

**“Looking to the Future, Now”**  
**Mackenzie and Area Seniors Needs Project**  
**Population Background and Trends Report**

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September 2004

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## **Acknowledgements**

This summer, our research team visited Mackenzie to conduct key informant interviews and focus groups, and to distribute a household questionnaire survey for the Mackenzie and Area Seniors Needs Project. We wish to thank all the residents, community groups, business members, service providers, policy makers, and municipal staff who took the time to answer our many questions. The Mackenzie Times newspaper with Jackie Benton, and CHMM radio with JD Mackenzie, each provided a lot of support in “getting the news out” about the project and survey. An appreciative thank you also goes to the members of Club 55, the Autumn Lodge Society, and the “Grumpy Old Men” who helped with a lot of background information and who staffed a table in the mall to help with distributing and collecting the surveys. Of note were Ray Bessette, and Joyce and Diane Smith, who went the extra mile to help us with the project. Their help is very much appreciated. On our research team, we wish to thank Chelan Hoffman for her assistance with the focus groups.

We also wish to extend our sincerest appreciation to all of the residents in Mackenzie who took the time to participate in our focus groups or to complete the questionnaire. The response to the questionnaire demonstrates the importance of this issue to residents and the community. We also wish to thank all of the people who helped to recruit focus group participants.

Funding for this project came from the District of Mackenzie and the Northern Land Use Institute at UNBC. We would like to thank them for their contributions. We would also like to thank the staff at the recreation centre and lotto booth in the mall for allowing us to set up convenient places for people to drop off their surveys, and to the District staff who collected those returned surveys. A special thank you goes to Judi Vander Maaten of the District who helped out many times along the way!

We would also like to thank Laura Ryser for all of her assistance and contributions to the creation of this report and to Onkar Buttar for his assistance with data entry.

Greg Halseth, Neil Hanlon, Virginia Pow, and Rachael Clasby  
Prince George  
September 2004

## **Availability**

Copies of all reports associated with the Mackenzie and Area Seniors Needs Study are available in a number of locations. In Mackenzie, copies have been deposited with the District of Mackenzie and the public library. At the University of Northern British Columbia, copies have been deposited at the Weller Library or can be accessed on Greg Halseth's website:  
<http://web.unbc.ca/geography/faculty/greg>

## **Project Reports**

- Methodology Report
- Background Literature Report
- Population Background and Trends
- Northern Seniors Housing and Support Services Report
- Final Report
- Executive Summary

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# **Mackenzie and Area Seniors Needs Project Population Background and Trends Report**

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## **1.0 Project Description**

Since the 1980s, Canada's population has been aging. In small towns, the provision of housing, services, and facilities influence the decisions of individuals when choosing to retire in a community. In Mackenzie, there were about 50 people over the age of 65 in 1991, but by 2001 there were approximately 140 people over age 65 (Census, 2001). The increase in the number of older residents, and the increase in the number of residents who wish to remain in Mackenzie when they retire, have increased the level of interest in how the community, local services, and available housing options will meet the needs of a growing seniors' population. As a result, UNBC and the District of Mackenzie are working together to assess the housing and service needs of older residents.

The purpose of the Mackenzie and Area Seniors Needs Project is to examine housing and support service needs for seniors in Mackenzie. The work was carried out by a research team from UNBC with the goal to provide decision-makers and community groups with information relevant to decision-making over community planning and infrastructure investments. The project was carried out over the Summer of 2004.

**Table 1.1 Timeline**

<b>January 2004</b>	<ul style="list-style-type: none"> <li>• Project application developed</li> </ul>
<b>March 2004</b>	<ul style="list-style-type: none"> <li>• NLUI funding confirmed</li> </ul>
<b>April 2004</b>	<ul style="list-style-type: none"> <li>• Project begins</li> <li>• Organize interviews and focus groups for assessment of seniors' needs</li> </ul>
<b>May 2004</b>	<ul style="list-style-type: none"> <li>• May 11<sup>th</sup> to 14<sup>th</sup>, 2004 – Key informant interviews &amp; distribution of thank you notes</li> <li>• May 17<sup>th</sup> to 20<sup>th</sup>, 2004 – Focus groups (4 groups) &amp; distribution of thank you notes</li> <li>• May 12<sup>th</sup> to 25<sup>th</sup>, 2004 – Collection of key informant and focus group scripts that had been checked by participants</li> <li>• Preparation of questionnaire survey</li> </ul>
<b>June 2004</b>	<ul style="list-style-type: none"> <li>• June 9<sup>th</sup> to 10<sup>th</sup>, 2004 – Distribution of the survey to all dwellings in Mackenzie</li> <li>• Analysis of interviews and focus group data</li> <li>• Data entry for surveys</li> </ul>
<b>July 2004</b>	<ul style="list-style-type: none"> <li>• Completion of analysis of interviews and focus group data</li> <li>• Integration of population analysis, seniors housing and support needs, and seniors interviews and focus groups</li> <li>• Analysis of survey data</li> </ul>
<b>August 2004</b>	<ul style="list-style-type: none"> <li>• Completion of analysis</li> <li>• Completion of draft final report</li> </ul>
<b>September – October 2004</b>	<ul style="list-style-type: none"> <li>• Review of draft final report</li> <li>• Public presentation of results</li> <li>• Public dissemination of final report</li> </ul>

## 2.0 Methodology

The data and information for this section of the project was collected through a review of Census population data. The Census is undertaken every five years and provides information on the age distribution of local populations. While the age groupings at which population information is reported does vary between Census periods, it is none-the-less possible to reconstruct the population history of the District of Mackenzie. Analysis of this population data assessed the following issues:

- 1) the rates of population growth in pre and post retirement age groups,
- 2) the rates of seniors' retention, as estimated by the age structure of the population over time and the number of seniors' remaining in the community, and

3) an estimate of potential growth in the seniors' population based on the current age distribution of the population.

It must be noted that population information for the area surrounding Mackenzie is not as straightforward to obtain or compare. It is not collected at a geographic scale that would allow it simply to be added to the Mackenzie data. Instead, it is grouped with a large region comprising part of the unorganized territory of the Fraser Fort George Regional District. Therefore, this information has not been included in the project. In some parts of this report, data from both BC and the Fraser Fort George Regional District is used to compare against the changes occurring in Mackenzie.

### 3.0 Population Change

Table 3.1 shows the population numbers for Mackenzie from 1976 to 2001. There was rapid early growth immediately following the construction of the townsite. Over the years, the pattern has since been one of relatively stable population numbers. While there has been considerable population turnover through in- and out-migration, the population only changed from about 5,000 people in 1976 to about 6,000 people in 1996. In 2001, the Census recorded a population closer to 5,000. This represents a small population loss over the preceding five year period and mirrors a more general pattern of population losses over this same time period in towns across northern BC.

These stable or declining population levels stand in marked contrast to the provincial growth rate of approximately 13% from 1991 to 1996 and approximately 5% from 1996 to 2001. They are, however, more in line with recent population declines in the regional centre of Prince George. The single-industry economy of Mackenzie has meant little opportunity for additional population growth. While there have been new value added plants constructed, automation and the resulting job losses in other plants limited the possibility of population growth. This pattern is very common in resource-dependent and single-industry towns in BC.

**Table 3.1 Population Counts**

Date	Mackenzie	Prince George	BC
1976	5,340	59,929	2,392,790
1981	5,890	67,559	2,744,467
1986	5,545	67,621	2,883,367
1991	5,796	69,653	3,282,061
1996	5,995	74,150	3,724,500
2001	5,206	72,406	3,907,738

Source: Statistics Canada

As shown in Table 3.2, the percent population change in Mackenzie has fluctuated between 1981 and 2001. Over that same period, population change in British Columbia was approximately 5% from 1981 to 1986, 13% over the 1986 to 1991 period, and 13% again between 1991 and 1996. Between 1996 and 2001, the population in BC grew by nearly 5%.

In contrast, population growth within the entire Fraser Fort George Regional District had been slower in the 1981 to 1986 period, and from 1996 to 2001, recorded a population decline.

The trend for Mackenzie is variable. Between 1981 and 1996 there was a population loss, while during each of 1986 to 1991, and 1991 to 1996, there was population growth. During the most recent 5 year Census period, there was a population decrease.

**Table 3.2      Percent Population Change, 1986-2001**

	Mackenzie	Fraser Fort George RD	British Columbia
1981-1986	-5.9	0.1	5.1
1986-1991	4.6	1.6	13.8
1991-1996	3.5	9.1	13.5
1996-2001	-13.2	-3.7	4.9

Source: BC Stats, Statistics Canada

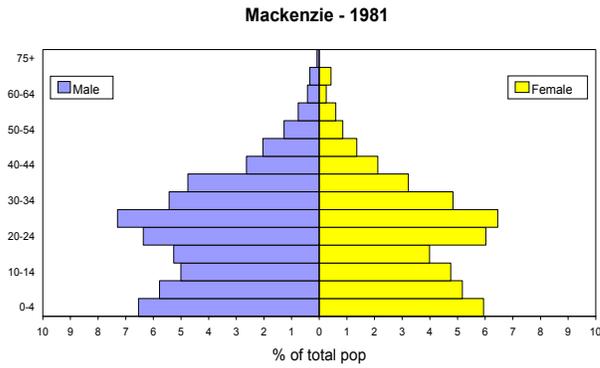
As described in the Literature Review Report for this project, much of the out-migration in recent years is by young households. This loss of younger people, together with the numbers of people aging-in-place, means that Mackenzie is dealing with an accelerating pattern of population aging. This is a process now underway in many rural and small town places across North America, and especially across northern BC. These population trends provide support for the observations which many in the town have been making about the need to address a growing ‘seniors’ issue.

**4.0      Population Pyramids**

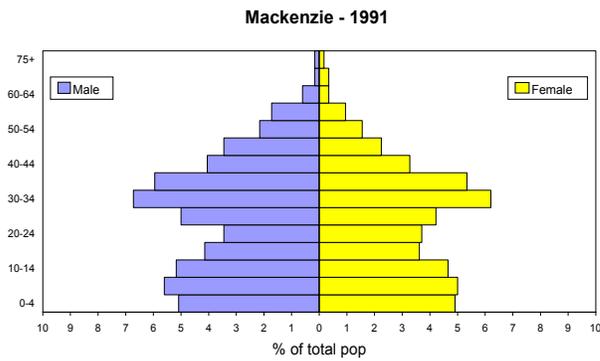
Against this backdrop of population growth and then decline, are associated changes in the age structure of Mackenzie’s population. These changes in age structure reflect the preceding discussion with respect to population aging and its constituent elements: youth out-migration and aging-in-place.

Population pyramids provide a ‘picture’ of the local population at any given point of time. Broken down into males and females, the pyramid identifies the proportion of the population within particular age groups. As a result, pyramids can provide a useful tool for illustrating how a local population is changing over time.

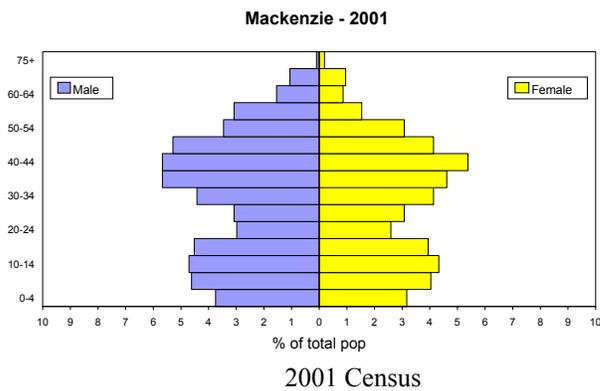
**Figure 4.1 Mackenzie Population – 1981**



**Figure 4.2 Mackenzie Population – 1991**



**Figure 4.3 Mackenzie Population – 2001**



The population pyramids for Mackenzie show a pattern typical of resource towns in northern BC. In 1981, the population is dominated by young families (Figure 4.1). This is shown by the large proportion of the local population in the 20 to 30 year age groups and the corresponding 0 to 10 year age groups. In a town like Mackenzie, young families were drawn by the work opportunities of an expanding forest industry.

By 1991, there is an aging of the local population taking place as more of the family households have adults in the 25 to 40 year age groups and children in the 5 to 15 year age groups (Figure 4.2). This is the start of an aging-in-place process where the workforce is fully engaged in a stable industrial base, but where limited new job growth has slowed the in-migration of younger households. Such also contributes to the out-migration of youth. This is seen by the smaller shares of the population in the 15-19 and 20-24 year cohorts. Young people may be leaving to pursue employment or educational opportunities outside of Mackenzie. Again, this population pyramid pattern is quite common in resource towns and across northern BC. By 2001, the trend towards population aging is again seen. Family households are now concentrated in the 35 to 50 year age groups and there is also a larger share of the population over age 50 than at any time in the past (Figure 4.3). Aging-in-place among those in the workforce, and a continued out-migration of young people in the 20-24 and 25-30 year age cohorts, continues to be easily seen within this population pyramid.

## **5.0 Age Dependency Ratios**

This section of the report deals with population change in terms of the shift described above between young and older populations in Mackenzie. As shown in Table 5.1, the percent of the population aged 65 years and older has increased since 1971. In Fraser Fort George Regional District, the percent of the population aged 65 and older has also increased over this period. For the Regional District, it has increased from approximately 3% in 1971 to approximately 7% in 2001. Over that same period, the percent of the population aged 65 and over in Mackenzie changed from less than a half a percent to just over 2%. The doubling noted at the Regional District level is a more than 5 times increase in Mackenzie.

**Table 5.1 Percent of Population 65 Years and Older, 1971-2001**

	<b>Mackenzie</b>	<b>Fraser Fort George RD</b>
1971	0.4	3.0
1976	0.6	3.2
1981	0.7	3.1
1986	0.8	4.0
1991	0.9	4.9
1996	1.2	5.7
2001	2.3	7.4

Source: Statistics Canada

As noted in the literature review report, resource dependent communities across northern BC are experiencing a process called “Frontier Aging”. In this case a workforce established in a northern community, which experiences little new employment growth over time, will age-in-place as people continue with their occupational engagement. As shown in Table 5.2, the percent of the population aged 45 years and older in the workforce has increased across both the Fraser Fort George Regional District and the town of Mackenzie since 1976. In Fraser Fort George Regional District, the share of the workforce aged 45 to 64 increased from 38% in 1976 to nearly 78% in 2001. Over that same time, the share of the workforce between ages 45 and 64 in Mackenzie grew even more remarkably. In 1976, just less than 20% of Mackenzie’s population was aged 45 to 64, while by 2001, this proportion had grown to nearly 64%. As noted in the Literature Review Report, the ‘nearing retirement’ population is important for its potential future impact on services and housing needs for older residents.

**Table 5.2 Percent Population of Workforce Aged 45 Years and Older, 1971-2001**

	<b>Mackenzie</b>	<b>Fraser Fort George RD</b>
1971	22.8	41.2
1976	18.4	38.1
1981	20.4	39.8
1986	26.5	30.6
1991	31.9	49.0
1996	38.4	57.3
2001	63.7	77.7

Source: Statistics Canada

This transition in age relationships can also be characterized by ‘dependency ratios’. A dependency ratio calculates the proportion of the population of interest against the remainder of the population in a particular place. For example, in Table 5.3, the total dependency ratio is calculated for the period from 1971 to 2001 for each of British Columbia, Fraser Fort George Regional District, and the District of Mackenzie. The total dependency ratio combines all those people over the age of 65 with all those people under the age of 15 and compares this to the remainder of the population. That is, those who are children (not in the workforce) and those who are retired (not in the workforce) are combined and compared against the workforce which would be supporting them. This is a statistical measure to try to illustrate changes in the relationship between the working age population and the very young and older populations.

The total dependency ratio combines both young and old populations. As noted in Section 4 with respect to the population pyramids, the significant transition in Mackenzie has involved a reduction in the share of the population under 15 years of age and an increase in the share of the population over age 65. The following tables identify the scale of this change and compare it to both the Fraser Fort George Regional District and the British Columbia results.

As shown in Table 5.3, the total dependency ratio for British Columbia from 1971 through to 2001 varied considerably from approximately 60% in 1971 to nearly 48% in 1981, to 50% again in 1996. For the Fraser Fort George Regional District, the trend has been more uniformly downward. In 1977, the total dependency ratio for Fraser Fort George Regional District was about 78%, declining to just over 40% in 2001. In Mackenzie, the pattern also followed a general decline. In 1971, the total dependency ratio in Mackenzie was about 63%. This has declined steadily since that time to approximately 37% in 2001. In other words, across both the Regional District and within Mackenzie, there is a growing proportion of working age residents relative to the very young and very old population. As noted in earlier sections, this is likely the result of an aging-in-place of the workforce and smaller shares of young households with children.

**Table 5.3 Total Dependency Ratio, 1971-2001 (Percent)**

	<b>Mackenzie</b>	<b>Fraser Fort George RD</b>	<b>British Columbia</b>
1971	63.5	77.7	59.5
1976	58.2	64.6	51.4
1981	51.0	45.5	47.7
1986	48.1	45.1	48.4
1991	45.5	44.1	49.3
1996	39.7	42.9	50.1
2001	36.8	40.6	46.4

Source: Statistics Canada

As shown in Table 5.4, the young dependency ratio calculated for the period 1971 to 2001 shows a number of quite remarkable declines. In British Columbia, the share of the population under age 15, compared to the rest of the working age population, was approximately 44%. This declined steadily until 2001 until the share of the young population had declined to approximately 26% of the working age population. For Fraser Fort George Regional District, the decline has been even more remarkable. In 1971, the young dependency ratio for Fraser Fort George Regional District was 72% but by 2001, this young dependency ratio had declined to approximately 30%. In Mackenzie, the young dependency ratio was approximately 62% in 1971, declining to approximately 34% in 2001. As noted above, it is a pattern of dramatic changes in the share of the population in younger age cohorts that is driving the large dependency ratio shifts to this point in time.

**Table 5.4 Young Dependency Ratio, 1971-2001 (Percent)**

	Mackenzie	Fraser Fort George RD	British Columbia
1971	62.5	72.4	44.5
1976	57.3	59.4	36.5
1981	49.9	41.9	31.7
1986	46.9	39.4	30.4
1991	44.3	37.1	30.1
1996	38.1	34.8	30.4
2001	33.7	30.3	26.5

Source: Statistics Canada

If changes in the young dependency ratios have been driving the overall dependency ratio changes to this point, the emphasis will soon shift to the old age dependency side of the equation. As will be noted below, there has been growth in old age dependency ratios. This growth in the share of the population in older age groups was also shown in the earlier discussion of population pyramids. To date, however, the size of those older age groups has not been large in northern BC. But with the coming of the ‘baby boom’ retirement years, the old age dependency ratio will have more impact on overall dependency ratio changes.

In contrast to that shown for the young dependency ratio, there has been a growth in the old age dependency ratio for all three spatial scales from 1971 to 2001. For British Columbia, the old age dependency ratio for 1971 was approximately 15%, increasing to approximately 20% in 2001. For the Fraser Fort George Regional District, the old age dependency ratio was approximately 5% in 1971 and has increased to approximately 10% in 2001. The change in Mackenzie has been even more remarkable. In 1971, the old age dependency ratio was only 0.5%. By 2001, the old age dependency ratio had increased in Mackenzie to 3.2%. Local aging-in-place means that there is a large number of workers who are soon to retire and soon to create increased demands for services and housing aimed at older residents.

**Table 5.5 Old Age Dependency Ratio, 1971-2001 (Percent)**

	Mackenzie	Fraser Fort George RD	British Columbia
1971	0.5	5.3	15.0
1976	0.9	5.2	14.9
1981	1.0	4.5	16.0
1986	1.2	5.7	18.0
1991	1.3	7.0	19.2
1996	1.6	8.2	19.7
2001	3.2	10.4	20.0

Source: Statistics Canada

## 6.0 Retention Rates

While the preceding sections have included information on how Mackenzie's population has changed, and how there is a 'bubble' of older workers approaching retirement, this section deals with an estimate of how Mackenzie's seniors' population may change in the coming years. To do this estimation, we have calculated potential retention rates for the population at retirement age and created high, medium, and low estimates by which to estimate how many of those who retire may stay in town.

In all of these estimates, we have used 10 year time periods. These are from 1981 to 1991, and 1991 to 2001. Over each of these two time periods, we are concerned with the change in the size of the population age group over that 10 year period and around the critical 65 year retirement age. Thus, we compare the size of the population that was aged 55 to 64 years of age in the first time period against the population which is then aged 65 to 74 years ten years later in time period two. Three elements impact population change as this group ages. The first is in-migration, the second is out-migration, and the third is death. In this study we are assuming that rates of mortality have not, and will not, change significantly between 1981 and 2011. We are also, based on the information noted above, suggesting that in-migration of a large number of seniors is not a significant issue. As a result, we are going to call this change in the size of the population from the first time period to a period ten years later as the 'retention rate'. That is, how many of the pre-retirement age group are we able to keep, or retain, in the community 10 years hence. Our interest is with how much of that population in the first time period is still in the community ten years later, and ten years older.

Table 6.1 shows the population retention rates as calculated for the Fraser Fort George Regional District for two time periods. Between 1981 and 1991, approximately 67% of those people who were 55 to 64 years of age in 1981 were retained in the community in 1991 as a population aged 65 to 74. Between 1991 and 2001, the retention rate shifted upwards to approximately 74%. In

other words, the population in 2001 aged 65 to 74 years was approximately 74% the size of the population aged 55 to 64 years in 1991 (74% of that population had been retained within the area).

**Table 6.1 Population Retention Rates  
Fraser Fort George Regional District  
1981-2001 (percent)**

	55-64yrs to 65-74yrs
1981-1991	66.6
1991-2001	73.9

Source: Statistics Canada

In Table 6.2, the population retention rates in Mackenzie from 1981 to 2001 are shown. As noted, between 1981 and 1991, the retention of the population from its pre-retirement to immediate post-retirement age group was only 25%. Between 1991 and 2001, however, the retention rates around the time of retirement increased to nearly 96%.

**Table 6.2 Population Retention Rates  
Mackenzie  
1981-2001 (Percent)**

	55-64yrs to 65-74yrs
1981-1991	25.0
1991-2001	95.5

Source: Statistics Canada

In order to estimate the potential retirement population in Mackenzie towards the year 2011, we will use three scenarios. The low range scenario is the 25% noted in Mackenzie between 1981 and 1991. The mid range estimate is the 70.3% average retention rate for the Fraser Fort George Regional District for the entire 1981 to 2001 period. The high estimate is derived from the nearly 96% retention rate in Mackenzie from 1991 to 2001.

As shown in Table 6.3, the estimated potential growth of seniors in Mackenzie from 2001 to 2011 is shown. In 2001, there were 355 people in Mackenzie who were aged 55 to 64 years. Multiplying this number by each of the three scenario percentages yields potential numbers of

‘new retirees’ who will be retained within Mackenzie to the year 2011. The high estimate range shows an addition of approximately 340 seniors in the age 65 to 74 year group, while the low estimate includes approximately 88 seniors in that same 65 to 74 year age group. We can have a fair level of confidence that the low estimate will be exceeded. This is partially because the 25% retention level corresponds to the approximate share of the local population who, in the survey, indicated that they are already planning to retire in Mackenzie. If one adds to this number the people who chose not to leave town due to family and friends networks, those who cannot afford to relocate, and those who might return to make use of support networks as they age, the number of seniors in the community has the capacity to grow considerably. In 2001, there were approximately 140 people over the age of 65. By 2011, this number could easily double.

**Table 6.3 Estimate of Potential Growth of Seniors 2001 to 2011**

	Mackenzie	Fraser Fort George RD
High	339	8,405
Mid	249	5,908
Low	88	2,101

Source: Statistics Canada

**7.0 Conclusion**

The purpose of this report has been to provide some background on population trends in Mackenzie and to use this information to estimate the scale of potential growth in the local seniors’ population. The data are derived from the Census and are, at times, compared to data from BC and the Fraser Fort George Regional District.

Since 1976, the population in Mackenzie has remained between 5,000 and 6,000 people. As is common in many of northern BC’s resource towns, the addition of new economic activities has only just stayed apace with workplace changes such as automation, with the net result being limited job growth. This lack of job growth has stemmed the in-flow of young families seeking work in these towns, with the consequence that the workforce from the 1960s, 1970s, and 1980s is aging-in-place.

This aging-in-place is clearly seen in the population pyramids for Mackenzie. In 1981, the town is comprised largely of young families with young children. By 2001, the workforce (buoyed by steady work in the forest sector) has aged, there are proportionally fewer children (especially the very youngest children), and proportionally more older residents. Along with this aging-in-place is the process of youth out-migration. In Mackenzie, a share of the young people between the ages of 20 and 30 are leaving to pursue work or educational opportunities. Together, the two forces described in the population pyramids contribute to population aging in Mackenzie.

This population aging is confirmed with an investigation of dependency ratios. A dependency ratio compares the young and/or old population against the working age population in order to provide benchmarks for assessing change over time. While there has been growth in the population over 65 years of age in Mackenzie, the largest share of population aging can be attributed to the declining youth component in the town.

While the growing seniors' population may not yet be numerically large in Mackenzie, the pending retirement of a large group of older workers will change this. The question is, how many of these workers will remain in Mackenzie after they retire? While other parts of the study look at key factors such as the presence of family and friends in predicting who is more likely to retire in town, we can also use past experiences with the share of the pre-retirement age group who end up staying in town (retention rate) to predict a range of scenarios for the next 10 years. Based on past experience, Mackenzie could see between 100 (low estimate) and 350 (high estimate) new 'retirees' between 2001 and 2011. These are based on retention rates ranging from 25 to 96%. Either of these numbers will change dramatically the size of the older population in town (which stood at a TOTAL of 140 in 2001). While this population will still be among the 'young elderly', others will start to require a greater level of housing, support, and health services.

**Appendix A**  
**Population Change Calculations**

**Table 3.1 Population Counts**  
Simple counts from the Census

**Table 3.2 Percent Population Change, 1986-2001**  
Percent Change in Population =  
 $(\text{Population in T2}) - (\text{Population in T1}) / (\text{Population in T1})$

**Table 5.1 Percent of Population 65 Years and Older**  
Percent Population 65 Plus =  
 $(\text{Population 65+} / \text{Total Population}) * 100$

**Table 5.2 Percent Population of Workforce Aged 45 Years and Older**  
Composition of Working Aged Population =  
 $(\text{Population 45 - 64 years}) / (\text{Population 25 - 44 years})$

**Table 5.3 Total Dependency Ratio**  
Dependency Ratio =  
 $[(\text{Population 65 years \& older}) + (\text{Population 0-14 years}) / \text{Population 15-64 years}] * 100$

**Table 5.4 Young Dependency Ratio**  
Young Age Dependency Ratio =  
 $(\text{Population 0-14 years} / \text{Population 15-64 years}) * 100$

**Table 5.5 Old Age Dependency Ratio, 1971-2001 (Percent)**  
Old Age Dependency Ratio =  
 $(\text{Population 65 years \& older} / \text{Population 15-64 years}) * 100$

**Table 6.1 & Table 6.2 Population Retention Rates**  
Retention Rates =  
*Example 1981 to 1991*  
 $\text{Population in 1991 aged 65-74 years} / \text{Population in 1981 aged 55-64 years}$

**Table 6.3 Estimate of Potential Growth of Seniors, 2001-2011**  
High/ Low Growth in Retention Rate (RR)  
High =  $(2001 \text{ population aged 55 - 64 years}) * (\text{highest calculated retention rate})$   
Low =  $(2001 \text{ population aged 55 - 64 years}) * (\text{lowest calculated retention rate})$