing breakdown for the project is as follows:

Table A.1. Bob Ward Funding Cost Breakdown

Sector	Source	Total
Public :		
City of Calgary	Provision of site	\$935,000
Federal Government	Human Resource and Development Canada	\$1,000,000
Province of Alberta	Community Facility Enhancement Program	\$125,000
Private:		
Imperial Oil	Imperial Oil Charitable Foundation	\$20,000
Nexen	-	\$25,000
Canadian Oil Sands	-	\$50,000
Alberta Real Estate Foundation	Contributions received by individuals, corporations, charitable foundations and special events	\$100,000
Canadian Pacific Charitable Foundation	Contributions received by individuals, corporations, charitable foundations and special events & in-kinds contributions	\$150,000
Canadian Homebuilders Foundation	Contributions received by individuals, corporations, charitable foundations and special events	\$761,347
	In-kind contributions	\$173,572
Non-Profit:		
Calgary Homeless Foundation	Contributions received by individuals, corporations, charitable foundations and special events & in-kinds contributions	\$716,631 (contributions received by individuals, corporations, charitable foundations and special events)
Housing Horizon Society	Contributions received by individuals, corporations, charitable foundations and special events & in-kinds contributions	\$100,000
Calgary Interfaith Housing Council	-	\$500,000

Data source: Moskalyk (2018)