Atlantic First Nations Housing Needs Assessment
Analysis of Findings

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Executive Summary

First Nations are experiencing a housing crisis with an estimated backlog of approximately 130,000 housing units across Canada. Approximately 44% of the existing housing stock needs major repairs and another 18% require outright replacement (AFN, 2012)

The central purpose of this assessment is to identify housing problems and needs for the Atlantic Region. The Atlantic Housing Needs Assessment represents a major milestone in First Nation effort to more effectively account for the housing problems in the region’s communities.

This survey is meant to answer questions through preliminary research and survey methodology to determine the number, type and location of affordable housing units to replenish the housing stock in the short-term and strengthen housing stock in the long-term. This report uses two components of Canada Mortgage and Housing Corporation’s (CMHC) criterion for assessing housing need—adequacy and suitability standards. First Nation regional housing needs were surveyed and researched according to the following dimensions:

- Demographic Profile
- Decontamination Needs
- Replacement and Renovation Needs
- Financial Analysis
- New Housing Needs

This survey is a starting point for an expanded longitudinal survey of housing needs of the Atlantic region’s First Nations, as well as to assess Federal funding shortfalls. The data from a majority of First Nation communities in the Atlantic Region was collected through the 2016 Atlantic First Nations Housing Needs Assessment (APC Survey).

Summary of Need

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcrowding</td>
<td>1,449</td>
</tr>
<tr>
<td>Population growth</td>
<td>1,765</td>
</tr>
<tr>
<td>Decontamination – mould</td>
<td>433</td>
</tr>
<tr>
<td>Decontamination – radon</td>
<td>88</td>
</tr>
<tr>
<td>Replacement – ageing units (&gt; 25 years old)</td>
<td>759</td>
</tr>
<tr>
<td>Replacement – condemned and occupied</td>
<td>53</td>
</tr>
<tr>
<td>Serve by infrastructures – water and wastewater</td>
<td>210</td>
</tr>
</tbody>
</table>
1.0 Introduction

The conditions of First Nation housing in Canada is problematic, largely due to shortages and substandard quality within the existing housing stock. According to the Assembly First Nations (2012), a large portion of the estimated 130,000 houses on First Nation communities in Canada, are in poor condition, over crowded, improperly serviced, poorly sited.

Based on preliminary research the housing needs of First Nations of the Atlantic region will increase in the coming years as long as the gap between the needs and the budgets from regular federal programs is increasing. In particular, this shortfall will translate into a pressing housing need within the actual and foreseeable financial context.

Given this backdrop, the Atlantic Housing Needs Assessment report represents a major milestone in providing a First Nation account and analysis of the housing needs in the current and future context.

Section 2 and 4 of this report provides the purpose and method used to undertake the research and ultimately from the APC survey. Section 5 presents detailed information about the demographic context of surveyed results. Section 6 analyzes decontamination needs of existing housing stock, with particular emphasis devoted to mould and radon contamination health risks. Section 7 reviews the replacement and renovation needs in the Atlantic region. Section 8 will analyze the financial needs, портрет the financial expenditure required to bring about the physical upgrades required for the existing housing stock. Section 9 will assess current and future housing needs, before providing a conclusion of results and next steps in Section 10.

2.0 Purpose

The central purpose of this assessment is the analysis of housing problems and needs. In doing so, it will provide a portrait of current and projected need for adequate First Nation housing in the region through a First-Nation determined account. In achieving this purpose, the report will:

- Provide a comprehensive picture of housing needs in Atlantic First Nation communities.
- Pursue a regional approach to addressing housing shortages and needs.
- Drive research and policy development towards resolving matters of housing stresses on Atlantic First Nation communities.

This is a starting point for a greater longitudinal initiative to study the housing needs of Atlantic First Nations, as well as the success of federal housing initiatives and programs. The APC survey will also be a useful tool by informing future adequate housing development by First Nation communities, or interested First Nation housing advocate public or private institutions.
3.0 Background

This section will outline the definition of housing need, and how it influences the questions that were formulated for the survey, which will allow the reader to gain a greater perspective on the overall objective of the APC survey. The study area will also be identified in this section.

3.1 Definition of Housing Need

This survey report uses two components of CMHC’s criterion for assessing housing need—adequacy and suitability. Based on CMHCs housing need criterion, housing conditions are assessed to identify households living below standards for adequacy, suitability or affordability.

*Adequacy* is measured by the condition of the unit. The goal of an adequacy indicator is to determine if a dwelling has properly functioning basic services. A dwelling needing major repairs is a sign that some of the basic housing services are not functioning properly and the dwelling is thus said to be ‘inadequate.’ (CMCH, 1996).

*Suitability* refers generally to the size of a unit. The goal of a housing suitability indicator is to determine if the living space is appropriate for the size of the household, or if there is overcrowding. A dwelling is deemed ‘overcrowded’ if there is a shortfall of bedrooms based on the National Occupancy Standard (NOS). In this report, the average number of persons per household (PPH), stated as 2.5 persons per household for Canada, is used as a suitability benchmark (Statistics Canada, 2013). A dwelling that is deemed overcrowded based on the average PPH would be considered unsuitable.

Table 1: Examples of adequacy and suitability benchmarks for each of the areas of focus from the APC Survey.

<table>
<thead>
<tr>
<th>Demographic Context</th>
<th>Adequacy</th>
<th>Suitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>A younger population represents a need for adequate housing in the future.</td>
<td>Above-average household occupancy relative to census averages, characterizes unsuitable housing.</td>
<td></td>
</tr>
<tr>
<td>Decontamination Needs</td>
<td>Mould or radon decontamination is required to provide adequate housing</td>
<td>Unsuitable housing (i.e., overcrowding) contributes to mould contamination.</td>
</tr>
<tr>
<td>Replacement Needs</td>
<td>Inadequate housing is brought on by structural and land issues.</td>
<td>Unsuitable housing creates structural stresses, further contributing to replacement needs.</td>
</tr>
<tr>
<td>Financial Gap</td>
<td>Major repair cost estimates reflect the financial resources required to restore adequacy in a dwelling.</td>
<td>Unsuitable housing worsens the conditions of dwellings, driving up repair costs.</td>
</tr>
<tr>
<td>New Housing Needs</td>
<td>Condemned and ageing units are adequacy-relevant factors that were used to determine housing need.</td>
<td>Population growth and overcrowding are suitability-relevant factors that were</td>
</tr>
</tbody>
</table>
By relying on adequacy and suitability standards as analytical tools, the survey falls in line with the consistent ‘core housing need model’ used by the federal government, provincial housing agencies, and a vast of key players within the housing field, such as municipalities and not-for-profit agencies (CMCH, 1996).

A caveat of this survey is that it does not account for affordability at either an individual or a community-level income. This is because affordability “cannot be fully applied on First Nation communities as most housing is band-owned and shelter costs are handled differently” (CMHC 1996). The limited scope of this survey and time constraints made it difficult to engage affordability standard sufficiently within the funding complexities at hand.

Despite this limitation, a wider unconstrained survey methodology may identify households on First Nations communities in relation to affordability.

3.2 Housing Wait Lists as an Indication of Housing Need

Housing shortage is exacerbated by population growth. The result is that there are long waiting lists for housing in many First Nation communities, resulting in many people living in overcrowded situations.

The 2016 Survey included a question concerning the backlog list of applications for new housing. Waiting lists are indicators of new housing need, as they are possible when the number of housing units available for supply tends to fall short-fall of the prevalent housing demand. To some extent, the short-fall is indicated quantitatively by the aggregate waiting list in the region.

3.3 Study Area

Housing Band Managers of each First Nation community in the Atlantic Region were provided with the APC survey directly by the housing and infrastructure (H&I) departmental staff, and received frequent follow-ups to help facilitate the discussion and collection of information. Out of 34 communities, 22 surveys contained demographic and financial information only, and 18 of these surveys were fully completed and returned to the H&I staff at APC. To remain consistent, only fully completed surveys (18) were analyzed throughout this report.
Special consideration were given to accommodate the Atlantic First Nation context, such as presenting the survey findings in two ways: by population size and by location (i.e., Provinces). Data presented by population size can show the differences or similarities between small and large communities, while data presented by provinces can show whether geographic location has an impact on First Nation communities. The survey oriented questions based on demographic profile trends nationally characteristic of First Nations throughout the country, as well the housing dynamics representative of First Nations in the Atlantic Region, with particular lessons taken from the Assembly of First Nations – Quebec and Labrador Housing Needs Assessment (AFNQL) study.

4.0 Methodology

Through the Atlantic Policy Congress (APC) Housing Working Group, and departmental staff, the overall survey methodologies were developed. The survey report has been formulated through primary and secondary research methods, listed below. This section will provide overview into the methodological research and design, as well as provide key information to the institutional environment in which this survey design was facilitated.

4.1 APC’s Housing Working Group

On March 11th, 2015, an APC All-Chiefs resolution was passed mandating APC’s Housing Working Group to peruse funding for an Atlantic wide First Nations housing needs assessment, based off AFNQL’s study.

APC’s Housing Working Group’s began work in early 2016 by focusing primarily on assembling and completing the Atlantic First Nations Housing Needs Survey, which had been largely inspired by the recently successful AFNQL Housing Needs Survey of 2014.

APC, through its Housing and Infrastructure (H&I) department, is committed to creating initiatives and attaining deliverables to ultimately advance the cause of First Nation Housing, specifically by delivering policy and research solutions to quell the housing shortage in the Atlantic Region.

4.2 Primary Research Methods

The survey questionnaire content and forms were developed through initial research and consultation efforts.

When researching previous assessments that were completed across the country, APC found the AFNQL study: The Housing Needs of the First Nations of Quebec and Labrador to be the best model to follow for the Atlantic region.

In terms of consultations throughout 2015-2016, APC’s H&I Department were actively engaged key stakeholders. Key stakeholders were Atlantic First Nation Chiefs and housing managers, as
well as decision making personnel from key federal departments—Canada Mortgage and Housing Corporation (CMHC), Health Canada (HC) and Indigenous and Northern Development Canada (INAC).

Primarily, consultation was organized through the APC’s Housing Working Group, which included select First Nations housing managers from across the Atlantic Region as well as federal representatives from CMHC, HC and INAC.

Information sessions was organized for all housing managers and directors to layout and discuss the parameters of the study defining what kind of information and involvement would be needed from them. These efforts included, but were not limited to consultation and engagement efforts, such as:

- December 2015 Teleconference Workshop
- January 2016 All-Chiefs Meeting
- January 2016 Housing Working Group meeting I
- March 2016 Housing Working Group meeting II
- March 2016 Housing Managers Meeting

In addition to these consultations sessions, a major engagement was through consistent communication and feedback from housing managers, which emphasized the overall development, distribution and data collection stages of the survey. While concerns and particular information were attained from housing managers via teleconferences and general meetings, information was consistently collected via telephone and face-to-face surveys from each community’s housing staff.

Moreover, the consultation feedback and AFNQL survey dimensions were contributing factors in the development of APC survey’s methodology. The APC survey gathered details into the following dimensions.

- Demographic context;
- Decontamination Needs;
- Replacement Needs;
- Financial Gap;
- New unit needs.

The survey consists of a survey questionnaire and three dwelling charts. The survey questionnaire gathered wide range of information, covering all dimensions of need, as outlined above. The dwelling charts survey information specific to household category type, such as section 95, individually-owned homes, and band-owned homes. Please see Annex B for examples of the APC survey questionnaire and dwelling charts, and Annex C for the summarized results of APC Survey communities.
4.3 Secondary Research Methods

The secondary research sources were: scholarly, census, government reports, and housing policy reports. The secondary research was engaged in the preliminary research stage, and survey report writing.

The collection of preliminary data consisted of reviewing previous publications and databases, such as the Indian Register and the Annual Housing and Infrastructure Report from INAC to collect basic data such as the population of the housing stock. Where relevant, these numbers were cross-referenced with data from the APC Survey.

The preliminary research to prepare for the housing needs’ assessment reviewed information from the following sources:

- **Population-based Information**—The 2011 National Household Survey, the 2001, 2006, and 2011 Census of Population, and the Indian Register were used to provide a demographic profile of Atlantic First Nations. In particular, the 2011 National Household Survey reflected the general profile of housing units in the communities, and as well as a breakdown of population in regards to Aboriginal identity, registered status, and Aboriginal identity.

- **Housing Conditions and Stock Overview**—Website information and the Annual Housing and Infrastructure Report from the INAC website were utilized to inform the Federal Government’s perspective on current housing situation of the Atlantic First Nations. In addition, CMHC Reports and website information contributed to the government’s picture of Atlantic First Nation’s housing stock.

- **Housing Needs Literature Review**—An all-encompassing housing needs literature review was needed to summarize the identify key housing needs and trends evident within Atlantic First Nation’s communities on the basis of Federal Government Reports, Census Information, and a holistic review of current online sources.

Another significant secondary research source was CMHC’s established housing definitions and indicators. In developing the glossary of terms, general brainstorming and multiple sources were the main factors, with particular reliance on the CMHCs *Glossary of Housing Terms* and descriptions and views from ongoing consultations with Housing Managers.

5.0 Demographic Context

5.1 Background

5.1.1 Rapid Rising Population

Nationally, a review of census information over the past decade shows that there has been a significant increase in the First Nation population, with a 20% increase between 2006 and 2011. More generally, Atlantic First Nation communities are a part of a rapidly increasing First Nation population, which has undergone a large extent of growth since the early 1970s. Overall,
between 1971 and 2011, the First Nation population grew by 487% while the Canadian population grew by 52%. (INAC, 2013)

Figure 1: Overall trend of the Aboriginal Population growth between 1901 and 2011. (INAC, 2013)

It is expected that this dramatic increase will continue into the near future, especially for band-members living outside First Nation communities and First Nation youth in general. In terms of the latter, a rapidly growing First Nation youth population will contribute significantly to Atlantic First Nations’ future demographic profile. This may translate into greater demands for homeowners, as little as soon as a few years from now.

5.1.2 Rising Youth Profile of First Nation Demographic

First Nations people are the youngest and fastest growing segment of the Canadian population, which only highlights the ever-growing demand for better housing on First Nation communities. Youth make up a much higher proportion of the overall First Nation population when compared to counterparts in the non-First Nation population (28% vs. 16.5% under 14 years of age; 18.2% vs.12.9% aged 15 to 24) (Statistics Canada, 2015).

As the number of young people across the First Nation demographic aged 15-24 mature into their adult years, they may want to form their own households if local circumstances permit. Otherwise, it is reasonable to discern they may be tempted to move away in search of better opportunities.

Nationally, the growth of the total Aboriginal population between 1996 and 2011 was more rapid outside First Nation communities.
The Aboriginal population living on reserve had an annual growth rate of 2.8% from 1996-2001, 1.5% from 2001-2006, and 1.0% from 2006-2011. As shown in Figure 2, the Aboriginal population living in rural areas off reserve had an annual growth rate of 4.4% from 1996-2001, 4.2% from 2001-2006, and 3.8% from 2006-2011. The Aboriginal population living in population centers off reserve had an annual growth rate of 4.7% from 1996-2001, 4.8% from 2001-2006, and 4.8% from 2006-2011. (NHS 2011).

![Graph showing annual growth rates](image)

Figure 2: The average annual growth of the total Aboriginal population on reserve, in rural areas off reserve, and in population centers (NHS 2011).

### 5.2 Results and Analysis

Population trends provide indications into the current and future First Nation residence in APC’s sampled communities. To the extent of this survey’s focus, the three major determinative demographic trends are: (1) rapid population growth among First Nation’s national population; (2) increasing youth components of demographics of First Nation communities; and (3) registered-band members living on and outside First Nation communities.

All these trends, taken cumulatively, translate into pressing needs for housing, likely in the ultimate form of homeownership and housing suitable for expanded family size.

It is important to note that this demographic analysis was surveyed in isolation of current and expected influences in First Nation communities. Population trends do not attempt to predict the impact that future government policies, changing economic circumstances or other factors might have on demographic behavior. For instance, demographic structure may be affected by local circumstances or policies (i.e., expansion in education or facilities for seniors). Migration levels, as one angle, may be affected by changes in employment growth or a one-off event such as a large employer moving in or out of an area or a large housing development such as an urban extension in the last five years.
Figure 3: Comparison of the Household Occupancy rate between APC survey communities and the Non-First Nations provincial average.

Overcrowding and housing shortages are exacerbated by population growth. As in Figure 3, the provincial average is roughly consistent across all Atlantic Provinces—at 2.30 persons per household. By comparison, the average occupancy rate for First Nations On-Reserve in the Atlantic Provinces is 3.0 (Statistics Canada, 2013).

The occupancy rate obtained from the Atlantic First Nation APC sample communities had an average of 3.10, significantly above the national and Atlantic census averages (of 2.50 and 2.30 persons per household, respectively).

According to Figure 3, First Nations in Newfoundland had the lowest household occupancy average, in contrast to other sample communities, who exhibited consistently higher averages than the census provincial averages. Newfoundland had a lower sample size, as only one out of three communities reported a total number of units in the dwelling chart. This may explain NFLD’s divergent trend.
Moreover, the Atlantic above-average occupancy rates suggest unsuitability of housing structures and overcrowding effects in Atlantic First Nation communities.

Figure 4: Percentage of population under 20 years of age as represented by APC sample communities, the provincial average, and the Canadian average.

As shown in Figure 4, the population under 20 years is consistently higher in the APC sample communities than the provincial non-First Nations averages and the Canadian average.

5.3 First Nation Populations (On and Outside First Nation Community)

Table 2: Registered Indian Population by Residence. (INAC, 2014).

<table>
<thead>
<tr>
<th></th>
<th>Total (All Residences)</th>
<th>Total (On Reserve / Crown Land)</th>
<th>Total (Off Reserve)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Canada</strong></td>
<td>919,745</td>
<td>481,068 (52.30%)</td>
<td>438,677 (47.70%)</td>
</tr>
<tr>
<td><strong>Atlantic Provinces</strong></td>
<td>61,742</td>
<td>23,082 (37.38%)</td>
<td>38,660 (62.62%)</td>
</tr>
<tr>
<td><strong>Atlantic (APC Survey)</strong></td>
<td>31,600</td>
<td>19,313 (61.12%)</td>
<td>12,287 (38.88%)</td>
</tr>
</tbody>
</table>

In comparing the residence dynamics of First Nation community populations, at the national and regional level, there have been three major points. As shown on Table 2, based on census data, it can be observed that Atlantic Canada has a greater proportion of registered band members living
outside of their First Nation communities. Second, in contrast, for APC survey sample, a reverse trend is observed, where the proportion of First Nation population on reserve outweighs those living outside the community. Third, the APC survey proportions agree with the Canadian national trend, where a majority of registered band members reside in First Nation communities, while a sizeable minority of registered band members live outside First Nation communities.

It is important to note that the difference between the APC survey and the census (Atlantic) data is possibly due to a broader definition of First Nation utilized by the federal census. Federal census defined First Nation identity (self-identify) augments the registered population count.

In addition, the APC survey only accounts for legally registered band members of First Nation communities that were sampled. There were Atlantic First Nation communities that did not participate in this survey.

5.4 Discussion

In sum, the results ultimately show that it is safest to plan on modest but continuing growth in the need for housing oriented to students, youth, and newly-formed couples wanting their own dwellings.

5.4.1 Returning Band-Members

As long as the off-reserve population trends continue, this will likely lead to growing applications for band members seeking to reside back in their original communities. It may explain trends that occur in smaller-sized communities as observed in the APC Survey, such as the co-habitation of non-native and native residents in Atlantic First Nation communities.

5.4.2 Vulnerability of First Nation Youth

Youth housing need is imperative as the younger segments of the population are most at risk in the following ways (see below). The lack of adequate and suitable housing conditions may increase vulnerabilities and risks systemic to First Nation youth as a whole.

First, a rising youth population may mean an increased risk of immediate poverty, substandard housing, violence or substance abuse (Peters and Robillard, 2009, Browne et al., 2007). In such cases, youths may choose to leave or be forced out of their homes and/or communities, and left with little economic or social supports.

Second, it is common for Aboriginal youth living on reserves to migrate to urban areas in the hopes of finding better economic opportunities or higher education (Peters and Robillard 2009). In recent years, Canadian urban areas have been characterized by high unemployment rates and a lack of affordable housing – far from an ideal context in which to establish oneself in a new place (Layton, 2008; also see Matsuba et al. 2008 and Miller et al. 2004).
Third, and linked to the previous point, Aboriginal youth are at a major disadvantage in securing well-paying, stable jobs as a large proportion of them (68.5%) do not complete high school (Hick, 2007, Erasmus and Dussault 1996).

Fourth, Aboriginal youth are overrepresented in the child welfare system (Brown et al. 2007). They may or may not have had a stable home to begin with, or leave their legally-appointed care (either voluntarily or involuntarily) for a variety of reasons.

5.4.3 Young People Wanting to Form Their Own Households

Unless there is a trend of youth moving off reserve, the rising youth population may mean increased demand for homeownership in the near future. As they mature into adulthood, First Nation young adults will require adequate housing in as few as five years. Surveyed communities in all four provinces reported an average of youth population above the national averages, as shown in Figure 4.

In consideration of the youth population count across the region, the 15-24 age group will most likely be forming their own households and/or wanting to change their living arrangements. According to the AFNQL report, “youth who will reach the age to form new households within 15 years (5-19 years old) are more numerous than the individuals who are in the age group that follows (20-34 years old)”. This may be a significant factor expected to drive the ever-growing demand for improved and renewed housing development on First Nation communities.

![Figure 5: Demographic breakdown of communities sampled in the APC survey in terms of Band Members, Non-First Nation and Band Members from another community.](image)

As per Figure 5, based on the APC survey, there was a noticeable indication of co-habitation of non-natives and natives within communities that have a population of less than 500. This may indicate a sub-set of the youth dynamic, as younger First Nations’ spouse or partner may return to the community with the expectation to settle and start a family household. This has been
noticeable to smaller communities, as their non-native influx is greater, relative to the constant First Nation residence population. While this seems to be a trend, further research is required.

5.5 Limitations

This survey only reviewed the youth demographic (i.e., 0-14 years of age, and 15-19 years of age) and did not survey the wider age brackets of each community. For example, no age brackets were measured beyond 20 years of age. Due to time constraints, the survey prioritized the number of youngest individuals to be tallied by each community’s housing department and populations living on and outside First Nation communities. However, the setback here is that APC does not know the proportion of youth in each community.

5.6 Options and Recommendations

Expanded future analysis, possibly through an expanded survey or a longitudinal study equivalent, could advance demographic analysis through improved methodology.

5.6.1 Methodological—Options

Once an overall housing figure has been identified, plan makers will need to break this down by tenure, household type (i.e., singles, couples and families) and household size. This information should be drawn together to understand how age profile and household mix relate to each other, and how this may change in the future. When considering future need for different types of housing, community leadership will need to consider whether they plan to attract a different age profile, for example, increasing the number of working age people.

Community leadership should therefore examine current and future trends of:

- The proportion of the population of different age profiles;
- The types of household (i.e., singles, couples, families by age group, numbers of children and dependents);
- The size of dwellings (i.e., one, two+ bedrooms);
- The tenure of housing.

5.6.2 Demographics—Options

The rapidly growing First Nation demographic is translating into a housing need across the demographic. Greater demand is derived from increasing youth, as well as the First Nations living outside the community.

Here are some examples of different intervention strategies based on different demographic situations:

- Put additions onto sound existing units; offer residents options to relocate to other communities to new housing;
• Support remaining residents in relocating to growing communities with new housing.
• Monitor population growth carefully; make additions to sound existing units a priority; support youth employment and mobility training through training teams travelling to each community; add new, flexible seniors housing.
• Make sustainable new housing construction a priority with maximum training for multiple trades and skills; support additional local ventures based on housing; service land in advance of need; anticipate future economic development in the form of flexible housing forms.

6.0 Decontamination Needs

Mould and Radon are cited problems in houses, both in and outside First Nation communities in Atlantic Canada. According to results from Phase 2 (2008-10) RHS and Community Survey, 50.9% of First Nation adults reported mould and mildew present in their homes. (AFN, 2013).

Mould problems indoors are caused by moisture. Water can come in from leaky pipes, through condensation on cold surfaces or by seeping through a wall, foundation, floor or roof. Moisture is also a result of the condensation produced by the people living in the house and from daily activities like bathing, cooking and washing clothes.

Many First Nation communities in Canada are located in high radon hazard zones. These communities need to know to test for radon to mitigate their risk. (Whitehead, 2014).

Radon is a natural radioactive noble gas that can be found in soil, water, outdoor and indoor air. Over two-thirds of the water content of radon is released into the indoor air (Bruno, 1983). Most radon in the atmosphere is not from radon but from the short-lived alpha emitting radon fragments. Indoor levels are typically two to three times higher than outdoor levels. (Hwang et al., 1999).

6.1 Results and Analysis
Under this category of needs, there are 2 problems included in the survey:

1. Contamination from mould;
2. Presence of radon (gas coming from the ground).

6.1.1 Mould

The contamination of houses from mould is a subject that incites much concern with the 18 communities sampled in the Atlantic region. Over half (15 of 18 communities) cited they have had formal assessments completed regarding mould contamination in households. The AFNQL Housing Needs Assessment reported that 1636 units (11.1%) were required to be decontaminated from mould, while the APC survey communities reported 433 units (8.2%) to be decontaminated (433 units divided by 5,265 x 100). (AFNQL, 2014).
In the APC survey, mould contamination was measured across three categories—light, moderate, and heavy—with most contaminations being relatively light or moderate in severity, as shown in Figure 6.

- **Light Mould Contamination Level**—visible mould contamination area totals less than 0.3m² (3ft²).
- **Moderate Mould Contamination Level**—visible mould contamination area totals more than 0.3m² (3ft²) but less than 3m² (32ft²).
- **Heavy Mould Contamination Level**—visible mold contamination area totals more than 3m² (32ft²)

![Homes Affected by Mould = 433 Units](image)

**Figure 6:** Breakdown of mold contamination area in terms of light, moderate and heavy contamination area in sample communities.

Formal Assessments, previously conducted by Health Canada or independent consultants concluded the cause of mould was mostly due to:

- Poor air circulation—Heat Recovery Ventilation (HRV) system required;
- Leaks in roof, foundation, plumbing, windows, etc.;
- Overcrowding
- Homeowner Neglect

Homeowner neglect has been an ongoing topic of discussion for the APC Housing working group and has been an issue raised by the Atlantic Housing Managers. There is a strong need to help develop life skills and homeowner responsibility in First Nations communities. Education is crucial to help residents learn the consequences of their negligence in terms of aerating rooms, the use of dehumidifiers and overall general cleanliness.
6.1.2 Radon

Few communities (2 of 18) have had formal radon assessments completed by Health Canada or consultants. Health Canada advocates testing for all homes, and mitigation if detection level is above 200 Bq/m$^3$ (Whitehead 2014). The APC survey reported a total of 88 (1.7%) units for the region needed to be decontaminated, while the AFNQL housing needs assessment cited 279 units (1.9%) were required to be decontaminated from radon. (AFNQL, 2014).

Formal assessments concluded the cause of radon was mostly due to geological location, leaks in foundation, unfinished floors, and poor air circulation, which could be remediated by installing a HRV system.

Geological location is an obvious factor, as radon in homes comes primarily from soil. Radon is an alpha-emitting radioactive gas, spontaneously released from rocks and soils during the decay of uranium. Rock permeability is an important factor influencing radon availability on the surface. Radon in the soil is under higher pressure than in the air inside the house, thus radon diffuses into homes. (Hwang et al., 1999).

Floors and foundations are permeable sources for radon. Radon enters homes primarily through openings or cracks in the building foundation or through well water. For floors, in particular, radon concentration in a house tends to be highest in basements and less significant at upper levels. Moreover, the weaker the barrier between the soil and the interior, the higher the level of radon in the house. (Hwang et al., 1999).

6.2 Discussion

In the APC survey, mould and, to a lesser extent, radon incidence are indicative of deterioration in existing housing stock and sub-standard quality of current housing. If housing stock is inadequate, residents are forced to contend with the health risks associated with mould and radon contaminations.

Where, for example, housing units are poorly ventilated, mould infestation occurs and occupants run the risk of contracting any one of a number of respiratory diseases. In this context, young children are considered particularly vulnerable to respiratory ailments because of the amount of time they spend in the home (Hwang et al, 1999). Strachan et al. (1990) found a highly significant association between mould and wheezing in a study of 1,000 children aged six and seven.

Although majority of sample communities have not had formal assessments of radon, inhalation of radon gas in high doses can cause lung cancer. A Health Canada workshop on radon cited that radon in homes is responsible for approximately 10% of all lung cancer deaths in Canada, making radon the second leading cause of lung cancer after tobacco smoking. (Tracy et al, 2006).

Future research efforts may require a survey approach to measure the relationship between housing stock and respiratory health outcomes. This survey advocates for greater national data
collection on adverse health effects of housing shortages and poor quality housing to promote housing policy that emphasizes the public health. At the same time, this survey section also advocates for prevention and remediation of indoor dampness and mould problems and such actions are likely to reduce respiratory maladies, in order to provide savings in the health care costs and improvement of public health.

7.0 Replacement and Renovation Needs

7.1 Background

Many homes on First Nation communities are in substandard condition and in need of major renovation or replacement to meet standards of adequacy and suitability. As the Assembly of First Nations (2012) cited nationally, approximately 44% of the existing housing stock needs major repairs and another 18% require outright replacement (AFN, 2012).

7.2 Results and Analysis

This survey defines replacement needs as demands for suitable and adequate housing, covering whether there is sufficient space per person (called "suitability") and whether structures meet building codes (called "adequacy"). According to this survey, replacement and renovation needs are to be characterized by necessity for ageing dwellings, occupied but condemned units, as well as land issues and un-serviced units in terms of infrastructure, such as water and wastewater hook-ups.

7.2.1 Ageing Units

Beyond demographic pressures, physical requirements are also driven largely by the age of the existing housing stock. The AFNQL Housing Needs Report cites an age benchmark of 25 years of age. Housing units built more than 25 years ago may not necessarily be up to minimum Health and Safety Standards, nor are they economically feasible to repair. In this survey, dwellings over the age of 25 were measured to be 759 units for the study area. In comparison, the AFNQL Housing Needs Assessment cited that only 1% percent (135 units) of existing housing stock needed to be replaced due to outdated or ageing dwellings, while the APC survey reported 14.4% (759 units divided by 5,265 x 100). (AFNQL, 2014).

7.2.2 Condemned Units

Coupled with lack of maintenance, many housing units are now falling into a dilapidated and unsafe state, but continue to be occupied despite being condemned. A house that is termed condemned is considered no longer sufficient for occupancy. There are 53 units that were occupied and condemned for the study area. As cited in survey responses, this may be due to structural issues and contamination problems.
7.2.3 Land Issues / Un-Serviced Units

A majority of the sample communities reported having land shortages amongst other land issues that plague their community. Some of these land issues may be due to the geographic profile (i.e., steep rock faces, marshy land) but other issues include un-serviced units. Un-serviced units can be linked to infrastructure shortage, such as inadequate access to water and wastewater services. Due to limited federal funds, as well as limited own source revenue, the need for infrastructure is strained. The APC sample communities reported 210 units that are not connected to water and wastewater infrastructure.

7.3 Discussion

Replacement and renovation needs are a driving factor for adequate and suitable housing options for those in need within the Atlantic First Nation community.

In judging the shift towards greater youth in First Nation communities, replacement needs may likely become more pronounced as future household formation accelerates. The demographic context of replacement demand is detailed in the demographic section of this report. For replacement needs, new dwellings are required both to accommodate future households to be formed and also to repair ageing units.

In expectation of increased future household demand, replacement needs will be best engaged if anticipating which dwellings will face most risk in coming years. This may save time, money, and energy, to best accommodate incoming household demand. For ageing dwellings, there are units that are at high risk of becoming uninhabitable in the near future amid no sufficient mechanism (i.e., loans, mortgages, government programs) to help the band and residents repair or replace it.

Land issues may be a contributing factor to structural and contamination issues by causing deteriorating foundation due marsh, bog land and soft-earth geology. Because of the limited land use in First Nations communities, certain units need to be built in locations in which water and wastewater infrastructure may be inaccessible. This creates another form of need in terms of increased federal funding for infrastructure upgrades, as well as funding for acquiring useable land

7.3.1 Limitation

In analyzing replacement needs, there are various issues concerned with the need to repair or upgrade parts or the whole of the dwelling. For example, demographic trends from sample communities can be compared to regional and national trends from census data, as the issue being compared is the demographic profile. The profile of the replacement needs is much more complex, and cannot be easily compared or contrasted with other sources of data.
8.0 Financial Gap Analysis

8.1 Background

In 1996, Indigenous and Northern Affairs Canada (INAC) implemented a Housing Policy with the intention of allowing greater flexibility and control to First Nations in terms of their housing policies and programs. The Housing Policy was based on four elements:

- First Nations Control;
- First Nations Expertise;
- Shared Responsibility (i.e., shelter charges and ownership options); and,
- Improved access to private capital.

First Nations were given the option to voluntarily opt in or out of this housing policy. By opting in, First Nations were given access to INAC’s housing funds to support their efforts at implementing a community-based housing plan which may include elements such as maintenance and insurance, debt charges, training, management and supports to establish housing authorities (INAC, 2008). In return, First Nations were required to develop and establish a set of housing policies, housing programs and a multi-year housing plan. The multi-year housing plan was required to have three components: a work plan covering maintenance, insurance, renovation, building, and management; a resource plan; and links between housing activities and training, job creating and business development initiative (INAC, 2008).

8.2 Distribution of Funds

Near the end of every fiscal year, the Federal Government releases budgetary information for the following year’s funds to support programs and initiatives. First Nations on-reserve housing funds are allocated to INAC and CMHC.

8.2.1 INAC

INAC created the First Nation Infrastructure Fund (FNIF) to provide support to First Nation communities through an application process for better access to funding. The FNIF funding was pooled from three existing federal funding sources: Infrastructure Canada’s Municipal Rural Infrastructure Fund (MRIF), the Gas Tax Fund (GTF), and the Capitals Facilities and Maintenance (CFM) Program.

The CFM program is the main pillar of the Government of Canada’s effort to support community infrastructure for First Nations on-reserve. The program’s funding is invested in four main areas: housing, education, water and wastewater systems, and other infrastructure, and totals over $1 billion per year (Parliament of Canada, 2015). The CFM program has three funding streams that are accessed through proposals submitted by First Nations: operations and maintenance (O&M) funding, minor capital (for projects under $1.5 million) funding, and major capital (for projects over $1.5 million) funding. Proposals submitted for the major capital funding stream is subject to the department’s national priority framework which lists protection of health and safety assets as
the highest standard, followed by health and safety improvements, recapitalization and major maintenance, and anticipated growth requirements (INAC, 2015).

In total, INAC provides $155 million annually for First Nation housing on reserve, and over the past five years this has supported the construction of 1,750 new units, renovations to about 3,100 existing units, capacity development and a number of other housing initiatives (INAC, 2010).

8.2.2 CMHC

CMHC provides housing assistance to First Nation living on-reserve by providing federal funding for the construction, purchase and rehabilitation of suitable rental housing, as well as improving the capacity of First Nations to manage and maintain their housing policies and programs. CMHC provides funding to these communities primarily through the following programs:

- **Loan Insurance Program On-Reserve with Ministerial Loan Guarantee** (Section 10) helps band councils or First Nation members on reserve access financing to build, purchase and/or renovate single-family homes or residential rental properties.
- **On-Reserve Non-Profit Housing Program** (Section 95) helps First Nation communities build, purchase and renovate affordable rental housing on reserve.
- **Residential Rehabilitation Assistance Program (RRAP) On-Reserve** helps First Nations and First Nation members to repair substandard homes to a minimum level of health and safety.
- **Home Adaptations for Seniors Independence Program (HASI) On-Reserve** helps First Nations and First Nation members pay for minor home adaptations to on-reserve housing to extend the time low-income seniors can live in their own homes independently. (CMHC, 2016)

On average, CMHC provides $152 million per year towards First Nations on-reserve housing programs. According to CMHC, the Section 95 program has supported the construction of 469 new non-profit housing units and provided ongoing subsidies for about 29,300 household in the 2012-2013 fiscal year. In addition, the RRAP program funds contributed to the repair of 1,144 homes on reserves in the same fiscal year (Parliament of Canada, 2015).

8.2.3 Other Sources of Funding

Another program that INAC administers is the Ministerial Loan Guarantee (MLG) Program. This program is intended to address the restriction on the seizure of reserve lands under section 89(1) of the Indian Act. The current guarantee authority limit for MLGs is $2.2 billion, of which $1.82 billion is currently issued; nationally, almost one third of on-reserve housing is currently financed through a Ministerial Loan Guarantee. MLGs have been well-used by a very large percentage of First Nations as one instrument that has enabled the construction of approximately 26,000 houses between 1996 and 2007. (INAC, 2015).

While there is a strong interest amongst First Nations in exploring home ownership, the usage of MLGs appears to be heavily weighted on housing quantity outcomes with the vast majority of MLGs being used to support CMHC’s Section 95 housing. (INAC, 2015).
The First Nations Market Housing Fund (FNMHF) was created by the government of Canada in April 2007 to facilitate and broaden the range of housing options for residents of First Nations communities so that they may have the same housing choices as people in non-First Nations communities. The FNMHF received $300 million in 2008 which would contribute to the construction of 25,000 new homes in First Nations communities over 10 years. Despite the stated commitment for an additional 3,700 homes, as of December 2013, the FNMHF had enabled the construction of only 55 homes (Parliament of Canada, 2015).

8.3 Results and Analysis

The following section presents results of the financial component of the APC survey. Questions in the financial section of the survey were focused in expenditures based on repairs, maintenance and accessibility for the 2015-2016 fiscal year.

Figure 7 below shows the average breakdown of expenditures of all APC Survey communities in terms of major repairs, minor repairs, maintenance, and accessibility. According to the APC survey, the allocation of operations and maintenance funds received is split fairly evenly between major repairs, minor repairs, and maintenance. Although this represents an average of the sample communities, less than five communities reported an expense larger than $150,000 on major repairs only, suggesting that these repairs do not pose a great impact on the housing stock in the Atlantic Region.

Figure 7: Average Breakdown of Expenditures for the 2015-2016 Fiscal Year for First Nation Communities in terms of Major Repairs, Minor Repairs, Maintenance, and Accessibility.
Another way to observe the breakdown of expenditures is by province. Figure 8 shows the breakdown of the 2015-2016 expenditures for First Nation communities by province.

Figure 8: Percent Allocation of Expenditures for the 2015-2016 Fiscal Year by Province.

A percent allocation of the financial expenditures is visually represented in Figure 8, above. As observed, the accessibility renovation costs are the lowest of all expenditures. The highest percentage of accessibility occurred in First Nations communities residing in New Brunswick. This suggest that communities in New Brunswick may have an older population as compared to other First Nations communities in other provinces.

Another interesting observation is the high percentage of minor repairs in Newfoundland and Labrador compared to other expenses. Only three out of the four First Nations communities that are members of APC participated in the survey, but all had similar breakdown of expenditures.

The total of all expenditures for the APC sample communities for the 2015-2016 fiscal year was $9,738,583. The APC survey comprised of 18 out of 34 communities, therefore there are 17 First Nations communities that are not included in this figure. Table 3 below shows the planned spending on housing for the Atlantic Region as outlined in the First Nations Infrastructure Investment Plan of 2015-2016.

Table 3: Excerpt from the First Nations Infrastructure Investment Plan 2015-2016 for the Atlantic Region alone. (INAC, Nov. 2015).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned Spending</td>
<td>$8,154,164</td>
<td>$5,913,210</td>
<td>$5,930,768</td>
<td>$6,030,768</td>
<td>$6,030,768</td>
<td>$5,930,898</td>
</tr>
</tbody>
</table>

The First Nations Infrastructure Investment Plan provides an overview of the CFM Program for the period of 2014-2015 to 2019-2020. The CFM Program has two funding streams; Formula-Based Funding, which includes operations and maintenance, as well as minor capital projects;
and Proposal-Based Funding, which includes minor and major capital projects. This investment plan is based on known factors at the time when each of the three linked investment plans are prepared at the community, regional and national level. The plan takes into account A-base, which is a recurring set of funds to support the function of the department, as well as targeted funding, however, it cannot anticipate unforeseen emergencies, new investment opportunities or other factors that may occur over the course each fiscal year.

When comparing the total expenditures as reported by the sample communities, the planned spending from the CFM program is almost half of what only 18 communities had spent for the 2015-2016 fiscal year. Other funding streams from CMHC, the FNMHF, and other initiatives were not available for the Atlantic Region alone.

Figure 9 shows the total expenditures according to each community population size, as well as the average cost per unit. The average cost per unit was calculated by taking the total expenditures and dividing by the total number of units reported (i.e., band-owned homes, individually-owned homes, and On-Reserve Non-Profit Housing units (Section 95)).

Figure 9: Total Expenditures based on repairs, maintenance and accessibility according to each community population size, along with the average annual cost per unit.

The main observation taken from Figure 9 is that First Nation communities with a larger population tend to spend less money per unit in terms of repairs, maintenance and accessibility renovations on an annual basis. This may be correlated to the amount of repairs larger communities complete annually. First Nations communities with larger populations will typically have contractors within their department to complete certain repairs and renovations. This allows them to save on labour and possibly materials as well.

Figure 10 below shows the total expenditures of each community population size as well as the average cost per unit. In this figure, the average cost per unit does not include the individually-owned homes.
Individually-owned homes are to be the responsibility of the owner, therefore bandwidth expenses on repairs, maintenance and accessibility renovations should not be spent on those homes. By removing those units from the calculation, it can be observed that the average cost per unit increases, but the overall trend remains the same.

8.4 Limitations

Major limitations in the financial component of the survey were as follows:

- Lack of information on the source of these funds; it was not justifiable to pose questions related to the source of funding for each community, since it was out of the scope of the survey.
- The total expenditures of all sample communities cannot be used as a baseline for 2015-2016 expenditures because there are 17 communities that have not participated in the survey.
- Figure 9 and 10 show the financial figures for 18 out of 34 communities. Only 18 communities reported a total number of dwellings in their community, therefore only the total expenditures from those communities were taken for this calculation.
9.0 Housing Need

9.1 Background

Current housing programs and available funds to First Nation communities is insufficient to meet the demand. The population living in First Nations communities is growing, and the impact of overcrowding, deterioration of units, and contamination will all factor in when determining the future housing need. (Clatworthy, S. 2009).

In 2009, INAC commissioned a consulting company to provide estimates of new construction, renovations and stock modifications needed to bring First Nations housing conditions up to a national standard. The study assessed the 2001 census data in terms of First Nations households on reserve, as well as private dwellings occupied by over 50% persons with Aboriginal identity. (Clatworthy, S. 2009).

The results of the Clatworthy study were compared with the housing needs analyzed through the APC survey. The existing housing need was calculated by considering the following requirements: the replacement of units that have deteriorated beyond repair, the modification of certain households to eliminate overcrowding, and the renovation of units that require major repairs. (Clatworthy, S., 2009).

9.2 Current Housing Need versus Anticipated Housing Need

In this study, the housing need is calculated in two ways: the current need required to match the average Persons per Household (PPH) of 2.5 persons per unit, and the anticipated need to accommodate population growth, and replacement of deteriorated units as well as condemned units that are occupied.

9.3 Results and Analysis

9.3.1 Housing Back-Log

A housing shortage can be exacerbated by population growth, resulting in long waiting lists for housing in many First Nation communities. APC survey communities reported, as a whole, a total of 911 applications, characterizing the region’s waiting lists as a whole. The extent of the waiting list is representative of the pressing housing need for the region.
Figure 11: Rate of New Housing Applications received versus the Rate of New Structures built in the 2015-2016 Fiscal Year.

Figure 11 shows the average number of new housing applications received according to each community population size, as well as the average number of structures built for each population size.

An expected trend is the rate of applications received is increasing as the community population increases. An interesting observation, however, is that the rate at which structures are built does not match the rate of applications received. This represents a housing need in terms of potential interest, but also represents the lack of supply to meet the demand. In turn, this exhibits a housing shortage.

9.3.2 Suitability Deficiencies – Current Need based on Overcrowding

As stated previously, the occupancy rate in First Nations living on reserve is considerably higher than the national average Persons per Household (PPH). Since the household types (i.e., bedroom sizes and total living area) are diverse, one way to view overcrowding is to look at the total number of dwellings and the population for each community. With the data obtained through the APC survey, an estimated number of units required to remediate overcrowding was calculated. An Example calculation is shown in Figure 12.
The national average Persons Per Household (PPH) = 2.5 persons/unit
Community A population living on reserve = 440
Community A total number of units reported = 132
Community A occupancy standard:
\[
\frac{440 \text{ persons}}{132 \text{ units}} = 3.33 \text{ persons/unit}
\]
Is Community A occupancy rate less than the national PPH?
\[
3.33 < 2.5 = FALSE
\]
Calculate the ideal number of units for Community A
\[
\frac{440 \text{ persons}}{2.5 \text{ persons/household}} = 176 \text{ households}
\]
Calculate the **Actual Units Required:**
\[
176 \text{ ideal units} - 132 \text{ reported units} = 44 \text{ Units}
\]

Figure 12: Sample calculation of the actual units required for one community based on the average PPH.

This calculation was completed for all APC survey communities and the total for each province is listed in Table 4 below. The total units required to remediate overcrowding for the sample communities in the Atlantic Region is 1,449 units.

Table 4: Estimates of the new units required to remediate overcrowding according to the national average Persons per Household (PPH)

<table>
<thead>
<tr>
<th>Province</th>
<th>Number of Sample Communities</th>
<th>Units Required - Overcrowding</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Brunswick</td>
<td>6</td>
<td>591</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>7</td>
<td>705</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>1</td>
<td>77</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Quebec</td>
<td>2</td>
<td>76</td>
</tr>
<tr>
<td>TOTAL</td>
<td>17</td>
<td>1,449</td>
</tr>
</tbody>
</table>

The number of sample communities listed in Table 4 shows 17 respondent communities. This differs from the total of 18 communities because one community only submitted the total number of Section 95 housing, which could not be used as the total number of dwellings for that community.

With the intention of finding an accurate number for the units required based on overcrowding for the Atlantic region, two extrapolation methods were applied to the APC survey data. The results are shown in Table 5 below. For details on the both extrapolation methods, see Annex A.
Table 5: Adjusted number of units needed based on overcrowding extrapolated for the Atlantic region.

<table>
<thead>
<tr>
<th>Missing Communities (17 communities)</th>
<th>Extrapolation Method 1</th>
<th>Extrapolation Method 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing Communities (17 communities)</td>
<td>1,114</td>
<td>876</td>
</tr>
<tr>
<td>APC survey communities (17 communities)</td>
<td>1,446</td>
<td>1,446</td>
</tr>
<tr>
<td>Total for Atlantic Region</td>
<td>2,560 units required</td>
<td>2,431 units required</td>
</tr>
</tbody>
</table>

9.3.3 Adequacy – Current Need based on Condemned Units

Some communities sampled in the APC survey reported that a certain number of condemned homes are still occupied. Due to health and safety violations, there have been numerous attempts at vacating these homes, but as a result of housing shortages, these attempts have been unsuccessful. There is a pressing need to replace these homes with new units. Table 6 shows the total number of reported condemned homes that are currently occupied and require replacement.

Table 6: Estimates of the new units required to replace occupied condemned homes.

<table>
<thead>
<tr>
<th>Province</th>
<th>Number of Sample Communities</th>
<th>Units Required – Occupied Condemned Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Brunswick</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Quebec</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4</td>
<td>53</td>
</tr>
</tbody>
</table>

The number of sample communities listed in Table 6 shows only 4 respondent communities. This is because only 4 communities reported having units that are condemned and occupied.

9.3.4 Summary of Current Housing Need

Figure 13 translates the data from Tables 4 and 6 into a visual representation of the potential costing of the current required units, according to the cumulative number of units reported by First Nation communities in each province. One of the questions posed in the APC survey was
concerning the average cost of constructing a new unit in their community. The reason these figures are separated by province as the cost of construction for a new unit is best represented in this manner. Some communities in Newfoundland and Labrador are very rural and the costs of goods and transportation are typically higher.

Figure 13: Average Cost of Construction for each province and the Total Cost of remediating the current housing need based on the average PPH.

The costs associated with the housing need based on overcrowding within each province is shown in Figure 13, above. By taking the total number of units required and multiplying them by the average cost of construction, a total cost of $198,290,324 is expected for the sample communities for the study area. This is a very liberal estimate as it factors in an average cost of construction for a new, free-standing unit. There are cost effective methods such as conversions and remedial solutions that could be explored.

9.3.5 Suitability – Anticipated Need based on Population Growth

As mentioned previously, the youth demographic may drive an increased demand for homeownership as soon as the next five years. Figure 14 shows the age population that fall within 15-19 years of age within the APC sample communities compared to the provincial averages. The population as reported show that the percentage of residents aged 15-19 is consistently higher than the provincial average of non-first nations.
Table 7 shows the total number of residents aged 15-19 years living on reserve in the APC sample communities. Assuming that all residents will choose to stay in their communities and will require new housing, this number can then be translated into a total number of units required to accommodate for population growth. A limitation on this estimate may be that not all residents will choose to stay in the community, or will leave to pursue education. In this case, the total number of units will only be required in a time frame of 10 years, when that population demographic reaches the ages of 25-29 years of age. The type of units needed will also change to accommodate the demographic profile of First Nations staying on-reserve.

Table 7: Estimates of the new units required to accommodate population growth for the age demographic of 15-19 years of age.

<table>
<thead>
<tr>
<th>Province</th>
<th>Number of Sample Communities</th>
<th>Units Required – Population Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Brunswick</td>
<td>6</td>
<td>487</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>8</td>
<td>763</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>3</td>
<td>319</td>
</tr>
<tr>
<td>Quebec</td>
<td>1</td>
<td>185</td>
</tr>
<tr>
<td>TOTAL</td>
<td>19</td>
<td>1,786</td>
</tr>
</tbody>
</table>

With the intention of finding an accurate number for the units required based on population growth for the Atlantic region, two extrapolation methods were applied to the APC survey data. The results are shown in Table 8 below. For details on the both extrapolation methods, see Annex A.
Table 8: Adjusted number of units needed based on population growth extrapolated for the Atlantic region.

<table>
<thead>
<tr>
<th>Missing Communities (15 communities)</th>
<th>Extrapolation Method 1</th>
<th>Extrapolation Method 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>843</td>
<td>762</td>
</tr>
<tr>
<td>APC survey communities (19 communities)</td>
<td>1,786</td>
<td>1,786</td>
</tr>
<tr>
<td>Total for Atlantic Region</td>
<td><strong>2,629 units required</strong></td>
<td><strong>2,548 units required</strong></td>
</tr>
</tbody>
</table>

9.3.6 Adequacy – Anticipated Need based on Ageing Units

As mentioned previously, homes that are over the age of 25 may not be up to the minimum health and safety standard, or may not be economically feasible to repair, therefore they may need to be replaced. A limitation on this housing need estimate is that not all homes that are over the age of 25 will need to be replaced. As a way of showing the anticipated housing need, Table 9 displays the total number of units required based on ageing units.

Table 9: Estimates of the new units required to accommodate ageing homes (> 25 years of age).

<table>
<thead>
<tr>
<th>Province</th>
<th>Number of Sample Communities</th>
<th>Units Required – Replacement Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Brunswick</td>
<td>5</td>
<td>483</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>4</td>
<td>181</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Quebec</td>
<td>1</td>
<td>88</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11</td>
<td>759</td>
</tr>
</tbody>
</table>

The number of sample communities listed in Table 9 shows only 11 respondent communities instead of the 18 submitted APC surveys. This is because only 11 communities reported having homes that are over the age of 25.

9.3.7 Summary of Anticipated Housing Need

The following figure translates the above tables into a visual representation of the potential costing of the anticipated required units over a 5-10 year timeframe. Again, show
ing the average cost of construction for a new unit for each province, the total anticipated units required is multiplied by the average cost of construction to give a total cost estimate to accommodate the housing need.

Figure 15: Average Cost of Construction for each province and the Total Cost of remediating the anticipated housing need based on population growth, replacement needs, and new units required due to condemned homes.

The costs associated with the anticipated housing need based on population growth, within each province is shown in Figure 15, above. By taking the total number of units required and multiplying them by the average cost of construction, a total cost of $425,851,940 is expected for the sample communities for the study area. This is a very liberal estimate as it factors in an average cost of construction for a new, free-standing unit. There are cost effective methods such as conversions and remedial solutions that could be explored.

10.0 Conclusion

The Atlantic Housing Needs Assessment report represents a major milestone in providing a First Nation account and analysis of the housing needs in the current and future context.

A younger population is indicative of greater future need for household and family formation, which will require adequate and suitable housing. In particular, unsuitable housing is indicated by regional above-average household occupancy relative to census averages. The large proportion of First Nations living off reserve may constitute a housing need in the near future. First Nations have a consistently higher percentage of population under 20 years of age compared to non-First Nations provincial average, as well as the Canadian average. In as few as 5 years, the anticipated housing need to accommodate population growth is 1,786 units.
Unsuitable housing exacerbates respiratory health risks from mold and radon contamination. Mould contamination in First Nation communities is largely due to overcrowding, homeowner neglect, and poor construction resulting in leaks in foundations, windows, and roofs. The presence of radon is strongly associated with geographic location and occurs mostly in homes that have poor air circulation. The total reported units that require decontamination is 433 for mould, and 88 for radon.

Replacement of inadequate dwellings is characterized by ageing homes (i.e., > 25 years old), condemned units and land issues that require infrastructure upgrades. Numerous factors contribute to the necessary replacement of units. As reported in the APC survey, 759 units are over the age of 25, 210 units require infrastructure upgrades, and 53 units are currently condemned and occupied.

The financial gap analysis shows that the APC sample communities are spending a considerable amount of money on repairs, divided almost evenly between minor and major repairs. Overall, larger community population sizes are spending less money on repairs, maintenance and accessibility per unit on an annual basis. The amount of capital funding received by First Nations communities is insufficient when considering the amount of new units required both presently and in the future to accommodate growth. It is unclear if the amount of funding received by First Nation communities is sufficient to cover all operations and maintenance costs of housing, since specific information was not provided from CMHC, FNMHF and other initiatives in terms of funds allocated to the Atlantic Region.

The housing need in terms of population growth, overcrowding, decontamination and replacement needs are summarized below. The current and anticipated housing need can be translated into an overall investment of $198,290,324 (see Section 9.3.4) and $425,851,940 (see Section 9.3.7), respectively.
11.0 References


Browne, A.J (2007). Clinical Encounters Between Nurses and First Nations Women in a Western Canadian Hospital. Social Science & Medicine, 64(10), 2165-2176


ANNEX A: Extrapolation Methods

OVERCROWDING

Using the data from APC survey communities, a total of 1,449 new units are required because of overcrowding. This was calculated through the following steps:

1. Calculate the occupancy rate by taking the total on-reserve population for each community and dividing it by the total number of private dwellings reported.
2. Take the calculated occupancy rate of each community and check if it is greater than the national average Persons per Household (PPH) of 2.5 persons per household. If yes, an ideal number of private dwellings was calculated for that community population size. If no, the total number of private dwellings meets the needs of that community population size and does not require additional units.
3. The ideal number of private dwellings was calculated by taking the on-reserve population and dividing it by the average PPH of 2.5 persons per unit.
4. The ideal number of private dwellings was then subtracted from the total number of private dwellings reported to find the number of additional units required for each community.
5. The additional number of units required for each community was tallied to find the total number of units required to remediate overcrowding conditions = 1,446.

Extrapolating for the region – Method 1

We have the following information:

- 2016 Population size of APC survey communities
- 2016 Total private dwellings of APC survey communities

We can gather information from the 2011 census on:

- 2011 Population size of APC survey communities
- 2011 Population size of missing APC communities (i.e., communities that have not submitted a survey)
- 2011 Total private dwellings of APC survey communities
- 2011 Total private dwellings of missing APC communities (i.e., communities that have not submitted a survey)

By taking the 2011 Census of population dataset, and comparing it to the 2016 APC survey population dataset, the percent growth was determined. The average percent population growth was determined to be 18.9% increase from 2011 to 2016. Similarly, by taking the 2011 National Household Survey housing stock information, and comparing it to the 2016 APC Survey housing stock dataset, the percent growth in terms of housing stock was determined. The average percent increase in housing stock was determined to be 10.15% increase in housing from 2011-2016.

Both of these percentages, 18.9% and 10.15%, were applied to (i.e., multiplied by) the 2011 Population size of missing APC communities, and the 2011 Total private dwellings of missing
APC communities, respectively. From this calculation, an updated list of 2016 population sizes of missing APC communities, and a 2016 total private dwellings of missing APC communities was obtained. By completing Steps 1 to 6 listed above to the updated lists, a new total of current housing need was calculated for the region. The total is 1,446 units (based on APC survey communities) + 1,114 units (from extrapolated data) for a total of 2,560 current units needed to remediate overcrowding conditions, according to the average PPH.

Extrapolating for the region – Method 2

We have the following information:

- 2011 Population size of missing APC communities (i.e., communities that have not submitted a survey)
- 2011 Total private dwellings of missing APC communities
- Therefore we have an average occupancy rate for 2011 (population divided by dwellings)

We can gather the following information from the 2006 and 2011 censuses:

- Population growth from 2006-2011 of missing APC communities.

Major assumptions:

- Population growth from 2006-2011 is the same for 2011-2016; and
- Occupancy rate in 2011 is the same for the occupancy rate in 2016.

By applying the population growth from 2006 to 2011 to the population of 2011, we can obtain a population size of missing APC communities for 2016. Once we have the estimated population size of missing communities for 2016, we can divide that by the occupancy rate in 2011 to find the total number of private dwellings in 2016. By completing Steps 1 to 6 above, we can obtain an ideal number of households based on the PPH and the new calculated 2016 population and find the additional number of dwellings required for the missing communities only by subtracting the total number of private dwellings calculated for 2016. The total is 1,446 units (based on APC survey communities) + 876 units (from extrapolated data) for a total of 2,431 current units needed to remediate overcrowding conditions, according to the PPH.

Overcrowding Summary Table:

<table>
<thead>
<tr>
<th></th>
<th>Extrapolation Method 1</th>
<th>Extrapolation Method 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing Communities (17 communities)</td>
<td>1,114</td>
<td>876</td>
</tr>
<tr>
<td>APC survey communities (17 communities)</td>
<td>1,446</td>
<td>1,446</td>
</tr>
<tr>
<td>Total</td>
<td>2,560 units required</td>
<td>2,431 units required</td>
</tr>
</tbody>
</table>
**POPULATION GROWTH**

**Extrapolation for the region – Method 1**

Using the data from the APC survey communities, an anticipated total of 1,786 units is required based on population growth. The number was calculated by adding the total number of individuals that are within the age range of 15-19 years old in each APC survey community.

We have the following information:

- 2016 population of residents aged 15-19 years old of APC survey communities

We can gather the following information from the 2011 census:

- 2011 population of residents aged 15-19 years old of APC survey communities; and
- 2011 population of residents aged 15-19 years old of *missing* APC communities (i.e., communities that have not submitted a survey)

From the 2011-2016 population of 15-19 year olds data set, the percent growth was calculated to be 18.7%. This percent growth was applied to the 2011 population of residents aged 15-19 years old of *missing* APC communities to determine the 2016 population of residents aged 15-19 years old of *missing* APC communities. The total number of residents aged 15-19 years old was added for all missing APC communities. **The total is 1,786 anticipated new units (based on APC survey communities) + 843 anticipated new units (based on extrapolation) for a total of 2,629 anticipated units needed to accommodate for population growth, based on residents aged 15-19 years old for the entire region.**

**Extrapolating for the region – Method 2**

We have the following information:

- 2011 population of residents aged 15-19 years old of APC survey communities;

We can gather the following information from the 2006 and 2011 censuses:

- Population growth from 2006-2011 of *missing* APC communities.

Major assumptions:

- Population growth from 2006-2011 is the same for 2011-2016 for residents aged 15-19 years.

By applying the population growth from 2006 to 2011 to the population from 201, we can obtain a population size of residents aged 15-19 of missing APC communities for 2016. The total number of residents aged 15-19 years old was added for all missing APC communities. **The total is 1,786 anticipated new units (based on APC survey communities) + 762 anticipated new units (based on extrapolation method 2) for a total of 2,527 anticipated units needed to**
accommodate for population growth, based on residents aged 15-19 years old for the entire region.

Population Growth Summary Table:

<table>
<thead>
<tr>
<th></th>
<th>Extrapolation Method 1</th>
<th>Extrapolation Method 2</th>
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