

# Calgary's Population

Briefing Note

October 2010

## Executive Summary

The report highlights the main characteristics of Calgary's demographic trends for the period 1991 to 2009:

- The city of Calgary was home to 29 per cent of Alberta's population in 2009.
- Natural growth remained relatively stable from 1991 to 2009 (figure 3).
- Net migration has fluctuated considerably depending on the phase of the business cycle.
- The 25+ age group of total population increased by more than 2 per cent since 1991.
- The labour force replacement ratio (the ratio of the population that is 15 to 24 relative to the population that is 55 to 64) declined steadily from 2 in 1991 to 1.5 in 2009 (figure 12). This means that people in the age group 55-64 grew at a faster pace than the number of people in the 15-24 age group.
- The dependency ratio (the ratio of the economically dependent part of the population – children (0-14 years) and the elderly (65+ years) - to the working-age population (15-64 years)) declined during the 1991 - 2009 period (figure 11). This means that the working-age population grew at a faster pace than the 0-14 and 65+ group in contrast to most developed countries, where the dependency ratio increases as the number of elderly people increases.
- Relative to Alberta, Calgary has a slightly older population with a median age of 36.2 years in 2009, compared to 36 years in Alberta.



# Briefing Note

## Introduction

The purpose of this document is to review the *demographic trends* in Calgary over the 1991-2009 period. Over the past 18 years several significant changes have occurred in the demographic composition of Calgary. The document also attempts to present possible *implications of the trends* for The City of Calgary. Changes in the structure of Calgary's population should have implications for:

- the demand for services
- the financing of services by the municipality

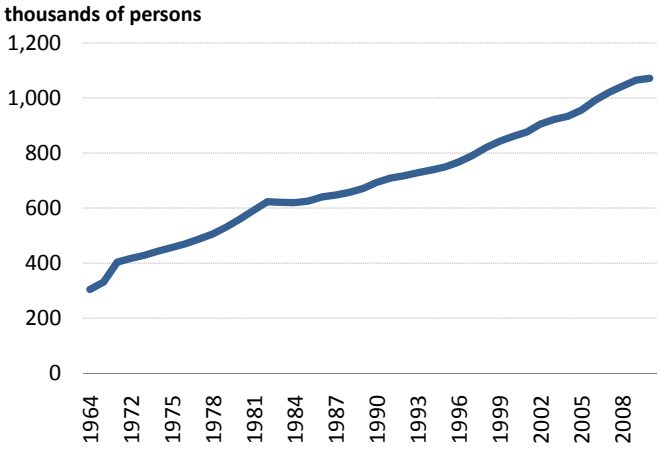
An expected aging population in the coming decades should reduce labour supply and consumption, slow down economic growth and increase government spending, while government revenues are projected to decline. These factors should increase fiscal pressures on municipalities and other levels of government.

## Calgary's Population Growth

Total population in the city of Calgary increased from 304,065 in 1964 to 1,071,515 in 2010[1]. The average annual growth rate for the past 46 years was 2.6 per cent in Calgary, as is shown in Figure 1.

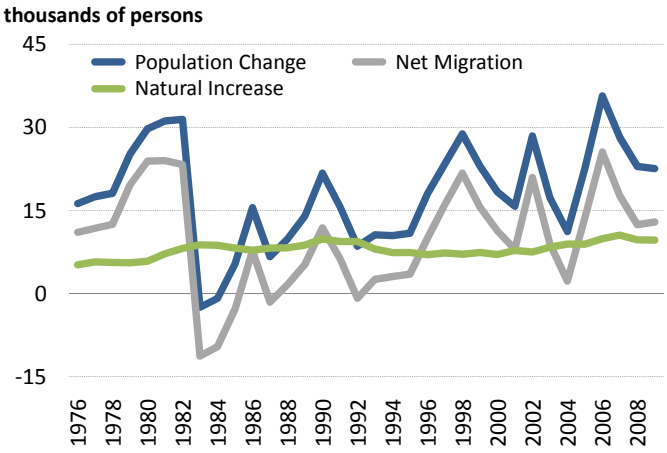
Population growth is determined by net migration and natural increase. Net migration is defined as the difference between in migration and out migration, while natural increase refers to the difference between births and deaths every year. Figure 2 shows that, in Calgary, natural increase has been relatively stable across time, while net migration determines the shape of fluctuation in population changes.

**Figure 1.** Total Population in the City of Calgary (1964-2010)




Sources: The City of Calgary, Corporate Economics

**Figure 2.** Total Population Change and the Causing Factor in Calgary




Sources: The City of Calgary, Corporate Economics

Table 1 in next page shows the city of Calgary's total population and its components from 1991 to 2009. The city of Calgary's population grew from 708,593 in 1991 to 1,065,455 in 2009 or by 356,862. As of 2009, approximately 29 per cent of Alberta's population lived in the city of Calgary.

1 Total population by April 2010 according to 2010 Civic Census Results by The City of Calgary.



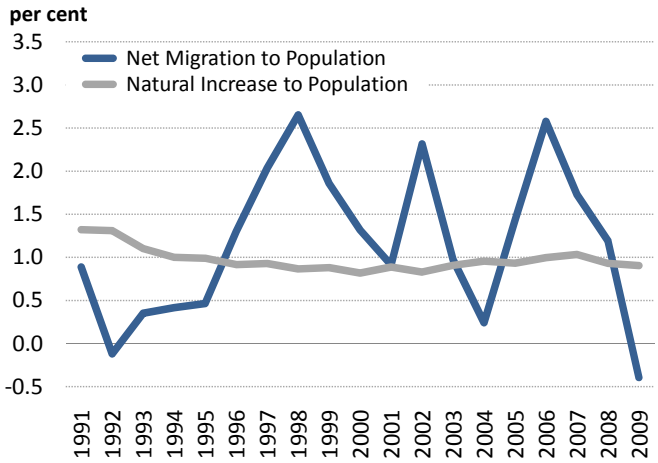
# Briefing Note

**Table 1.** Components of Calgary's Population Growth

| Components of city of Calgary's Population Growth 1991 - 2009 | | | | | | |
|---|---|---|---|---|---|---|
| Year | Population | Net Migration | Natural Increase | Annexation | Absolute Change | Percentage Change |
| 2009 | 1,065,455 | 12,920 | 9,643 | 0 | 22,563 | 2.2 |
| 2008 | 1,042,892 | 12,441 | 9,695 | 814 | 22,950 | 2.3 |
| 2007 | 1,019,942 | 17,631 | 10,552 | 0 | 28,183 | 2.8 |
| 2006 | 991,759 | 25,557 | 9,887 | 237 | 35,681 | 3.7 |
| 2005 | 956,078 | 13,677 | 8,906 | 0 | 22,583 | 2.4 |
| 2004 | 933,495 | 2,253 | 8,927 | 0 | 11,180 | 1.2 |
| 2003 | 922,315 | 8,965 | 8,363 | 0 | 17,328 | 1.9 |
| 2002 | 904,987 | 20,962 | 7,506 | 0 | 28,468 | 3.2 |
| 2001 | 876,519 | 7,991 | 7,779 | 0 | 15,770 | 1.8 |
| 2000 | 860,749 | 11,317 | 7,044 | 0 | 18,361 | 2.2 |
| 1999 | 842,388 | 15,629 | 7,425 | 0 | 23,054 | 2.8 |
| 1998 | 819,334 | 21,735 | 7,101 | 0 | 28,836 | 3.6 |
| 1997 | 790,498 | 16,100 | 7,339 | 0 | 23,439 | 3.1 |
| 1996 | 767,059 | 9,979 | 7,028 | 979 | 17,986 | 2.4 |
| 1995 | 749,073 | 3,477 | 7,412 | 0 | 10,889 | 1.5 |
| 1994 | 738,184 | 3,078 | 7,387 | 0 | 10,465 | 1.4 |
| 1993 | 727,719 | 2,564 | 8,022 | 0 | 10,586 | 1.5 |
| 1992 | 717,133 | -853 | 9,393 | 0 | 8,540 | 1.2 |
| 1991 | 708,593 | 6,315 | 9,393 | 0 | 15,708 | 2.3 |

Sources: Civic Census, Corporate Economics

**Figure 3.** Components of Population Changes: Annual Growth Rate




Sources: Civic Census, Corporate Economics

Figure 3 shows the percentage changes of the two components of population growth in Calgary from 1991 to 2009. Compared to natural increase, the net migration has fluctuated more considerably depending on the level of economic activity in the city.

Favourable economic conditions in Calgary due to a booming energy sector resulted in low unemployment rates and high net migration for the period 1997 to 2002. Net migration reached its peak in 2006 when the region's unemployment rate was estimated at 3.4 per cent compared to a national rate of 6.3 per cent. But improved economic conditions in neighboring provinces and the recent global economic recession resulted in a significant reduction in the unemployment rate differential. Consequently, Calgary's attraction as a destination for would-be job seekers was reduced.



# Changes in the Age Composition of Calgary's Population

Economic and socio-demographic factors, such as migration and reduction in fertility rates, caused a shift in Calgary's age composition during the period 1991 to 2009. Strong economic activity in the late 1990's in Calgary attracted a large number of people to the city.

Table 2 shows that the age group of 0-24 accounted for 18.4 per cent of Calgary's population in 1991. However, in 2009 the proportion of 0-24 years old decreased to 16.1 per cent and that of the age group 25+ increased to 83.9 per cent.

**Table 2.** Age Composition in Calgary

| Calgary's Population | | | | | |
|---|---|---|---|---|---|
| Year | Age Groups | | | | Total |
| | 0-24 | Percentage of Total | 25+ | Percentage of Total | |
| 2009 | 171,401 | 16.1 | 894,054 | 83.9 | 1,065,455 |
| 2008 | 171,596 | 16.5 | 871,296 | 83.5 | 1,042,892 |
| 2007 | 170,723 | 16.7 | 849,219 | 83.3 | 1,019,942 |
| 2006 | 162,368 | 16.4 | 829,391 | 83.6 | 991,759 |
| 2005 | 159,013 | 16.6 | 797,065 | 83.4 | 956,078 |
| 2004 | 156,186 | 16.7 | 777,309 | 83.3 | 933,495 |
| 2003 | 157,342 | 17.1 | 764,973 | 82.9 | 922,315 |
| 2002 | 148,252 | 16.4 | 756,735 | 83.6 | 904,987 |
| 2001 | 150,589 | 17.2 | 725,930 | 82.8 | 876,519 |
| 2000 | 154,067 | 17.9 | 706,682 | 82.1 | 860,749 |
| 1999 | 146,230 | 17.4 | 696,158 | 82.6 | 842,388 |
| 1998 | 148,167 | 18.1 | 671,167 | 81.9 | 819,334 |
| 1997 | 141,014 | 17.8 | 649,484 | 82.2 | 790,498 |
| 1996 | 135,405 | 17.7 | 631,654 | 82.3 | 767,059 |
| 1995 | 131,958 | 17.6 | 617,115 | 82.4 | 749,073 |
| 1994 | 131,043 | 17.8 | 607,141 | 82.2 | 738,184 |
| 1993 | 597,420 | 50.0 | 597,420 | 50.0 | 1,194,840 |
| 1992 | 129,622 | 18.1 | 587,511 | 81.9 | 717,133 |
| 1991 | 130,685 | 18.4 | 579,985 | 81.6 | 710,670 |

Sources: Civic Census, Corporate Economics

**Table 3.** Calgary's Population by Age Cohorts

| Population by Age Cohorts | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | 0 - 4 | 5 - 14 | 15 - 19 | 20 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65 - 74 | 75 + |
| 2009 | 65,274 | 123,003 | 66,767 | 80,731 | 183,391 | 179,765 | 167,418 | 100,534 | 54,756 | 43,816 |
| 2008 | 62,627 | 127,649 | 70,048 | 75,473 | 157,737 | 166,762 | 171,304 | 108,094 | 56,406 | 46,793 |
| 2007 | 61,229 | 126,028 | 69,150 | 76,544 | 167,312 | 171,979 | 159,251 | 92,921 | 51,998 | 43,529 |
| 2006 | 57,709 | 119,330 | 65,299 | 77,509 | 162,997 | 174,136 | 154,654 | 86,266 | 52,670 | 41,189 |
| 2005 | 56,693 | 117,723 | 64,842 | 71,023 | 156,541 | 160,419 | 151,134 | 87,918 | 49,222 | 40,563 |
| 2004 | 53,137 | 118,292 | 63,232 | 72,989 | 153,956 | 167,810 | 141,737 | 75,743 | 48,956 | 37,643 |
| 2003 | 54,414 | 117,518 | 62,429 | 72,849 | 152,891 | 160,524 | 138,268 | 77,147 | 48,550 | 37,725 |
| 2002 | 52,794 | 116,262 | 61,078 | 72,846 | 152,822 | 167,297 | 131,918 | 67,903 | 47,795 | 34,273 |
| 2001 | 51,069 | 116,308 | 59,464 | 67,927 | 147,049 | 168,264 | 125,303 | 62,367 | 46,530 | 32,238 |
| 2000 | 54,645 | 110,193 | 59,452 | 77,910 | 150,502 | 153,229 | 113,101 | 60,870 | 47,644 | 33,203 |
| 1999 | 51,912 | 114,995 | 55,165 | 63,961 | 145,114 | 167,494 | 111,336 | 57,337 | 45,911 | 29,163 |
| 1998 | 53,167 | 111,068 | 55,392 | 71,036 | 142,172 | 151,991 | 101,743 | 57,597 | 44,913 | 30,254 |
| 1997 | 52,968 | 110,482 | 51,401 | 61,816 | 138,861 | 150,064 | 97,373 | 56,071 | 42,984 | 28,477 |
| 1996 | 53,273 | 109,205 | 48,099 | 55,149 | 138,097 | 147,069 | 93,060 | 54,899 | 41,390 | 26,818 |
| 1995 | 53,968 | 107,481 | 45,633 | 52,115 | 139,005 | 143,128 | 88,719 | 53,861 | 39,839 | 25,322 |
| 1994 | 55,457 | 104,851 | 44,564 | 52,915 | 142,202 | 138,355 | 83,891 | 53,297 | 38,685 | 23,966 |
| 1993 | 56,171 | 102,300 | 43,686 | 54,448 | 145,482 | 133,447 | 79,337 | 52,428 | 37,317 | 23,102 |
| 1992 | 56,354 | 100,109 | 43,369 | 55,447 | 148,615 | 128,879 | 74,431 | 51,766 | 35,884 | 22,279 |
| 1991 | 56,465 | 97,885 | 44,665 | 58,465 | 152,305 | 124,315 | 69,440 | 50,910 | 34,630 | 21,590 |

Sources: Civic Census, Corporate Economics

The age groups 0-14 and 65+ is dependent upon the 15 -64 year age group for its well-being. The dependency ratio, which is the ratio of the economically dependent part of the population – children (0-14 years) and the elderly (65+ years) - to the working-age population (15-64 years), declined during the 1991 - 2009 period (figure 4). This means that the working-age population grew at a faster pace than the 0-14 and 65+ group in contrast to most developed countries, where the dependency ratio increases as the number of elderly people increases. Three factors could be contributing to the decline in the old-age dependency ratio in Calgary:

- **Net migration**. Strong economic activity in the past two decades attracted a significant number

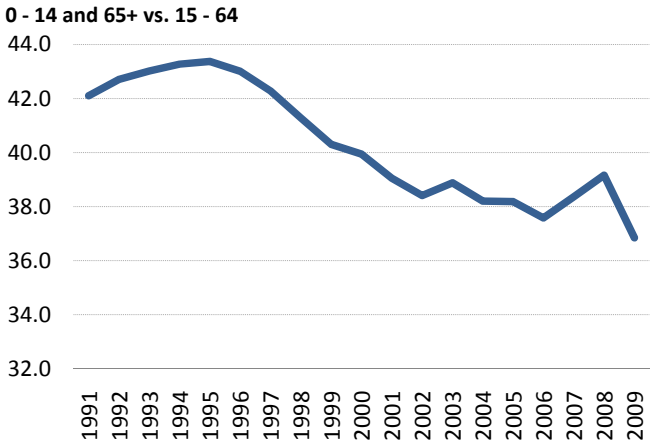


of newcomers to Calgary. These job-seekers were mostly in the working-age category.

- **Fertility rates**. Fertility rates as measured by the average number of children born to a woman of reproductive age have been relatively stable as most of the females moving to Calgary were in the childbearing age group. The stable reproductive rate was achieved despite:
  - Improvement in the workplace for women, which usually place them in a position to choose to devote less time to child-bearing and more to work;
  - The increase in social and economic costs of raising children;
  - The fact that many knowledge-age parents invest more resources in each child, thereby limiting the number of children they are able to support;
  - The decline in parental authority and the social prestige associated with parenting, which created less societal incentives to bear children.
- **Higher workforce participation rate among elderly**. During periods of economic boom elderly are usually encouraged to remain longer in the workforce. The negative impact of the recent recession on (private) sector pensions and savings is expected to keep an increasing number of elderly workers in the workforce.

Another reason for a higher workforce participation rate among older workers and children is the **increased life expectancy in the developed world**. The life expectancy in Canada has increased significantly in part due to improvements in the field of medicine, while Canada also experiences falling infant mortality. Decreasing infant deaths combined with higher workforce participation rate among elderly workers increases the labour force.

**Figure 4.** The Dependency Ratio in Calgary

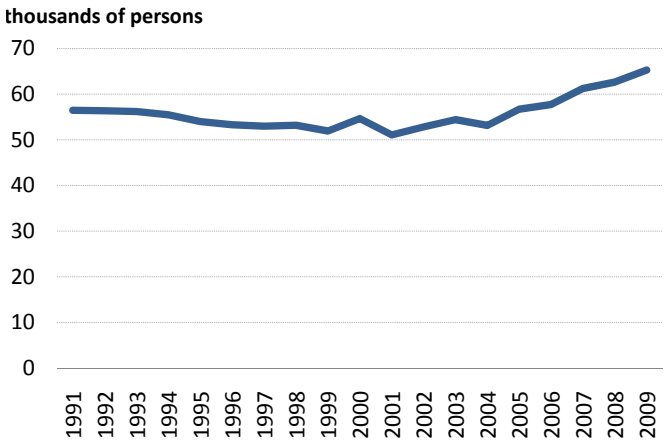



Sources: Civic Census, Corporate Economics

## The preschoolers (0-4 years)

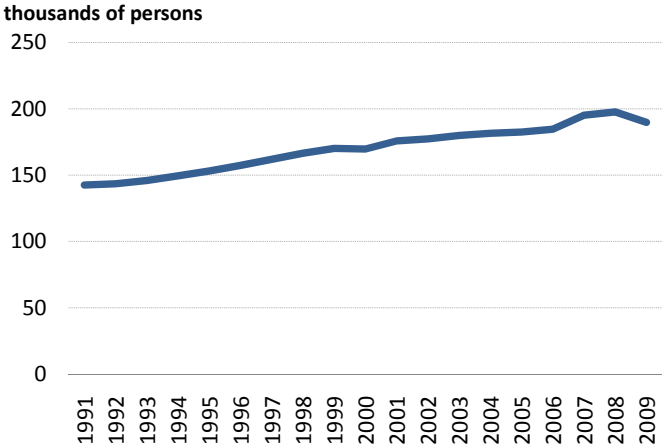
This age group comprised 7.9 per cent of Calgary's population in 1991, but declined to 6.1 per cent in 2009, which is below the average for the 1991-2009 period. The share of preschoolers declined steadily during the study period, although the number in this age group increased from 56,465 in 1991 to 65,274 in 2009 (table 3). Preschoolers usually attend day care and nursery schools.

**Figure 5.** Preschoolers in Calgary




Sources: Civic Census, Corporate Economics

**Figure 6.** School Age Population in Calgary




Sources: Civic Census, Corporate Economics

## 5-14 years

In 1991, this age group comprised 13.8 per cent of Calgary's total population and declined to 11.5 per cent in 2009. This age group usually attends early childhood services, day care and elementary schools.

## 15-19 years

The 15-19 year age group accounted for 6.3 per cent of the population in 1991 and 6.3 per cent in 2009. The proportion of this age group in relationship to the total population remained relatively stable throughout the study period. Persons in this age group generally live with their parents and represent high school and/or first year university students. Total school age population peaked in 2008 and declined slightly in 2009.

## 20-24 years

The 20-24 year age group represented 8.2 per cent of the population in 1991 and 7.6 per cent in 2009. The proportion of this age group in relationship to the total population remained relatively stable throughout the study period. Persons in this age group rent dwelling, participate in household and family formation. This group generally represents the first time labour market entrants and as a result is very mobile. They tend to migrate in search of jobs and other opportunities.

## 25-34 years

Persons in this cohort of the labour force generally own or buy homes, durables, participate in family and households formation. This age group comprised 21.4 per cent of Calgary's total population in 1991 and 17.2 per cent in 2009. The proportion of this age group in the total population has been steadily decreasing, during the study period.



## 35-44 years

This is the age group which is most economically active. Persons in this age group of the labour force own or buy homes, durables, participate in family and households formation and support children in the age group 0-14. In 1991, 17.5 per cent of the total population was in the 35-44 age group. The proportion decreased slightly to 16.9 per cent in 2009.

## 45-54 years

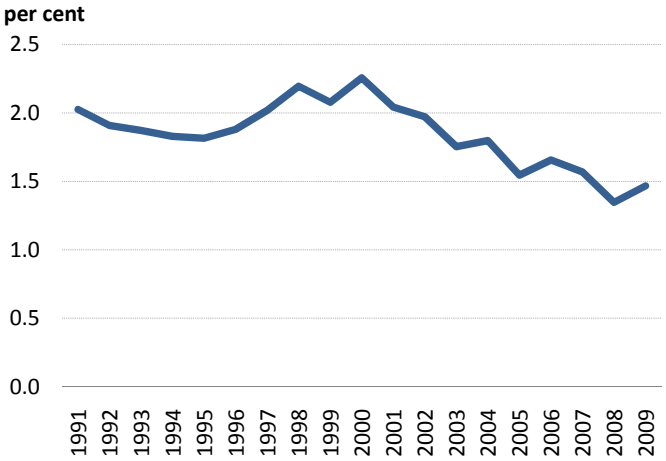
This age group is also economically active. Persons in this age group of the labour force own or buy homes, durables, participate in looking after dependent age groups such as 0-14 years age group and seniors 65+ years. In 1991, 9.8 per cent of the total population was in the 45-54 age group and this proportion increased to 15.7 per cent in 2009. The growing trend of this age cohort signifies the aging of the population.

## 55-64 years

Persons in this age group of the labour force own or buy homes, durables, participate in looking after dependent age groups such as seniors 65+ years. In 1991, 7.2 per cent of the total population was in the 55-64 age group. This increased to 9.4 per cent in 2009. The growing trend of this age cohort signifies the aging of the population.

The labour force replacement ratio is a ratio of the population that is 15 to 24 relative to the population that is 55 to 64. This ratio declined steadily from 2 in 1991 to 1.5 in 2009 (figure 7). This means that people in the age group 55-64 grew at a faster pace than the number of people in the 15-24 age group.

**Figure 7.** Labour Replacement Ratio in Calgary

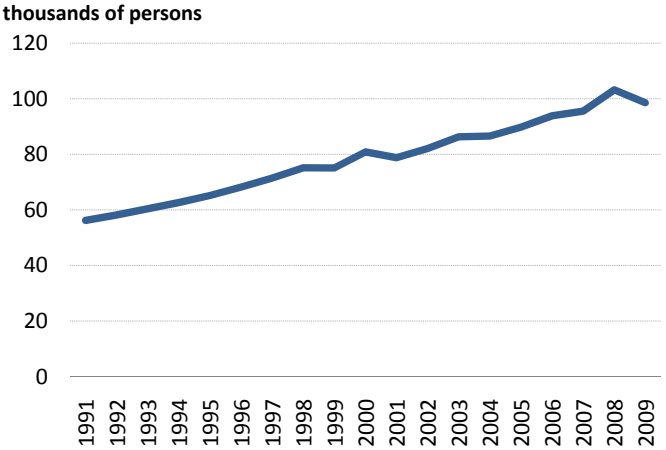



Sources: Civic Census, Corporate Economics

## 65+

The recent increase in the share of this age group in the total population reflects the aging of the "baby boomers" in Calgary. In particular, in 1991, 7.9 per cent of the total population was in the elderly age group, whereas in 2009, this proportion increased slightly to 9.3 per cent.

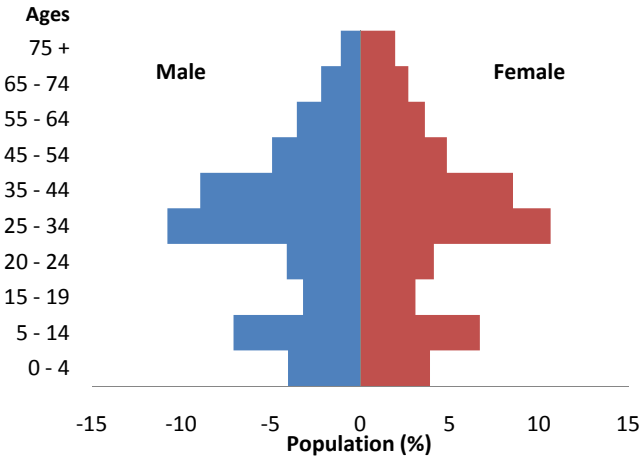
**Figure 8.** Retirees in Calgary




Sources: Civic Census, Corporate Economics

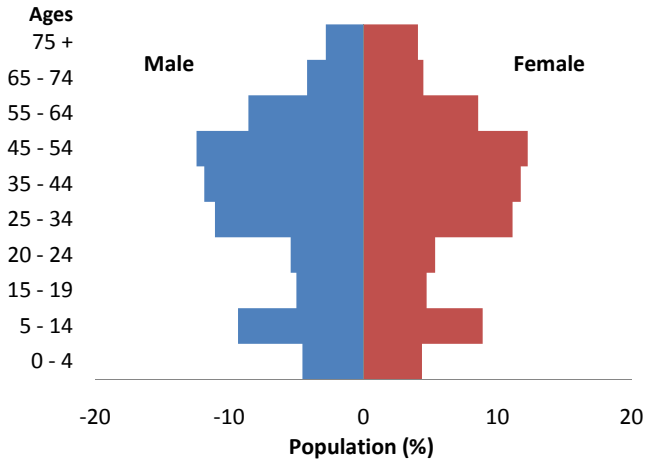
Figures 9 and 10 show the distribution of males and females in the total population in 1991 and 2010. The data also shows that the majority of the 65+ population is female. This results from the relatively longer lifespan for females. In 1991, the "baby boomers" were found in the 20 to 44 years cohorts. Within this group, the majority were between 25 and 34 years old. By 2010, nineteen years later, the boomers were found in the 25 to 54 years group. The majority of boomers were now in the 45-54 years age cohorts.

**Figure 9.** Distribution of Males and Females in 1991




Sources: Civic Census, Corporate Economics

**Figure 10.** Distribution of Males and Females in 2010




Sources: Civic Census, Corporate Economics

**Table 4. Changes in Calgary's Age Groups**

| Age Groups of City of Calgary | | | | | | | |
|---|---|---|---|---|---|---|---|
| Year | 0 - 4 (persons) | Percentage of Total | 15 - 64 (persons) | Percentage of Total | 65+ (persons) | Percentage of Total | Total (persons) |
| 1990 | 154,350 | 21.7 | 500,100 | 70.4 | 56,220 | 7.9 | 710,670 |
| 2000 | 164,838 | 19.2 | 615,063 | 71.5 | 80,847 | 9.4 | 860,749 |
| 2009 | 188,277 | 17.7 | 778,606 | 73.1 | 98,572 | 9.3 | 1,065,455 |

Sources: Civic Census, Corporate Economics



## Median Age of the Population

Relative to Alberta as a whole, Calgary has an older population. The median age of Calgarians (both male and female) in 1994 was 33.1 years and that of Albertans was 32.5 years. In addition, the median age of the female population in Calgary was slightly higher at 33.4 years than the median age of the male population at 32.7 years. In 2009, the median age of Calgarians increased to 35.9, with the median age of the female population estimated at 36.4 years and that of the male population at 35.5 years.

The aging population overall reflects, in part, the low birth rates of the "baby boomers" and their children. Another reason for the aging population is the increase in life expectancy. Life expectancy is most commonly presented as 'life expectancy at birth'. (i.e. the average number of years a hypothetical birth cohort would live if they were subjected to the current mortality conditions throughout the rest of their lives). Calgary's life expectancy was projected at 79.8 years in 1994 and increased to 82.4 years in 2009.

## Crude Birth and Death Rates

**Table 5** shows data on birth and death rates for Calgary and Alberta. The crude birth rate is defined as the number of live births per 1,000 population in a given year. The crude death rate, on the other hand, is expressed as the number of deaths per 1,000 population per year. The crude birth rate for Calgary increased from 15 births per 1,000 population in 1994, to 15.2 in 2008. The birth rate in the province declined from 14.7 births per 1,000 population in 1994 to 14.5 in 2008.

The natural growth rate in Calgary, which represents the difference between the crude birth and death rates, remained unchanged from 1994.

Because of longer life expectancies due in part to advances in medical technology, the crude death rate has remained relatively stable in recent years. In 1994 the crude death rate in Calgary was 5.2 deaths per 1,000 population in 1994. In 2008, the crude death rate was 5.4 per 1,000 population.

**Table 5. Crude Birth and Death Rates in Calgary and Alberta**

| Birth and Death Rates | | | | | | |
|---|---|---|---|---|---|---|
| Year | Calgary | | | Alberta | | |
| | Birth Rate | Death Rate | Natural Growth Rate | Birth Rate | Death Rate | Natural Growth Rate |
| 2008 | 15.2 | 5.4 | 9.8 | 14.5 | 6.0 | 8.5 |
| 2007 | 14.8 | 5.4 | 9.5 | 14.3 | 5.9 | 8.5 |
| 2006 | 14.2 | 5.4 | 8.8 | 13.7 | 5.9 | 7.7 |
| 2005 | 13.8 | 5.3 | 8.5 | 13.0 | 5.9 | 7.1 |
| 2004 | 13.3 | 5.4 | 7.9 | 12.8 | 5.8 | 7.0 |
| 2003 | 13.4 | 5.4 | 8.0 | 12.8 | 5.9 | 7.0 |
| 2002 | 12.8 | 5.4 | 7.4 | 12.5 | 5.8 | 6.7 |
| 2001 | 12.7 | 5.3 | 7.3 | 12.4 | 5.7 | 6.6 |
| 2000 | 13.0 | 5.5 | 7.5 | 12.4 | 5.7 | 6.7 |
| 1999 | 13.2 | 5.3 | 7.8 | 13.0 | 5.8 | 7.2 |
| 1998 | 13.5 | 5.4 | 8.1 | 13.2 | 5.8 | 7.4 |
| 1997 | 13.5 | 5.4 | 8.1 | 13.2 | 5.8 | 7.4 |
| 1996 | 14.0 | 5.7 | 8.3 | 13.8 | 5.9 | 7.9 |
| 1995 | 14.4 | 5.4 | 9.0 | 14.3 | 5.8 | 8.5 |
| 1994 | 15.0 | 5.2 | 9.8 | 14.7 | 5.7 | 9.0 |

Sources: Alberta Health and Wellness, Corporate Economics

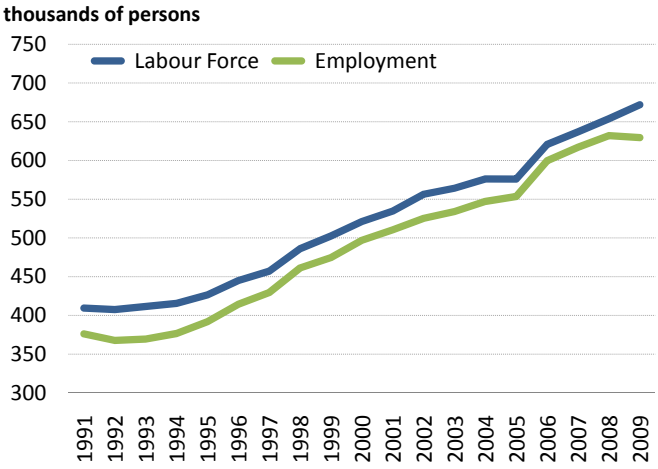


# Data Analysis

## Employment and Labour Force in Calgary

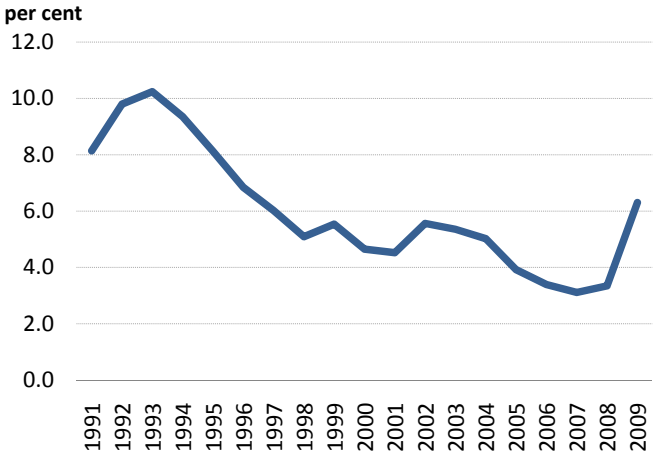
Calgary's economy created approximately 331,000 new jobs during the 1991-2009 period. A significant portion of these jobs were in the professional, scientific and technical services industries (16.8 per cent), which illustrates Calgary's importance as a head office for the energy industry and a business centre. During this period employment grew at a faster pace than the labour force (figure 11). The unemployment rate (averaged 6 per cent) remained below the national rate (averaged 8.3 per cent) during this period, which attracted job seekers from outside the region and abroad (figure 12).

**Figure 11.** Labour Force vs. Employment in Calgary



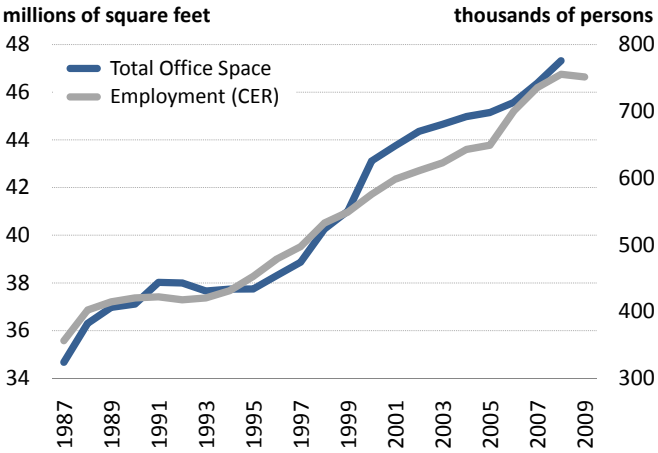

Sources: Civic Census, Corporate Economics

**Figure 12.** Calgary's Unemployment Rate



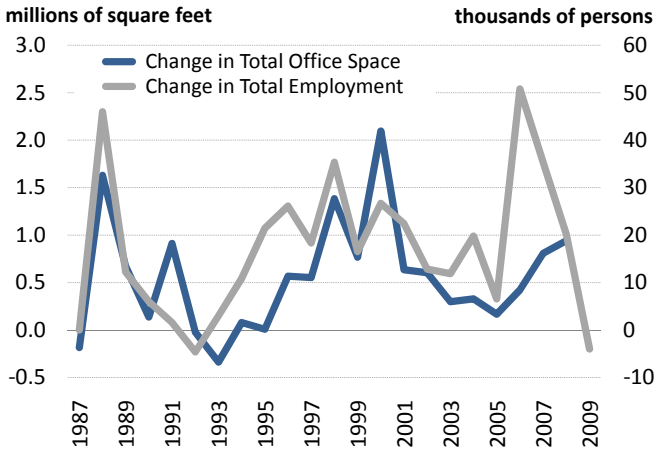

Sources: Civic Census, Corporate Economics

**Figure 13.** Total Office Space and Employment in Calgary




Sources: Civic Census, Corporate Economics

**Figure 14.** Changes of Total Office Space and Employment in Calgary



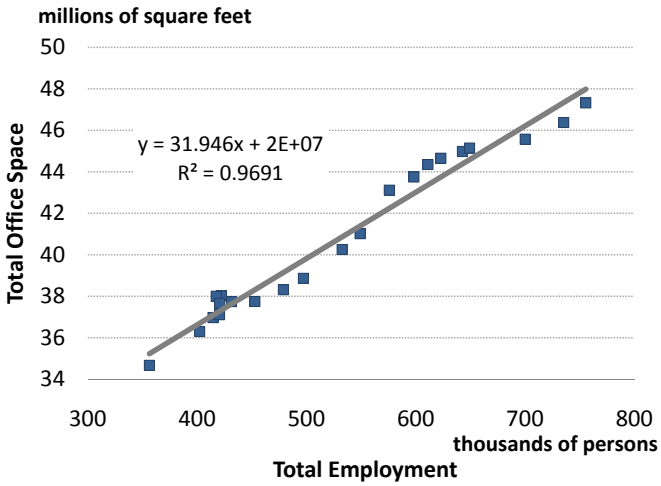

Sources: Civic Census, Corporate Economics

Growth of employment is the main driver for the increase in total office space in Calgary. Historical data shows that, with the increase of employment from 356,308 in 1987 to 751,517 in 2009, total office space has also increased by 41 million square feet in the same period.

The changes in employment and office space show a strong correlation between the two indicators. The fluctuation in employment will cause office space to change in the same direction with time lags of a couple of years.

Statistical analysis suggests that for every 1,000 new employees working in Calgary, the demand generated for office space would be 31,946 sq. ft.

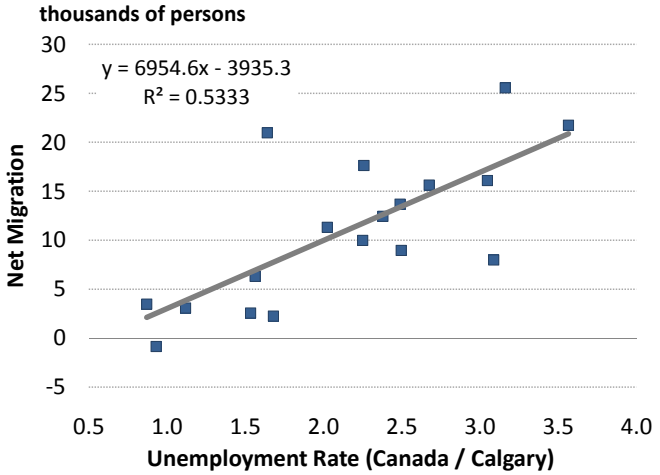
**Figure 15.** Office Space and Employment in Calgary




Sources: Civic Census, Corporate Economics

## Unemployment Rate and Migration

**Figure 16.** Unemployment Rates and Net Migration to Calgary




Sources: Civic Census, Statistics Canada, Conference Board of Canada, Corporate Economics



# Briefing Note

The difference between the unemployment rate in Canada and that of Calgary has an important impact on the migration of Calgary. Lower rate of unemployment in Calgary than the national level indicates comparative advantage in working opportunities and attracts in-migration from other parts of the country.

The data analysis shows a positive relationship between the net migration and the relative ratio of unemployment rate of Canada over that of Calgary. The annual data indicates that in the period from 1991 to 2009, when the unemployment rate in Calgary is one per cent lower than the national level, about 6,955 person will come to Calgary because of the better job market. This relation is statistically significant.

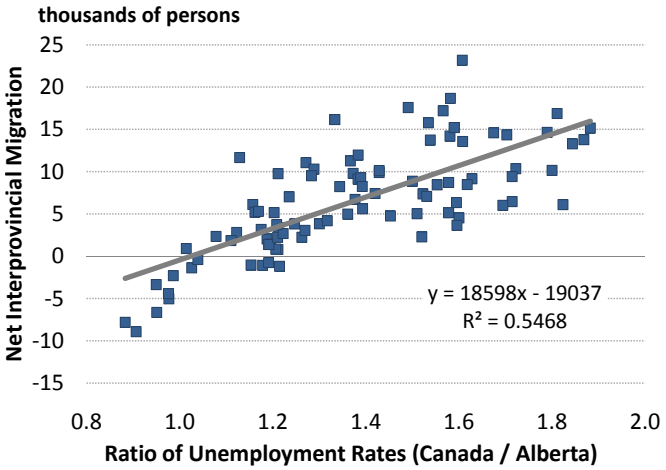
**Figure 17.** Unemployment rates and net international migration to Calgary


Sources: Civic Census, Statistics Canada, Conference Board of Canada, Corporate Economics

The relationship between unemployment rates difference and in-migration to Calgary can be further discussed by looking into the components of migration. There are three types of migration: international, inter-provincial, and inter-city (intra-provincial).

The relationship between international migration and the unemployment rates difference between the national level and Calgary local level also has a positive slope by using the quarterly data from Q1 1987 to Q1 2010. It shows that more international immigrants will choose to stay in Calgary if the local unemployment rate is lower than the Canadian average level.

**Figure 18.** Net Interprovincial Migration and Unemployment Rate in Calgary

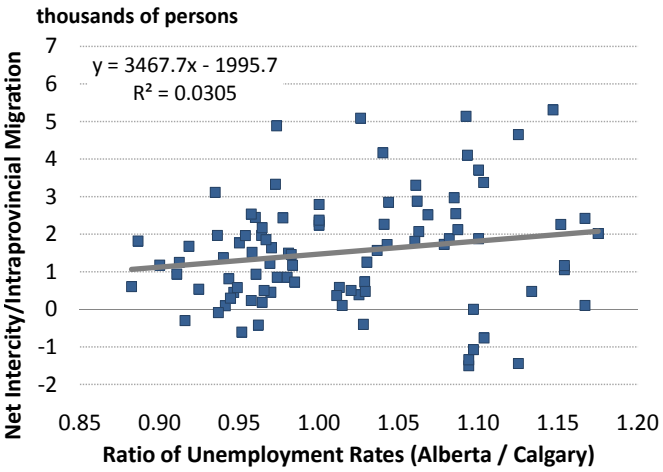



Sources: Civic Census, Statistics Canada, Conference Board of Canada, Corporate Economics

To explain the net interprovincial migration in Calgary, the difference between the Canadian unemployment rate and the rate of Alberta is used as the independent variable here. Again, quarterly data from Q1 1987 to Q1 2010 is used for the econometric analysis.

The results from the above graph indicate that, when the unemployment rate in Alberta is one per cent lower than the national unemployment rate, around 18,598 migrants will move to Alberta. Based on the proportion of population in Calgary, around one third of the interprovincial migrants will locate in Calgary.

**Figure 19.** Net Intra-provincial Migration and Unemployment Rate in Calgary




Sources: Civic Census, Statistics Canada, Conference Board of Canada, Corporate Economics

Intra-provincial migration refers to the in- or out-migration between Calgary and other cities or areas within Alberta. The relationship between net intra-provincial migration and the unemployment rate difference between Alberta and Calgary shows a slightly positive slope. It means lower unemployment rate in Calgary would attract people moving in from other cities, towns, and rural areas in the province.

This positive relationship is not as strong as the previous two. It is caused by the relatively smaller size of migration from the rest of Alberta than international and interprovincial. Furthermore, the unemployment rate of Calgary is highly correlated with the provincial level due to the similarity of industries, which gives people living in other parts of the province less incentive to move.



## Housing and Population

**Table 6: Housing Starts and Population Structure in Calgary**

| | Housing Starts Total | | Housing Starts Single Family Houses | | Housing Starts Multi Family Houses | |
|---|---|---|---|---|---|---|
| | Without lag (1) | With lag (2) | Without lag (3) | With lag (4) | Without lag (5) | With lag (6) |
| Age cohort 15-29 | -0.0009222 (-0.00) | -0.622394 (-0.46) | 0.6840709 (0.92) | -0.3246201 (-0.57) | 0.9105997 (1.16) | 0.9038448 (1.19) |
| Age cohort 30-49 | 3.523757 (4.87)*** | 2.121295 (2.98)*** | 2.331367 (6.11)*** | 0.7487523 (2.41)** | 1.751476 (4.44)*** | 1.406058 (3.54)*** |
| Age cohort 50-64 | 6.74059 (3.79)*** | 4.844415 (2.87)*** | 1.332706 (1.41) | 0.5550771 (0.78) | 2.593209 (2.66)*** | 1.923913 (2.03)** |
| Age cohort 65-74 | -41.49874 (-4.67)*** | -27.64519 (-3.22)*** | -15.6588 (-3.36)*** | -3.887664 (-1.09) | -15.08384 (-3.10)*** | -11.86736 (-2.51)** |
| Age cohort 75+ | -149.4228 (-5.41)*** | -91.9426 (-3.36)*** | -110.4029 (-7.64)*** | -32.35074 (-2.66)*** | -82.83586 (-5.37)*** | -70.16447 (-4.31)*** |
| Lagged Housing Starts | | 0.364938 (6.38)*** | | 0.6749645 (14.08)*** | | 0.2086131 (3.46)*** |
| Obs. | 276 | 275 | 273 | 269 | 273 | 269 |
| R-squared | 0.5396 | 0.5975 | 0.5026 | 0.7127 | 0.5095 | 0.5425 |

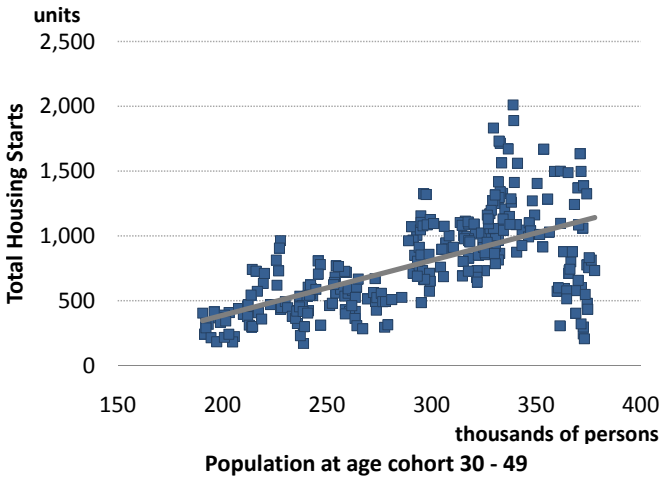
Note: 1. Numbers in bracket are the t-values of the coefficients. *, **, and *** indicate statistical significance at 10%, 5%, and 5% level respectively.
2. The lagged values of housing starts are the lagged total starts in the first two columns; lagged single family housing starts in columns (3) and (4); and lagged multifamily housing starts in the last two columns respectively.

Residential construction depends on the population's age structure in Calgary. Large groups of working age population (15-64) are associated with higher rates of residential construction. There are also significant negative impacts from age cohorts of 65-74 and 75 above. Age effects on residential construction are robust.

Analysis in the above table is based on econometric analysis of monthly data in Calgary from 1987.

Regression results indicate that young adults in age cohort 15-29 do not have a statistically significant impact on housing starts in Calgary. Population in this group start to form households and usually do not have enough savings for house ownership. The impact of this group on residential construction is negligible.

**Figure 20.** Total housing starts and population age cohort 30-49 in Calgary (1987-2010)

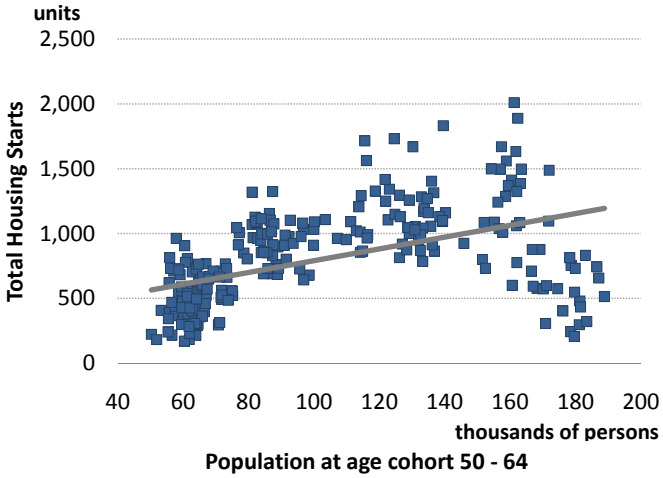



Sources: Canada Mortgage and Housing Corporation, Corporate Economics

Working age population between 30 and 49 has a positive effect on residential investment. More population in this group will increase the housing starts both for single family buildings and multifamily buildings.

Population in age cohort 30-49 generally demand residential spaces for raising family and children. At the same time, higher participation in job market boosts their affordability of houses.

**Figure 21.** Total housing starts and population age cohort 50-64 in Calgary (1987-2010)




Sources: Canada Mortgage and Housing Corporation, Corporate Economics

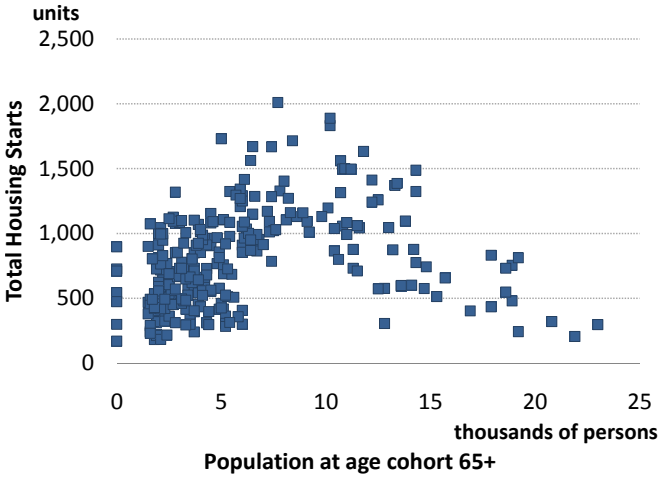
Working age population between 50 and 64 also positively affects residential construction.

Adults in the age cohort of 50-64 are more likely to affect the housing starts of multifamily construction, while their impacts on single family houses are not statistically significant.

Working age population in this group demand relatively less residential spaces compared to the age cohort 30-49, with their children growing up and moving out of the houses.



**Figure 22.** Total housing starts and population age cohort 65+ in Calgary (1987-2010)

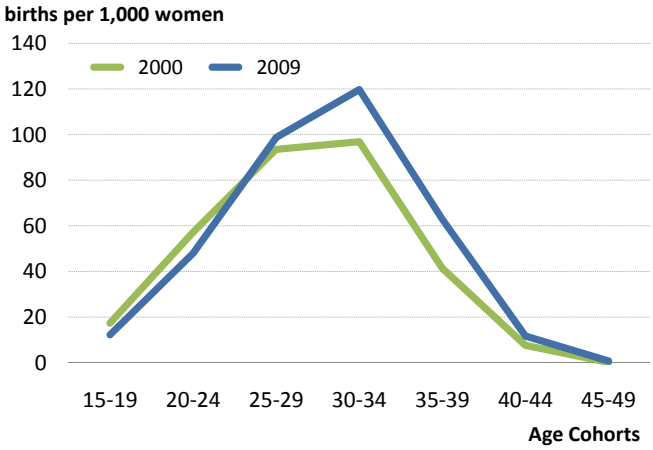



Sources: Canada Mortgage and Housing Corporation, Corporate Economics

Increasing population shares in the dependent age groups have depressing effects on residential construction. Population older than 65 have negative effects on housing starts, with the cohort of 75 above having a much bigger impact than the age cohort of 65-74.

## Fertility and Mortality Rates

**Figure 23.** Fertility Rate in Calgary (2000 vs. 2009)

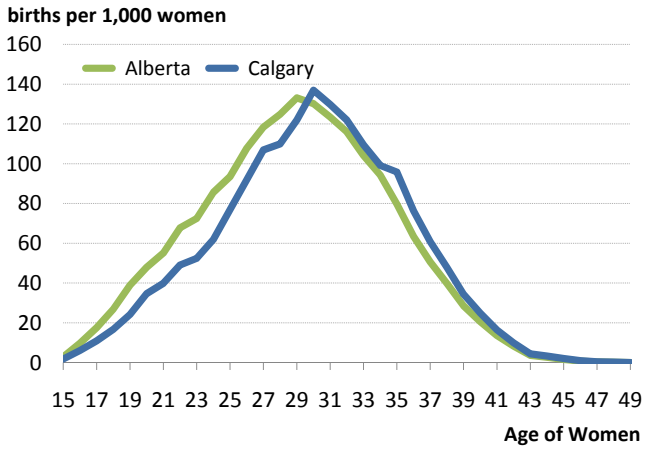



Sources: Alberta Health and Wellness, Alberta Finance and Enterprise, Corporate Economics

The above graph compares the fertility rates in Calgary at 2000 and 2009. The average fertility rate in 2009 was 52.15 births per 1,000 women, which was higher than the average in 2000, 44.32 births per 1,000 women.

More women tended to give births at older ages in 2009 compared to 2000. The peak of fertility rate happened in the group of age 30-34 in 2009.

**Figure 24.** Fertility Rate in Calgary and Alberta 2009



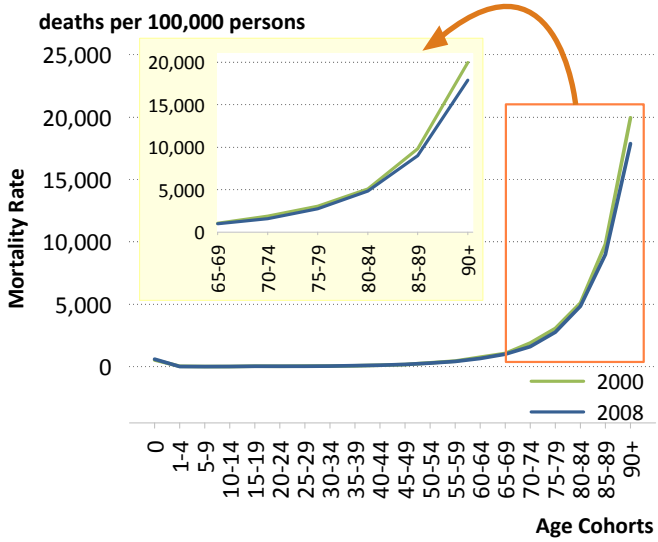

Sources: Alberta Health and Wellness, Alberta Finance and Enterprise, Corporate Economics

The above graph shows the age-specific fertility rates in Calgary and Alberta respectively. Age-specific fertility rate measures the number of live births per 1,000 women for each age between 15 and 49 to capture the differences in the probability of bearing children.

The fertility rate in Calgary shifts slightly to the right of the fertility rate curve of Alberta. It indicates that, compared to the whole Alberta, women living in Calgary tend to have children several years later, reflected by the shift of the peak from their late 20s to early 30s.

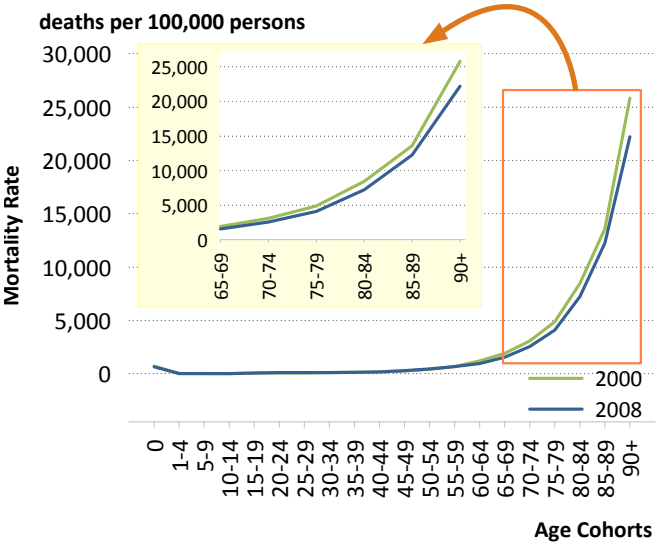
This right-shifting of fertility rate in Calgary implies that women living in urban area with better education and more job opportunities tend to postpone their child-bearing ages.

**Figure 25.** Mortality Rates for Female in Calgary (2000 -2008)




Sources: Alberta Health and Wellness, Alberta Finance and Enterprise, Corporate Economics

**Figure 26.** Mortality Rates for Male in Calgary (2000 -2008)




Sources: Alberta Health and Wellness, Alberta Finance and Enterprise, Corporate Economics



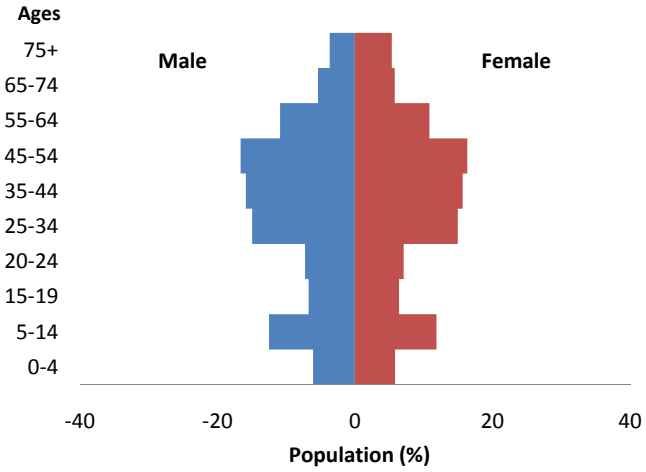
Mortality rates fell for most of the age cohorts for both female and male in Calgary from 2000 to 2008. For population above age 65, this decrease is more significant.

Drop in mortality rates reflects the improvement in medical conditions, as well as social and economic conditions.

Lower mortality rate for older population contributes to the aging problem in Calgary.

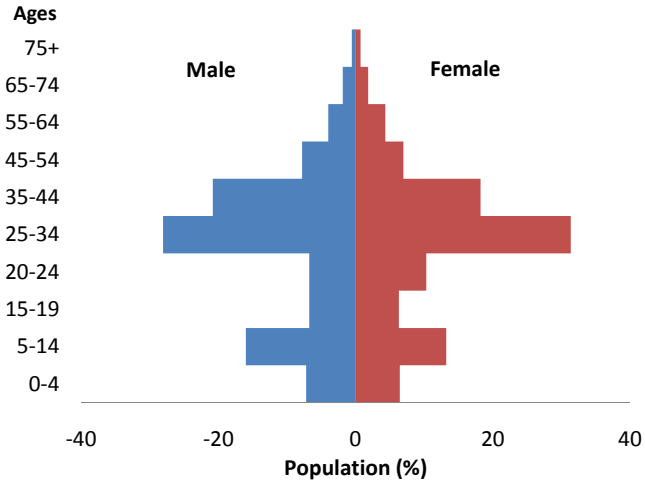
## Age Structure of In-migrants

**Figure 27.** Age Structure of Population in Calgary (2009)




Sources: Civic Census, Corporate Economics

**Figure 28.** Age Structure of In-migrants to Calgary (2009-2010)

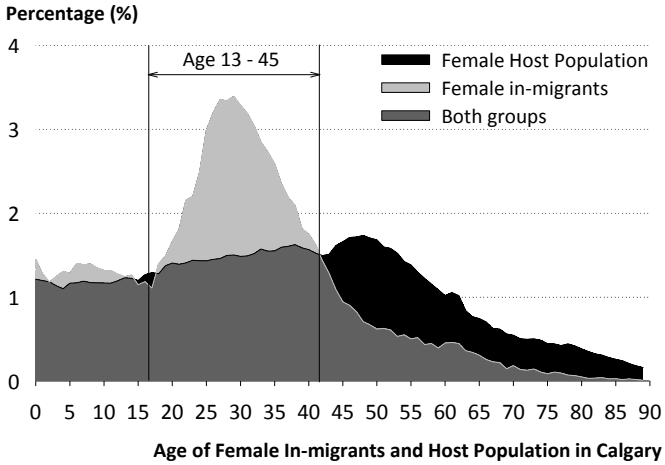



Sources: Civic Census, Corporate Economics

The above two graphs show the age structures of host population in Calgary in 2009 and in-migrants to Calgary from 2009 to 2010. Percentage distribution of each age cohort is reflected in the graphs for both genders.

The age structure of in-migrants is younger compared to the host population in Calgary. About 76 per cent of in-migrants are in their working ages, i.e., within the age cohort of 15-64. In comparison, only 72 per cent of the host are in the working age population. Only 2.5 per cent of the in-migrants in 2009-2010 are above 65, compared to over 10 per cent of the host population in Calgary in this age group.

**Figure 29.** Age Structures of Female In-migrants and Host Population in Calgary




Sources: Civic Census, Corporate Economics

About 70 per cent of the female in-migrants are in their child-bearing ages, i.e., within the age cohort of 13-45. In comparison, only 49 per cent of the local female population are at this age group. It indicates that more in-migrants will increase the fertility rate in Calgary.

## Implications of Changes in Demographic Trends

- **Reduced labour supply**. An increase in the old-age dependency ratio is expected to reduce the labour force as a percentage of total population. This could reduce productivity and GDP growth in the city.
- **Fiscal pressure**. With a smaller proportion of the population employed and able to pay taxes, in particular property taxes and user fees, municipal revenues are expected to come under increasing pressure.
- **Changing service mix**. The demand for services provided to the elderly population (public transit, infrastructure, job retraining and policing) is expected to increase, while the demand for services for the school-age population (K-12 education, youth services and playgrounds) should decline slightly.



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## Glossary

**Aging of Population**. A process in which the proportions of adults and elderly increase in a population, while the proportions of children and adolescents decrease. This process results in a rise in the median age of the population. Aging occurs when fertility rates decline while life expectancy remains constant or improves at the older ages.

**Baby Boom**. A dramatic increase in fertility rates and in the absolute number of births in the United States, Canada, Australia, and New Zealand during the period following World War II (1947-1961).

**Birth rate**. The number of live births for every 1,000 people in the population.

**Cohorts**. A group of persons who experience the same event or series of events in a particular period. For example, all persons born in a particular year or all couples married in a particular year are considered cohorts of that year.

**Components of demographic growth**. Any of the classes of events generating population movement variations. Births, deaths and migrations are the components responsible for the variation since they alter the total population.

**Dependency Ratio**. This is the ratio of the population that is 0 to 14 and 65+ relative to the population that is 15 to 64.

**Fertility**. The childbearing performance of individuals, couples, groups or populations. Sometimes measured as the number of live births per 1,000 people in a given year or as the number of children born to women of a particular childbearing age.

**Labour Force**. The working age population who are employed or unemployed.

**Labour Force Replacement Ratio**. This is a ratio of the population that is 15 to 24 relative to the population that is 55 to 64.

**Migrants**. Persons who lived in a different census subdivision (CSD) than the one they lived in five years earlier (internal migrants) or who lived outside Canada (external migrants).

**Mortality**. Death as a component of population change. Usually measured as the number of deaths per 1,000 people in a given year.

**Natural increase**. Variation in population size over a given period as a result of the difference between the numbers of births and deaths.

**Population**. Estimated population and population according to the census are both defined as being the number of Canadians whose usual place of residence is in that area, regardless of where they happened to be on Census Day. Also included are any Canadians staying in a dwelling in that area on Census Day and having no usual place of residence elsewhere in Canada, as well as those considered **non-permanent residents.**

**Population growth or total growth**. Variation of population size between two dates. It can also be obtained by summing the natural increase, total net migration and if possible, subtract residual deviation. It can be positive or negative.

**Population Projection**. Computation of future changes in population numbers, given certain assumptions about future trends in the rates of fertility, mortality, and migration. Demographers often issue low, medium, and high projections of the same population, based on different assumptions of how these rates will change in the future.



**Population Pyramid**. A bar chart, arranged vertically, that shows the distribution of a population by age and sex. By convention, the younger ages are at the bottom, with males on the left and females on the right.

**Pre-schoolers**. The population between the ages of 0 to 4.

**Retirees**. The population ages 65 and above.

**School Age Population**. The population between the ages of 5 to 19.

**Women of Childbearing Age**. Women between the ages of 15 to 49 are defined as childbearing.

**Working Age Population**. Corresponds to all persons aged 15 years and over, with the exception of the following: persons living on Indian reserves, full-time members of the regular armed forces, and persons living in institutions.

# Briefing Note

## Who We Are

Over the past ten years Corporate Economics has researched dozens of economic topics and developed reliable methods of forecasting and analysis. Monitoring economic trends allows us to develop unique insights on how external events are impacting the local economy and the Municipal Corporation. We provide services in four areas: forecasting, information provision, consulting and policy analysis.

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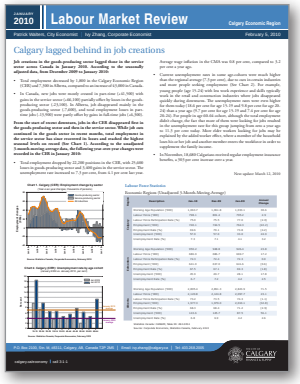


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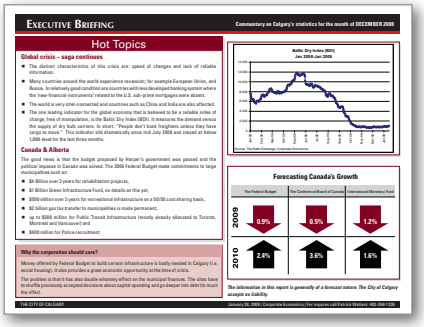


**Quarterly**
Calgary's Quarterly Economic Outlook


Corporate Research Analyst: Estella Scruggs