DOCUMENT X

Growth Projections for the New Official Plan: Methods and Assumptions for Population, Housing and Employment 2018 to 2046

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Planning, Infrastructure and Economic Development Department

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Executive Summary

Projections of long-term change in population and associated housing and employment are fundamental to a community's ability to plan for land use, housing needs, land requirements, transportation and infrastructure, financing, recreational and social needs, and other basic services.

The new Official Plan provides a strategy and policy framework to guide development and growth over a 28 year period from July 2018 to July 2046. New projections are required to estimate the growth that will occur over this period. The projections begin with population growth, being the driver for household growth and employment growth.

The purpose of this report is to:

a) explain the methodology and assumptions in the growth projections;

b) present the results of the scenarios developed, including the recommended Medium Population Projection as the basis for growth projections in the new Official Plan;

c) develop the projected housing demand from 2018 to 2046; and,

d) develop the projected employment from 2018 to 2046.

Population

The projections of population use a cohort-survival model, the widely-accepted best methodology and the same technique used in previous projections. Cohort-survival separates population change into its basic components; births are added to the population, deaths are subtracted, net migration is incorporated and the existing population is aged to arrive at future population totals.

The new projections are based on the most recent detailed Statistics Canada data for the City of Ottawa. A base year of 2018 on July 1 is used; the latest year for which reliable data are available. The end year is 2046 providing a projection period of 28 years. The City of Ottawa population projections benchmarks various growth components to Ontario projections by Statistics Canada and the Ontario Ministry of Finance. Similar to other major Canadian cities, the most significant component of population growth will be from international immigration.

Three scenarios were developed, summarized below.

Low Projection: assumes a continuation of declining birth rates, a life expectancy increase of about 2 years, lower rates of in-migration and higher rates of out-migration. The above assumptions result in a 2046 population of 1,271,848, an increase of 264,000 (26%) from 2018.

Medium Projection: Assumes an increase in the birth rate, a life expectancy increase of about 4 years, increasing in-migration based on the federal immigration targets and moderate rates of out-migration. Under this scenario the result is a 2046 population of almost 1,410,000, an increase of 402,000 (40%) from 2018.

High Projection: Assumes a larger increase in birth rates, a life expectancy increase of about 5 years, in-migration rates exceeding the mid-point of the federal immigration targets and minimal out-migration. These result in a 2046 population of 1,587,000, an increase of 579,000 (57%) from 2018.

The medium projection is the recommended scenario as the basis for the new Official Plan growth projections. This projection is higher than the previous projection developed in 2016. Using 2031 for comparison, the medium projection is 66,000 persons or 5.7% higher at 1,219,200 than the previous 2031 projection of 1,153,500 persons.

Households and Housing

Projected housing requirements for this population projection is estimated to be 194,800 new private households, including a vacancy factor, over the 28-year period, an increase of 48% from 2018. These new dwelling units are projected to be comprised of 34% single-detached, 3% semi-detached, 36% rowhouse, and 27% apartments.

Employment

The projected employment includes the work force that lives in Ottawa from the population projection along with commuters from outlying communities and persons with more than one job. The projected employment by 2046 is 827,000 jobs, an increase of 30% from 2018.

Basis of the Growth Projections for the New Official Plan, 2018-2046

Growth projections begin with the population growth as the foundation for future housing and employment needs. Housing needs are analyzed by the types of housing or dwellings that the future population will occupy. Employment needs are analyzed by the amount of jobs stemming from the future population and commuting flows between Ottawa and outlying communities. This report provides methods and assumptions used for the projections and the selected scenario that is the basis of the growth projections recommended for the City of Ottawa's new Official Plan from 2018-2046.

This report is divided into three parts:

Part I: Population Projections

Part II: Households and Housing Projections

Part III: Employment Projections

Appendices are provided as a reference and for further information in relation to each of the projections.

Part I. Population Projections

Methodology

The projections use a cohort-survival model, the widely-accepted best methodology for projections by age and gender. The same technique has been used in all previous City of Ottawa and, prior to 2001, Region of Ottawa-Carleton projections since the 1980s. Cohort survival separates population change into its basic components; births are added, deaths are subtracted, and net migration (in and out migration from various sources) is added. These components are summarized in Figure 1 with further details in subsequent sections of the report.

Figure 1: Cohort-Survival Components of Growth

Population Gain	Births		International Immigrants		Returning Emigrants		Positive Net non-permanent residents	Positive Net Interprovincial migration	Positive Net Intraprovincial migration
Population Loss		Deaths		Emigrants		Net Temporary Emigration	Negative Net non-permanent residents	Negative Net Interprovincial migration	Negative Net Intraprovincial migration

Base Year

Statistics Canada conducts a Census every five years with the last being 2016. After each Census they also produce post-censal population estimates for non-Census years by each of the population components of births, deaths, and the various sources of in- and out-migration at the city of Ottawa level. The most recent estimate was on July 1 2018, with a population of 1,007,501[1]. This population estimate is used as the base for the current set of projections rather than city staff's own population estimate to keep data sources consistent throughout the model.

Projections Benchmarks

Statistics Canada produces population projections for Canada, Provinces and Territories[2]. The Ontario Ministry of Finance also produces population projections for Ontario and the counties within[3]. Both projections also use a cohort-survival model and provide specific population growth estimates by component.

The Ottawa population projections rely on benchmarks to the best data available at the time of development. The Statistics Canada projections are preferred on the basis that the development of assumptions incorporates both quantitative and qualitative analysis through a survey of experts on future demographic trends. Assumptions are provided for each of the growth components, which is particularly important for international migration being the most significant contributor to population growth for Ottawa and all other major Canadian cities. Projections are provided nationally and each of the provinces and territories.

In addition to geographic breakdown, Statistics Canada also provide projections through low, medium and high growth scenarios. The Ottawa projections are benchmarked to each of the Ontario scenarios to provide a local estimate of low, medium and high growth scenarios.

However, the Statistics Canada projections are less useful for Ottawa assumptions on domestic migration. Their interprovincial migration projection sees Ontario as the origin and destination source,

[1] Statistics Canada, Population Estimates July 1, by Census Division. Table 17-10-0139-01

[2] Statistics Canada, 2019. *Population Projections for Canada (2018 to 2068), Provinces and Territories (2018 to 2043): Technical Report on Methodology and Assumptions.* Publication 91-620-X. https://www150.statcan.gc.ca/n1/pub/91-620-x/91-620-x2019001-eng.htm

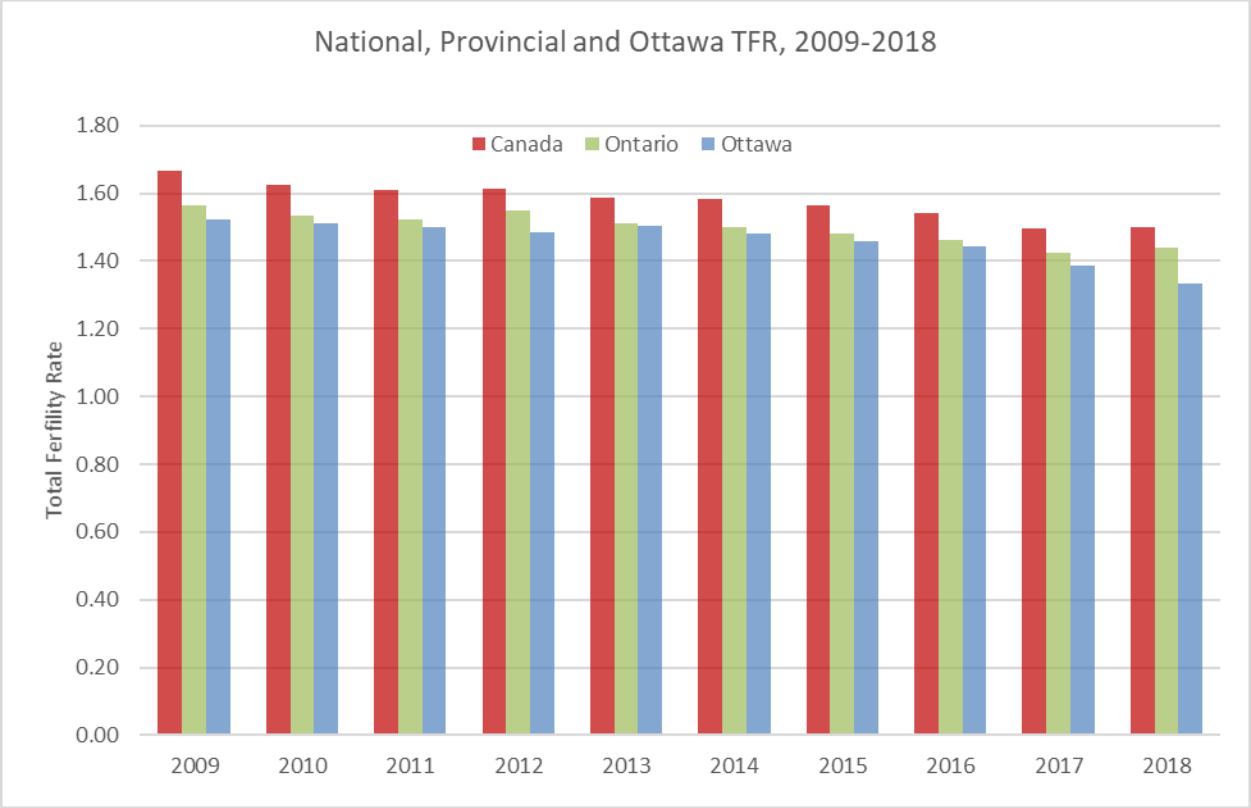
[3] Ministry of Finance, 2019. *Ontario Population Projections, 2018-2046.* https://www.fin.gov.on.ca/en/economy/demographics/projections/

rather than Ottawa. In addition, as domestic projections are only provided at the Provincial and Territory level, no estimates are provided for intraprovincial migration, being movement within Ontario. The Ontario Ministry of Finance projections however provide projections at the county level, with the city of Ottawa being one of the counties. The Ministry then is able to provide Ottawa specific growth estimates for both the interprovincial and intraprovincial migration components.

Births and Fertility

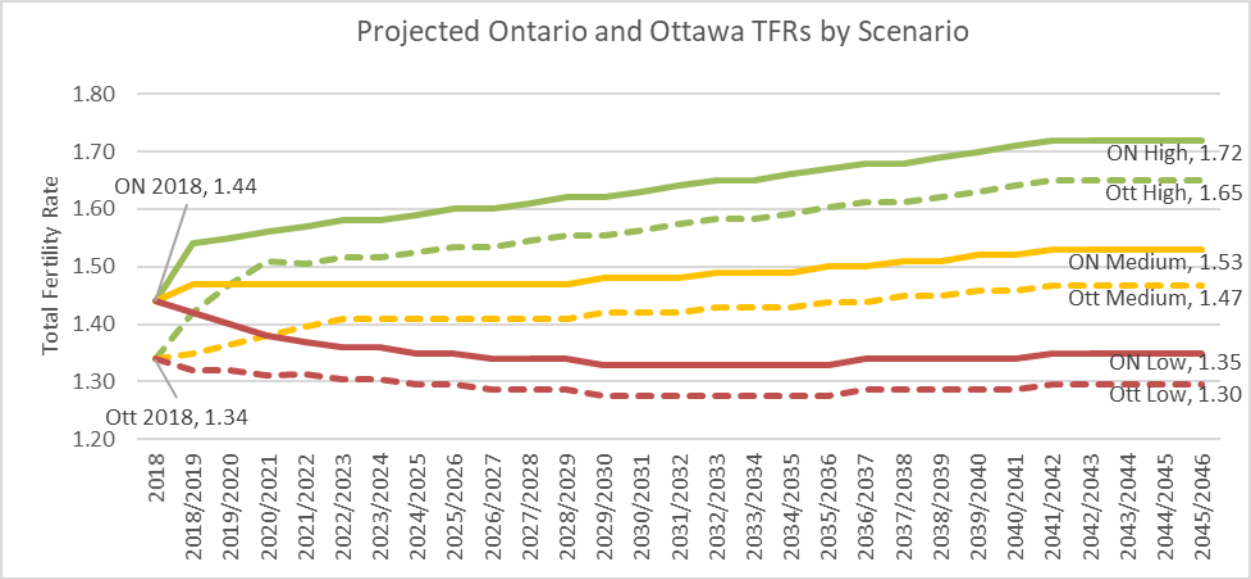
The best predictor of future births is the Total Fertility Rate (TFR), the average number of children per woman throughout child-bearing years. Rates in Ottawa have historically been lower than the national and provincial averages and continue to be lower according to the most recent data. Over the past decade Ottawa rates were steady in the first half and then declined slightly in the second half. Generally Ottawa rates have declined in a similar trend to national and provincial rates, with the exception of the two most recent years when Ottawa rates declined in contrast to the increases seen at the other levels as shown in Figure 2.

Figure 2: National, Provincial and Ottawa Total Fertility Rates (TFR)



The Statistics Canada Ontario TFR projections assume a change from a TFR of 1.49 in 2018 to a decrease to 1.35 in the low scenario, a small increase to 1.53 in the medium scenario and a larger increase to 1.72 in the high scenario. The historical relationship of the past 10 years between Ontario and Ottawa TFRs is assumed to be maintained throughout the projection period, with a transition in the short-term to account for the recent lower Ottawa ratios to the provincial rate. Applying this ratio to the Statistics Canada TFR projections for Ontario results in Ottawa TFRs that change in 2018 from 1.34 to 1.30 in the low scenario, 1.47 in the medium scenario and 1.65 in the high scenario. The Ontario and Ottawa TFR projections by 2046 for these scenarios are shown in Figure 3.

Figure 3: Projected Ontario and Ottawa Total Fertility Rates (TFR) by Scenario

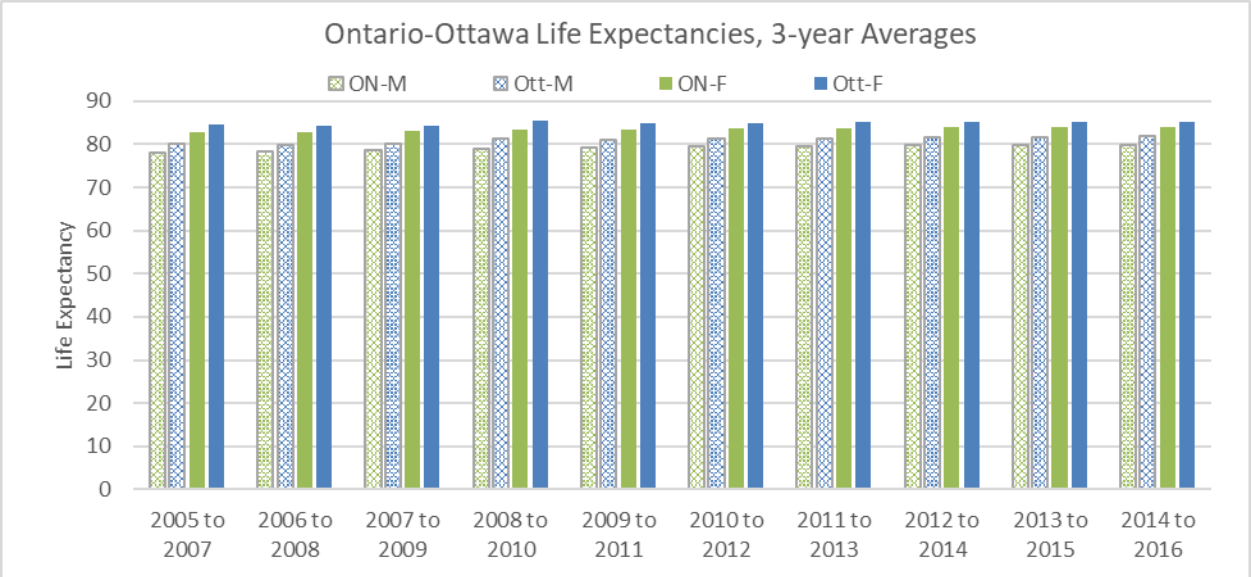


Deaths: Life Expectancy and Mortality Probabilities

Ottawa-specific life tables were developed to estimate future deaths. Life tables determine annual probabilities for survival for each age and gender over the projection period. Mortality probabilities by age and gender were derived from the Statistics Canada death projections for Ontario.

The associated life expectancies at birth were determined based on the historical relationship in the past 10 years of life expectancies between Ontario and Ottawa. Ottawa residents typically exhibit a longer life expectancy than the provincial average as shown in the three-year averages in Figure 4.

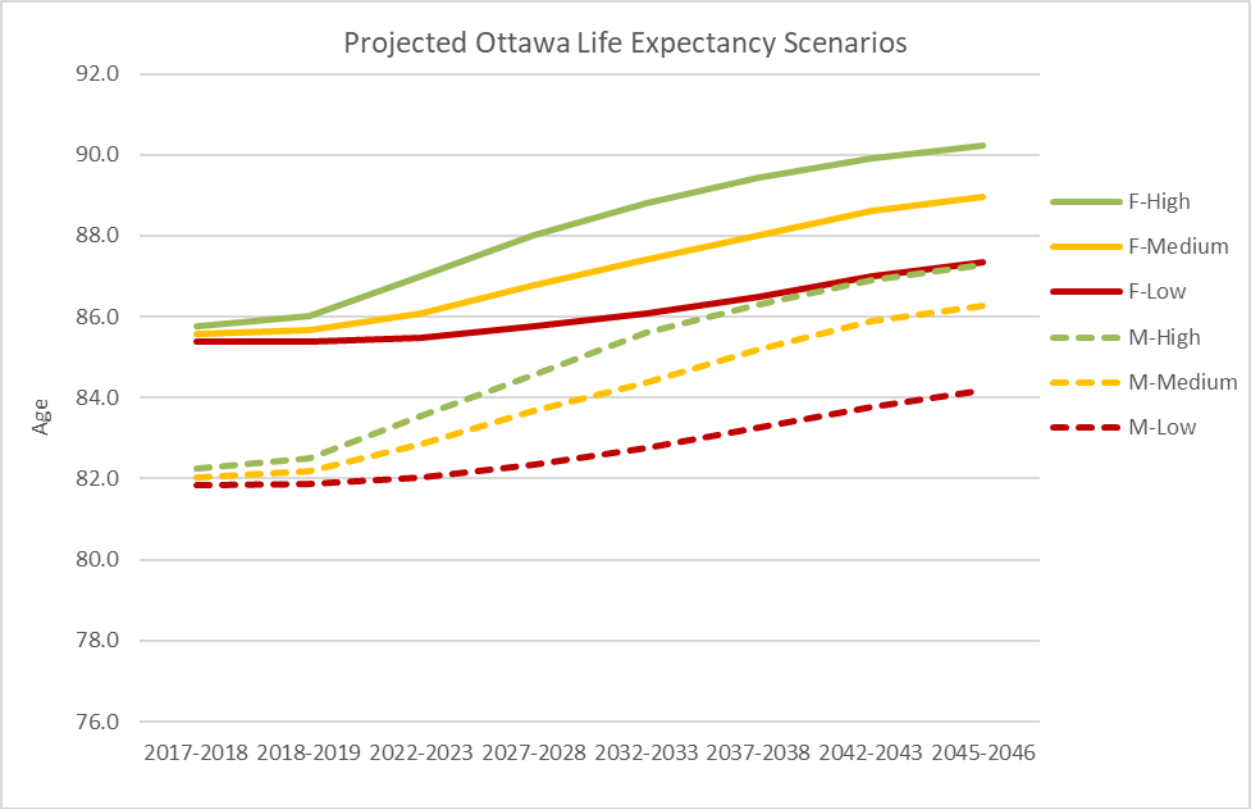
Figure 4: Ontario-Ottawa Life Expectancies



F = Female; M = Male

This historical relationship is applied to the Statistics Canada life expectancy projections for Ontario in their low, medium and high scenarios to develop projected Ottawa life expectancy scenarios by gender as shown in Figure 5.

Figure 5: Projected Ottawa Life Expectancy Scenarios



F = Female; M = Male

Net International Migration

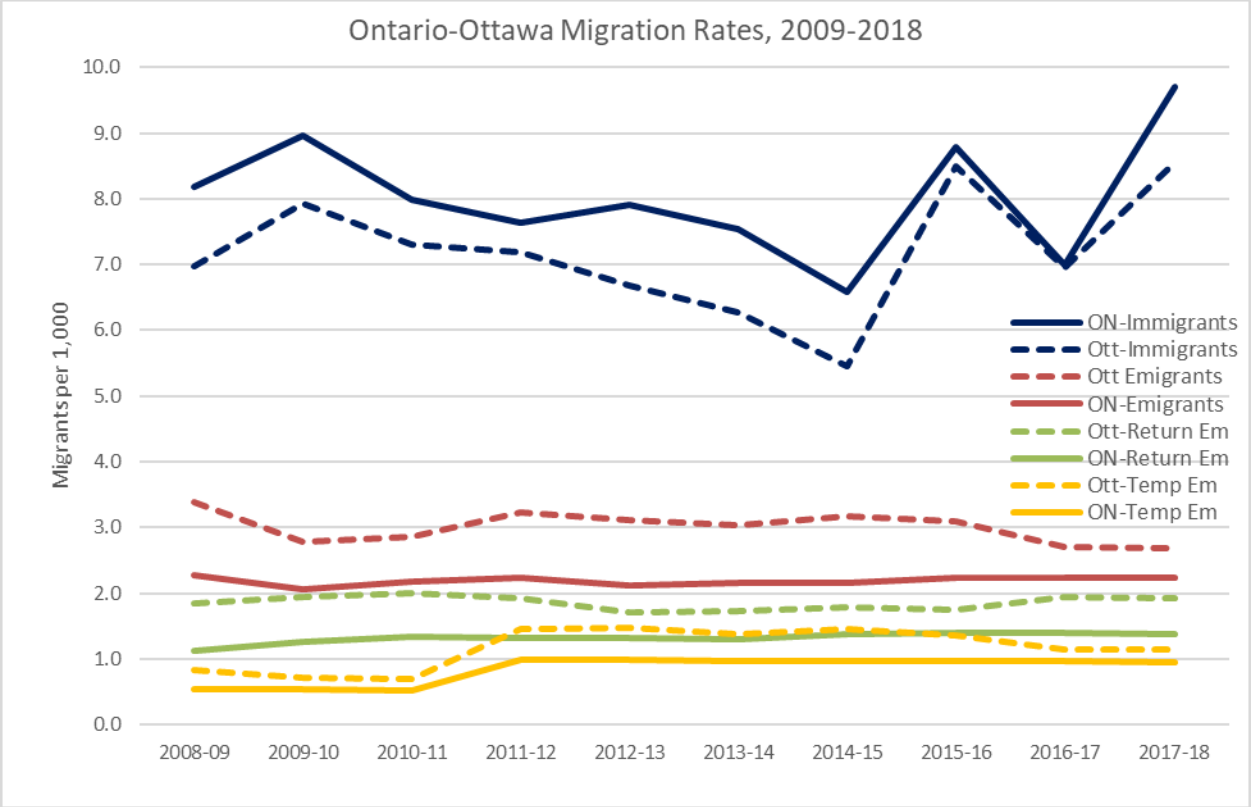
Migration is, and has been for many decades, the most important factor affecting changes in Ottawa's population. Net migration, the number of people moving to Ottawa minus the number moving out, is the result of many processes. For the purposes of the projections, these are categorized into three primary migration streams; international, interprovincial, and intraprovincial migration.

International migration is the movement of people between Ottawa and all countries outside of Canada. International migration is further subdivided into permanent resident immigrants (those that move to Ottawa), emigrants (those that leave Ottawa on a permanent basis), returning emigrants (those that move back to Ottawa from another country), temporary emigrants (those that leave Ottawa on a temporarily for another country), and net non-permanent residents (the difference between those that move to Ottawa on a temporary basis and those that leave Ottawa after a temporary stay or able to change their status to a permanent residency). Non-permanent residents (NPRs), are persons who have work, student or temporary resident permits, or persons claiming refugee status.

With the exception of the net non-permanent residents, the migration streams can be measured as a rate of migrants per 1,000 persons. Net NPRs are measured in absolute number of persons.

Immigration rates were in decline for both Ontario and Ottawa since 2009/2010 but have picked up starting in 2014/2015. In contrast, emigration rates have been relatively steady in both Ontario and Ottawa over the past 10-years as shown in Figure 6.

Figure 6: Historical Ontario-Ottawa Migration Rates

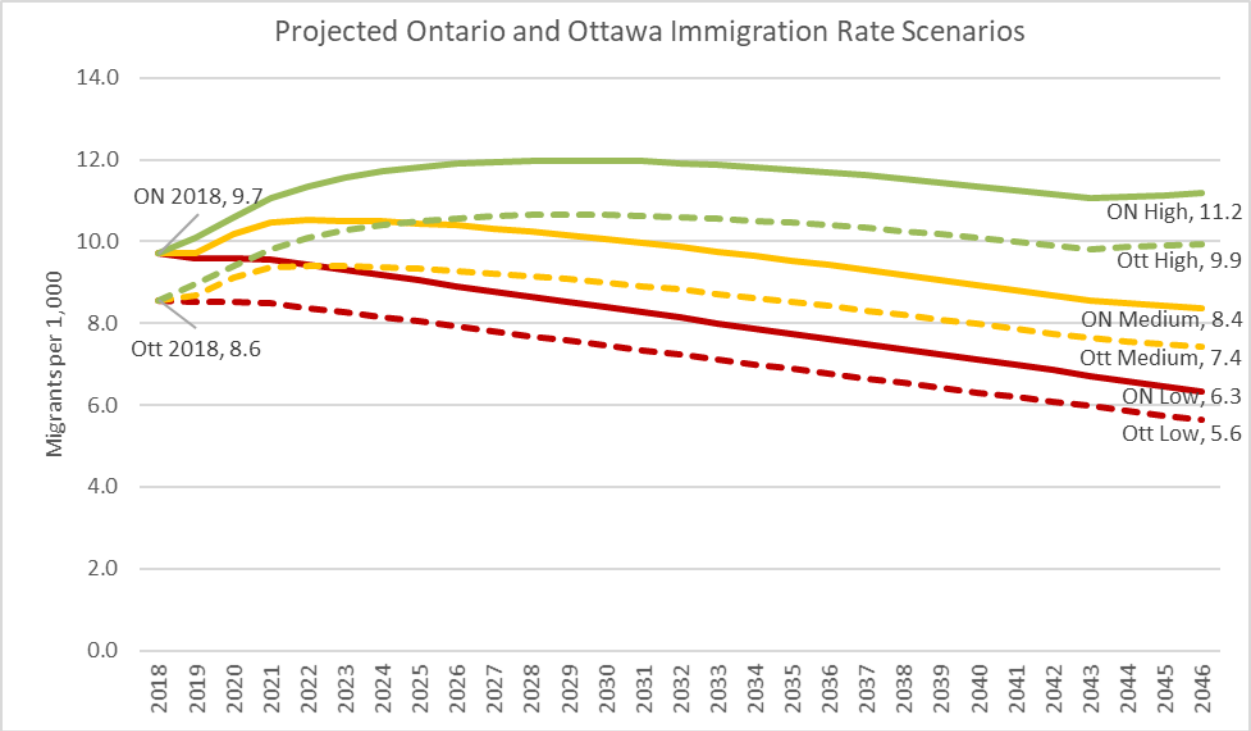


The Statistics Canada projections for Ontario are used as benchmarks to project population changes in each of five sub-categories of international migration. All Ontario immigration scenarios assume a peak rate during the projection period and then decline and differ not only in the level of immigration but also when the peak is reached. The 2018 Ontario immigration rate of 9.7 per 1,000 declines to 8.4 by 2046 in the low scenario, increases to 10.5 in 2022 then declining to 8.4 by 2046 in the medium scenario, and increases to 12.0 by 2029 then declining to 11.1 by 2046 in the high scenario. These scenarios are a result of the short-term assumptions based on federal immigration targets established to 2021 and the results of the Statistics Canada survey of experts on future demographic trends regarding their views on the future evolution of immigration in Canada for the long term.

Each of the emigration components however are assumed to have a constant rate throughout the projection period, with the medium scenario being similar to the current 10-year historical rates, the low scenario about 75% of the medium scenario and the high scenario about 33% higher than the medium scenario.

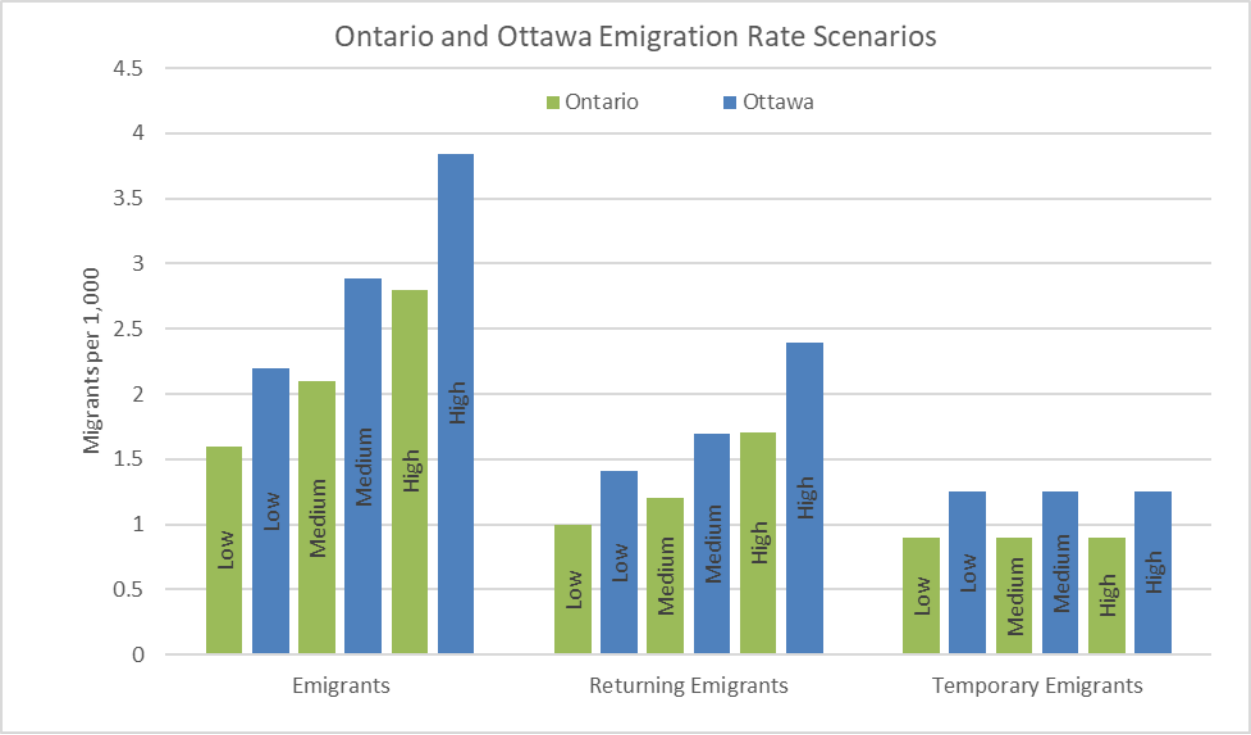
The historical relationship between Ontario and Ottawa in the past 10-years are applied to each of the projected Ontario immigration and emigration components for each of the low, medium and high growth scenarios to derive the projected Ottawa immigration and migration components. The projected immigration rates for by 2046 Ontario and Ottawa are shown in Figure 7.

Figure 7: Projected Ontario and Ottawa Immigration Rate Scenarios



The projected Ottawa emigration components are held constant throughout the projection period as per the Statistics Canada projections for Ontario. The constant ratios between Ontario and Ottawa for these components by scenario are shown in Figure 8.

Figure 8: Ontario and Ottawa Emigration Rate Scenarios



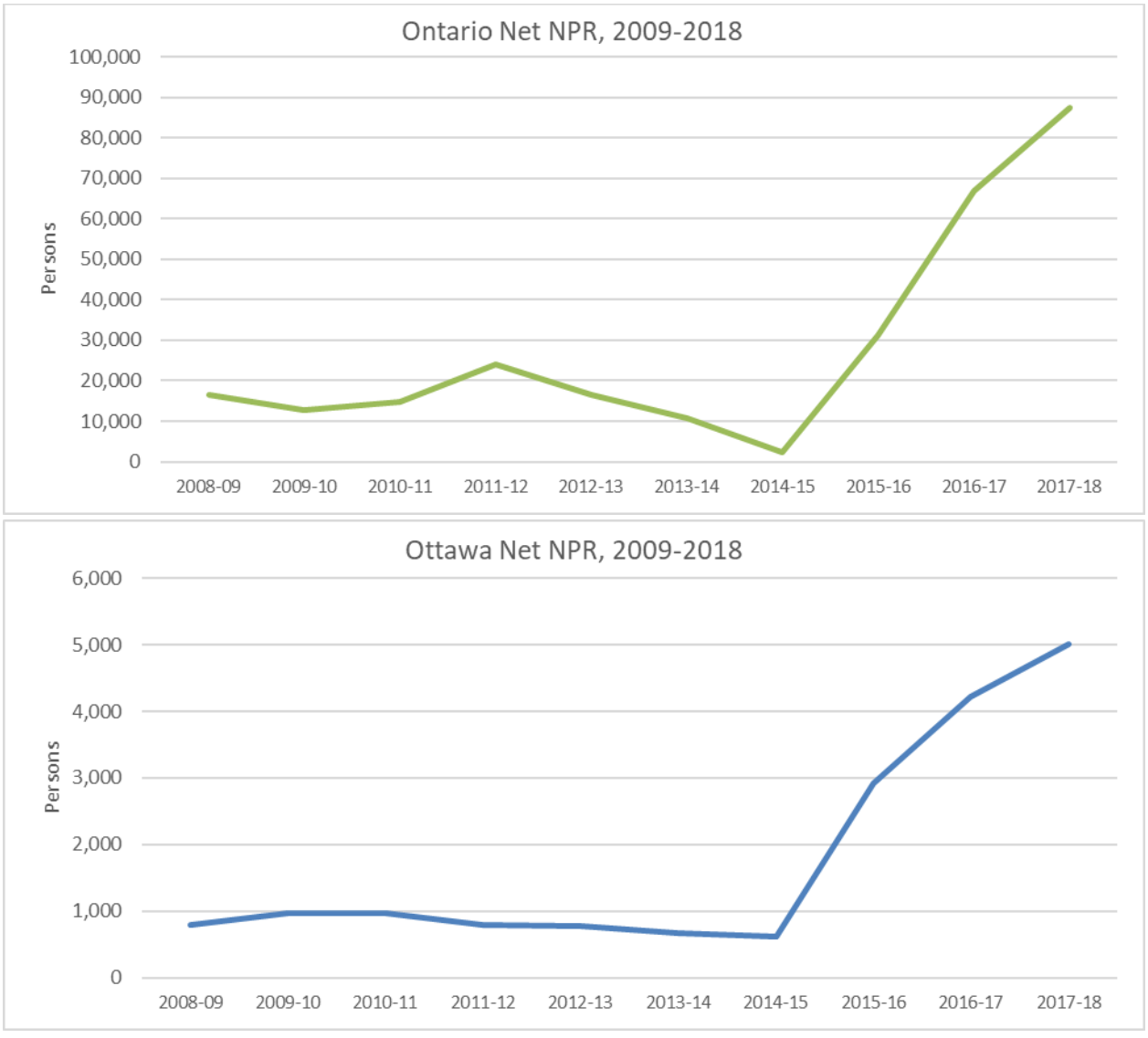
The difference between the projected immigrants, emigrants, returning emigrants, and temporary emigrants provides the net international migration projections.

Net Non-Permanent Residents

Non-Permanent residents are persons who have been legally granted the right to live in Canada on a termporary basis through a student permit, work permit, visitor permit or refugee claimants. This group is not subject to the same risks and probabilities of dying or emigrating during the projection period and is not affected by immigration since immigrants are permanent residents. Since children born in Canada are automatically Canadian citizens regardless of the parents' status as permanent residents or visitors, the fertility of female non-permanent residents only affects the projected population of permanent residents. Hence, the non-permanent population depends only on absolute counts rather than rates.

Over the past 10-years the number of net non-permanent residents in Ontario and Ottawa have followed a similar pattern, holding relatively steady with a sharp increase from 2015 to 2018 as shown in Figure 9. The sharp increase in recent years is mostly the result of an increase in foreign students and to a lesser extent refugee claimants.

Figure 9: Ontario and Ottawa Net Non-Permanent Residents (NPR), 2009 to 2018

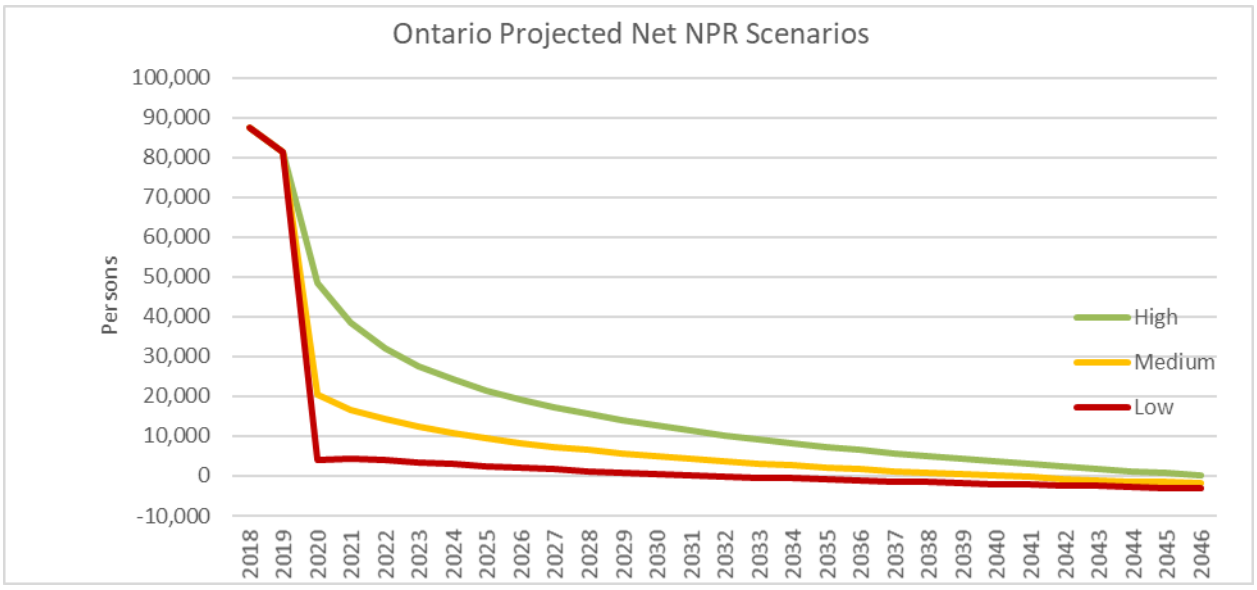


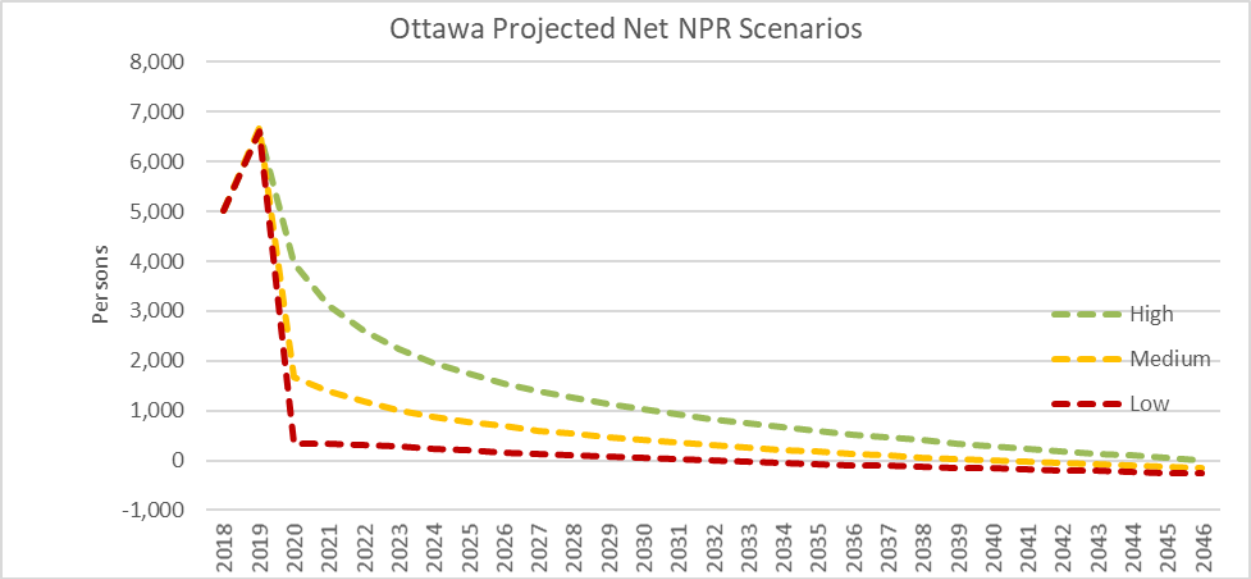
Unlike other components of migration, the Statistics Canada projections of NPRs are based on the number of non-permanent residents in Canada each year. The net change in NPRs is then derived by comparing one year with the previous year.

Similar to the immigration projections, the Statistics Canada projections of NPRs combine a short-term outlook influenced by recent historical data and a long-term outlook based on the results from the survey of experts on future demographic trends. The total number of NPRs in Canada generally increases gradually to a future year such as 2043 then are constant afterwards. For projections purposes a number for net change is required, being the annual inflow minus outflow of temporary residents. Because this category is only temporary, a person entering the country as a NPR has to eventually leave the country or move to another category with a permanent residency status, which is also considered as an outflow. When the number of NPRs in Canada decreases on an annual basis this means the outflow was higher than the inflow and the net change in the number of NPRs is negative.

The historical relationship over the past 10-years for net non-permanent residents between Ontario and Ottawa has been applied to the Statistics Canada net non-permanent resident projections for Ontario. The projections assume a sharp decline in the short-term for all scenarios and gradually decreasing over the projection period as shown in Figure 10. As indicated earlier, in recent years there was a sharp increase in the inflow of NPRs to Ottawa coupled with a relatively low outflow of NPRs from Ottawa, resulting in a net change that was historically high. The assumption for the future is that the inflows and outflows will be more in balance resulting in a low net change and even a negative change in the long term.

Figure 10: Ontario and Ottawa Projected Net Non-Permanent Residents (NPR) Scenarios



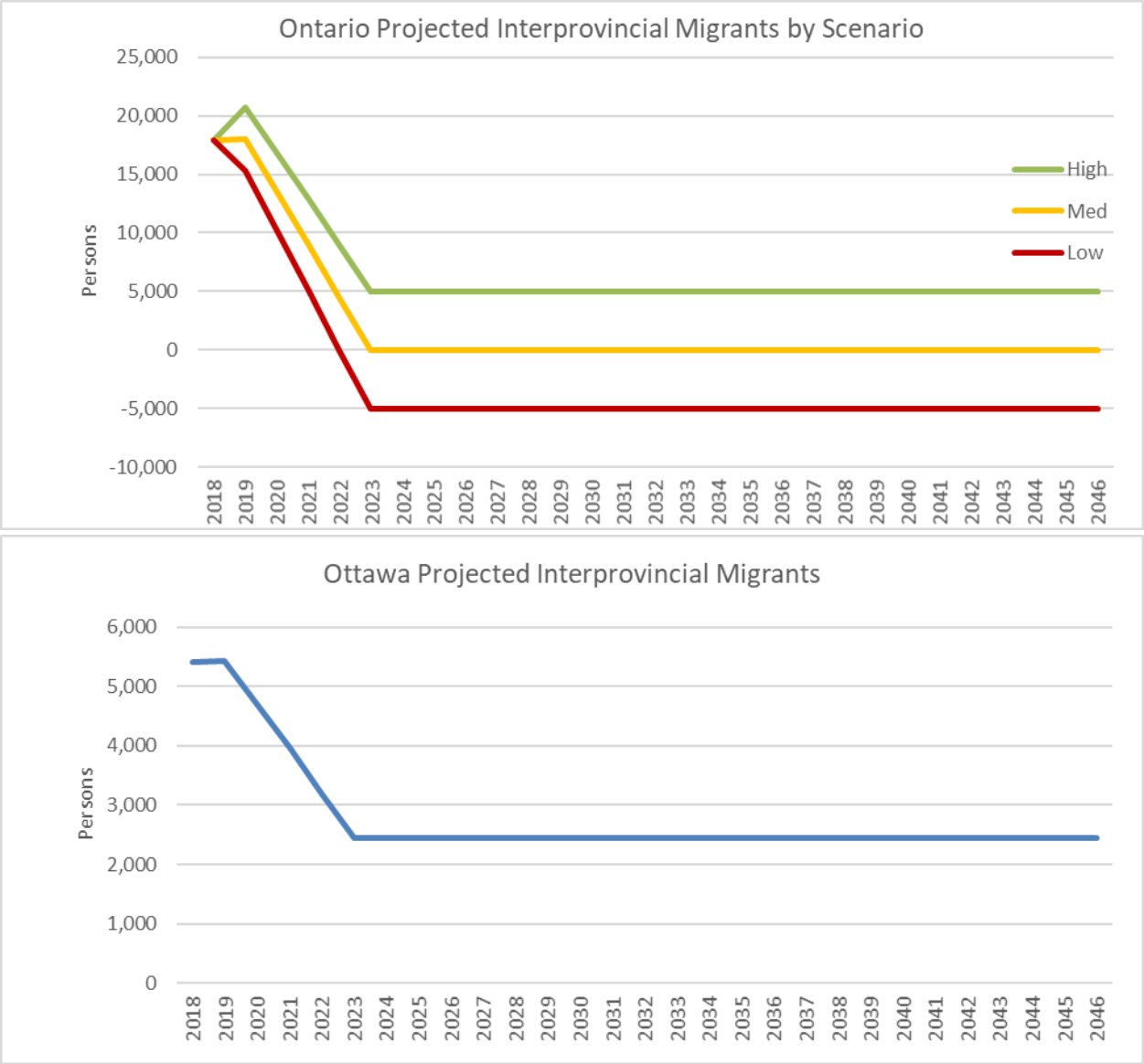


Net Domestic Migration

Interprovincial migration is movement between provinces outside of Ontario to Ottawa. Net interprovincial migration is the difference between those that move out of Ottawa to non-Ontario provinces and those that move to Ottawa from non-Ontario provinces. Although Statistics Canada provides net interprovincial migration they treat Ontario as the source and destination for migration flows. This is a subtle but significant distinction for Ottawa as flows to Ontario but outside of Ottawa should not count as flows to Ottawa.

The Ontario Ministry of Finance has recently developed new projections to the year 2046 for Ontario and its 49 counties or census divisions, including the city of Ottawa. For interprovincial migration, the projection assumes a sharp decrease in the short-term and then holds constant over the long-term for all scenarios and only differ on the amount of decrease and the level that is held constant. Each census division's share of Ontario inflow and outflow of interprovincial migrants over the last five years is applied to projected flows at the provincial level and then held constant throughout the projection period. However, Low and High scenarios were not were not conducted for census divisions. Figure 11 shows the projected three net interprovincial migration scenarios for Ontario and the single scenario for Ottawa.

Figure 11: Ontario and Ottawa Projected Net Interprovincial Migration

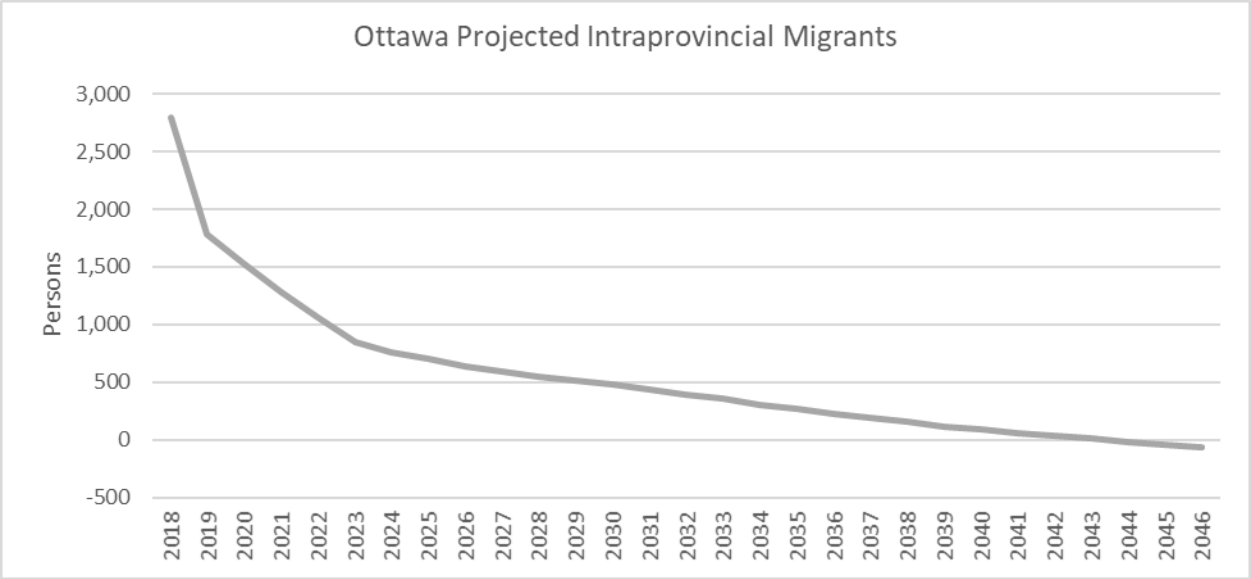


The Ontario Ministry of Finance projections assume that overall net interprovincial migration for Ottawa will decline in the short-term and then assumed to maintain it's share of positive net interprovincial migration of about 2,500 persons annually.

Intraprovincial migration is movement within Ontario to Ottawa. Net intraprovincial migration is the difference between those that move out of Ottawa to other areas within Ontario and those that move to Ottawa from other areas within Ontario. Statistics Canada projections do not include movement within provinces hence no estimates for intraprovincial migration within Ontario are available.

The Ontario Ministry of Finance models intraprovincial migration using origin-destination migration rates by age for each census division over the past five years. This approach takes into account annual changes in age structures within census divisions as migration rates and origin-destinations differ by age group. The assumptions are the same throughout all the scenarios. As with interprovincial migration for census divisions, Low and High scenarios were not conducted for intraprovincial migration. Figure 12 shows the projected net intraprovincial migration for the city of Ottawa.

Figure 12: Ottawa Projected Intraprovincial Migration



The Ontario Ministry of Finance projections assume that net intraprovincial migration for Ottawa will decline rapidly in the short-term and then gradually decline to slightly negative, meaning more people will be moving-out than moving-in over the long-term.

Summary of Ottawa Population Projection Component Assumptions by Scenario

The population projections for the city of Ottawa from 2018 to 2046 are benchmarked to the Statistics Canada population projections for Ontario for the births, deaths and international migration components and the Ontario Ministry of Finance for the domestic migration components. This approach results in three scenarios representing low, medium and high growth. A summary of the assumptions for the growth components by scenario are shown in Figure 13.

Figure 13: Summary of Ottawa Population Projection Component Assumptions by Scenario

Component	Scenario 1 Low	Scenario 2 Medium	Scenario 3 High
Natural Increase			
Total Fertility Rate (TFR)	1.38 to 1.29	1.38 to 1.42	1.38 to 1.65
Male Life Expectancy	82 to 84.2 years	82 to 86.3 years	82 to 87.3 years
Female Life Expectancy	85.6 to 87.4 years	85.6 to 89 years	85.6 to 90.2 years
Rates/1,000 population			
International immigrants	8.6 to 5.6	8.6 to 10.5 to 7.4	8.6 to 12.0 to 9.9
Emigrants	2.6 to 3.8	2.6 to 2.9	2.6 to 2.2
Returning emigrants	1.9 to 2.4	1.9 to 1.7	1.9 to 1.4
Net temporary emigration	1.1 to 1.2	1.1 to 1.2	1.1 to 1.2
Annual numbers			
Net non-permanent residents	5,006 to -256	5,006 to -159	5,006 to 10
Net interprovincial migration	5,417 to 2,438	5,417 to 2,438	5,417 to 2,438
Net intraprovincial migration	2,791 to -62	2,791 to -62	2,791 to -62

Projection Results

Results for the three scenarios are summarized in Figure 14 with further details provided in Appendix 1. Relative to the current Official Plan projection to 2031, the medium projection is higher by 65,700 persons or 5.7 percent.

Figure 14: Population Projections by Scenario

				Growth				
Scenario	**2018**	**2031**	**2046**	**Annual**	**2018-31**		**2018-46**	
Low	1,007,501	1,172,813	1,271,848	9,441	165,312	16.4%	264,347	26.2%
Medium	1,007,501	1,219,232	1,409,649	14,362	211,731	21.0%	402,148	39.9%
High	1,007,501	1,276,126	1,586,515	20,679	268,625	26.7%	579,014	57.5%

Compared to Ottawa's historical population growth, the medium scenario is within 4% of the annual population growth in the past 10-years, which saw more growth in the second half (2013-2018) than the first half (2008-2013) as shown in Figure 15. Compared to the 2013-2018 period, on an annual basis the medium scenario is 8% lower. However, population growth over the past 10-years has been on an upward trend, whereas the growth projections in all scenarios do not necessarily sustain annual increases over the projection period.

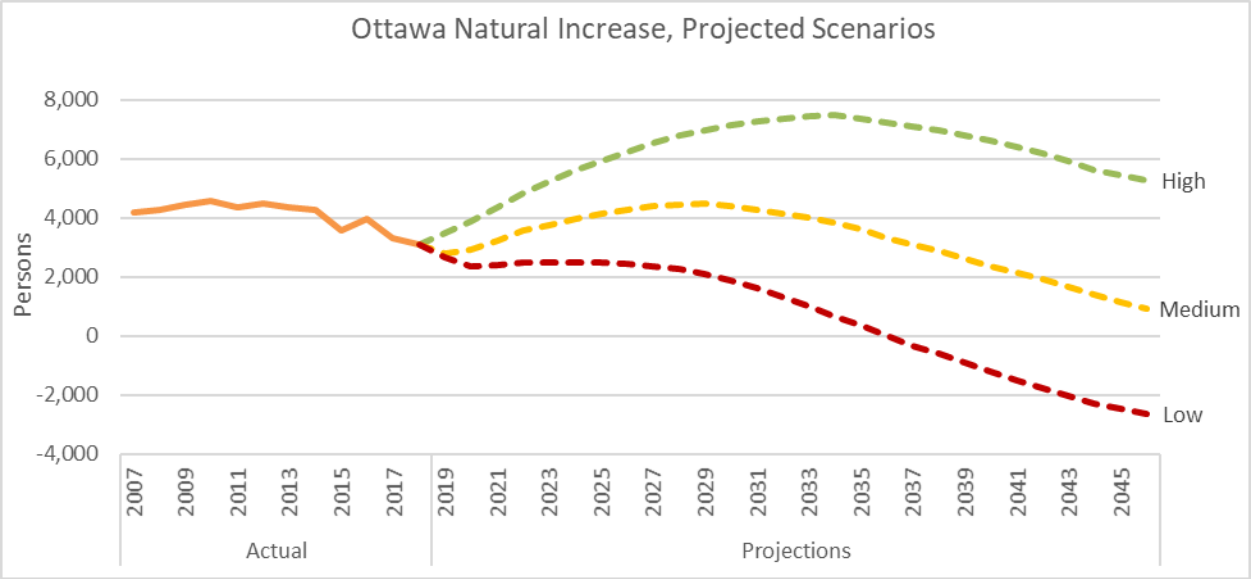
Figure 15: 10-year Historical Ottawa Annual Population Growth and by Period

				Annual, first 5-yr period	**Annual, second 5-yr period**	**Annual, 10-yr period**
Post-censal estimates	2008	2013	2018	2008-13	2013-18	2008-18
	869,038	930,748	1,007,501	12,342	15,531	13,846

Annual Population Growth by Scenario

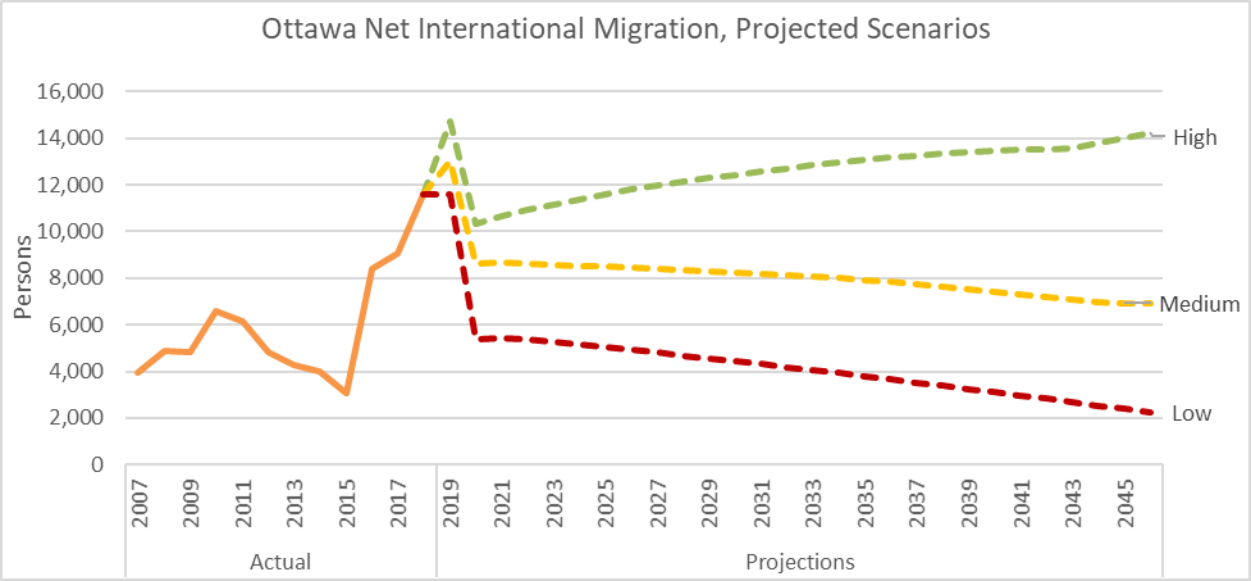
As shown in Figure 1 earlier, population growth is the sum of components that contribute to population gain less those that are subject to population loss. The addition of births and the subtraction of deaths is referred to as natural increase. The addition of those moving to Ottawa and subtraction of those moving out of Ottawa are referred to as net migration and the migration components can be categorized between net international migration and net domestic migration. Reviewing how growth will occur throughout the projection period by natural increase (Figure 16), net international migration (Figure 17) and net domestic migration (Figure 18) provides context on whether population growth is expected to continue growing annually or eventually decline.

Figure 16: Ottawa Natural Increase by Projected Scenarios



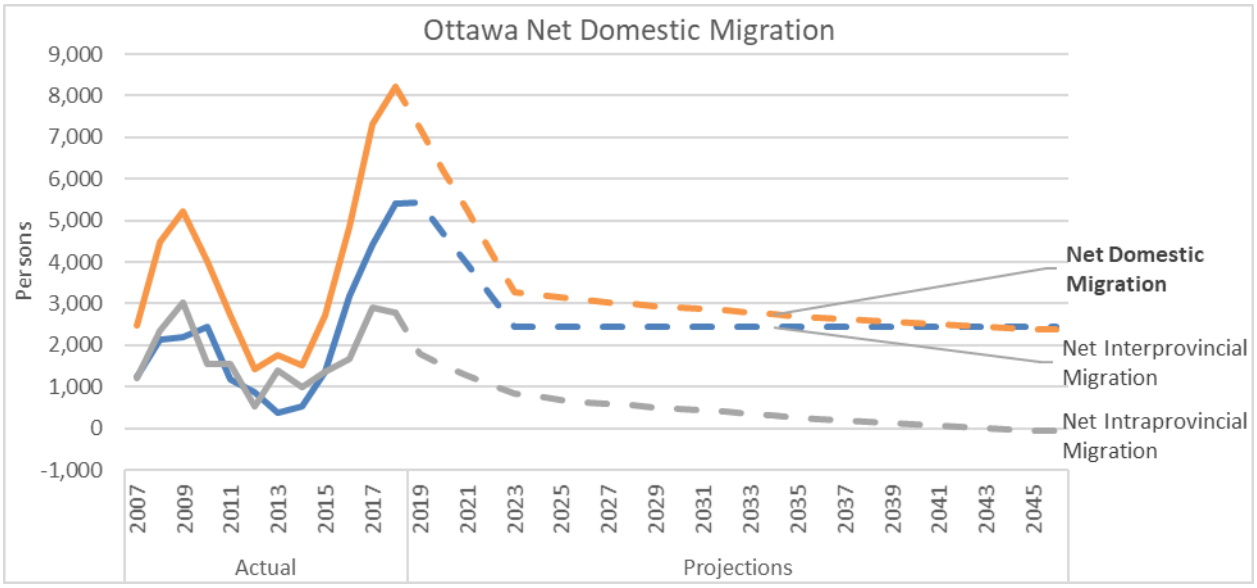
All scenarios regarding natural increase show an eventual decline due to an increase in the number of deaths related to the aging population, with a relatively small difference in absolute persons between the medium and high scenarios. Regardless of the scenario, natural increase is expected to make up a smaller component of population growth in the long-term.

Figure 17: Ottawa Net International Migration by Projected Scenarios



The projected net international migration scenarios show a decline in the short-term, mainly influenced by the drop for net non-permanent residents shown in Figure 10 earlier, after which the rates for immigration and returning emigrants offset declines in the out-migration streams. However only the high scenario projects a continued net increase with the other scenarios projecting net growth declining slightly.

Figure 18: Ottawa Net Domestic Migration



Net domestic migration is benchmarked to net interprovincial and intraprovincial projections for the city of Ottawa from the Ontario Ministry of Finance. However, low and high scenarios were not developed for these migration streams at the municipal level. Domestic net migration is projected to decline sharply over the short-term and then gradually decline over the long-term.

Most of the growth components in the scenarios project that population growth will eventually decline on an annual basis mainly due to declines in natural increase and declines in the relatively high levels of recent actual net international, in particular NPRs, and domestic migration. The annual growth by component for scenario are provided in Appendix 2.

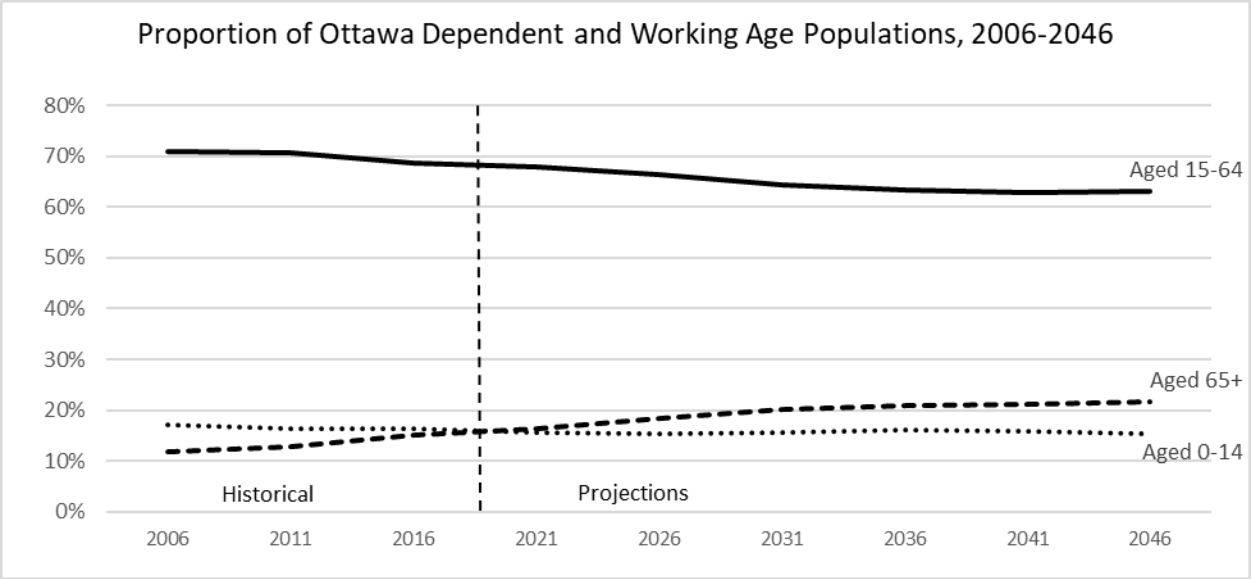
The federal immigration target levels have been set to increase annually to 2021 and there is no indication of a reversal or decline of annual target levels[4] post-2021. When compared with recent historical post-censal population estimates, their annual growth and components of growth, the medium growth scenario would be the most likely scenario for population growth from 2018 to 2046.

Dependency Ratio

The Dependency Ratio measures the ratio between the “dependent” population, being the combined population aged 14 and under and over 65 to the population aged 15 to 64, traditionally the “working age” population. Under the medium scenario, the ratio for Ottawa is projected to increase from 46.2 in 2018 to 58.6 in 2046. Over 70 percent of the increase is due to growth in the older population. The medium scenario has the working-age population continuing to increase to 2046, with their proportion of the total growth being about the same as the dependent population (49.6% and 50.4% respectively over 2018-46); however, the proportion of the working age population will gradually decrease while the dependent population will gradually increase as shown in Figure 19.

[4] Federal immigration targets are numbers of persons rather than a rate per 1,000 population used in the population projections.

Figure 19: Proportion of Ottawa Dependent and Working Age Populations



Conclusion

By 2046, the medium scenario projects a population of 1,409,649 for the city of Ottawa. This scenario should be selected as the reference scenario for the Official Plan growth projections because it incorporates the most reasonable set of assumptions when considering all the information available and on an annual basis tracks relatively close to population growth over the past 10-years. By 2046, Ottawa's population will be older with more than 1 in 5 persons being aged 65 or older (compared to roughly 1 in 6 in 2018). This age group will double in size and those 80 or older will almost triple in size.

Part II. Households and Housing Projections

Housing is the single largest consumer of urban land and consequently a vital component in planning for future land requirements. The projected population forms the basis for the projected number of new households and the number of new housing types they will live in.

Methodology

The methodology to determine future housing demand is determined as follows:

1. Households are determined by applying a headship rate, the portion of the population in each five-year age group that represents a single household, to the projected population by age group.
2. Housing units by dwelling type are projected by applying the "propensity" for each household age group to choose a single-detached, semi-detached, row house or apartment. Rates for both household headship and housing propensities are based on historical census data.
3. A factor is added to allow for a vacancy rate in rental and ownership units and to replace demolished units of the same type.

Private Households

Residents of collective establishments, which include hospitals, certain retirement homes[5], shelters, prisons, etc, are separate from the "population in private households" (PIPH). The PIPH with age distribution from the 2016 Census is available from Statistics Canada. However, the 2016 Census does not include persons missed on Census day, also known as the undercount. Statistics Canada provides post-censal estimates to determine how many individuals were missed and adjusts the Census population accordingly. For this reason, post-censal estimates are preferred over the Census results when feasible. Further details on the PIPH and the post-censal estimates used as the starting point for the household projections are provided in Appendix 3.

Number of Households

The number of households is determined by applying a headship rate to the projected population by age groups. The headship rate is the percentage of the population that is classified as the "primary household maintainer" in a Census by Statistics Canada, being the person that pays the rent, mortgage, taxes and other related property bills for the dwelling. The headship rate for an age group is the percentage of the population within that age group that is classified as the primary household maintainer. The headship rates for 2016 are held constant throughout the projection period as previous testing of projected headship rates yields relatively little change to the overall results. An adjustment is made to estimate the private households missed in the undercount by applying the PIPH to the post-censal population estimates and the headship rate. Further details on the 2016 headship rates and the adjusted estimate for total private households are provided in Appendix 4.

Applying the 2016 headship rates to the projected population in private households by age determines the number of private households per age group. Private households were estimated to be 404,400 in 2018 and projected to be 590,600 in 2046, being a growth of almost 186,200 or 46% private households over the projection period.

Households by Dwelling Type

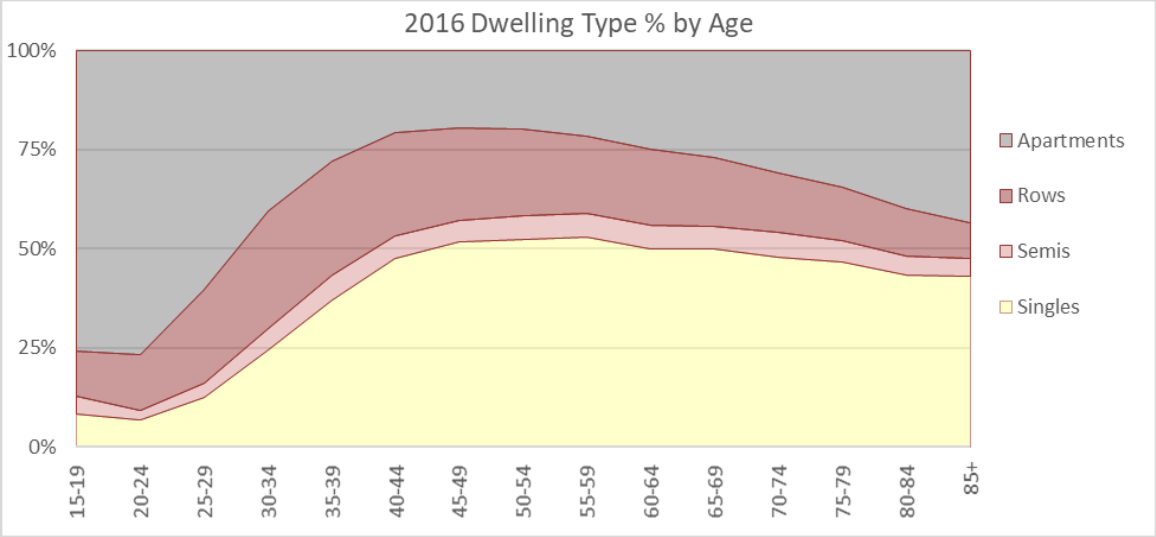
The growth of approximately 186,200 private households need to be divided between dwelling types in order to adequately plan how much land is required for accommodation as different dwelling types develop at different densities and require different amounts of land. The propensity of the population in private households to occupy a dwelling type derives the division into dwelling types. The Census provides the percentage of household maintainers occupying one of four general dwelling types for the

[5] Some retirement homes are classified as collective dwellings, while others are counted as private dwellings. The differentiating criterion is based on the level of care provided on a unit basis within each building.

projections model: single-detached, semi-detached, rowhouse, and apartment. Further details on the dwelling type definitions are provided in Appendix 5.

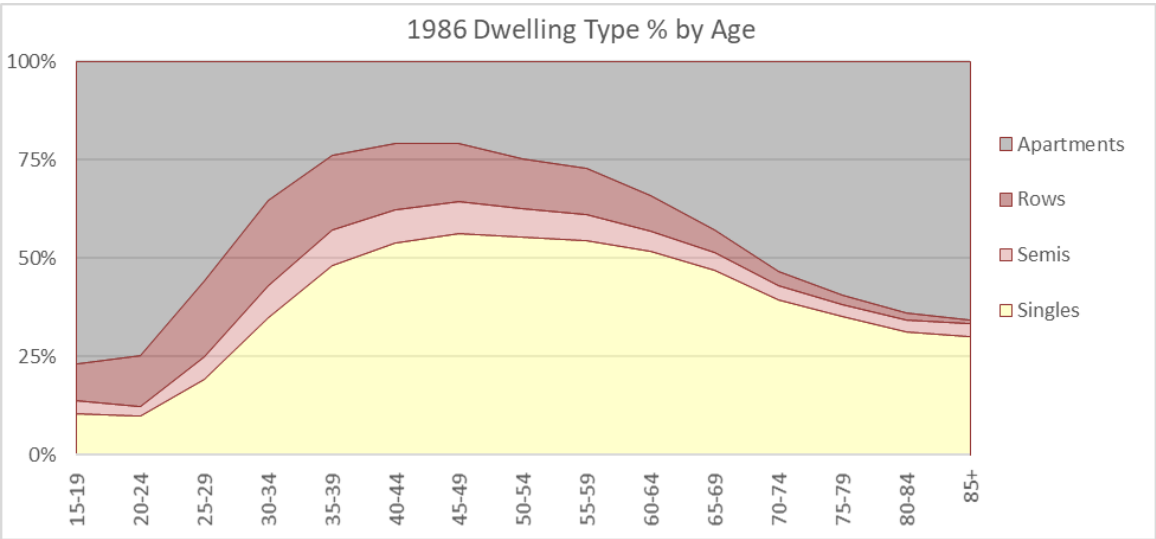
For example, Figure 19a shows the percentage of dwelling types that were occupied by the age of the household maintainer from the 2016 Census, where younger households occupied apartments, then as they became older, they tended to occupy rowhouses and single-detached. But then after their mid-fifties their share of apartment occupancies increased.

Figure 19a: Percentage of Dwelling Types by Age of Household Maintainer, Ottawa 2016



Data on housing propensities were available for each census beginning in 1986. The same information for 1986 shows a difference in dwelling type occupancy by age. While younger households still occupied mostly apartments, their preferences for rowhouses and single-detached increased faster and were higher to their mid-fifties in 1986 than in 2016. But after their mid-fifties the decline in single-detached was steeper, with a smaller share of rowhouses and a larger share of apartments compared to 2016.

Figure 19b: Percentage of Dwelling Types by Age of Household Maintainer, Ottawa 1986



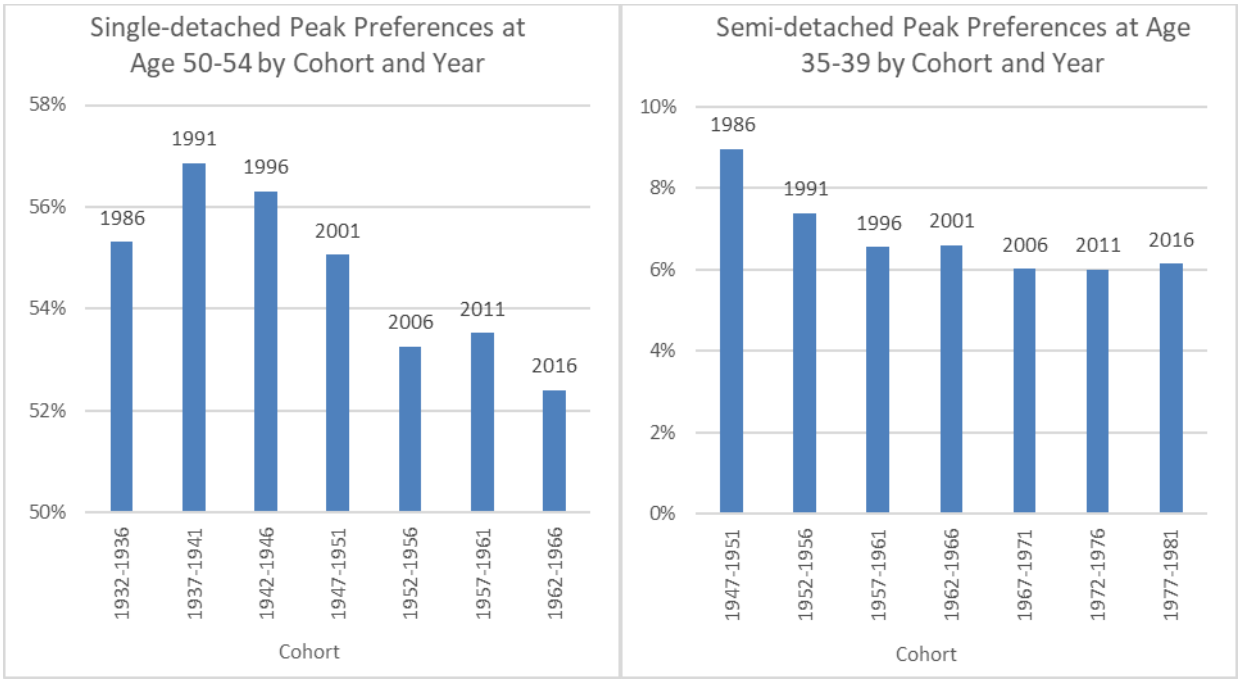
Looking to the Past: Emerging Patterns in Dwelling Type Propensities

The examination of dwelling type propensities by age of household maintainer begins by reviewing each Census from 1986 to 2016, a period of 30 years, for the city of Ottawa[6]. A form of longitudinal analysis was used where the occupancies for each cohort was observed as they aged every 5 years throughout this 30-year period. A cohort in this analysis is a group of people born within a period of five years. For example, those born between 1947 to 1951 were aged 35 to 39 years in 1986. In 1991 they were aged 40 to 44 years and so on to 2016 when they were aged 65 to 69 years. The occupancy shares of the four general dwelling types were observed in this manner from the oldest cohorts being born between 1912 to 1916 to the youngest cohorts born between 1997 to 2001, totalling 18 cohorts across age groups as young as 15 to 19 years to over 85 years.

Between 1986 to 2016 three patterns become evident in the preference and occupancy of dwelling types. First, single-detached, semi-detached and rowhouse appear to have a peak preference at certain ages. For single-detached, the highest preference across most cohorts was at age 50 to 54. The only exception is the cohort born between 1942 to 1946 where their peak preference for single-detached was at 45 to 49 years. For semi-detached, the highest preference for most cohorts was at age 35 to 39. For rowhouses the highest preference for most cohorts was either age 30 to 34 or 35 to 39. Apartments show the opposite with the lowest preference at age 50 to 54 across most cohorts.

Second, the peak propensity at these age groups for the single-detached and semi-detached dwelling types decrease for younger cohorts. As shown in Figure 20, the preference of the cohort born between 1932 to 1936 for single-detached was 55.3% at age 50 to 54 in 1986. Although the next cohort to reach age 50 to 54 in 1991 increases their single-detached preference to 56.9%, the remainder of the cohorts decrease their single-detached preference to 52.4% in 2016 by those born between 1962 to 1966. Semi-detached follows a similar pattern with those born between 1947 to 1951 having a semi-detached preference of 9.0% at age 35 to 39 in 1986. Future cohorts at the same age then decrease their semi-detached propensities, with those born between 1977 to 1981 having a preference of 6.1% in 2016.

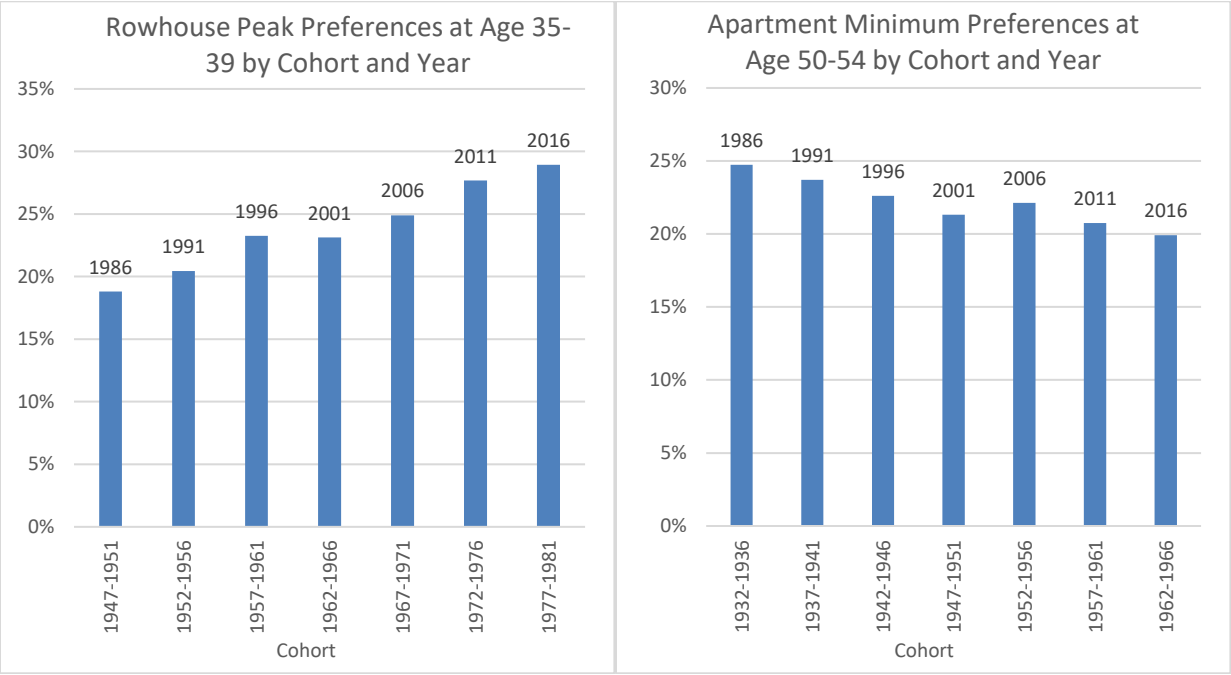
Figure 20: Declining Peak Preferences by Cohort for Single-Detached and Semi-Detached



[6] Statistics Canada defines the current city of Ottawa geographic area as the Ottawa Census Division or Subdivision. The Census Division was used to maintain the same geographic boundaries pre- and post-amalgamation in 2001.

Rowhouse peak preference occurs in the opposite direction with the propensities increasing for younger cohorts. As shown in Figure 21, in 1986, those born between 1947 to 1951 were 35 to 39 years old and had a rowhouse preference of 18.8%. In 2016, those born between 1977 and 1981 were also 35 to 39 years old and had a rowhouse preference of 28.9%. The peak age group for rowhouse does seem to shift between the two age groups of 30 to 34 and 35 to 39. For the projections model, an assumption was made that future cohorts would peak in the older age group of 35 to 39 to coincide with the assumption that the delayed life stage milestones associated with this generation would continue due to the pursuit of post-secondary education, increased debt and rising housing costs[7, 8,9].

Figure 21: Increasing Rowhouse Peak Preferences and Declining Apartment Minimum Preferences



The minimum apartment preferences at age 50 to 54 decreased with younger cohorts as shown in Figure 21. In 1986 those born between 1932 to 1936 had an apartment minimum preference of 24.7% at age 50 to 54. In 2016, those born between 1962 to 1966 had an apartment minimum preference of 19.9% at age 50 to 54.

Figure 22 shows the changing percentage that each of the four dwelling types of single-detached, semi-detached, rowhouse, apartment by cohort as they age from 1986 to 2016. Generally, bars on the far left side of a cohort represent preferences in 1986 and bars on the far right side of a cohort represent preferences in 2016, showing a cohort's dwelling type preference as they age, with older ages represented by darker shading. The 35 to 39 and 50 to 54 age groups shown in Figures 20 and 21 are highlighted in Figure 22, showing the peak (for single- and semi-detached and rowhouse) and minimum (for apartment) dwelling propensities relative to the other age groups.

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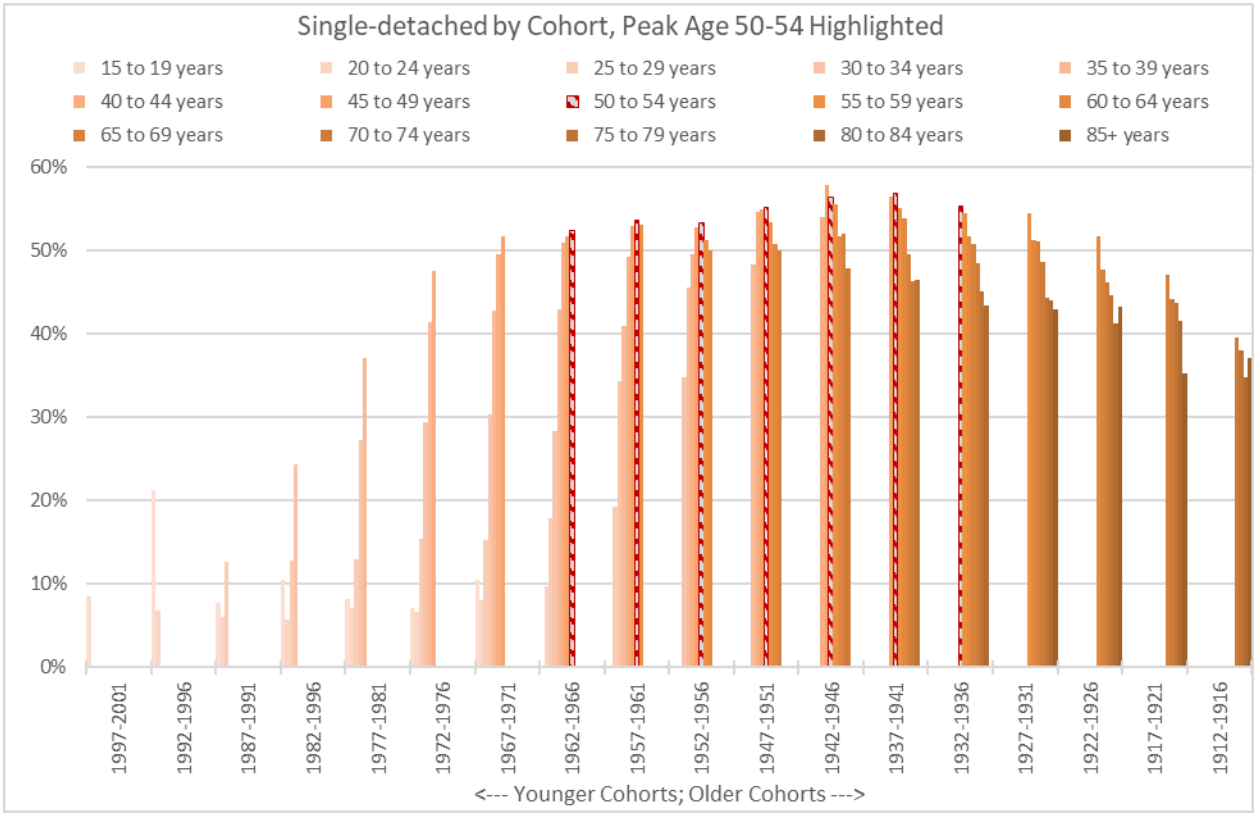
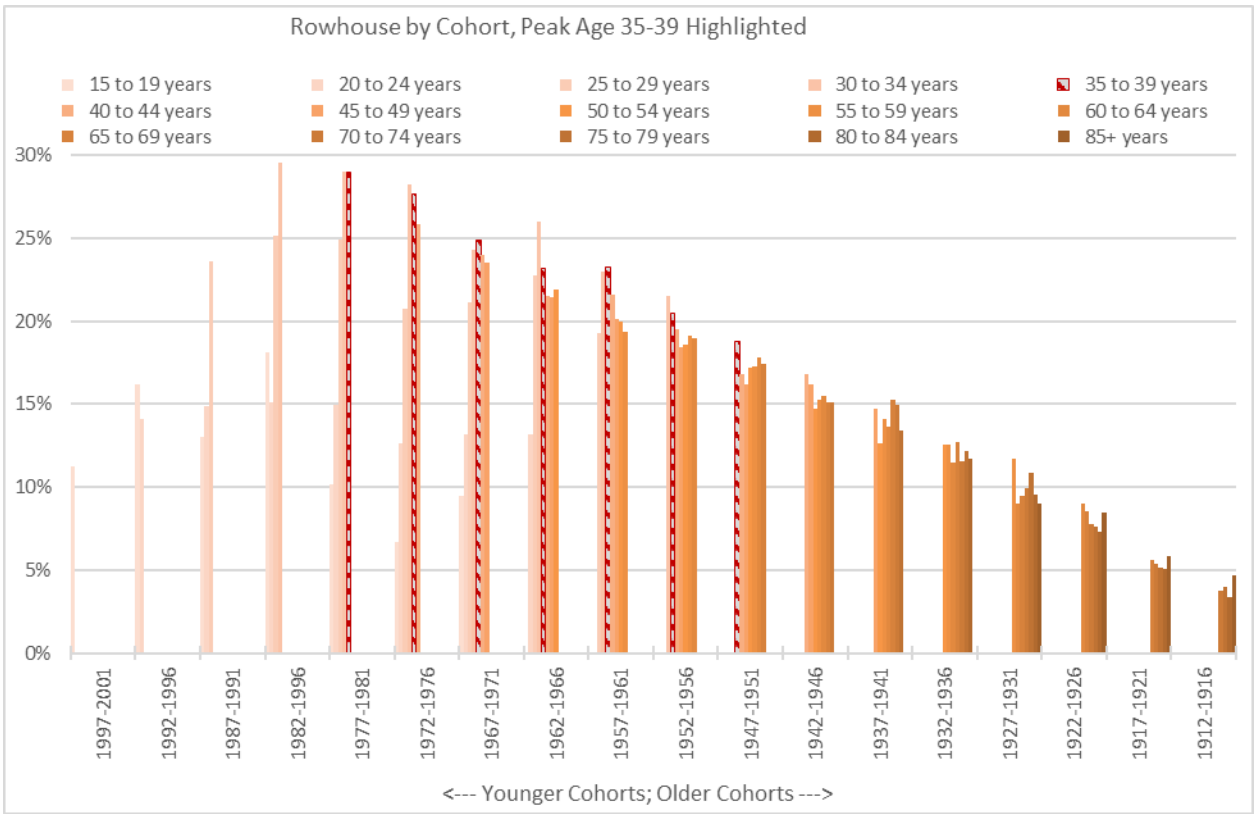
[7] Statistics Canada, 2019. *Economic Well-being Across Generations of Young Canadians: Are Millennials Better or Worse Off?* Publication 11-626-X No.092. https://www150.statcan.gc.ca/n1/pub/11-626-x/11-626-x2019006-eng.htm

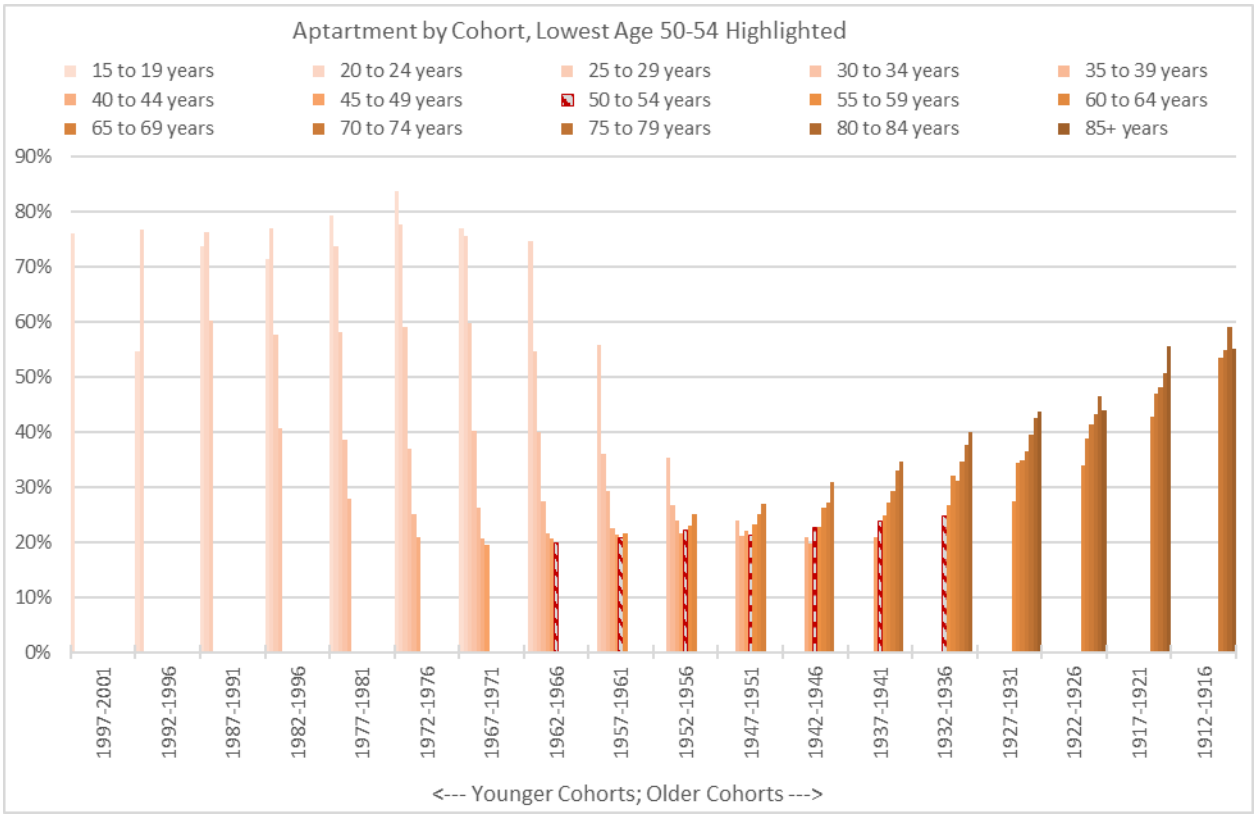
[8] US Census Bureau, 2017. *The Changing Economics and Demographics of Young Adulthood: 1975-2016*. Publication P20-579.

[9] Abacus Data, 2015. *Life, Work, and the Emerging Workforce: A study of the perceptions and attitudes of Canada's emerging Millennial generation.* https://abacusdata.ca/wp-content/uploads/2015/04/Abacus_CCCE_Report_FINAL.pdf

Figure 22: 1986-2016 Dwelling Type Preferences by Cohort.




Rowhouse by Cohort, Peak Age 35-39 Highlighted
15 to 19 years
20 to 24 years
25 to 29 years
30 to 34 years
35 to 39 years
40 to 44 years
45 to 49 years
50 to 54 years
55 to 59 years
60 to 64 years
65 to 69 years
70 to 74 years
75 to 79 years
80 to 84 years
85+ years
30%
25%
20%
15%
10%
5%
0%
1997-2001
1992-1996
1987-1991
1982-1996
1977-1981
1972-1976
1967-1971
1962-1966
1957-1961
1952-1956
1947-1951
1942-1946
1937-1941
1932-1936
1927-1931
1922-1926
1917-1921
1912-1916
<--- Younger Cohorts; Older Cohorts --->


Aptartment by Cohort, Lowest Age 50-54 Highlighted
15 to 19 years
20 to 24 years
25 to 29 years
30 to 34 years
35 to 39 years
40 to 44 years
45 to 49 years
50 to 54 years
55 to 59 years
60 to 64 years
65 to 69 years
70 to 74 years
75 to 79 years
80 to 84 years
85+ years
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1997-2001
1992-1996
1987-1991
1982-1996
1977-1981
1972-1976
1967-1971
1962-1966
1957-1961
1952-1956
1947-1951
1942-1946
1937-1941
1932-1936
1927-1931
1922-1926
1917-1921
1912-1916
<--- Younger Cohorts; Older Cohorts --->

A third observed pattern is that all the cohorts increase their preference from age 20 to 24 years to their respective peak ages for the single-detached, semi-detached and rowhouse dwelling types. The cohorts then tend to decrease their preference from their respective peak ages as they get older. For example, in Figure 22, those that were born between 1962 to 1966 increase their preferences for single-detached from age 20-to-24 to 50-to-54. Those that were born between 1932 to 1936 decrease their preferences for single-detached dwellings from age 50-to-54 to 80-to-84.

For semi-detached in Figure 22, the cohort born between 1977 to 1981 increased their preferences for semi-detached from age 20-to-24 to 35-to-39. Those that were born between 1947 to 1951 decreased their preferences for semi-detached from age 35-to-39 to 65-to-69.

For rowhouse in Figure 22, the cohort born between 1977 to 1981 increased their preferences for rowhouses from age 20-to-24 to 35-to-39. Those that were born between 1947 to 1951 decreased their preferences for rowhouses from age 35-to-39 to 65-to-69.

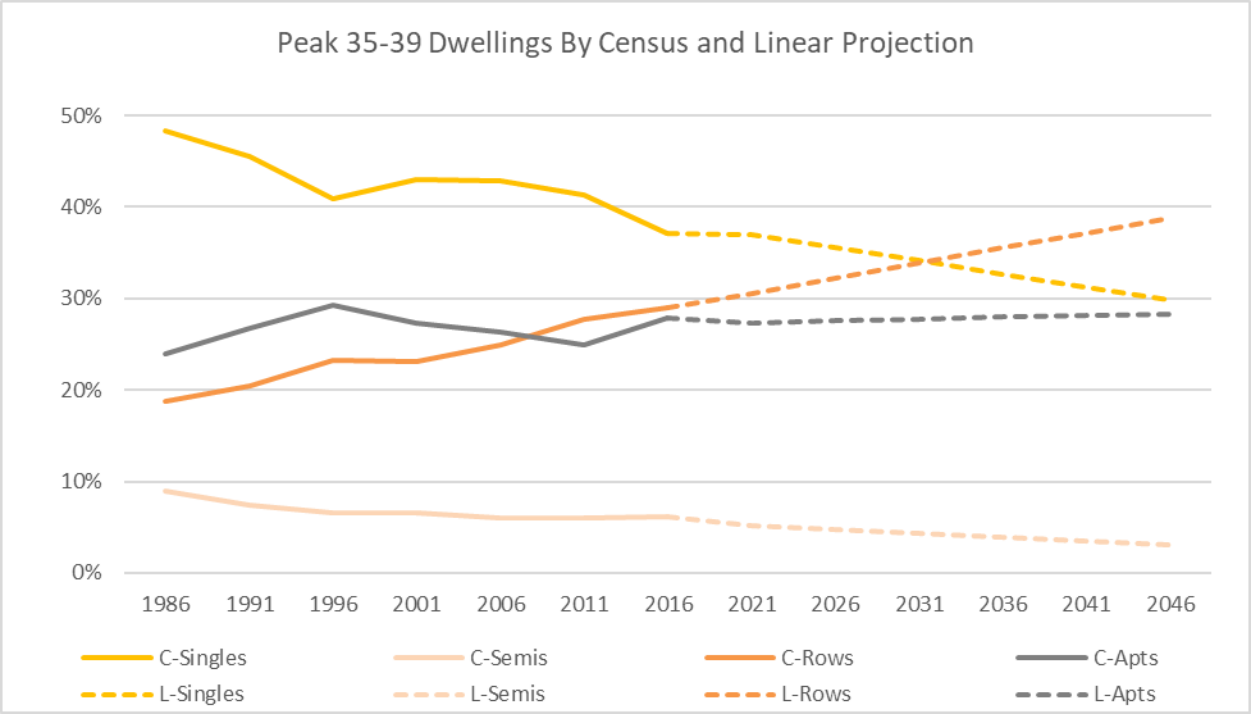
Apartments exhibit the opposite trend from the other dwelling types where apartment preference tends to peak at the younger ages, then declines to the lowest levels at age 50 to 54, then increases with age at a more gradual rate. For example, in Figure 22, those that were born between 1962 to 1966 decrease their preferences for apartments from age 20-to-24 to 50-to-54. Those that were born between 1932 to 1936 increase their preferences for apartments from age 50-to-54 to 80-to-84.

Dwelling Type Propensity Projections

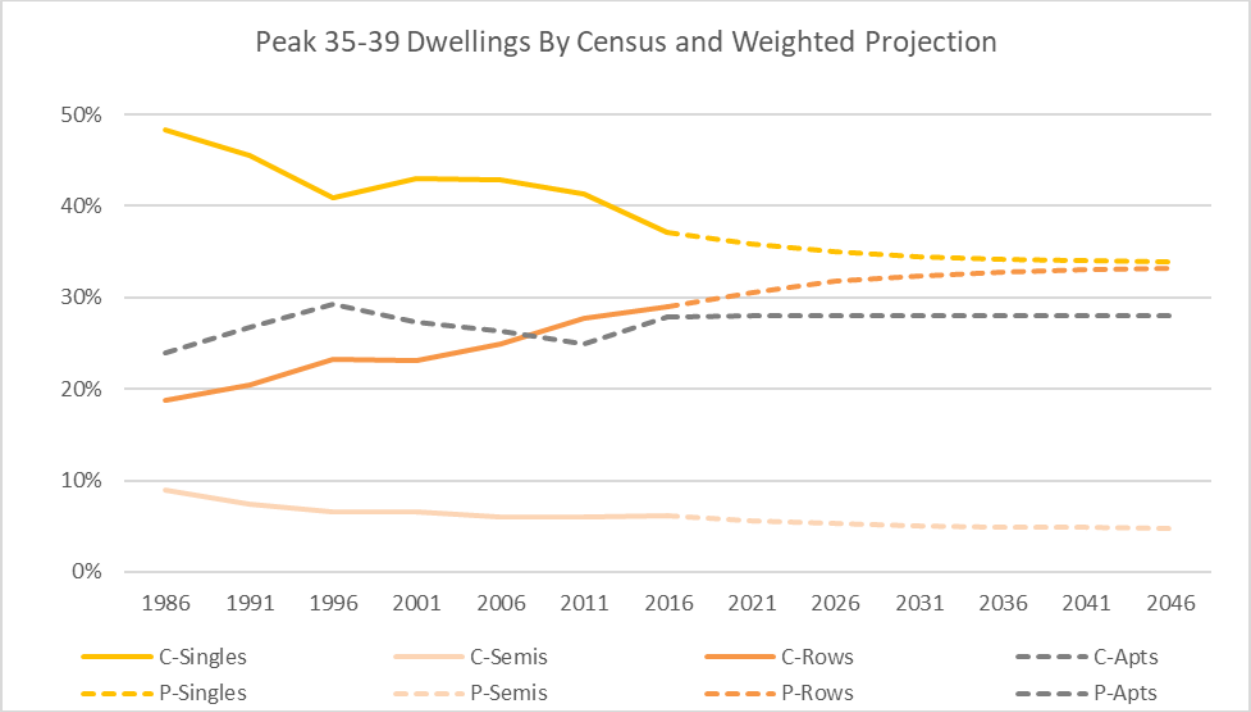
These observations of various cohort behaviours form the basis for the method to project what the future propensities for dwelling types will be for existing and future cohorts as they age. The method has three parts based on the observed trends. First, the peak propensity at ages 50 to 54 for single-detached, 35 to 39 for semi-detached and rowhouse, and the minimum propensity at age 50 to 54 for apartments are assumed to continue throughout the projection period. Second, the continued decline of the peak propensities at these ages for single-detached, semi-detached and apartments; and, the continued increase of peak propensity for rowhouses are assumed to continue. Third, the increase of propensities from age 20 to 24 to the respective peak age groups and then a decline as cohorts age for single-detached, semi-detached and rowhouse are assumed to continue. Apartments are assumed to decline from the 20 to 24 age group to the minimum propensities at age 50 to 54 and then increase gradually as cohorts become older.

A variety of trends were applied to the continuation of the peak propensity change for single-detached, semi-detached and rowhouses and minimum propensity change for apartments, but a limiting factor is that all the dwelling types are proportions of the total private occupied housing stock for an age group and need to be treated uniformly. A method was selected that continues the past observed changes in propensities for the 35 to 39 and 50 to 54 age groups in the short-term, with the influence or historical observations diminishing over the long-term. The method assumes that the linear trend of observed propensities from 1986 to 2016 continues to 2021, and then a logarithmic (log) weighting is applied to the linear trend after 2021 so that the rate of change slows to 2046. This method has the advantage of not over-exaggerating shifts in the longer term from one dwelling type to another thereby overestimating some dwellings and underestimating others. Figures 23 and 24 show the differences between the potential over exaggeration of linear projections and linear-log weighted projections for the 35 to 39 and 50 to 54 age groups over the long-term.

Figure 23: Age 35-39 Peak Dwelling Propensities, Linear Projection and Linear-Log Weighted Projection

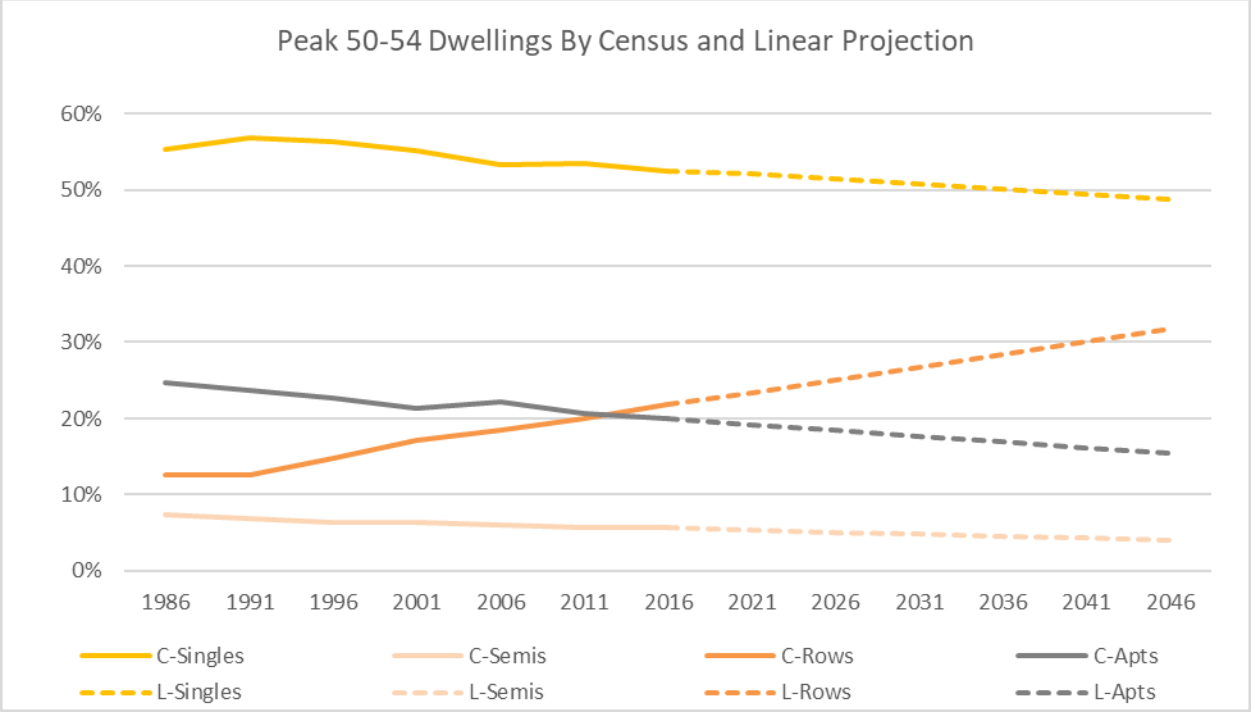


C = Census; L = Linear Projection

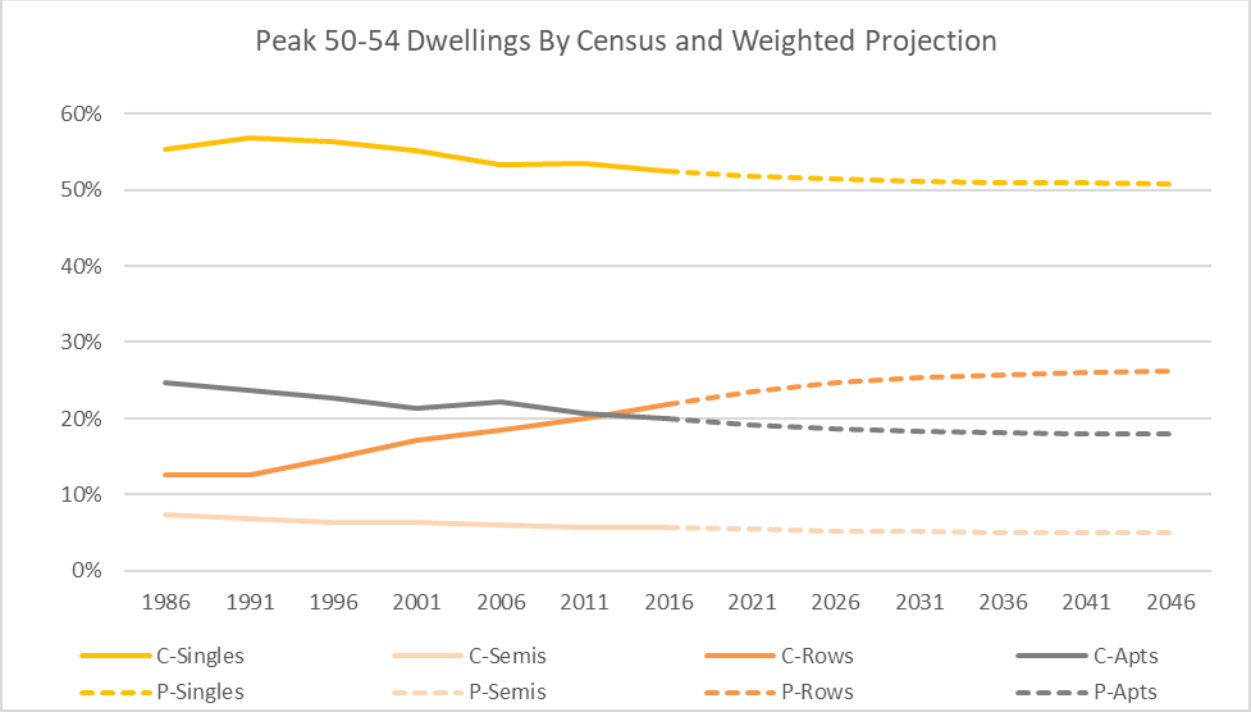


C = Census; P = Weighted Projection

Figure 24: Age 50-54 Peak Dwelling Propensities, Linear Projection and Linear-Log Weighted Projection



C = Census; L = Linear Projection



C = Census; P = Weighted Projection

The third component of the dwelling type projections is to determine the propensities of each cohort as they age to and from the 35 to 39 and 50 to 54 age groups. The future dwelling type propensity for each cohort relies on the average propensity change from the existing age group to the future target age group of the three previous cohorts that had already reached the target age group. As shown in Figure 25, the cohort that was born between 1972 to 1976 was age 40 to 44 years in 2016 and had a single-detached propensity of 47.5%. The previous three cohorts born between 1967 to 1971, 1962 to 1966, and 1957 to 1961 on average increased their preference for single-detached as they aged from 40-to-44 years to 45-to-49 years by 2.3%. Applying this average rate of increase to the cohort born between 1972 to 1976 as they aged to 45 to 49 years increases their preference for single-detached by 2.3% to 49.8% in 2021 from 47.5% in 2016. The previous three cohorts are used because their rate of change tends to be more stable than the previous cohorts, decreasing the amount of variance assumed to be applied as cohorts age and resulting in smoother propensity changes throughout the projection period.

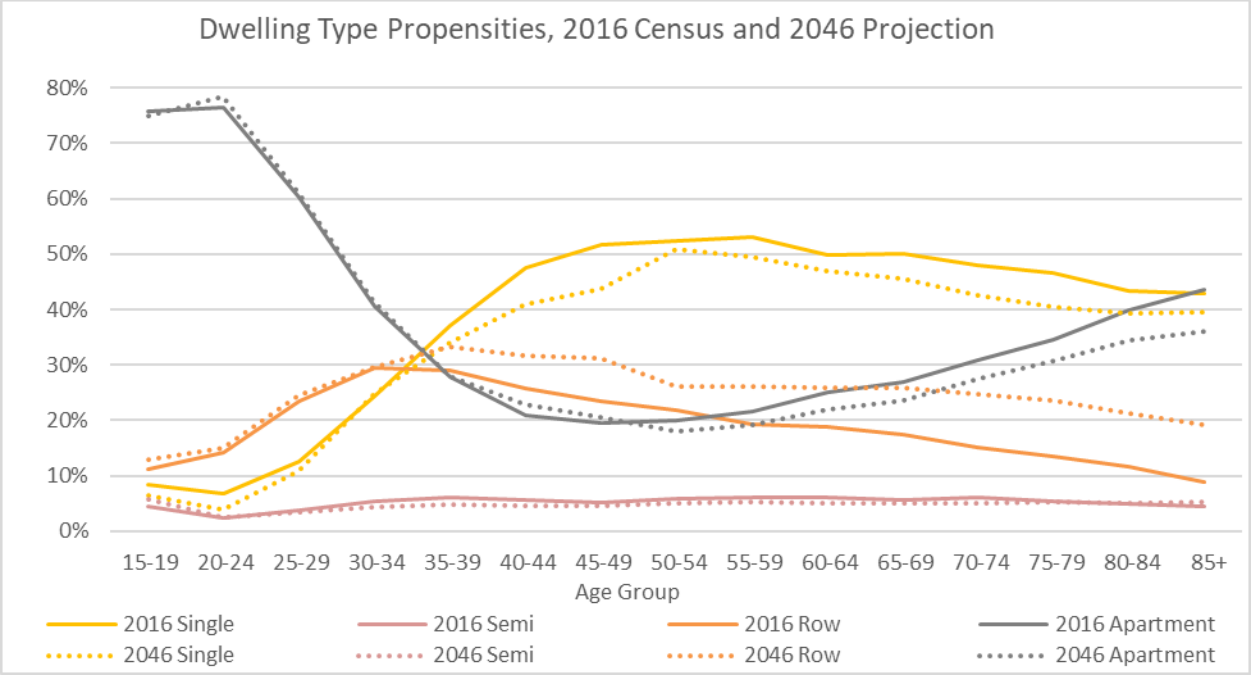
Figure 25: Example of applying cohort change to a future age from average of three previous cohorts

Cohort % in Single-detached	Year aged	40-44	Year aged	45-49	Change from 40-44 to 45-59	Average Cohort Change	40-44 in 2016	Average Cohort Change	45-49 in 2021
1972-1976	2016	47.5%	2021	?			47.5%	+2.3%	49.8%
1967-1971	2011	49.6%	2016	51.7%	2.1%	2.3%			
1962-1966	2006	50.8%	2011	51.7%	0.9%				
1957-1961	2001	49.2%	2006	53.0%	3.8%				

Dwelling Type Projections Results

The dwelling type projections show an increasing shift towards rowhouse type dwellings from the population in their mid-30s to their mid-50s than what has been observed in the past. As shown in Figure 26, from their mid-50s to their senior years, the population will see decreasing preferences for both single-detached and apartments, with some increasing preferences for rowhouses. Semi-detached will remain relatively stable throughout the projection period. Overall, single-detached will remain the most preferred dwelling type from age 35 to 39 and onward.

Figure 26 Dwelling Type Propensities, 2016 Census and 2046 Projection



Demolitions and Vacancies

In addition to 186,200 private household occupancies, additional dwelling units for demolition replacements and vacancies should be added to create a more fulsome picture of land demand. The concept of demolition replacements should be limited to the households that intend to remain within the city and occupy a new private household after the demolition of their principal residence. Demolitions however occur for a variety of reasons where the original occupants either move out of the city, or stay within the city but move to a collective dwelling, move to a rental unit, move to a resale unit, or move to a new housing unit, including a replacement unit on the same lot. For the purposes of projecting demand for new private housing units, only the last situation adds new dwelling units to the 186,200 private household occupancies stemming from net migration and natural increase. In practice however it is not possible to determine the rationale for a demolition or the type of housing the original occupants move to or follow where they move to and create a direct relationship with the net migration estimates in the population projection.

The City can track demolition permits and determine the dwelling type that was demolished and the dwelling type that the original unit was replaced with. Because the projections categorize new households by dwelling type, assumptions must be made about the specific dwelling types that are added to the dwelling type projections developed from the above propensities. The dwelling projections model assumes that for those demolished units that are replaced with the same units, half are assumed to be for those occupying the previous unit, with the exception of apartments where all of the former tenants are assumed to seek another apartment unit and remain within the city due to tenure and the different ownership structure associated with apartment units.

Housing demand was adjusted by allowing for the replacement of 260 demolished units annually being the annual average of demolition permits over the past ten years. The split of the same replacements by unit type was 22% single-detached, 1% semi-detached, 1% rowhouse and 76% apartments.

A further adjustment was made to allow for a vacancy rate in new units. Ownership units were assumed to have a 0.5% vacancy, similar to previous projection models. Rental units were assumed to have a 3.0% vacancy throughout the projection period, which is referred to as a balanced market. While there may be periods where vacancies are lower or higher the projection model assumes overall there will be a balanced market throughout the period.

Overall, demolition replacements and vacancy allowances are estimated to add 9,400 units to housing needs between 2018 and 2046 (Figure 26).

Figure 26 Demolition Replacements and Vacancies in New Units, 2018-2046

	Single-detached	Semi-detached	Rowhouse	Apartment	Total
Demolitions	1,568	84	28	5,544	7,224
Vacancies	329	32	525	1,297	2,183
Total	1,897	116	553	6,841	9,407

Conclusion

Over the 2018 to 2046 period there is a projected demand for 194,808 new housing units. Demand by unit type, including demolitions and vacancies, are shown in Figure 27. Further details on the projected number of households by age group and dwelling types can be found in Appendix 6.

Figure 27 Projected Housing Demand by Unit Type, 2018-2046

	Single-detached	Semi-detached	Rowhouse	Apartment	Total
2018-46	66,116	6,375	69,736	52,582	194,808
Shares	33.9%	3.3%	35.8%	27.0%	100.0%

Part III. Employment Projections

Ottawa's employment prospects will be influenced by the aging workforce, governmental budgets for the Federal service and macro-level factors that can impact the private sector. These drivers are taken into consideration in the assumptions for the components of the employment projection.

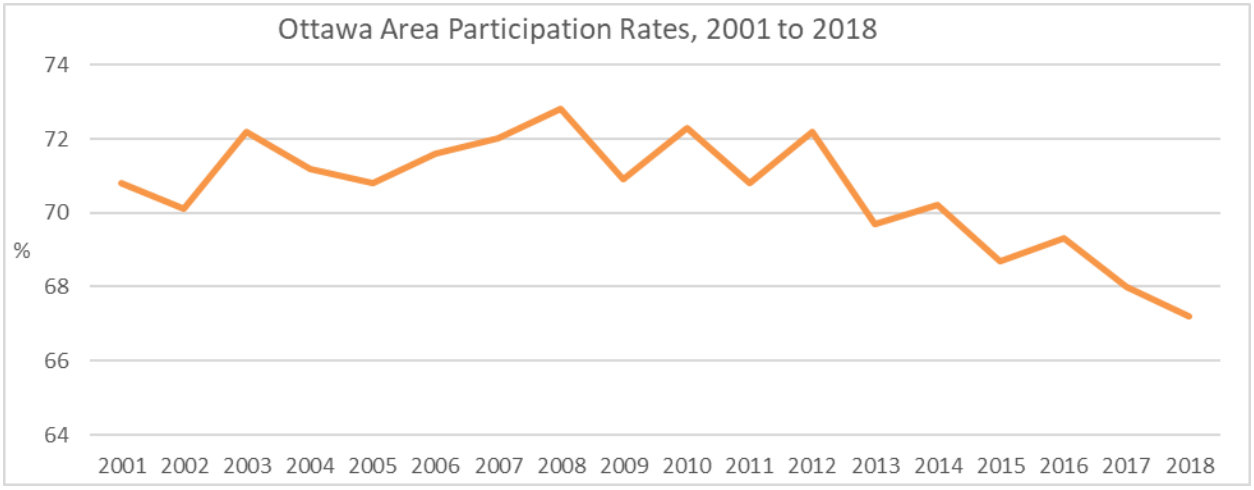
Methodology

Labour force participation rates by age and sex were applied to the age-sex structure of the projected population to produce an estimate of the resident labour force. This number is adjusted by assumed unemployment rates to produce the number of employed residents. The number of net in-commuters from adjacent municipalities, the difference between the number of Ottawa residents who hold jobs outside of the City and the number of people who reside outside of Ottawa but hold jobs in Ottawa, is added to the projected resident labour force to project the total number of jobs located in Ottawa. A multiple jobholder rate is then applied to account for people having more than one job.

Participation Rates

The labour force participation rate (LFPR) is the percentage of the population 15 and over that is in the labour force, either working or seeking work. Since 2011, the LFPR has been declining in the Ottawa area, mainly due to the aging population, with 2011 coinciding with the first cohort of the baby boom generation reaching 65 years of age. Figure 28 shows the LFPR for the Ontario portion of the Ottawa-Gatineau Census Metropolitan Area (CMA)[10], which declined from 70.8% in 2001 to 67.2% in 2018.

Figure 28: Ontario part of the Ottawa-Gatineau CMA Participation Rates, 2001-2018

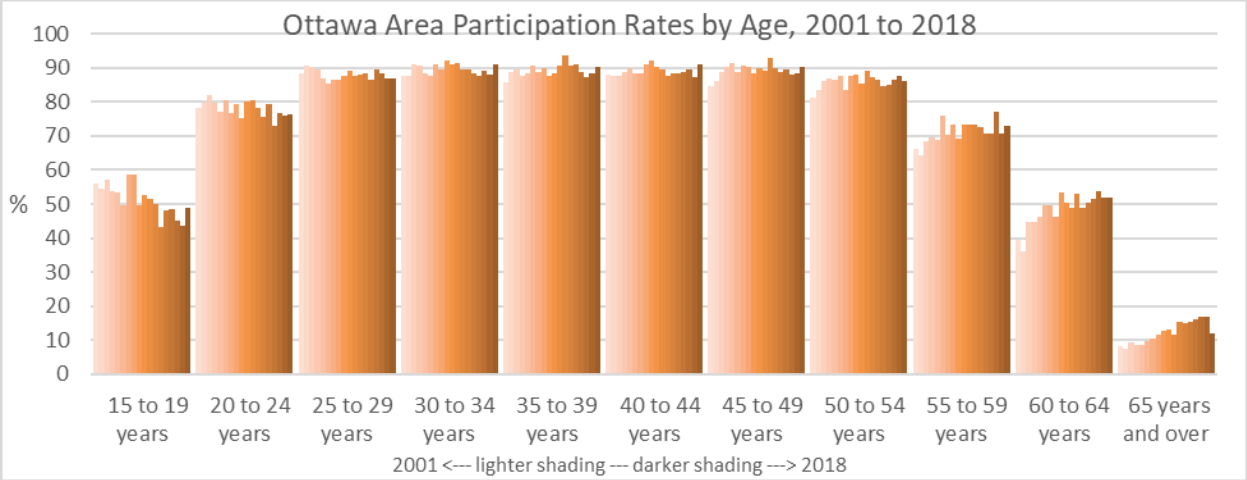


Two primary factors influence the total LFPR; the health of the overall economy and the demographic age/sex structure of the population. Higher economic growth attracts more people into the labour force, increasing the rate. The age structure of the labour force has strong influences on the effect of demographic change. Typically, rates among the younger segment of working age adults are lower due to the pursuit of education. The older segment of working age adults can also be lower due to retirements and health limitations. However, in recent years, there have been changes in the patterns observed for the older adults with increasing participation rates for both males and females. Figure 29 shows the LFPRs from 2001 to 2018 by age group. In general, the younger segments of the working population are participating less in the labour force since 2001, with some signs of increase over the most recent years, possibly due to lower than historical unemployment rates providing more job opportunities. The middle

[10] Statistics Canada, Custom Tabulation. Statistics Canada does not provide detailed labour force statistics for the City of Ottawa geography. The Ontario part of the Ottawa-Gatineau CMA includes the City of Ottawa, City of Clarence-Rockland, Township of Russell, and the Municipality of North Grenville and is the closest geography to the City of Ottawa for detailed labour force statistics.

age segment has seen relatively stable LFPRs, while the older population age groups have been increasing their participation rates.

Figure 29: Ontario part of the Ottawa-Gatineau CMA Participation Rates by Age, 2001-2018



While the recent LFPR increase for the younger age segments differs somewhat from earlier observations, there is not enough of a long-term trend to reasonably assume the increases for these age groups will continue over the projection period. However, stable rates among the mid-age segments and increases among older adults are expected to continue over the projection period as the local economy has a strong knowledge-based sector that coincides with a demographic that is showing interest in continuing to work past the traditional retirement age of 65. In general, people will have longer and healthier life-spans and projected increases in the older adult population will likely result in labour shortages and add pressure to pension systems, factors which can also contribute to the likelihood of increasing older age participation rates.

Statistics Canada has published a study on labour force projections to 2036 and concludes that the overall national participation rate will decrease mainly due to the aging of the population, from 66% in 2017 to 63% in 2036 but that the LFPR is expected to continue increasing in the older adult work force[11]. The study provides a benchmark for the participation rate by age group for the employment projections to 2046. The study projects that in 2036 the Ottawa-Gatineau CMA will have a participation rate of 64.3 in their reference scenario. The participation rate projections for the Ottawa employment projections to 2046 takes the Statistics Canada projection into account by adjusting for the city of Ottawa proportion of the CMA and the projected national participation rate by age group[12]. The result is a decline of participation rates for age groups under 50 and an increase of participation rates for age groups over 55. Despite the assumed increase in participation rates for the older segment of the population, it will not fully offset the effects of an aging labour force and overall LFPRs for the city of Ottawa are projected to decrease from 66.7% in 2018 to 62.5% by 2046.

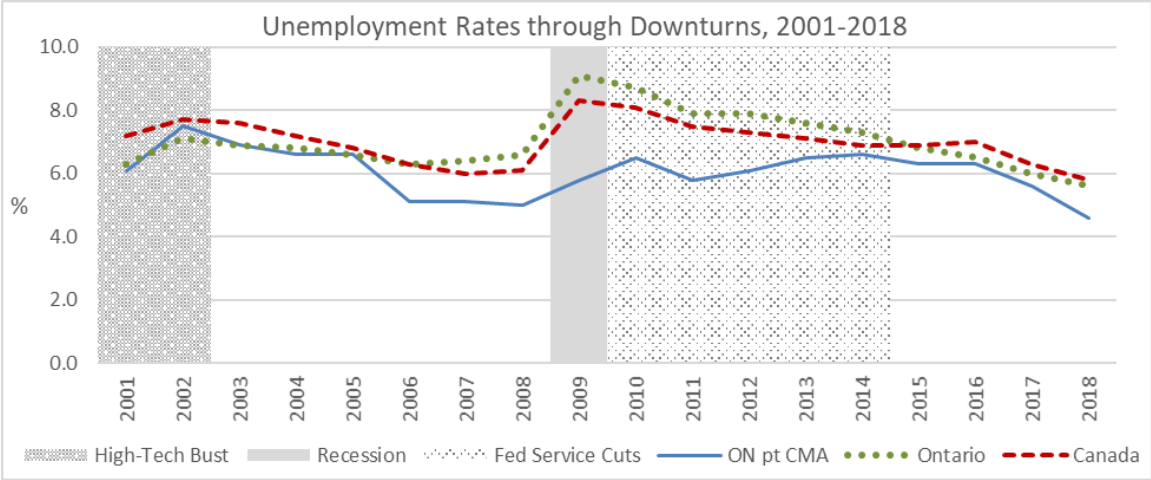
Unemployment Rates

Relative to the national and provincial rates, Ottawa has typically had lower unemployment rates even during periods of downturn as shown in Figure 30. During the local “high-tech bust” in 2001-2002, Ottawa rates were still under national rates; in the 2008-2009 recession Ottawa rates were below national and provincial rates; and, while the Federal government austerity measures through 2010 to 2014 saw job cuts to the federal service, the Ottawa unemployment rate was still lower than national and provincial unemployment rates.

[11] Statistics Canada, 2019. *The labour force in Canada and its regions: Projections to 2036*. Publication 75-006-X. https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00004-eng.htm

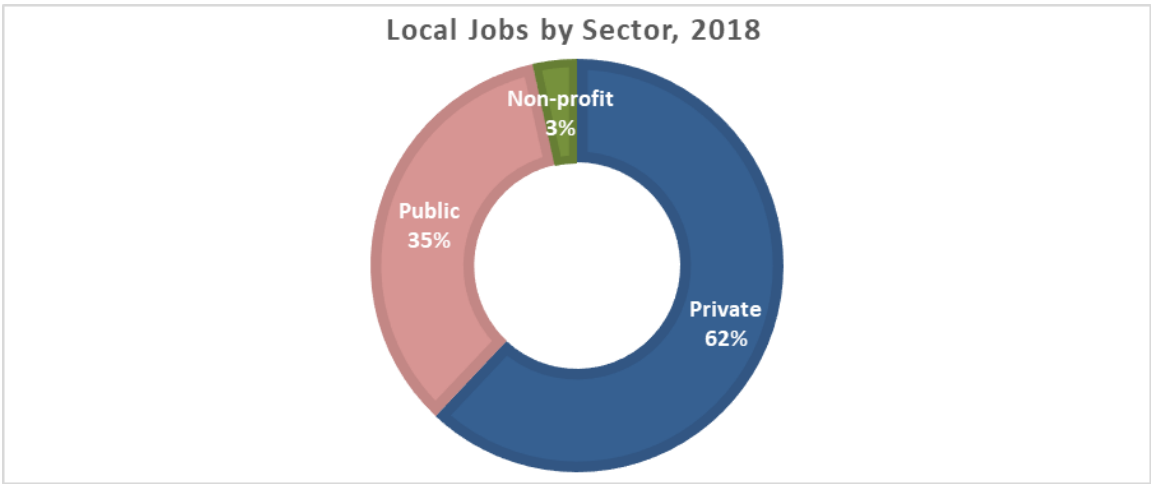
[12] *Ibid.* Chart 8, Trends from 1995 to 2017 Scenario.

Figure 30: Comparative unemployment rates through periods of downturn, 2001-2018



This shows that the local unemployment rate has remained relatively robust to disruptions to both macro and local economies and, public and private sectors. Much of this resiliency may be related to the make up of the local economy by sector, where the public sector accounts for 1 out of 3 jobs as shown in Figure 31[13]. The relatively large proportion of the public sector[14] provides some measure of insulation to the overall local economy when one sector is more affected by a downturn than the other.

Figure 31: Local Economy Composition by Sector, 2018



In addition to the context of the local economy, as with the LFPR, the unemployment rate is also expected to remain low over the long-term relative to rates observed in the past, as the older segment of the population ages out of the work force, creating more employment opportunities and reducing the ratio of those participating in the labour force seeking a job to the overall labour force. Throughout the projection period the unemployment rate is assumed to remain at lower levels based on the resiliency of the local economy to economic downturns and the demographic change that will put pressure on a lower unemployment rate. The local unemployment rate is forecast to increase slightly from 4.6% in 2018 to 4.8% in 2021 due to expected lower federal service growth that will be somewhat offset with committed and anticipated construction opportunities and a positive outlook for the high-tech sector[15]. As Stage 2 of

[13] Statistics Canada, Labour Force Survey, custom tabulation.
[14] *Ibid:* the Ottawa public sector is comprised of federal (55%), provincial (39%) and local (6%) governments, providing additional breadth in downturns from a single senior government's policies.
[15] Conference Board of Canada, 2019. *Metropolitan Outlook 1: Ottawa-Gatineau – Autumn 2019*.

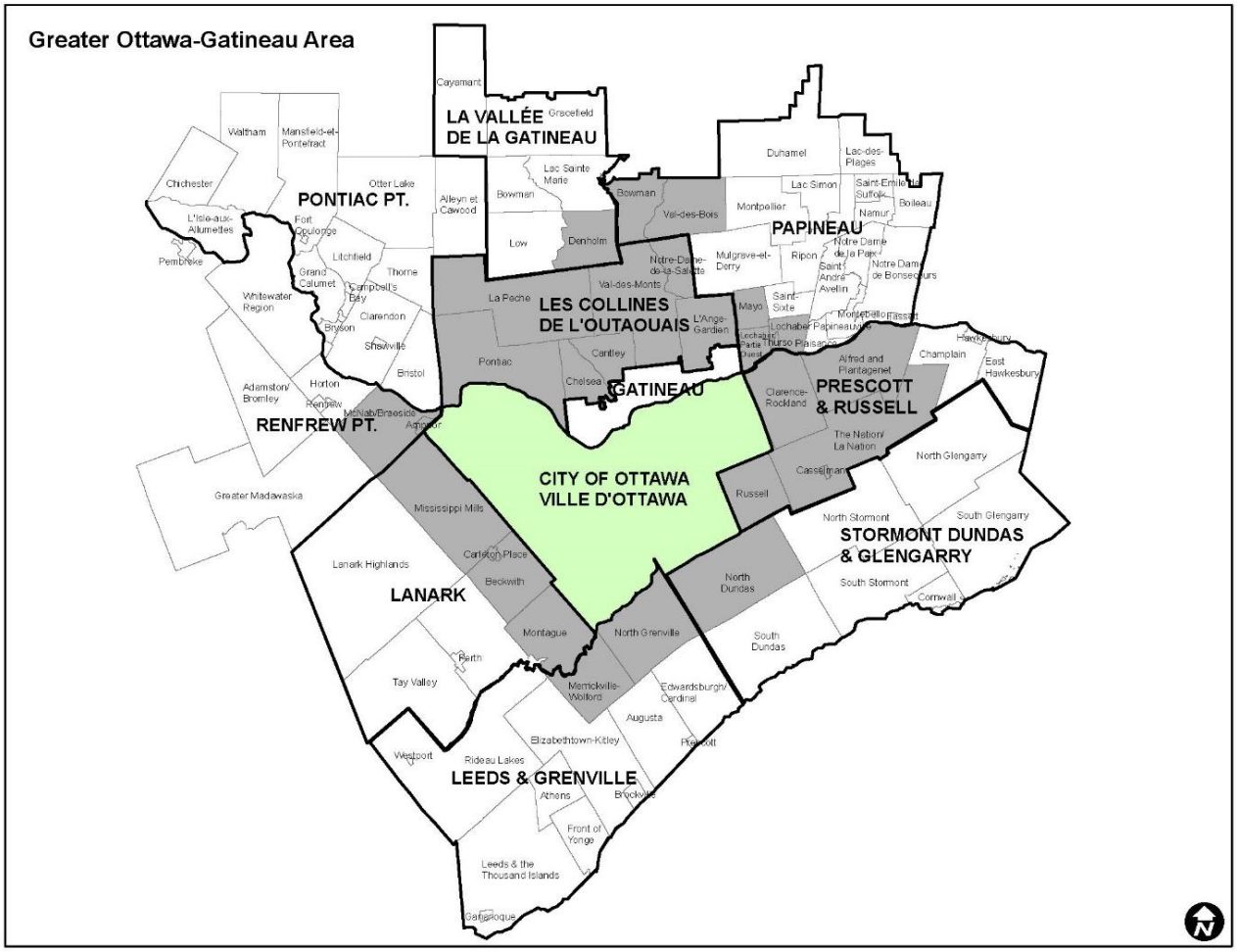
LRT wraps-up post-2021, the unemployment rate will gradually ease to 4.9% by 2026, reaching 5.0% by 2031 and holding constant to 2046.

Net In-Commuting

As part of a larger regional economy, a portion of Ottawa's resident labour force commutes out of the city for work and residents from outlying areas commute into the city. The net change of in-commutes minus out-commutes are additional jobs to the resident labour force that works within the city. These outlying areas include not only the municipalities that form the Ottawa-Gatineau CMA, but also the smaller municipalities in both provinces that are adjacent to the CMA. There are also significant flows to and from other areas, with the most significant being Montréal, Toronto, Lanark, and Cornwall.

The main commuter area of Ottawa is the entire Ottawa-Gatineau Census Metropolitan Area (CMA) plus adjacent municipalities in Ontario and Québec that are not included in the CMA. Map 1 shows the City of Ottawa in relation to these outlying areas

Map 1: City of Ottawa and Adjacent Municipalities



In 2016, municipalities from the Québec side of the CMA had the most flows to and from Ottawa, followed by the Ontario municipalities that are outside but adjacent to the CMA, the Ontario municipalities within the CMA and then the Québec municipalities that are outside but adjacent to the CMA. These areas are shown on Map 1, where the Ontario municipalities within the CMA are the City of Clarence-Rockland, Township of Russell, and the Municipality of North Grenville. The shaded Ontario municipalities, with the exception of the previous three mentioned, are adjacent to Ottawa and the shaded Québec municipalities

are those outside and adjacent to the CMA. In 2016 there were over 96,000 people commuting into Ottawa for work and over 27,000 persons commuting out of Ottawa for work, for a net difference of about 69,000 more people commuting into Ottawa[16], representing about 11% of total Ottawa jobs.

Destination-origin commuting flows for these areas were extrapolated from the 2006 and 2016 Census and the 2011 National Household Survey to the year 2021. After 2021 flow increases are assumed to diminish to 2046 as work force population growth in outlying areas will grow at lower rates than Ottawa. By 2046 net commuters will represent about 9% of total Ottawa jobs.

Place of Work

Statistics Canada separates employed residents by their place of work. For the purpose of this report, Ottawa's employed labour force includes all workers with usual place of work, no fixed place of work, and those who work at home. It is assumed that the majority of workers with no fixed place of work (such as landscape contractors and salespersons) conduct most of their business within Ottawa and therefore they are counted as part of the employed labour force.

Multiple Jobholders

In addition to jobs from commuters that live outside of Ottawa and those that live and work in Ottawa, there are persons that have more than one job and these jobs should also be included into the overall employment projection. A multiple jobholder rate is derived from the number of Ontario multiple jobholders[17] and is applied to the Ottawa employed labour force. A 5-year moving average of the growth rate based on recent historical data is applied throughout the projection period, starting at 5.6% in 2018, increasing to 6.1% by 2046.

Employment Projections Results

Figure 32 summarizes the employment projection results. The projected employed labour force will increase to 707,500 jobs by 2046, a growth of 168,800 or 31%. Net commuters are projected to increase to 76,400 by 2046 and multiple jobholders will increase to 43,200 by 2046. In total the number of jobs in the City of Ottawa is projected to grow to 827,000 in 2046, a growth of almost 190,000 jobs or 30%.

Figure 32: Employment Projections Summary, 2018-2046

	2018	2026	2036	2046
1. Employed Labour Force, Ottawa[18]	538,629	593,320	651,571	707,490
2. In-commutes from Québec CMA	51,710	54,532	58,205	60,681
3. Out-commutes to Québec CMA	-18,915	-20,354	-22,257	-23,576
4. In-commutes from Adjacent Québec	390	411	439	458
5. Out-commutes to Adjacent Québec	-	-	-	-
6. In-commutes from Ontario CMA	15,005	15,618	16,409	16,932
7. Out-commutes to Ontario CMA	-1,765	-1,948	-2,194	-2,371
8. In-commutes from Adjacent Ontario	19,275	20,063	21,078	21,750
9. Out-commutes to Adjacent Ontario	-2,665	-2,941	-3,313	-3,579
Number of jobs in Ottawa	607,414	664,573	725,956	783,883
Multiple Jobholders in Ottawa	30,163	33,819	38,443	43,157
Total number of jobs in Ottawa	**637,577**	**698,393**	**764,398**	**827,040**

[16] Statistics Canada. Custom tabulation.
[17] Statistics Canada. Table 14-10-0044-01 Multiple jobholders by industry, annual (x 1,000) https://doi.org/10.25318/1410004401-eng
[18] Ottawa's employed labour force includes employed Ottawa residents that work from home and residents with no fixed workplace address.

Conclusion

From 2018 to 2046, the total number of jobs in Ottawa is expected to increase by 30 percent to 827,000, slower than the population growth rate of 40 percent, mainly due to the aging population, the number of people reaching retirement and leaving the work force. Even with an anticipated increase in participation rates by the older adult population the increased proportion of seniors in the labour force will lead to lower employment growth rates than observed in the past. Additional details on the employed labour force, participation rates, unemployment rates, Ottawa jobs, and multiple jobholders over the projection period can be found in Appendix 6.

Appendix List

1. Population Projection Scenario Summaries
2. Components of Population Growth by Scenario
3. Population in Private Households
4. Census and Estimated Post-Censal Private Households
5. Descriptions of Dwelling Types
6. Households, Dwelling Types and Employment Details

Appendix 1 – Population Projection Scenarios

Low Scenario Population Projection City of Ottawa	2018	2021	2026	2031	2036	2041	2046	Change 2018-2046
Population (mid-year)	1,007,501	1,058,576	1,118,635	1,172,813	1,217,164	1,249,784	1,271,848	264,347
Average annual increase		10,215	12,012	10,836	8,870	6,524	4,413	9,441
Average Annual % Increase		1.0%	1.1%	1.0%	0.8%	0.5%	0.4%	0.9%
Population by Age Group								
0-4	51,018	51,572	55,031	58,460	58,460	56,554	54,712	3,694
5-9	54,870	55,432	54,741	57,954	61,178	60,952	58,802	3,932
10-14	55,696	58,605	58,791	57,918	60,973	64,009	63,572	7,876
15-19	60,083	62,123	63,237	62,819	61,477	64,100	66,727	6,644
20-24	77,393	78,184	69,030	68,678	67,115	64,763	66,534	-10,859
25-34	147,624	163,431	178,804	168,836	157,700	154,207	148,650	1,026
35-44	133,551	142,343	159,569	181,951	195,688	184,332	171,733	38,182
45-54	138,674	134,205	136,516	147,968	164,290	185,868	198,799	60,125
55-64	131,924	138,880	136,503	129,776	132,458	143,926	160,077	28,153
65-69	49,350	54,157	64,284	68,678	62,537	62,537	65,439	16,089
70-74	40,314	46,153	51,410	60,973	65,145	59,587	59,802	19,488
75-79	27,142	31,381	41,570	46,459	55,158	59,129	54,508	27,366
80+	39,862	42,110	49,150	62,343	74,986	89,818	102,492	62,630
0-19	22.0%	21.5%	20.7%	20.2%	19.9%	19.7%	19.2%	10.0%
20-34	22.3%	22.8%	22.2%	20.3%	18.5%	17.5%	16.9%	-4.4%
35-54	27.0%	26.1%	26.5%	28.1%	29.6%	29.6%	29.1%	36.1%
55-64	13.1%	13.1%	12.2%	11.1%	10.9%	11.5%	12.6%	21.3%
65-69	4.9%	5.1%	5.7%	5.9%	5.1%	5.0%	5.1%	32.6%
70-74	4.0%	4.4%	4.6%	5.2%	5.4%	4.8%	4.7%	48.3%
75-79	2.7%	3.0%	3.7%	4.0%	4.5%	4.7%	4.3%	100.8%
80+	4.0%	4.0%	4.4%	5.3%	6.2%	7.2%	8.1%	157.1%

Medium Scenario Population Projection City of Ottawa	2018	2021	2026	2031	2036	2041	2046	Change 2018-2046
Population (mid-year)	1,007,501	1,064,144	1,141,815	1,219,232	1,291,690	1,355,263	1,409,649	402,148
Average annual increase		11,329	15,534	15,483	14,492	12,714	10,877	14,362
Average Annual % Increase		1.1%	1.5%	1.4%	1.2%	1.0%	0.8%	1.4%
Population by Age Group								
0-4	51,018	52,281	59,778	66,327	68,987	69,087	68,446	17,428
5-9	54,870	55,729	56,257	63,632	70,079	72,584	72,505	17,635
10-14	55,696	58,830	59,727	60,231	67,566	73,909	76,277	20,581
15-19	60,083	64,036	65,188	65,169	65,068	71,883	77,770	17,687
20-24	77,393	79,365	73,887	72,740	71,231	69,898	75,719	-1,674
25-34	147,624	163,614	181,876	178,691	171,378	167,827	163,888	16,264
35-44	133,551	142,716	161,562	186,205	204,257	200,583	192,443	58,892
45-54	138,674	134,345	137,487	150,555	169,266	193,623	211,213	72,539
55-64	131,924	139,000	137,180	131,300	135,303	148,720	167,500	35,576
65-69	49,350	54,242	64,741	69,652	64,011	64,621	68,390	19,040
70-74	40,314	46,247	51,926	62,162	67,103	62,045	62,898	22,584
75-79	27,142	31,467	42,109	47,696	57,416	62,324	58,134	30,992
80+	39,862	42,273	50,095	64,871	80,024	98,157	114,465	74,603
0-19	22.0%	21.7%	21.1%	20.9%	21.0%	21.2%	20.9%	33.1%
20-34	22.3%	22.8%	22.4%	20.6%	18.8%	17.5%	17.0%	6.5%
35-54	27.0%	26.0%	26.2%	27.6%	28.9%	29.1%	28.6%	48.3%
55-64	13.1%	13.1%	12.0%	10.8%	10.5%	11.0%	11.9%	27.0%
65-69	4.9%	5.1%	5.7%	5.7%	5.0%	4.8%	4.9%	38.6%
70-74	4.0%	4.3%	4.5%	5.1%	5.2%	4.6%	4.5%	56.0%
75-79	2.7%	3.0%	3.7%	3.9%	4.4%	4.6%	4.1%	114.2%
80+	4.0%	4.0%	4.4%	5.3%	6.2%	7.2%	8.1%	187.2%

High Scenario Population Projection City of Ottawa	2018	2021	2026	2031	2036	2041	2046	Change 2018-2046
Population (mid-year)	1,007,501	1,072,306	1,171,228	1,276,126	1,383,776	1,487,871	1,586,515	579,014
Average annual increase		12,961	19,784	20,980	21,530	20,819	19,729	20,679
Average Annual % Increase		1.3%	1.8%	1.8%	1.7%	1.5%	1.3%	2.1%
Population by Age Group								
0-4	51,018	54,004	65,426	75,169	82,238	85,850	87,490	36,472
5-9	54,870	56,089	58,915	70,441	80,313	87,440	91,123	36,253
10-14	55,696	59,111	60,799	63,877	75,614	85,608	92,853	37,157
15-19	60,083	67,234	68,148	68,411	70,708	81,853	91,427	31,344
20-24	77,393	81,390	81,901	79,144	77,400	78,191	88,244	10,851
25-34	147,624	163,389	185,367	193,116	191,995	188,196	187,766	40,142
35-44	133,551	142,916	163,053	189,864	214,172	223,373	223,205	89,654
45-54	138,674	134,406	138,238	152,933	174,227	201,747	226,424	87,750
55-64	131,924	139,119	137,851	132,778	138,124	153,634	175,340	43,416
65-69	49,350	54,322	65,217	70,623	65,467	66,669	71,329	21,979
70-74	40,314	46,336	52,458	63,323	68,947	64,342	65,759	25,445
75-79	27,142	31,557	42,682	48,900	59,500	65,114	61,201	34,059
80+	39,862	42,432	51,174	67,549	85,071	105,854	124,354	84,492
0-19	22.0%	22.0%	21.6%	21.8%	22.3%	22.9%	22.9%	63.7%
20-34	22.3%	22.8%	22.8%	21.3%	19.5%	17.9%	17.4%	22.7%
35-54	27.0%	25.9%	25.7%	26.9%	28.1%	28.6%	28.3%	65.2%
55-64	13.1%	13.0%	11.8%	10.4%	10.0%	10.3%	11.1%	32.9%
65-69	4.9%	5.1%	5.6%	5.5%	4.7%	4.5%	4.5%	44.5%
70-74	4.0%	4.3%	4.5%	5.0%	5.0%	4.3%	4.1%	63.1%
75-79	2.7%	2.9%	3.6%	3.8%	4.3%	4.4%	3.9%	125.5%
80+	4.0%	4.0%	4.4%	5.3%	6.1%	7.1%	7.8%	212.0%

Appendix 2 – Components of Population Growth by Scenario

Low Scenario Population Projection						
Year*	Start	Births	Deaths	Natural Increase	Net Migration	End
2019	1,007,501	9,553	7,205	2,348	19,883	1,029,731
2020	1,029,731	9,893	7,631	2,262	12,634	1,044,627
2021	1,044,627	10,003	7,795	2,207	11,742	1,058,576
2022	1,058,576	10,250	7,963	2,286	10,696	1,071,559
2023	1,071,559	10,496	8,138	2,358	9,645	1,083,562
2024	1,083,562	10,685	8,318	2,367	9,470	1,095,400
2025	1,095,400	10,870	8,477	2,393	9,301	1,107,094
2026	1,107,094	11,047	8,647	2,400	9,141	1,118,635
2027	1,118,635	11,184	8,827	2,357	8,998	1,129,990
2028	1,129,990	11,310	9,018	2,293	8,848	1,141,131
2029	1,141,131	11,412	9,220	2,193	8,703	1,152,027
2030	1,152,027	11,476	9,452	2,024	8,564	1,162,615
2031	1,162,615	11,483	9,695	1,788	8,410	1,172,813
2032	1,172,813	11,469	9,946	1,523	8,257	1,182,594
2033	1,182,594	11,432	10,205	1,227	8,099	1,191,919
2034	1,191,919	11,415	10,470	944	7,931	1,200,795
2035	1,200,795	11,362	10,702	660	7,772	1,209,227
2036	1,209,227	11,263	10,936	326	7,611	1,217,164
2037	1,217,164	11,160	11,171	-11	7,444	1,224,598
2038	1,224,598	11,077	11,404	-326	7,283	1,231,555
2039	1,231,555	11,030	11,632	-602	7,118	1,238,070
2040	1,238,070	10,963	11,843	-880	6,960	1,244,151
2041	1,244,151	10,888	12,047	-1,160	6,793	1,249,784
2042	1,249,784	10,809	12,244	-1,435	6,638	1,254,987
2043	1,254,987	10,747	12,431	-1,684	6,468	1,259,771
2044	1,259,771	10,680	12,609	-1,928	6,300	1,264,143
2045	1,264,143	10,605	12,721	-2,116	6,134	1,268,161
2046	1,268,161	10,540	12,826	-2,286	5,973	1,271,848

* Population figures are mid-year

Medium Scenario Population Projection

Year*	Start	Births	Deaths	Natural Increase	Net Migration	End
2019	1,007,501	9,553	7,107	2,446	20,241	1,030,189
2020	1,030,189	9,900	7,484	2,416	14,813	1,047,417
2021	1,047,417	10,399	7,582	2,817	13,910	1,064,144
2022	1,064,144	10,815	7,683	3,132	12,879	1,080,155
2023	1,080,155	11,245	7,790	3,454	11,858	1,095,467
2024	1,095,467	11,543	7,901	3,643	11,731	1,110,841
2025	1,110,841	11,843	8,017	3,826	11,624	1,126,292
2026	1,126,292	12,142	8,144	3,998	11,526	1,141,815
2027	1,141,815	12,408	8,281	4,126	11,434	1,157,376
2028	1,157,376	12,672	8,429	4,243	11,349	1,172,967
2029	1,172,967	12,880	8,587	4,293	11,255	1,188,515
2030	1,188,515	13,049	8,772	4,276	11,177	1,203,968
2031	1,203,968	13,158	8,968	4,191	11,073	1,219,232
2032	1,219,232	13,250	9,172	4,078	10,974	1,234,284
2033	1,234,284	13,321	9,386	3,935	10,857	1,249,075
2034	1,249,075	13,405	9,607	3,798	10,740	1,263,613
2035	1,263,613	13,447	9,840	3,607	10,619	1,277,839
2036	1,277,839	13,433	10,078	3,355	10,497	1,291,690
2037	1,291,690	13,406	10,318	3,089	10,371	1,305,149
2038	1,305,149	13,393	10,557	2,836	10,237	1,318,222
2039	1,318,222	13,413	10,794	2,619	10,098	1,330,939
2040	1,330,939	13,409	11,017	2,391	9,962	1,343,293
2041	1,343,293	13,389	11,236	2,153	9,817	1,355,263
2042	1,355,263	13,361	11,449	1,913	9,676	1,366,851
2043	1,366,851	13,346	11,654	1,692	9,528	1,378,072
2044	1,378,072	13,296	11,851	1,445	9,402	1,388,919
2045	1,388,919	13,238	12,056	1,182	9,335	1,399,436
2046	1,399,436	13,193	12,253	941	9,272	1,409,649

* Population figures are mid-year

High Scenario Population Projection

Year*	Start	Births	Deaths	Natural Increase	Net Migration	End
2019	1,007,501	9,553	7,014	2,539	20,937	1,030,978
2020	1,030,978	10,462	7,346	3,116	17,804	1,051,898
2021	1,051,898	11,174	7,356	3,818	16,590	1,072,306
2022	1,072,306	11,650	7,367	4,282	15,528	1,092,116
2023	1,092,116	12,153	7,383	4,770	14,559	1,111,445
2024	1,111,445	12,539	7,401	5,138	14,508	1,131,091
2025	1,131,091	12,933	7,508	5,425	14,498	1,151,014
2026	1,151,014	13,336	7,626	5,710	14,505	1,171,228
2027	1,171,228	13,718	7,754	5,965	14,521	1,191,714
2028	1,191,714	14,117	7,892	6,226	14,548	1,212,488
2029	1,212,488	14,490	8,041	6,449	14,576	1,233,513
2030	1,233,513	14,824	8,195	6,629	14,607	1,254,749
2031	1,254,749	15,105	8,360	6,746	14,631	1,276,126
2032	1,276,126	15,378	8,534	6,844	14,638	1,297,609
2033	1,297,609	15,640	8,717	6,923	14,645	1,319,178
2034	1,319,178	15,890	8,907	6,982	14,643	1,340,803
2035	1,340,803	16,093	9,174	6,919	14,645	1,362,366
2036	1,362,366	16,227	9,447	6,780	14,630	1,383,776
2037	1,383,776	16,334	9,723	6,611	14,617	1,405,004
2038	1,405,004	16,441	10,001	6,441	14,592	1,426,037
2039	1,426,037	16,573	10,277	6,295	14,556	1,446,889
2040	1,446,889	16,677	10,580	6,097	14,524	1,467,510
2041	1,467,510	16,758	10,878	5,879	14,482	1,487,871
2042	1,487,871	16,821	11,172	5,649	14,439	1,507,959
2043	1,507,959	16,885	11,458	5,427	14,382	1,527,768
2044	1,527,768	16,878	11,737	5,141	14,524	1,547,433
2045	1,547,433	16,868	11,968	4,899	14,667	1,566,999
2046	1,566,999	16,891	12,194	4,698	14,818	1,586,515

Appendix 3 – Population in Private Households

Age Group	2016 Census Total Population, Age 15+	2016 Census Population Age 15+ in Private Households	2016 Census % of Population Age 15+ in Private Households	2016 Post-Censal Total Population, Age 15+	2016 Post-Censal Estimated Population Age 15+ in Private Households
15-19	57,190	56,695	99.1%	59,133	58,621
20-24	68,645	68,155	99.3%	73,430	72,906
25-29	63,695	63,245	99.3%	68,873	68,386
30-34	61,670	61,275	99.4%	66,427	66,002
35-39	59,575	59,160	99.3%	63,113	62,673
40-44	62,710	62,225	99.2%	65,183	64,679
45-49	65,960	65,440	99.2%	67,582	67,049
50-54	73,210	72,530	99.1%	74,430	73,739
55-59	66,765	66,020	98.9%	67,968	67,210
60-64	54,990	54,315	98.8%	55,680	54,997
65-69	48,130	47,425	98.5%	48,235	47,528
70-74	33,875	33,110	97.7%	34,269	33,495
75-79	24,600	23,460	95.4%	24,656	23,513
80-84	17,950	15,855	88.3%	17,975	15,877
85+	19,580	12,510	63.9%	19,698	12,585
Total 15+	778,545	761,420	97.8%	806,652	789,261

Source: Statistics Canada, 2016 Census, 2016 Post-censal estimates, City of Ottawa calculations.

Appendix 4 – Census and Estimated Post-Censal Private Households

Age Group	2016 Census Population Age 15+ in Private Households	2016 Census Number of Household Maintainers	2016 Census Headship Rate	2016 Post-Censal Estimated Population Age 15+ in Private Households	2016 Post-Censal Estimated Private Households
15-19	56,695	1,470	2.6%	58,621	1,520
20-24	68,155	13,665	20.0%	72,906	14,618
25-29	63,245	25,290	40.0%	68,386	27,346
30-34	61,275	30,660	50.0%	66,002	33,025
35-39	59,160	31,645	53.5%	62,673	33,524
40-44	62,225	34,095	54.8%	64,679	35,440
45-49	65,440	37,950	58.0%	67,049	38,883
50-54	72,530	43,235	59.6%	73,739	43,955
55-59	66,020	39,290	59.5%	67,210	39,998
60-64	54,315	32,550	59.9%	54,997	32,958
65-69	47,425	28,920	61.0%	47,528	28,983
70-74	33,110	20,360	61.5%	33,495	20,597
75-79	23,460	14,670	62.5%	23,513	14,703
80-84	15,855	10,945	69.0%	15,877	10,960
85+	12,510	9,015	72.1%	12,585	9,069
Total 15+	761,420	373,760	49.1%	789,261	385,580

Source: Statistics Canada, 2016 Census, 2016 Post-censal estimates, City of Ottawa calculations.

Appendix 5 – Descriptions of Dwelling Types

Ottawa Projections		Census Definition	
	Single-detached	Single-detached house	A single dwelling not attached to any other dwelling or structure (except its own garage or shed). A single-detached house has open space on all sides, and has no dwellings either above it or below it. A mobile home fixed permanently to a foundation is also classified as a single-detached house.
		Other single-attached house	A single dwelling that is attached to another building and that does not fall into any of the other categories, such as a single dwelling attached to a non-residential structure (e.g., a store or a church) or occasionally to another residential structure (e.g., an apartment building).
	Semi-detached	Semi-detached house	One of two dwellings attached side by side (or back to back) to each other, but not attached to any other dwelling or structure (except its own garage or shed). A semi-detached dwelling has no dwellings either above it or below it, and the two units together have open space on all sides.
	Rowhouse	Row house	One of three or more dwellings joined side by side (or occasionally side to back), such as a townhouse or garden home, but not having any other dwellings either above or below. Townhouses attached to a high-rise building are also classified as row houses.
	Apartment	Apartment or flat in a duplex	One of two dwellings, located one above the other, may or may not be attached to other dwellings or buildings.
		Apartment in a building that has five or more storeys	A dwelling unit in a high-rise apartment building which has five or more storeys.
		Apartment in a building that has fewer than five storeys	A dwelling unit attached to other dwelling units, commercial units, or other non-residential space in a building that has fewer than five storeys.
		Mobile home	A single dwelling, designed and constructed to be transported on its own chassis and capable of being moved to a new location on short notice. It may be placed temporarily on a foundation pad and may be covered by a skirt.
		Other movable dwelling	A single dwelling, other than a mobile home, used as a place of residence, but capable of being moved on short notice, such as a tent, recreational vehicle, travel trailer, houseboat or floating home.

Source: Statistics Canada, Dictionary, Census of Population, 2016.
Dwelling images, Wood Buffalo Economic Development Corporation

Appendix 6 – Household, Dwelling and Employment Details, Medium Scenario

City of Ottawa	2018	2021	2026	2031	2036	2041	2046	Change 2018-2046
Total Households	**404,437**	**428,900**	**468,050**	**504,739**	**537,133**	**565,524**	**590,583**	**186,146**
Households by Age Group of Head								
<25 years	16,951	17,445	16,384	16,155	15,852	15,762	17,072	121
25-34 years	65,759	72,750	81,572	80,581	77,093	75,524	73,742	7,983
35-44 years	71,766	76,666	86,797	100,000	109,782	107,859	103,457	31,691
45-54 years	80,864	78,318	80,125	87,696	98,609	112,760	123,113	42,249
55-64 years	77,842	82,027	80,973	77,492	79,848	87,757	98,842	21,001
65+ years	91,255	101,694	122,199	142,815	155,949	165,862	174,356	83,101
Total Dwellings	**404,437**	**429,778**	**470,703**	**509,104**	**542,949**	**572,773**	**599,245**	**194,808**
Single-detached	167,934	174,873	187,083	199,923	212,195	223,634	234,050	66,116
Semi-detached	21,612	22,569	24,009	25,237	26,240	27,163	27,987	6,375
Rowhouse	88,169	96,757	111,457	125,736	138,280	148,995	157,904	69,736
Apartment	126,722	135,580	148,154	158,209	166,234	172,982	179,303	52,582
Average annual new dwelling units	-	8,447	8,185	7,680	6,769	5,965	5,294	6,957
Labour Force & Employment								
Population 15+	845,917	897,304	966,053	1,029,042	1,085,057	1,139,682	1,192,422	346,505
Participation Rate	66.7%	65.7%	64.6%	63.7%	63.2%	62.8%	62.5%	-
Labour Force	564,600	589,741	623,891	655,361	685,864	716,007	744,727	180,126
Unemployment Rate	4.6%	4.8%	4.9%	5.0%	5.0%	5.0%	5.0%	-
Unemployed Persons	25,972	28,466	30,571	32,768	34,293	35,800	37,236	11,265
Employed Residents	538,629	561,275	593,320	622,593	651,571	680,206	707,490	168,862
5-Year Absolute Change	-	22,646	32,045	29,273	28,978	28,636	27,284	-
Net In-Commuting	68,785	69,706	71,253	72,800	74,385	75,586	76,392	7,607
Employment in Ottawa	607,414	630,981	664,573	695,393	725,956	755,792	783,883	176,469
Multiple Jobholder Rate	5.6%	5.6%	5.7%	5.8%	5.9%	6.0%	6.1%	-
Multiple Jobholders	30,163	31,431	33,819	36,110	38,443	40,812	43,157	12,994
Total Employment in Ottawa	637,577	662,413	698,393	731,504	764,398	796,605	827,040	189,463