



An Exploratory Study on the Life Cycle of First Nations Homes

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First Nations National Building Officers Association
Shannonville, Ontario

For information regarding this project, please contact Mr. Bud Jobin, President
info@fnnboa.ca

The views expressed in this case study are those of the authors and may not necessarily reflect FNNBOA or Indian and Northern Affairs Canada who funded this project.

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Introduction

The design and construction of a new home is one of the most resource-intensive decisions made by Chief and Council. For example, in February 2005, the Government of Canada announced \$295 million would be provided over five years to increase the supply of housing by 6400 units (4400 of which are CMHC Section 95 fully subsidized units; 2000 are INAC, targeted as homeowner or market-rental units)¹. In addition, funding for renovations would be increased by 1500 units (1100 through CMHC's Residential Rehabilitation Assistance Program and 400 through INAC's renovation program). INAC will also receive funding to service 5400 lots².

Over the years, however, several reports and studies have focused on problems with deteriorating and inadequate housing in First Nations communities³. Much of this deterioration is the result of many factors, such as the houses that are too small and therefore overcrowded, with inadequate and dilapidated kitchens and washrooms (see Figures 1, 2 and 3). These reports also suggest that many homes do not meet provincial or federal standards with respect to building, fire, electrical or environmental codes. Many of these homes were constructed or assembled without proper supervision or inspections. Homes in the community are often poorly maintained by the occupants with no sense of responsibility for their own living conditions. While people in the homes have not been deliberately destructive, in some cases the homes have been vandalized.

Furthermore, many of the communities have no rental policies, housing standards or by-laws, nor personnel with any responsibility for enforcing housing or living standards. As the Chief and Council own the homes, occupants have generally not been motivated to resolve the housing problems; nor is there a framework to take on responsibility for the housing problems (e.g., is it the Chief and Council, CMHC, or INAC?).

To better respond to these conditions, members of First Nations communities need to understand the life cycle of a home, and all the operation and maintenance costs that encompasses.

A review of the literature on First Nations housing revealed that no studies have been conducted to examine the costs of homes from a life-cycle perspective⁴. There is

¹ Indian and Northern Affairs Canada (ND) *First Nations Housing*. Retrieved from: <http://www.ainc-inac.gc.ca/ai/mr/is/info104-eng.asp>

² Ibid

³ See for example, the seven part series called "native housing crisis" published by the *Times Colonist* <http://www.timescolonist.com/news/housing-crisis/index.html>. Also see A. Durbin (2009), "The on-reserve housing crisis: A study of the Kelowna accord," *Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health*, Vol. 7., No.2., 181- 200. Assembly of First Nations (2005) *First Nations Housing Action Plan* (Draft). Retrieved from: <http://64.26.129.156/cmslib/general/Housing-AP.pdf>

⁴ There have been a few studies that looked at the total life cycle energy consumption of materials used to construct a house. See For example, Steven Blanchard and Peter Reppe (1998) *Life Cycle Analysis of A residential Home in Michigan*. Sponsored by the National Pollution Prevention Center . G. Keoleian, Steven Blanchard, and Peter Reppe (2001), "Life-Cycle energy, Costs and Strategies for Improving a

however, anecdotal information that the average home in First Nations lasts only eight to 10 years. In a recent speech, First Nations housing has been referred to as disposal housing because many homes require major renovation or demolition after several years⁵. A presentation by Vince Genereaux and Al Lafond (2004) showed the ongoing costs associated with the maintenance of homes in the community. They pointed out that the average costs of repairs to a house is around \$40,000 and general maintenance cost is approximately \$27,000. These costs also increase if the house is neglected, which amounts to approximately \$28,000. The authors also estimate that if a home costs \$127,000 over 25 years, the owners will spend around \$67,000 on repairs and maintenance and another \$28,000 if the home is neglected.



Figure 1 Fire Damage



Figure 2 Repairs to Soffit



Figure 3 Repairs to bathroom

In a recent article, Trusty (2011) argues that life-cycle assessment needs to be incorporated in building codes. This will allow contractors or builders to select materials that include maintenance and replacement costs. This should also include other costs, such as operating energy and disposal⁶.

Importance of Understanding Life Cycles

Understand the life cycle of a home is important, especially when it comes to estimating the maintenance and repair cost of Chief and Council-owned homes. During planning, life-cycle costs are needed to evaluate alternate ways of meeting requirements (e.g., new construction, or renovation of existing facilities). During design, maintenance and repair costs for various types of components, such as built-up or shingle roofs, need to be calculated, so that the total life cycle cost of different designs can be minimized. Finally, once the home has been constructed, yearly predictions of maintenance and repair costs

Single-Family House,” *Journal of Industrial Ecology*, Vol. 4., No 2: 135- 156. Peter Smith (2010), *Life Cycle Costs and Housing Affordability Measurement*. Retrieved from: .
<http://www.icoste.org/ICMJ%20Papers/SMITH2010.pdf>

⁵ Closing speech by C.T. (Manny) Jules, Chief Commissioner, at the Vancouver conference at the First Nations Property Ownership, October 20, 2010, Fairmount Hotel Vancouver, British Columbia.

⁶ Wayne Trusty (2011), The Future of Life Cycle Assessment (LCA) in Codes,” *Building Safety Journal Online*, February, Pages 43-46. See also, Wayne Trusty (2010) Misconceptions and Misunderstanding about LCA,” *Building Safety Journal Online*, December 14, 2010. Retrieved from :
http://bsj.iccsafe.org/2010Dec/2010Dec_PDFs/DecBSJ_misconceptions_LCA.pdf

are needed so that enough funds can be programmed to ensure that the homes are maintained properly and do not deteriorate due to lack of maintenance.

Approach

For the purposes of this exploratory study, life-cycle costs are defined as the total cost of a property over a 50-year period. These include maintenance, repair and improvement costs. Maintenance and repair costs are based on a detailed analysis of home inspectors based on their experience of inspecting homes in First Nations. Other costs, such as mortgage repayments, insurance premiums and other fees, were excluded.

To collect the data, inspectors from the First Nations National Building Officers Association (FNNBOA) and others working in housing were asked to complete a maintenance and home-improvement schedule (Appendix A, based on their experience in inspecting homes in one of the three communities). The estimations were based on pricing the repair of items identified in the maintenance and repair schedule. As each table was completed, the information was collected and shared among the inspectors for further feedback. A conference call was also held to discuss the completion of the tables.

To collect the data, three community scenarios were presented:

1. **First Nations Community with Poor Housing Conditions (PHC)** – This represents, unfortunately, most First Nations housing stock. It includes those communities where the Chief and Council have no band by-laws or resolutions for the construction of homes, and where there is no or limited capacity for decision-making on how homes are built. While the Chief and Council are the authority having jurisdiction for the construction of homes in the community, there is little evidence they have exercised their authority. The person managing the housing projects is not trained or has limited experience, and the homes were built by unqualified/certified journey people. Homes are not fully inspected during the construction process. The person conducting the inspections may not be familiar with some construction practices, but has not been certified, and therefore it is unclear if the individual is qualified to carry out such inspections. Occupants pay no rent or consideration to reside in the homes. There is also no general maintenance program to ensure homes are repaired. Housing conditions in these communities can be described as overcrowded and dilapidated. In some cases, homes can be viewed as uninhabitable, yet people are still living in these quarters. Examples of these types of homes can be found in Figures 4, 5 and 6.



Figure 4 A home in a remote First Nations community



Figure 5 A home not properly constructed



Figure 6 Collapsed railing from porch

- 2. First Nations Community with Average Housing Conditions (AVC)** - This would represent those communities that have some band by-laws and resolutions in place to ensure homes are built to codes. Housing decision-makers are familiar with the construction process. Staff responsible for construction are familiar with the process and may have experience in managing the construction of homes. Homes are built mainly by qualified contractors, but this process may not be consistent because the Chief and Council may want another individual to build the homes. Many of the homes are inspected six times and, in most cases, the Chief and Council will respond to the issues of inferior construction practices as identified by the inspector. A maintenance program is in place, but needs to be implemented. Residents are obligated to pay rent, but payment is inconsistent. This represents the norm of housing conditions in the communities. Pictures of these types of homes can be found in Figure 7.



Figure 7 Homes built in communities where codes may apply

- 3. First Nations Communities with Excellent Housing Conditions (EHC)** – This represents those communities that have in place band by-laws and resolutions to ensure homes are built the code.

Decision-makers have an understanding of home construction practices. There are also people on staff or hired as consultants to manage the construction processes. Materials used in the homes are of a better quality. These communities also have a process for approving homes, and instruct members on where the homes will be built, as these buildings are part of a larger comprehensive community plan. There is also a maintenance program to fix the homes. The homes are built by qualified/certified contractors and quality materials are used. Homes are inspected several times during the construction process. Inspectors are certified or qualified. Occupants pay rent, which is used to maintain the homes. These communities also have the funds to repair damaged homes. Examples of these types of homes can be found in Figures 8, 9 and 10.



Figure 8 Modern homes built in a community with building-code by-laws



Figure 9 A home in a community that emphasizes building homes to code and other standards.



Figure 10 A home constructed to building codes

The maintenance and repair schedule consists of a table with six columns. The first column (A) provides a list of maintenance activities.

The second column (B) provides the normal life expectancy in years for each of the maintenance activities. These years are based on the Canada Mortgage and Housing Corporation rating (Appendix B).

The third column (C) represents the estimated actual replacement in years. However, it does not mean that the Chief and Council made repairs. For that matter, in many cases, the Chief and Council do not make the necessary repairs, causing more damage to the house. Responses for each maintenance activity were taken and only the medium was provided. Unfortunately, there was no information on replacement rates for many of the items listed. Consequently, replacement frequencies were estimated by the inspectors who provide similar estimations to the Chief and Council for repairs to existing homes.

The fourth column (D) provides a statement for the most common cause for premature repair or maintenance. These are also estimated.

The fifth column (E) is the estimated average cost for a repair based on dollar value. These responses were collected and the medium score was taken as the estimated value. The final column provides the total costs for repairs for the life expectancy of 50 years.

The primary drawback of such an approach is that it requires large quantities of life-cycle inventory data. Each material of each building component must be assigned best estimates of its life-cycle environmental impacts, with respect to the sustainability indicators chosen. This information must be continuously revised to reflect refinements in the estimates and updated to include new materials that will evolve. Another shortcoming of this approach is heavy reliance on the inspector's experience and understanding the costs of repairs. The estimates are based on the inspector's years of experience in First Nations communities. As part of their job, they provide estimations on the costs of repairing homes. While this is a shortcoming, many of the figures provided by the inspectors did not substantially vary. In fact, a large portion of the responses had the same figures and estimated costs.

First Nations Community with Poor Housing Conditions (PHC)

Table 1 represents the figures for a First-Nation community with PHC. The information provided is based on 10 responses from experienced inspectors. The table shows that home repair and replacement costs in First Nations communities are much higher than those off reserve. These replacement costs are associated with substandard building practices, vandalism and neglect. Many of these items are expensive, and should not be a necessary if homes were properly built to building-code standards. For example, it is estimated that external foundation walls are replaced or repaired every five years. This cost amounts to \$120,000 over the 50-year life cycle.

If the Chief and Council will not make the required or necessary repairs, the cost of repairs is compounded. Assuming that all the repairs were done, this would amount to \$903,992. If we further assume the average cost of a house is \$180,000 over the 50-year period, your average house is rebuilt five times.

Table 1 Estimated Maintenance and Repairs for Homes in First Nations Communities with Poor Housing Conditions over a 50-Year Life Cycle

A	B	C	D	E	F⁷
Activity (based on home life of 50 years)	Normal life expectancy in years	FN Estimated replacement in years	State most common Cause for premature repairs: (1) vandalism/neglect, (2) code infraction, (3) substandard material, (4) shoddy construction, (5) overcrowding, (6) other	Estimated Average Cost for a repair dollar value	Total Repair costs for life expectancy of 50 years in First Nations Communities.
Inside door repair	30	3	vandalism/neglect	1,000	16,667
Internal painting, wall repair	15	5	vandalism/neglect	3,000	50,000
External re-painting	10	15	neglect	2,500	83,333
PVC siding replaced	25	15	vandalism/neglect	7,000	23,333
PCV siding - repaired		5	vandalism/neglect	2,000	20,000
New roofing (asphalt shingles)	20	12	substandard material	6,500	32,000
New refrigerator	15	10	neglect	800	4,000
New sump pump	10	5	overcrowding	275	2,750
New water heater	15	5	neglect	750	2,750
New range /stove	15	10	neglect	525	2,625
New range hood	15	15	neglect	400	1,333
New dishwasher	15	10	overcrowding	600	3,000
New cloths washer	15	10	overcrowding	1,000	5,000
New cloths dryer	15	10	overcrowding	1,000	5,000
New furnace	30	15	neglect	3,600	12,000
Repair furnace		7	neglect	1,750	12,450
Kitchen and bathroom cabinet replacement	20	10	vandalism/neglect	6,300	31,500
Renovate bathroom tub area	15	10	substandard material,	1,500	15,000
Renovate all bathroom	20	10	shoddy construction	6,300	31,500
Renovate kitchen (all cabinets, floor, plumbing)	20	10	vandalism/neglect	11,500	57,000
Replace all flooring in house	15	10	substandard material	6,000	30,000
Replace carpets	15	7	neglect	7,000	50,000
Replace all windows	25	15	vandalism/neglect	7,500	25,000
Replace glazing	50	5	vandalism	4,000	40,000
Repair windows	25	5	neglect	1,000	10,000
Repair structure to the house					

⁷ Total repair costs for life expectancy is 50 years ÷ Column C x Column E

• Internal walls	50	10	vandalism	3,000	30,000
• External walls	50	15	Code infraction	12,000	120,000
• Roof (excluding shingles)	25	15	shoddy construction	6,500	32,500
• Basement walls	50	15	Code infraction	20,000	66,667
• Structure footings etc	50	15	Code infraction	17,000	56,667
Outside activities					
Replace deck front/back	20	7 years	substandard material	1,400	11,667
Repair deck	20	5	Shoddy construction	900	9,000
Repair of stairs	20	5	Substandard material	450	11,250

First Nations Communities with Average Housing Conditions (AHC)

Table 2 reveals the information gathered from the inspectors on the estimated maintenance and repairs for homes in First Nations communities with average housing conditions. In many instances, the estimated replacement years almost double in terms of the longer times an item needs to be replaced. If all the repairs were conducted the total costs over a 50-year period would be \$361,975. If we assume a house value is \$180,000, the total repairs will be two times the value of the house.

Table 2 Estimated Maintenance and Repairs for Homes in First Nations Communities with Average Housing Conditions over a 50-Year Life Cycle

A	B	C	D	E	F⁸
Activity (based on home life of 50 years)	Normal life expectancy in years	FN Estimated replacement in years	State most common Cause for premature repairs: (1) vandalism/neglect, (2) code infraction, (3) substandard material, (4) shoddy construction, (5) overcrowding, (6) other	Estimated Average Cost for a repair dollar value	Total Repair costs for life expectancy of 50 years in First Nations Communities.
Inside door repair	30	11	vandalism/neglect	1,000	4,545
Internal painting, wall repair	15	9	vandalism/neglect	3,000	16,667
External re-painting	10	15		2,500	8,333
PVC siding replaced	25	20		7,000	17,500
PCV siding - repaired		10		2,000	10,000
New roofing (asphalt shingles)	20	20		6,500	16,250
New refrigerator	15	12		800	3,333
New sump pump	10	5	overcrowding	275	2,750
New water heater	15	10	neglect	750	3,750
New range /stove	15	10	neglect	525	2,635

⁸ Total repair costs for life expectancy is 50 years ÷ Column C x Column E

New range hood	15	10	neglect	400	2,000
New cloths washer	15	10	overcrowding	1,000	5,000
New cloths dryer	15	10	overcrowding	1,000	5,000
New furnace	30	20	neglect	3,600	9,000
Repair furnace		5	neglect	1,750	17,500
Kitchen and bathroom cabinet replacement	20	15	vandalism/neglect	6,300	21,000
Renovate bathroom tub area	15	15	substandard material,	1,500	5,000
Renovate all bathroom	20	20	shoddy construction	6,300	15,750
Renovate kitchen (all cabinets, floor, plumbing)	20	15	vandalism/neglect	11,500	38,333
Replace all flooring in house	15	15	substandard material	6,000	20,000
Replace carpets	15	10	neglect	7,000	35,000
Replace all windows	25	20	vandalism/neglect	7,500	25,000
Replace glazing	50	10	vandalism	4,000	20,000
Repair windows	25	10	neglect	1,000	5,000
Repair structure to the house					
• Internal walls	50	30	vandalism	3,000	5,000
• External walls	50	40	Code infraction	12,000	15,000
• Roof (excluding shingles)	25	28	Building above standards	6,500	11,607
• Basement walls	50	40	Code infraction	20,000	25,000
• Structure footings etc	50	40	Code infraction	17,000	21,250
Outside activities					
Replace deck front/back	20	15	substandard material	1,400	4,667
Repair deck	20	8	Shoddy construction	900	5,625
Repair of stairs	20	8	Substandard material	450	2,813

First Nations Communities with Excellent Housing Conditions (EHC)

Table 3 provides an overview of the maintenance and repairs for homes in First Nations communities that have excellent housing conditions. Again, there is a reduction in the estimated times that items need to be repaired or maintained. While these types of communities are located near more populated centres, the estimated average costs for repairs should also be slightly reduced. This will be attributed to the Chief and Council having the opportunity to tender the work or have qualified individuals to complete the work at a reduced rate. If all the repairs were to be conducted over the 50-year life cycle, the estimated costs of repairs would be \$305,206. Assuming the house is valued at \$180,000, the total cost of repairs is 1.7 times. This housing value may also be low, as First Nations communities near populated areas may have a higher house value because of the economy and the demand for housing.

Table 3 Estimated Maintenance and Repairs for Homes in First Nations Communities with Excellent Housing Conditions over a 50-year Life Cycle

A	B	C	D	E	F⁹
Activity (based on home life of 50 years)	Normal life expectancy in years	FN Estimated replacement in years	State most common Cause for premature repairs: (1) vandalism/neglect, (2) code infraction, (3) substandard material, (4) shoddy construction, (5) overcrowding, (6) other	Estimated Average Cost for a repair dollar value	Total Repair costs for life expectancy of 50 years in First Nations Communities.
Inside door repair	30	30		1,000	1,667
Internal painting, wall repair	15	15		3,000	10,000
External re-painting	10	13		2,500	9,615
PVC siding replaced	25	25		7,000	23,333
PCV siding - repaired		10		2,000	10,000
New roofing (asphalt shingles)	20	25		6,500	13,000
New refrigerator	15	12		800	3,333
New sump pump	10	10		275	1,375
New water heater	15	10		750	3,750
New range /stove	15	15		525	1,750
New range hood	15	15		400	1,333
New cloths washer	15	12		1,000	4,167
New cloths dryer	15	12		1,000	4,167
New furnace	30	25		3,600	7,200
Repair furnace		7		1,750	12,500
Kitchen and bathroom cabinet replacement	20	25		6,300	12,600
Renovate bathroom tub area	15	15		1,500	5,000
Renovate all bathroom	20	20		6,300	15,750
Renovate kitchen (all cabinets, floor, plumbing)	20	20		11,500	28,750
Replace all flooring in house	15	18		6,000	20,000
Replace carpets	15	15		7,000	23,333
Replace all windows	25	25		7,500	15,000
Replace glazing	50	25		4,000	8,000
Repair windows	25	15		1,000	3,333
Repair structure to the house					
• Internal walls	50	50		3,000	3,000
• External walls	50	50		12,000	12,000
• Roof (excluding shingles)	25	50	Building above standards	6,500	6,500
• Basement walls	50	50		20,000	20,000
• Structure	50	50		17,000	17,000

⁹ Total repair costs for life expectancy is 50 years ÷ Column C x Column E

footings etc				
Outside activities				
Replace deck front/back	20	20	1,400	3,500
Repair deck	20	15	900	3,000
Repair of stairs	20	18	450	1,250

For comparison purposes, Table 4 provides the maintenance and repair costs for homes located off reserve. Upon reviewing the repair life cycle, many of the items are not frequently repaired. The estimated costs may also be much lower than provided here, as in many cases the home owner would seek out several quotes to repair the items, especially those items that are very costly (e.g., roof repair, foundations). In some cases, insurance may also repair some of these items. In other cases, new home-warranty programs may repair any defects in a new home. Some publications on home maintenance suggest that the general rule for home repairs should be about one percent of the value of a home. For instance, a \$300,000 home will require about \$3,000 a year for basic maintenance¹⁰. Over a 50-year period this may amount to \$150,000. According to Table 4, this amount of all general repairs is estimated to be \$305,532, which is considerably higher than the estimation of one percent.

Table 4 Estimated Maintenance and Repairs for Homes located Off Reserve over a 50-year Life Cycle

A	B	E	F¹¹
Activity (based on home life of 50 years)	Normal life expectancy in years	Estimated Average Cost for a repair dollar value	Total Repair costs for life expectancy of 50 years for Off Reserve Housing
Inside door repair	30	1,000	1,667
Internal painting, wall repair	15	3,000	10,000
External re- painting	10	2,500	12,500
PVC siding - replaced	25	7,000	14,000
PVC Siding - repaired		2,000	6,667
New roofing (asphalt shingles)	20	6,500	16,250
New refrigerator	15	800	2,607
New sump pump	10	275	1,375
New water heater	15	750	2,500
New range /stove	15	525	1,750
New range hood	15	400	1,333
New dishwasher	15	600	2,000
New cloths washer	15	1,000	3,333
New cloths dryer	15	1,000	3,333
New furnace	30	3,600	6,000
Repair furnace		1,750	8,750
Kitchen and bathroom cabinet replacement	20	6,300	15,750
Renovate bathroom tub area	15	1,500	5,000
Renovate all bathroom	20	6,300	21,250
Renovate kitchen (all cabinets, floor, plumbing)	20	11,500	28,750
Replace all flooring in house	15	6,000	20,000
Replace carpets	15	7,000	23,333

¹⁰ See Mike Gustus (2009), "The cost of owning a home," Saskatoon Real Estate. Retrieved from: <http://www.gustusgroup.com/Blog/The-Cost-of-Owning-a-Home>

¹¹ Total repair costs for life expectancy is 50 years ÷ Column C x Column E

Replace all windows	25	7,500	15,000
Replace glazing	50	4,000	15,000
Repair windows	25	1,000	2,000
Repair structure to the house			
• Internal walls	50	3,000	3,000
• External walls	50	12,000	12,000
• Roof (excluding shingles)	25	6,500	6,500
• Basement walls	50	20,000	20,000
• Structure footings etc	50	17,000	17,000
Outside activities			
Replace deck front/back	20	1,400	3,500
• Repair deck	20	900	2,250
• Repair of stairs	20	450	1,125

Discussions

This exploratory study shows that those communities where the Chief and Council do not exercise their authority having jurisdiction to ensure homes are built to building codes spend a substantial amount of their funds on repair and maintenance. In the case of those communities with poor housing conditions, it can be argued that the Chief and Council may spend approximately five times the value of the house (i.e., \$180,000) over a 50-year life cycle. While the Chief and Council may not spend these funds as their resources are very limited. Consequently, the lack of repairs leads the homes being further run down, resulting in the occupants being exposed to other conditions such as mould.

In communities that have average housing conditions, there is a substantial difference in terms of the items in the house needing to be repaired or maintained. In these communities, the Chief and Council may have people working for the Council or have access to professionally trained contractors and certified inspectors. The information collected shows that the Chief and Council may spend approximately 2.2 times the value of the house. Communities that have excellent housing conditions have several factors that may support these conditions. First, these communities are generally located in populated areas of the country and have access to professional and skilled trade and labourers. Many of these communities also have progressive leadership that emphasizes the importance of building homes to code to protect their investment in housing stock. In these communities, the Chief and Council may spend roughly 1.7 times the value of the house over a 50-year life cycle.

The exploratory study also identifies the need for Chief and Council, Indian and Northern Affairs Canada and Canada Mortgage and Housing Corporation as well as other stakeholders to start to focus on the important of understanding the life cycle of a home. Understanding the life cycle of a First Nation home will help the Chief and Council to better plan their budgets. Many communities may need to implement a maintenance program and ensure those individuals responsible for maintenance receive the proper training. Most importantly, understanding the life cycle is particularly crucial for the evaluation of design alternatives that satisfy a required level of performance (including

safety, adherence to building codes and engineering standards) but that may have difficult initial investment, operating, maintenance, and repair costs. Thus, before homes are built consideration may want to be given to alternative housing products, rather than the lower price of an item.

Recommendations

1. Further research required on life cycle of homes in First Nations communities.

While this is an exploratory study to identify the costs of a home on a 50-year life cycle, further research needs to be conducted. Understanding the life cycle of First Nations homes is a valuable method for evaluating the cost consequences of homes that have not been constructed to building codes and standards. In addition to further research, there is a need to consult with experts who specializes in life-cycle costing.

2. Construct housing in accordance with building codes and other standards

Many of the activities identified for repairs could be reduced or eliminated if the homes are built to code. For example, the repairs to the structure of the house are mainly due to poor construction practices. As the Chief and Council are the authority having jurisdiction, they are responsible for the construction of buildings in their communities. The authority of having jurisdiction is an excellent example of how the Chief and Council can exercise their own governance. This also gives the Chief and Council the ability to build homes that are culturally appropriate to their communities (e.g., customary beliefs, domiciliary preferences). The Chief and Council need to implement risk mitigation measures such as:

- Establish by-laws to ensure homes are being built meet the minimum building-safety codes (e.g., quality construction, health and safety).
- Implement a building-permit system which will ensure that all departments have approved the construction (or renovation) of a home.
- Establish zoning laws to discourage the construction of homes near commercial buildings or in areas that are not suitable for buildings (e.g., wetlands).
- Hire only certified or properly trained contractors.
- Hire certified inspectors and project managers.
- INAC and CMHC must ensure that the Chief and Council are signing off on homes that are compliant to building codes, and not just compliant for a process payment.

3. Develop the capacity of First Nations to incorporate life-cycle management into their housing.

While the emphasis has been on building new homes, there needs to be a more effective balance between new buildings, upgrading and maintenance and housing management. Life-cycle costing for the homes should reflect the principle of best value rather than best price. Life-cycle management needs to integrate the cost of construction (e.g., properly built foundations, as this will reduce the risk of future costly repairs) with the planned and budgeted life span of a house and the associated repair and maintenance schedules.

4. Develop information packages for occupants on basic home maintenance

FNNBOA has several courses that they currently teach. They could revise these courses and develop an information package for occupants on basic home maintenance.

5. Develop courses and information packages for individuals responsible for maintenance of Chief and Council's owned homes.

In the past, FNNBOA has identified the individual responsible for maintenance as occupying an important position to ensure homes are properly cared for. FNNBOA will be able to develop an information package and training courses for these individuals. However, one of the limitations is that many communities have not identified the individual(s) responsible for maintenance.

Appendix A – Maintenance Schedule

Instructions

Upon reviewing the table you will see five columns of information. Column A provides activity for home repair; B, the normal life expectancy in years (based on CMHC research); C, the FN-estimate in replacement in years; D, the reasons for repair, and E, the estimated cost. Based on your experience and the three scenarios of housing in First Nations communities, please provide your insight on inspecting homes in these communities, and your professional estimation on the costs for repairs.

ESTIMATED IS BASED ON WHICH TYPE OF COMMUNITY

POOR HOUSING CONDITIONS _____

AVERAGE HOUSING CONDITIONS _____

EXCELLENT HOUSING CONDITIONS_ _

A	B	C	D	E
Activity (based on home life of 50 years)	Normal life expectancy in years	FN Estimated replacement in years	State most common Cause for premature repairs: (1) vandalism/neglect, (2) code infraction, (3) substandard material, (4) shoddy construction, (5) overcrowding, (6) other	Estimated Average Cost for a repair \$dollar value
Inside door repair	30 yrs			
Internal painting, wall repair	15 yrs			
External re- painting	10 yrs			
PVC siding replaced	25yrs			
_____ repaired				
New roofing (asphalt shingles)	20 yrs			
New refrigerator	15 yrs			
New sump pump	10 yrs			
New water heater	15 yrs			
New range /stove	15 yrs			
New range hood	15 yrs			
New a/c central unit	20 yrs			
New dishwasher	15 yrs			
New cloths washer	15 yrs			
New cloths dryer	15 yrs			
New furnace	30 yrs			
_____ Repair furnace				
Kitchen and _____	20 yrs			

bathroom cabinet replacement				
Renovate bathroom tub area	15 yrs			
Renovate all bathroom	20 yrs			
Renovate kitchen (all cabinets, floor, plumbing)	20 yrs			
Replace all flooring in house	15 yrs			
Replace carpets	15 yrs			
Replace all windows	25 yrs			
Replace glazing	50 yrs			
Repair windows	25 yrs			
Repair structure to the house				
• Internal walls	50 yrs			
• External walls	50 yrs			
• Roof (excluding shingles)	25 yrs			
• Basement walls	50 yrs			
• Structure footings etc	50 yrs			
Outside activities				
Replace deck front/back	20 yrs			
Repair deck	20 yrs			
Repair of stairs	20 yrs			

Appendix B – Replacement Reserve Worksheet

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REPLACEMENT RESERVE WORKSHEET

PER SINGLE FAMILY DWELLING UNIT

RESERVE: ##### First Nation
OCCUPANT: J## S#####

ITEM	# ITEMS	REMAINING USEFUL LIFE	EXPECTED USEFUL LIFE YEARS	CURRENT REPLACEMENT COST/ ITEM
ROOFING	1	15	15 years	\$1400/roof
EAVESTROUGM & DOWN SPOUTS	1	15	15 years	\$ 350/unit
EXT. WALL and SOFFIT COVERING	1	25	25 years	\$3400/house
WINDOWS	1	25	25 years	\$ 850/unit
Living-room	4	25	25 years	\$ 250/unit
Basement	8	25	25 years	\$ 450/unit
Others				
EXTERIOR DOOR (S)	2	20	20 years	\$ 300/door
SEPTIC SYSTEM	1	20	20 years	\$ 4,500/unit
WATER SUPPLY	Well	20	20 years	\$6,000
Cistern	1		30 years	\$3,500
FURNACE	1	30	25 years	\$ 1,400/unit - furnace
HOT WATER TANK	1	10	10 years	\$ 400/unit
APPLIANCES		15	15 years	\$ 750/unit
Fridge				\$ 500/unit
Stove				
PLUMBING	Kitchen Sink	15	15 years	\$ 280/unit
FIXTURES	Bathtub & surround	1	25 years	\$ 1,000/unit
Wash Basin	1	25	25 years	\$ 180/unit
Toilet Bowl	1	25	25 years	\$ 80/unit
Faucets	3	10	10 years	
FLOOR COVERING		15	15 years	\$ 30 00sq.yd
Carpet	143	15	15 years	25.00 sq.yd.
Lino				
KITCHEN CABINETS	1	20	20 years	\$ 4,500/unit
I NTERIOR PAINTING	1	10	10 years	\$ 1,200/unit