populations & housing projections
REVELSTOKE

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by: rennie consulting services

rennie

table of
contents

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introduction

As part of the City of Revelstoke's Official Community Plan (OCP) review, rennie consulting was asked to develop a series of long-range projections for the City's population and associated housing requirements. While compiling demographic projections can be straightforward, compiling them for resort-type city-regions like Revelstoke present a unique set of circumstances.

Firstly, as a significant portion of the City's economy is focused on the travel and tourism sector, it experiences seasonal fluctuations in population that are not typically experienced by other cities. As long-range projections are typically conducted at a certain point in time and reported out on an annual basis, they may not reflect these seasonal patterns. That being said, issues of peak population due to seasonality need to be considered in a planning context, as fluctuations in these population groups have implications for infrastructure, engineering and planning initiatives.

The objective of this work is to build upon work previously conducted by the City (such as the Dillon Housing Needs Assessment) to provide long-range outlooks for various population groups within the City. As such, the research focuses on three distinct population groups: the City's usual resident population (captured as part of traditional data counts such as the Census), the City's shadow population (residents who may not captured in traditional Census counts due to seasonality but are living in the City's housing stock) and the City's visitor and tourist population. The three combined are referred to as the City's potential peak population.

With the objective of forecasting these three groups forward, a variety of traditional and non-traditional data sources and approaches were relied upon to develop an outlook for the City's total future peak population and associated housing needs of its usual residents to 2041.

Traditional sources include:
• Current and historical Census counts from Statistics Canada;
• Canada Revenue Agency
• BC Ministry of Finance
• BC Stats' Municipal Population Estimates, PEOPLE projections; and
• BC Vital Statistics.

Non-traditional data sources include:
• Water consumption data from various municipalities
• BC Assessment property data
• ICBC Vehicle registrations
• Tourism Revelstoke visitor data; and
• TELUS Insights data.
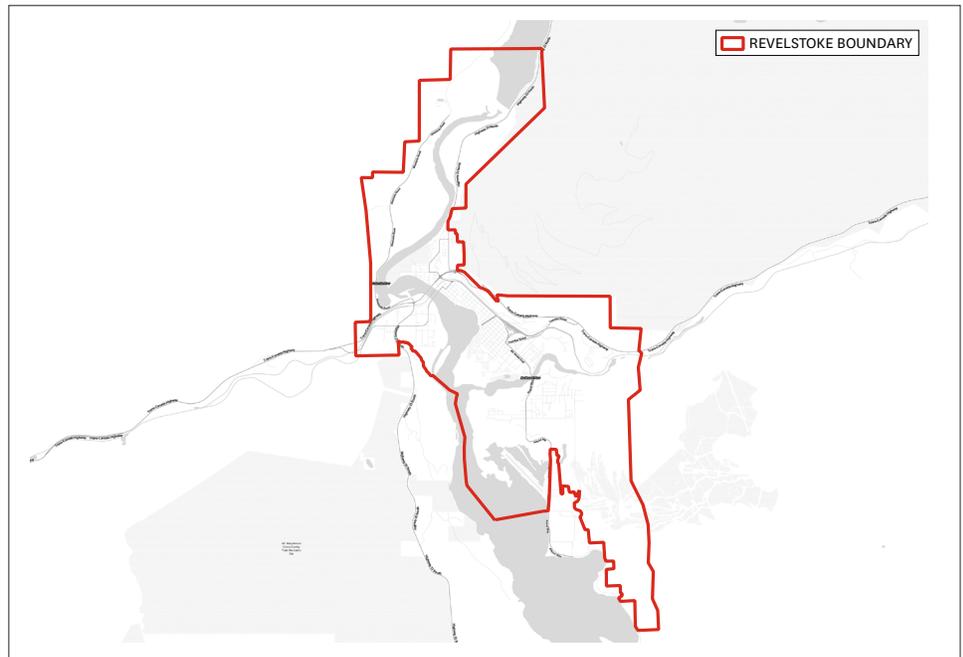
It is important to note that the City of Revelstoke Development Services has also developed population projection estimates for infrastructure planning purposes. These population numbers are greater than those seen in this report as the infrastructure analysis focuses on potential 'build out' of the City, or the point in time when all the residential, commercial, industrial and institutional uses are completed. The expected timeline for these buildout scenarios is the next 40 – 50 years.

While these population estimates dovetail in the short-term, the population projections developed for the OCP consider a shorter timeframe than the infrastructure plans. Given the tie between demography and household formation, the OCP projections also consider changes in the age composition of the City's population.

The report that follows addresses the population projections out to 2041 and has been divided into three phases as outlined below.

USUAL RESIDENT POPULATION

The first section of this report includes a review and documentation of historical and projected changes in the size and composition of the City of Revelstoke's usual resident population as described by Statistics Canada's current and historical Census counts. It provides a review of the shifts in the City of Revelstoke's total population, its age composition and the major components driving those demographic changes (international, interprovincial and intraprovincial migration). Understanding these shifts and the driving factors behind them is integral to understanding the trajectories of long-range changes that could be expected for the City's usual resident population.

In addition to the historical review, this section also documents BC Stats' annual historical and projected population estimates for the City of Revelstoke. BC Stats is British Columbia's public statistics agency, and is charged with conducting and compiling demographic and economic data, research and analysis for BC and its communities. As part of its mandate, BC Stats produces annual municipal population estimates as well as age and gender-specific population projections for 88 Local Health Areas (LHAs) within the province, which are used by many public and private agencies for long-range planning initiatives.[1] [2]

Three future scenarios for demographic growth and change for the City of Revelstoke are presented. The first scenario is based on BC Stats' most recent outlook (PEOPLE 2020) for BC and the Revelstoke Local Health Area (LHA 141). This provides an update to previous work compiled for the City as part of its Housing Needs Assessment compiled in 2018. That being said, given the patterns of longer-term demographic change seen in the BC Stats outlook, a second projection scenario was developed which allowed the younger labour force in the City to grow alongside expectations for economic and employment growth in the City. This scenario was deemed the Baseline scenario as it aligned better with plans and expectations economic growth in the City in the coming years. Finally, a scenario that considered the most recent period of higher growth the City has seen (the past 5 years) as the City's new normal. This scenario has been termed the High scenario.

Each scenario documents growth and change City's population and the major components that are expected to drive those changes (births, deaths and net migration) to 2041.

HOUSING THE CITY'S USUAL RESIDENT POPULATION

The second phase of this research and modeling began with a review of the scale and composition of the occupied dwelling stock from the 2016 and previous Census counts. From these data, profiles of household occupancy and household formation (specifically household maintainer rates) were developed by age of the householder, dwelling structural type, and household tenure. This review allowed the lifecycle pattern of housing occupancy and formation to be determined for different housing types, and how they have changed over time due to broader socio-economic shifts such as the growing prominence of kids living at home for longer periods of time.

These household formation rates (and trends in them) were then applied to the City's projected population by age to provide a demographically-based projection of future housing occupancy demand for the City's usual resident population. These projections were made by broad structure type of dwelling (ground oriented and apartment) and tenure (owned/rented) for the 2019 to 2041 period. It should be noted that these projections of the occupied dwelling stock are for the usual resident population exclusively, and are provided for each of the three different projection scenarios discussed above.

THE CITY'S POTENTIAL PEAK POPULATION

The peak population can be defined as the total population count including usual residents counted in traditional Census counts, those who were missed in those counts, as well as the visitor and tourist populations. In Canada, there are few data sources that quantify the scale of these latter two population groups. As such, the third phase of this research employed a variety of data sources and approaches to attempt to quantify the scale of the shadow and visitor and tourist population groups within the City.

One data sources is BC Assessment, who collects housing data annually for all properties in the province for taxation purposes. As part of this collection BC Assessment segments all properties by use type rather than by structure type (as the Census does). From the BC Assessment dataset we can consider the total dwelling stock and its capacity to accommodate people, be they usual residents or part of the City's shadow population.

Further to this, the Census also reports on the scale of the City's total residential dwelling stock (which is a 100% count of all residential structures) and segments it into homes that are occupied by the City's usual resident population and homes that were unoccupied . In this context, the Census also gives some indication of the number of people that could potentially be housed in the unoccupied segment of the City's residential dwelling stock, namely the City's shadow population.

The Tourism Revelstoke Hotel database was consulted to determine the scale of total visitor accommodation and its ability to accommodate visitor and tourist populations within the City. In addition to the number of hotel rooms and beds, the number of registered short term vacation rental (STVR) properties in the city was obtained through the City of Revelstoke's list of business licenses, which along with data obtained through the Revelstoke Accommodation Association, an estimate of the total number of short term vacation rentals can be made.

Finally, to validate the range of current population counts and estimates for the City's resident population from the Census, BC Stats, the Ministry of Finance and most recently Telus Insights, a variety of consumption- and finance-related datasets were used to benchmark Revelstoke's population against other non-resort communities within the province. These elements ranged from water consumption and sewer services, to spending on waste, recycling and protective services, as well as ICBC automobile registrations. Some of these datasets (specifically the level of water treatment and consumption) were also used to gauge annual variance in the City's total peak population due to seasonality through the winter months.

The results of this benchmarking have been included as Appendix I and showed that once adjusted for a net Census undercount (as is done for the BC Stats estimates and projections), estimates of the City's usual resident population should be in the range of 8,200 residents. Estimates above or below this level pushed many of the benchmark measures beyond a reasonable scope of variance when compared to non-resort communities within the province.

With respect to annual variance in total peak population through the winter months, tracking monthly water treatment volume data from the past 4 years showed that from low months of production and consumption (typically November) volumes increased by roughly 15% above this level moving into the month of March. As this is not a time associated with increased consumption or production due to non-personal consumption usage such as garden and lawn watering, this variance in large part can be associated with the seasonality in population and its associated personal consumption. As indicated above, for more details on the benchmarking or seasonality analyses, please see Appendix I.

historical growth & change

THE CITY'S USUAL RESIDENT POPULATION

Statistics Canada conducts Census counts every five years with the aim of producing counts for the population of Canada and its communities. The target population counted by Statistics Canada consists of Canadian citizens (by birth or by naturalization), landed immigrants (permanent residents) and non-permanent residents and their family members living with them here in Canada. Non-permanent residents are further defines as persons who hold a work or study permit, or who are claiming refugee status.[3]

The Census enumerates these target groups according to their usual place of residence, as defined by statistics Canada as where people spend the majority of their time (even if they were temporarily away on Census Day). The Census questionnaire includes questions to determine a person's sole, or main, residence in early May of each Census year. It is through this enumeration process that Statistics Canada reports on a variety of demographic, social, housing, and economic characteristics of Canada's population and is the most comprehensive source of information to consider the demographic and socio-economic characteristics of communities across the country

For a variety of reasons Statistics Canada admits that some people are missed through their enumeration process, either because the household did not receive a questionnaire (for example, if a separate dwelling was not easily identifiable) or because they were not included in the questionnaire completed for the household (for example, the omission of a boarder or a lodger). Some people may also be missed because they have no usual residence and did not spend Census night in a private dwelling (for example those in shelters or the homeless).[4]

After each census collection Statistics Canada conducts rigorous post-Census survey that is matched to other administrative data in order to assess the quality of its population counts. The Reverse Record Check Survey and the Census Overcoverage Study measure, respectively, the number of people missed (and the number of people counted more than once) on census reference day. For the 2016 Census, the net undercoverage rate was 2.4%, similar to the 2.3% rate for the 2011 Census.

Statistics Canada and other statistical agencies (such as BC Stats) use the base Census counts and undercount adjustments as a basis for a variety of other surveys and programs. For example, Statistics Canada uses it to benchmark its Labour Force and Annual Demographic Estimates surveys, both of which are released annually. Similarly, BC Stats uses the Census as a basis from which to compile annual population estimates for all communities within British Columbia.

For the purposes of this report, the primary population group we are considering is defined as:

> *"The City's resident population including Canadian citizens, landed immigrants and non-permanent residents who are counted at their usual place of residence, or where they spend the majority of their time"*

This population group has been defined through this report as the City's usual residents and is distinct from its seasonal shadow or tourist and visitor populations.

The most recent Census counts for the City of Revelstoke from Statistics Canada report a usual resident pop-

ulation of 7,547 in the spring of 2016. Adjusting for an undercoverage rate of 2.4% would put the City's ad-

justed population in the range of 7,728 usual residents for 2016. Relative to the 7,139 residents in 2011, this most recent period saw the City grow by 408 residents, or approximately 5.7%, over the 5 year period (Table 1). This growth is notable if the longer history of population change for the City is considered where a general pattern of slow decline is seen (the exception being 1991 to 1996 when the City added 318 people and grew by 4.1% over the 5-year period). This recent growth period is likely in part being driven a general diversification of the City's economy and in part by the expansion of the Revelstoke Mountain Resort.

That being said, looking farther back to the 1991 to 2011 period, the City saw its population decline by 7.6% while the provincial population grew by 34%. By 2016 the City still had not regained its previous population peak that was seen in the mid 1980s. Using the province as a whole as a point of comparison, while between 2011 and 2016 Revelstoke grew at a similar rate as the province as a whole (5.7% versus 5.6%), all previous periods where the City declined were contrasted by province-wide population growth.

As indicated above, part of BC Stats mandate is to provide annual historical estimates and future projections of population for most communities within the province. Historical estimates are provided **intercensally,** or between each 5-year Census count and are adjusted for net a net census undercoverage.
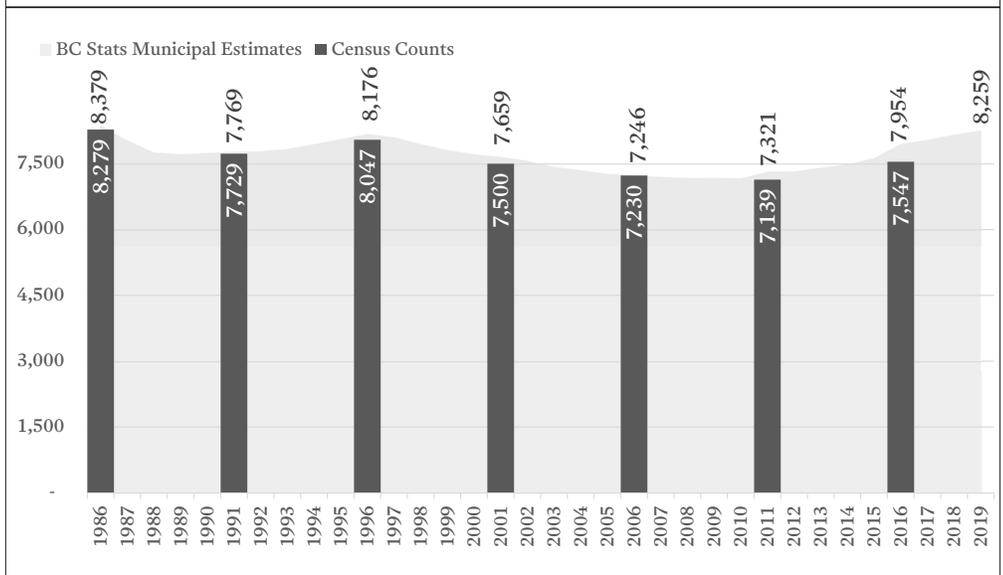
Once adjusted for the undercount, through the post 2016 period the City of Revelstoke is estimated to have grown to 8,259 usual residents by 2019 (Table 1). This represented a growth of 305 residents (or approximately 3.8%) since the Census was conducted in 2016 and compares to the 4.4% growth seen province-wide over the same period.

In looking at the composition of the City's population by age and sex (**Figure 1, page 9**), the City of Revelstoke

⊙ TABLE 1: POPULATION CHANGE, REVELSTOKE & BC

		BC Stats				
		Revelstoke		British Columbia		
	Total Pop	# chg.	% chg.	Total Pop	# chg.	% chg.
2019	8,259	305	3.8%	5,071,336	212,086	4.4%
2016	7,954	633	8.6%	4,859,250	357,146	7.9%
2011	7,321	75	1.0%	4,502,104	260,413	6.1%
2006	7,246	−413	−5.4%	4,241,691	164,810	4.0%
2001	7,659	−518	−6.3%	4,076,881	202,605	5.2%
1996	8,176	407	5.2%	3,874,276	500,812	14.8%
1991	7,769	−610	−7.3%	3,373,464	369,360	12.3%
1986	8,379			3,004,104		

		Census				
					5-yr chg.	
2016	7,547	408	5.7%	4,648,055	247,998	5.6%
2011	7,139	−91	−1.3%	4,400,057	286,570	7.0%
2006	7,230	−270	−3.6%	4,113,487	205,749	5.3%
2001	7,500	−547	−6.8%	3,907,738	183,238	4.9%
1996	8,047	318	4.1%	3,724,500	442,439	13.5%
1991	7,729	−550	−6.6%	3,282,061	398,694	13.8%
1986	8,279			2,883,367		

Legend: ▢ BC Stats Municipal Estimates ■ Census Counts

BC Stats (top values): 8,379 (1986), 7,769 (1991), 8,176 (1996), 7,659 (2001), 7,246 (2006), 7,321 (2011), 7,954 (2016), 8,259 (2019)

Census Counts (bar values): 8,279 (1986), 7,729 (1991), 8,047 (1996), 7,500 (2001), 7,230 (2006), 7,139 (2011), 7,547 (2016)

shows a distinct bulge in its population aged 26 to 40 when compared to BC as a whole. As per the Census counts in 2016 this working-aged population represented 26% of all residents in the city, versus 20% provincially. That being said, the 10 to 25 population is generally underrepresented in the City, comprising 16% versus 18% provincially. A similar underrepresentation is seen for the City's older population as well, with the over 40 population representing 47% of Revelstoke's population versus 53% province-wide.

FIGURE 1: POPULATION BY AGE & SEX, BC & REVELSTOKE

British Columbia - 2016

Revelstoke - 2016

It is interesting to note that the youth population represents a greater share in the City than what is seen provincially. The population under the age of 10 represented 11% of the City's population versus 10% provincially. This greater proportion of kids is reflective of the greater share of residents in the prime family formation and rearing stages of the lifecycle.

Changes in this age composition over time are driven by the typical demographic elements of births, deaths and flow of net migration to and from domestic and international sources. The most overlooked driver to changes in the composition of the local resident population however is perhaps the most simple: the aging of the City's existing resident population.

Figure 2 clearly demonstrates this process: looking at the peak 45 to 49 age group in 2006, this segment would have aged into the 50 to 54 age group 5 years later (in 2011), and then further into the 55 to 59 group by 2016. The decline in size of this group as it aged indicates falling numbers, in part due to net outward mobility of these age groups and in part due to mortality.

On the other hand, consider the peak population in 2016, which was between the ages of 30 and 34. With no bulge preceding it in previous age groups and time periods, this new population bulge emerge as a result of net migration into Revelstoke. To some degree, this trend emerged in the 2011 Census period, as the bulge in the City's late-20s and early-30s population established itself between 2006 and 2011. In addition to giving a sense for
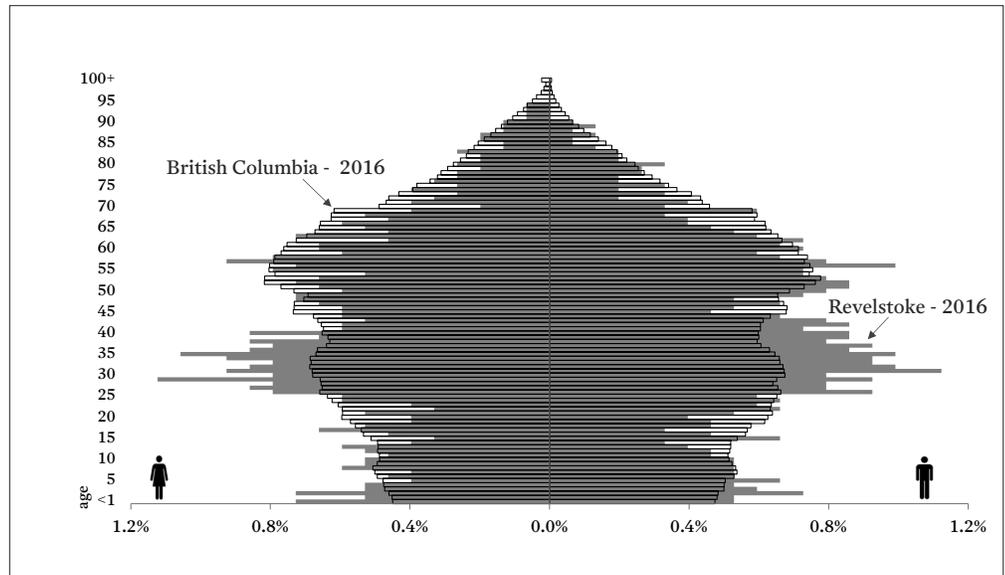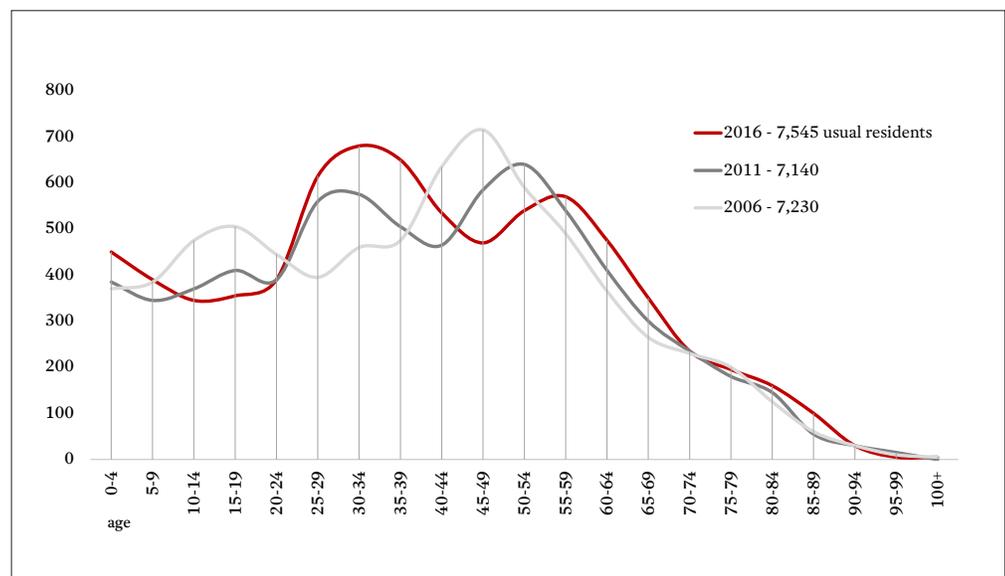
FIGURE 2: POPULATION CHANGE BY AGE, REVELSTOKE

2016 - 7,545 usual residents
2011 - 7,140
2006 - 7,230

overall changes in the City's changing demography, as alluded to above changes in the age profile are indicative of the drivers to change, such as net migration, births and deaths. From a demographic perspective the impact of net migration can be illustrated through tracking population change on a cohort basis rather than by age group.

For example, the cohort approach follows people as they age for example from the 20 to 24 age group to the 25 to 29 group over a five-year period. Grouping together and looking at cohort changes essentially adjusts for the scale of population in a younger age group in a previous time period and their subsequent aging. In this approach positive changes for an age cohort are associated with net in-migration, while negative change is associated with outward migration or mortality.

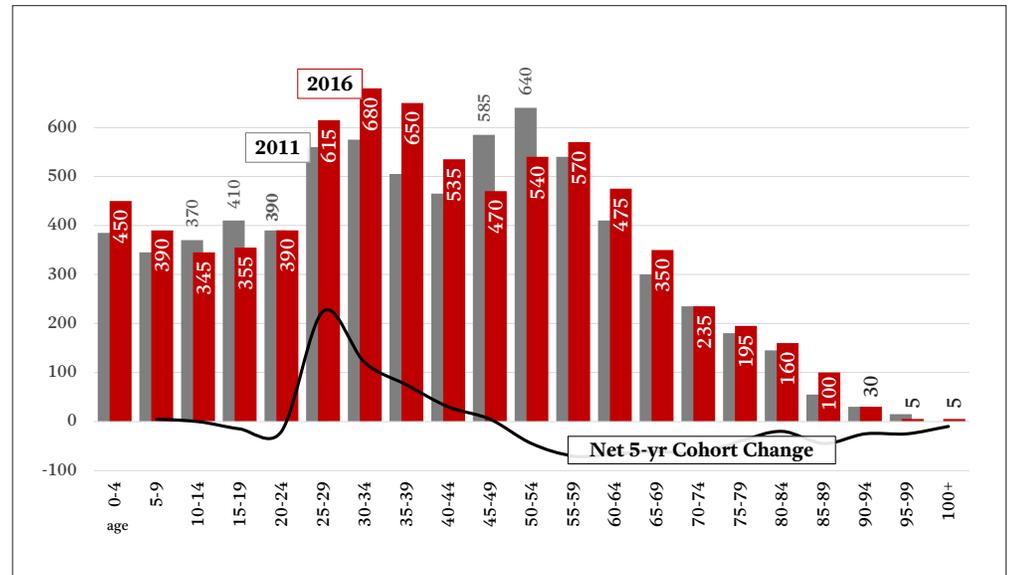FIGURE 3: COHORT CHANGE BY AGE, REVELSTOKE

Figure 3 illustrates this net cohort change for the City of Revelstoke over the last Census period. It shows that over this 5-year period the City gained residents in each of the 20 to 24, 25 to 29, 30 to 34, 35 to 39, 40 to 44 and 45 to 49 age groups. The most significant cohort gain from net migration was the 25 to 29 age group. For example, in 2011 there were only 390 people aged 20 to 24; as these 390 people would have aged into the 25 to 29 age group by 2016 their numbers increased to 615 residents, implying net migration into this age group that would have been in the order of 225 net new residents over the 5-year period.

Net losses were seen for the 15 to 24 population as well as for all groups over the age of 50. While outward migration would typically characterize the younger population as they either move with their parents or out of the parental home for school, work or lifestyle, outward mobility and mortality would characterize changes for the older population.

As part of the Census questionnaire, Statistics Canada also asks residents questions about where they were living one year and five years previously. This mobility status data documents whether people had moved around in the City, moved to Revelstoke from another City in Canada, or from outside Canada. Although it does not track residents who moved out of the City, the Mobility Status question on the Census is another means to gauge the drivers to demographic change within Revelstoke.

Table 2 shows that since 1986, the City has seen an average of approximately 2,961 movers to the city over each 5-year Census period, or approximately 590 movers each

TABLE 2: 5-YEAR MOBILITY STATUS - REVELSTOKE, 1986 - 2016 CENSUS

	1986	1991	1996	2001	2006	2011	2016
5-yr Mobility Pop.	7,520	7,065	7,475	7,030	6,790	6,675	6,990
Non-Movers	4,090	3,550	4,330	4,390	4,080	4,230	4,150
Movers	3,430	3,515	3,150	2,635	2,710	2,445	2,840
Movers from:							
Within Revelstoke	2,005	1,875	1,485	1,490	1,585	1,025	1,390
Within BC	990	1,180	1,190	845	700	760	555
Within Canada	330	425	400	180	365	525	665
Outside Canada	105	35	75	120	60	135	230

year (note again that this includes just those moving around within or into the City, and does not account for those that moved out).

Traditionally the majority of movers in Revelstoke have been people changing residences within the City, averaging more than 1,550 people over each 5-year period.

Of those who moved to the City, the largest share came from elsewhere within the province of BC, averaging almost 900 people over each 5-year period. Those moving to the City from other provinces in Canada averaged just over 400 people, while those moving from international origins averaged around 100 people over each 5-year Census period back to 1986.

It is interesting to note that the 2016 Census saw a bit of a shift in migration trends as the largest contributor of new migrants to the City of Revelstoke years was people moving from elsewhere in Canada rather than from elsewhere in BC. People moving to the City from outside Canada also saw an increase over this most recent period; the 230 movers from outside Canada is more than double the City's historical average going back to 1986. This would suggest that in recent years Revelstoke has gained increasing recognition and begun to attract a greater portion of out-of-province and international migrants. As indicated previously, is likely in part due general growth and diversification of the City's economy and in part to the expansion of the Revelstoke Mountain Resort.

HOUSING

OCCUPIED DWELLINGS

The number of dwellings in the City can be considered through a variety of data sources. In order to consider ties to the socio-economic composition of occupants in the City's housing, the Census is typically the first source considered. In 2016 the Census enumerators counted a total of 3,530 private dwellings in the City (Table 3). Of these private dwellings, 3,250 of them were occupied by usual residents (as previously defined).

The total number of occupied dwellings in the City of Revelstoke has historically seen minimal fluctuation, ranging from a low of 2,925 dwellings in 1991 to 3,250 in 2016 (Figure 4). Single family/mobile dwellings have increased from 2,275 dwellings in 1991 and 2,520 dwellings in 2016, attached/row from 245 to 330 and apartments from 320 to 455 dwellings.

In terms of the composition of housing, traditional single family housing formats comprise the majority of the City's dwellings. As of 2016, single family/mobile dwellings comprised 78% of all dwellings in the City of Revelstoke. Of these, the majority were single detached homes (90% or 2,195 of 2,435). Attached forms of housing represented a much smaller share, with row/duplex and apartment dwellings representing 10% and 12% respectively (330 and 400 homes respectively).

Since 1991 the stock of occupied housing in the City has increased by 11% or a total of 330 homes. More than three quarters (76%) of this increase was in single family homes (250 units), with attached/row increasing by 75 units. Although the number of occupied apartment units over this longer period saw little change, the most recent period saw the number of occupied apartments grow by 80 homes.
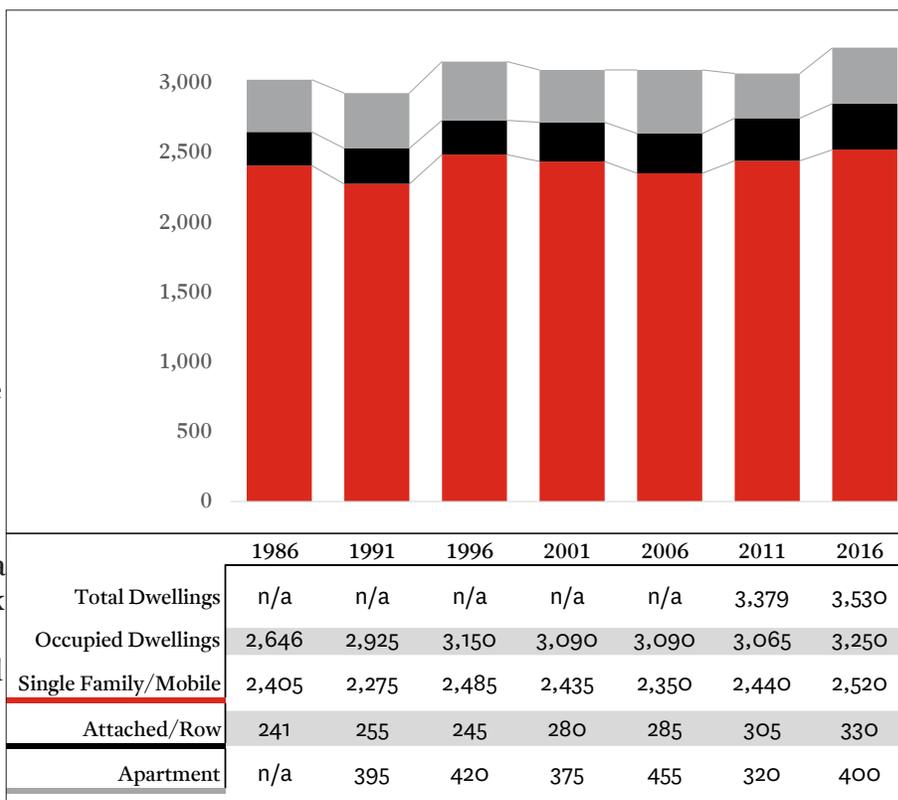
UNOCCUPIED DWELLINGS

In addition to the 3,250 occupied dwellings reported on the Census in 2016, the Census reported an additional 230 dwellings that were unoccupied in May of 2016. Of these 230 dwellings, 85 were single family detached dwellings, 70 were for attached (row or duplex) dwellings, and 85 unoccupied apartment dwellings.

For the purposes of this report, it is important to reiterate how Statistics Canada determines the scale of the dwelling stock with the City. In order to determine the number of both occupied and unoccupied dwellings, Statistics Canada uses an Address Register (AR) to verify and update all addresses in Canada. The verification of the Address Register is done by com-

⟩ **TABLE 3: HOUSING STOCK - REVELSTOKE, 2016 CENSUS**

	Total	Single-detached	Attached (row/duplex)	Apartment
Total - Private dwellings	3,530	2,155	880	495
Occupied by usual residents	3,250	2,045	805	400
Occupied by foreign/temp.-res.	50	25	10	10
Unoccupied	230	85	70	85

⟩ **FIGURE 4: HOUSING FORMS - CITY OF REVELSTOKE, 1986-2016**

	1986	1991	1996	2001	2006	2011	2016
Total Dwellings	n/a	n/a	n/a	n/a	n/a	3,379	3,530
Occupied Dwellings	2,646	2,925	3,150	3,090	3,090	3,065	3,250
Single Family/Mobile	2,405	2,275	2,485	2,435	2,350	2,440	2,520
Attached/Row	241	255	245	280	285	305	330
Apartment	n/a	395	420	375	455	320	400

piling a variety of record files such as telephone billing files (landlines and cells), telephone directory files, tax files, Canada Post address lists and provincial assessment files, among others. The Address Register provides the basis upon which a variety of surveys done by Statistics Canada, such as the Census survey of population, can be conducted.[5]

The census of population is the largest survey that uses the Address Register and conducts Visitation Record (VR) and Dwelling Classification Surveys (DCS) to confirm and update the addresses in the Address Register. The Visitation Record is used to list every occupied and unoccupied private or collective dwelling, agricultural operation and agricultural operator in the areas of the country where a list of dwellings is created before the survey questionnaires are delivered and thereby represents a 100% count of dwellings in Canada.[6]

THE JOBS

In considering the composition of employment in Revelstoke, two dimensions can be measured: employment by place of residence (POR) and employment by place of work (POW). In terms of the number of jobs tabulated for the city's residents (POR), the Census shows that over the past decade the number of Revelstoke residents in the labour force grew to 4,415, 245 more than reported in 2006, or at an average annual rate of 0.6% per year over the decade. As with the pattern of population growth, this labour force growth was all seen between 2011 and 2016, pushing the annual growth in the City's active labour force to 1.4% per year.

When the number of jobs at a place of work in the city are considered (POW), 2016 reported 3,545 jobs at a usual place of work in the City (3,305 outside of the home and 240 at home). This indicates that a number of people living in the city (870) are either working with no fixed workplace address (for example some contractors, truck drivers or real estate agents) or live in the City and work somewhere throughout the rest of the province, country or abroad.

⟩ **FIGURE 5: JOBS IN THE CITY OF REVELSTOKE, 2006 & 2016**

	Educ. & health	Trade	Prof.& business svcs.	Constr-uction	Manuf-acturing	Accom. & food	Transport & warehousing	Arts & culture	Finance, ins. & real estate	Public admin.	Primary
absolute growth	60	-110	35	5	-110	80	-145	175	10	-20	-10
relative growth	+11%	-22%	+16%	+2%	-23%	+15%	-34%	+66%	+8%	-11%	-11%

⟩ **FIGURE 6: JOBS BY INDUSTRY SECTOR, REVELSTOKE, 2016**

Over the past decade the Census shows jobs at a usual place of work was relatively static (a loss of 30 jobs over the decade), but increased by 105 jobs between 2011 and 2016, meaning the city's job base grew at an average annual rate of 0.6% between 2011 and 2016.

Over the past decade the sectors that saw their job base grow most rapidly were in the arts & cultural industries (+66%) and in professional & business services (+16%).

In terms of the composition of the city's overall jobs base, Revelstoke is relatively consistent with the rest of BC, though there are a few notable differences. The most notable of these is in the accommodation and food sectors where Revelstoke comprised almost double the province-wide share (17% versus 9%). The City also showed significant competitive advantage in the arts and cultural sectors, as it represented 12% of its job base versus only 7% provincially. On the other hand, the city was under-represented in sectors such as trade (11% in the City versus 17% provincially), education, health & culture (17% locally versus 23% provincially) and professional and business services (7% versus 12%).

Overall in 2016 the Education, Health and Culture and Accommodation & Food industries comprised the two largest sectors in the city, each representing 17% of all jobs. The next most prevalent sectors were Art & Culture (12%) and Trade (Retail & Wholesale), at 11%).

projections to 2041

REVELSTOKE'S USUAL RESIDENTS

As previously noted, in addition to producing annual population estimates for BC communities, BC Stats compiles age specific projections of usual residents for Health Authorities throughout the province of British Columbia. BC Stats uses a component/cohort-Survival methodology to project future population by age and sex. This method of projecting future population accounts for the aging, births, deaths and migration by age of the most recent estimates of usual resident population.[7]

BC Stats compiles these age-specific population projections for the Revelstoke Local Health Area (LHA), a geography that is slightly larger than the municipality itself. The 2016 Census showed that the City of Revelstoke accounted for 93% (7,545 residents) of the Revelstoke LHA's Census population of 8,070 residents (LHA 141).

In order to standardize BC Stats projections for the Revelstoke Local Health Area to the City of Revelstoke, historical Census data on the City's share of the LHA population by 5-year age group was applied to the age specific projection of population for the Local Health Area. For example, Census data show that while the City holds 93% of the total LHA population, the City was home to 96% of the Health Area's 40 to 44 year old population and 89% of its 60 to 64 aged population. Segmenting the population in this manner recognizes both the unique composition of the City's population as well as compositional changes expected for the Health Area.

In considering the BC Stats most recent PEOPLE 2020 projections, the outlook showed a 20% decline in the prime working aged 20 to 44 aged population in th City between 2019 and 2041. As a result, three scenarios (BC Stats, Baseline and High) were tabulated for the City's future usual resident population. The BC Stats scenario would represent a low projection for the City over the coming 22 years, achieving only 0.06% of provincial net migration expected by BC Stats. The Baseline scenario represents an increased labour scenario where the City's annual share of future provincial net migration increases to 0.14% from 0.06% annually under the baseline projection. This share of provincial net migration generally represents what the City has experienced over the past decade.

The High scenario would see the City's share of net provincial migration increase further to 0.15% over the projection period. This would be representative of the more robust period of migration and population growth experienced in the City over the most recent five years.

In both cases, increased levels of net migration are distributed into the population based on the 5-year mobility status data from the 2016 and previous Census counts for the City, where the additions fell predominantly under the age

FIGURE 7: PROJECTED USUAL POPULATION, CITY OF REVELSTOKE (BASELINE)

--- annual growth rate
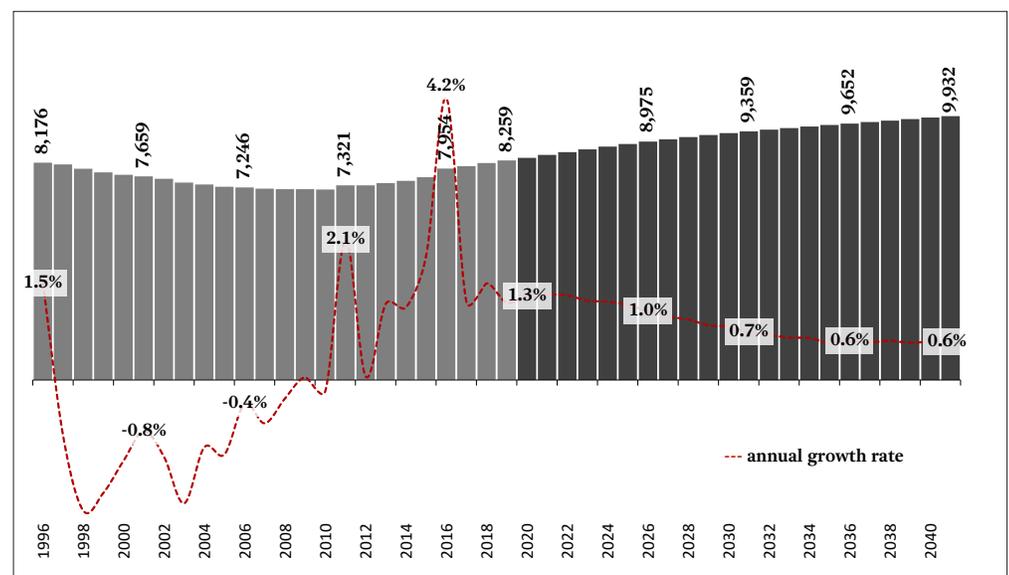
of 35. Summing the output from these calculation each year results in the projection of annual population growth for the City under each scenario.

The Baseline projection shows the City's population growing from an estimated 8,259 usual residents in 2019 to just over 9,359 usual residents by 2031 and further to 89,932 by 2041 (Figure 7, page 15). This would see the City grow by 1,673 new usual residents over the next 22 years, or by an average of 0.8% per annum.

From a historical perspective, the previous 22 years (1997 to 2019) saw the City grow by only 151 residents, or by 0.1% per annum. That being said, this was characterized by periods of absolute population decline in the early and mid 2000s. Figure 7 shows the post 2010 period was a period of growth when the City grew by almost 1,100 new residents and averaged annual growth of 1.6% each year. As indicated previously, this most recent period is representative of a new period of growth for the City driven in part by a growing tourism and recreation based economy and in part by the continued diversification of economic activity away from traditional primary sector and resource based activities.

FIGURE 8: COMPONENTS OF POPULATION GROWTH, REVELSTOKE (BASELINE)

Within this context, it is important to note that average annual growth under the baseline scenario is expected to slow over the longer term from the 1.0% range currently towards 0.6% by the end of the projection period. This slowing rate of resident population growth is in large part explained by the demographics of our aging populations nationally and provincially. Slowing growth rates are also seen when demographically based projections are considered for these broader geographies.

The driver to slowing pace of growth for the City is illustrated in Figure 8 where natural increase (the annual difference between births and deaths) is expected to go from adding to the City's population to subtracting people from it by the mid-2020s. This is the result of the annual number of deaths outweigh the number of births in the City. This is also seen at the provincial level where natural increase becomes natural decrease by 2030, driving the provincial growth rate to fall from the current range of 1.2% annually to 0.7% by 2041.

Net migration however is expected to continue to add to the City's population over the coming two decades, adding an average of 30-40 net new people to the City each year under the Baseline projection. While this falls below the estimate of an average of almost 90 net new residents that were seen each year since 2010, it is well above the average of the previous decade when the City lost an average of 81 people per year through net migration.

On an age specific basis, relative to the 9% growth expected for the overall population in the City over the next 22 years, the 65 plus age group is expected to grow most significantly, both in absolute and relative terms: this group is expected to grow by more than 40% by 2041 or by more than 525 residents. While some migration will be seen in these older age groups, it is important to recognize that much of this growth will be driven by aging of the City's existing residents into these older age groups over the next 22 years.

The 20 to 64 age group is also projected to grow, albeit more modestly. This working aged population is
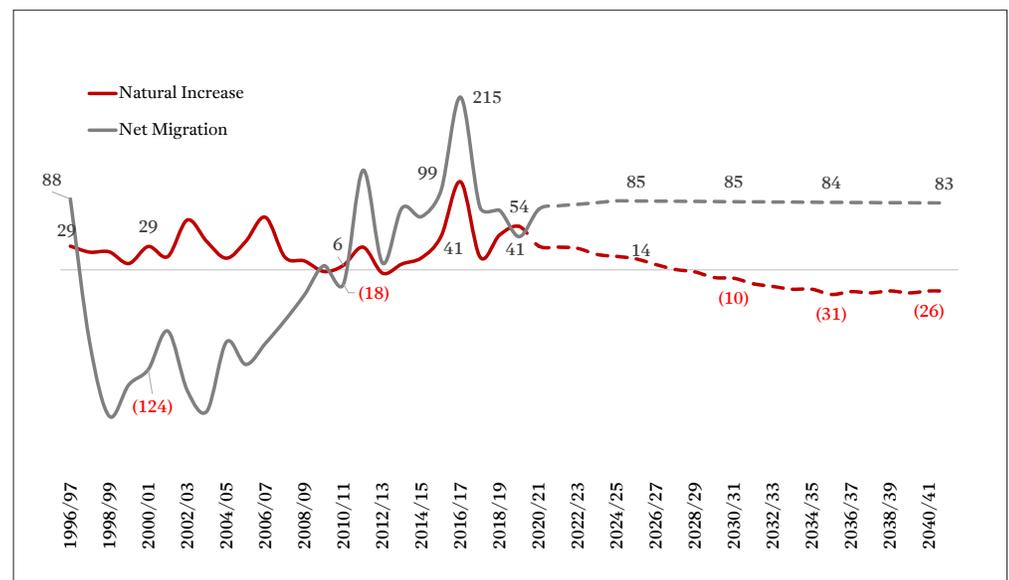
expected to grow by 155 new residents over the next decade (2.9% growth relative to 2019) under the Baseline projection.

The under 20 age groups on the other hand are expected to see slight increases in the Baseline projection. Relative to 2019 the City's youth population is expected to decline by 23 residents, or by 1.5%. Given the longer term outlook, some of this decline will be driven by low fertility rates as well as a greater share of the City's population aging out of the family formation stages of the lifecycle.

In terms of the shifts in the overall age composition in the city, the share of residents in the prime 20 to 44 aged family formation stage of the lifecycle is expected to decline from a peak of 41% in 2018 to only 29% by the end of the projection period. This will in large part be driven by the aging of the City's existing resident population over the coming two decades from family formation to empty nester and early retirement stages of the lifecycle.

FIGURE 9: PROJECTED USUAL RESIDENTS BY AGE, REVELSTOKE (BASELINE)

These shifts can be seen in Figure 9: by tracking the City's current 30 to 34 aged population bulge in 2019 to 2041 when they will be between the ages of 50 and 54. The implications of population aging are also evident on the outlook for the older age groups where the share of the City's population 65 and older is expected to increase from 15% currently to 20% by 2041.

It is important to note that the baseline projection presents one potential outlook for the City's future usual resident population. To the degree that the City continues to diversify its local economy and establish itself as a migration destination for usual residents as well as a recreation destination for visitors, it could garner an even greater share of net migration than outlined under the Baseline or BC Stats scenarios. A potential High scenario where Revelstoke achieves a 0.15% share of BC net migration is also included in Figure 10.

That being said, given some of the shorter term implications for the travel and tourism sector pre-sented by the current COVID 19 pandemic, the City could also see several years of suppressed eco-nomic activity that could result in slower job and population growth than these scenarios. As such a Low has been included as the BC Stats scenario in Figure 10.
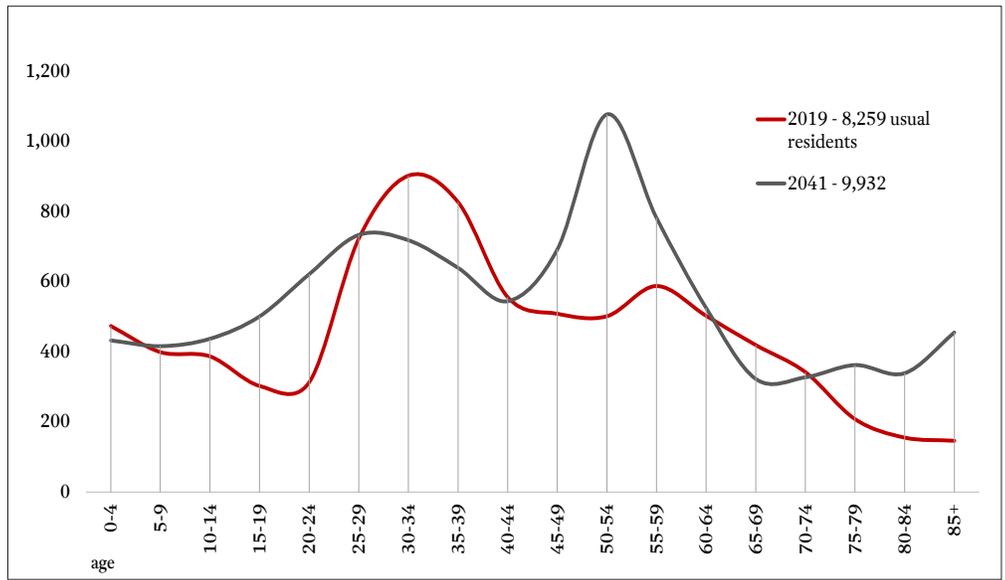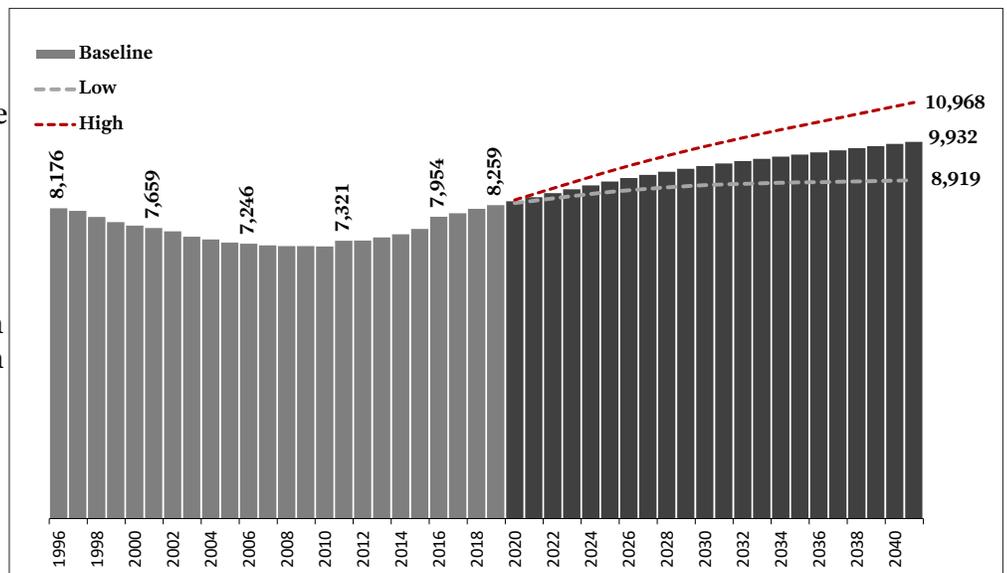

FIGURE 10: USUAL RESIDENT POPULATION SCENARIOS, REVELSTOKE

Recognizing this range of perspectives, the baseline projection for the City's future usual resident population provides a reasonable outlook for the City, allowing its labour force and hence employment base to grow and expand over the coming years. Within the context of economic diversification an growth and growth of Revelstoke Mountain Resort , more potential upside could exist to the longer-term outlook for the City of Revelstoke than downside.

OCCUPIED PRIVATE HOUSING OUTLOOK

THE LIFECYCLE OF HOUSING OCCUPANCY

In moving from the outlook of growth and change for the City's usual resident population to that of the housing required to accommodate them, a demographic approach has been adopted that allows the housing implications of both a growing and a changing population to be addressed.

The link between demographics and housing can be represented through what are called *household maintainer rates*, or the proportion of the population in an age group that identifies themselves as being the person who is primarily responsible for the finances of the household on their Census questionnaire (the primary household maintainer).

Considering primary household maintainer rates on an age-specific basis yields what is referred to as the lifecycle pattern of housing occupancy. Table 4 shows this pattern for the City of Revelstoke, where the youngest age group (those under 25 years of age) saw only 18% of residents indicating they maintained their own household. The remaining 82% either lived with their parents (one of whom identified themselves as being the primary maintainer), or with room mates (where someone else in the household identified themselves as being the primary maintainer).

From this point, the share of people identifying as being a primary maintainer more than doubles (to 41% for those aged 25 to 34) as people enter the next lifecycle phases of going to school, starting new jobs, or beginning families. It is this lifecycle transition were this group predominantly forms new households of their own.

Further to this, rates increase again to between 55% and 62% for residents between the ages of 35 and 74 years and peak at 73% in the 75 to 84 age group before declining to 63% for residents 85 years of age and older. This lifecycle transition is when elderly residents begin to move from being a primary household maintainer to either living in other forms of housing (such as seniors' residences) or living with their adult kids (who are the primary maintainers).

This lifecycle pattern can be considered by structural type of dwelling (for example, for ground oriented homes or apartments) or by household tenure type (rented or owned). Doing so illustrates not only

⊙〉 **TABLE 4: PROJECTED MAINTAINER RATES, REVELSTOKE**

	Total 2016	2031	2041	Apartment 2016	2031	2041	Ground Oriented 2016	2031	2041	Owner Occupied 2016	2031	2041	Tenant Occupied 2016	2031	2041
<25	18.2%	17.7%	17.6%	6.1%	6.0%	6.0%	12.2%	11.7%	11.6%	5.4%	5.2%	5.2%	12.8%	12.5%	12.4%
25..34	41.3%	39.8%	39.4%	3.5%	4.2%	4.3%	37.8%	35.7%	35.1%	23.2%	21.2%	20.7%	18.1%	18.6%	18.7%
35..44	55.5%	57.5%	58.1%	4.6%	4.8%	4.8%	50.8%	52.7%	53.3%	39.9%	40.1%	40.1%	15.5%	17.4%	17.9%
45..54	58.4%	58.0%	57.9%	5.9%	6.0%	6.0%	52.5%	52.0%	51.9%	45.0%	44.2%	43.9%	13.4%	13.8%	14.0%
55..64	62.0%	62.5%	62.6%	5.8%	6.0%	6.0%	56.3%	56.5%	56.6%	49.0%	49.0%	49.0%	13.0%	13.4%	13.6%
65..74	61.5%	61.1%	61.0%	10.3%	10.2%	10.2%	51.3%	50.9%	50.8%	49.6%	49.4%	49.3%	12.0%	11.7%	11.7%
75..84	73.2%	74.3%	74.6%	11.3%	11.4%	11.5%	62.0%	62.9%	63.1%	60.6%	60.9%	61.0%	12.7%	13.4%	13.6%
85+	63.0%	63.9%	64.1%	22.2%	22.5%	22.6%	40.7%	41.3%	41.5%	44.4%	44.6%	44.7%	18.5%	19.2%	19.4%

the pattern of overall household formation, but how these patterns shift with age as some move from apartments to ground oriented homes, or from owning to downsizing and renting. (For clarity, apartments are defined as any private dwelling that shares a common corridor entrance, while ground oriented comprises traditional single detached homes, row houses and townhomes and mobile homes).

The pattern of household formation by structural type and tenure is also shown in Table 4, and shows that apartment maintainer rates are highest in the younger and older age groups, lifecycle stages that are generally associated with relatively smaller household sizes. In contrast, ground oriented maintainer rates are highest through the family-formation and rearing stages of the lifecycle where household sizes are generally larger as families grow.

From a tenure perspective, the role that rental plays as an entry point to into the private dwelling stock for young people is clearly evident: for each of the under-30 age groups, rental maintainer rates far exceed those for owner-occupancy. This is a pattern characterized by the desire for a higher degree of mobility for education, labour market opportunities or lifestyle choice. That being said, ownership maintainer rates predominate through the family-formation and family-rearing stages of the lifecycle (much like those for ground oriented homes).

In looking to how these lifecycle patterns may change in the future, three general trends can be identified. The first is a continued, but curtailed, increase in the proportion of individuals in the youngest age cohorts choosing to remain in the familial home, pursuing higher education, labour force, or lifestyle opportunities. This pattern is evident through the historical data as 58% of British Columbia's residents aged 20 to 24 were still living with their parents in 2016, up from 47% two decades earlier. Similarly, 27% of BC's 25 to 29 year olds were still living at home in 2016 (up from only 16% two decades earlier). further to this, 11% of BC's 30 to 39 population were also still in the parental home.

The second trend is a continued increases in life expectancy (and particularly disability-free life expectancy) and associated increases in independent living for the seniors' population. Healthier, longer lives will continue to broaden the range of housing choice expressed by this segment of the City's population. From current levels of life expectancy that are in the range of 84 years at birth for females and 81 years for males, trends in declining mortality rares would point towards life expectancies in the range of 86 years for females by 2041 and 83 years for males.

Another interesting shift in life expectancies that will have a potential impact on housing is the declining gap between male and female life expectancies. For many, housing lifecycle transitions through the elderly stages are initiated by the death of a spouse; to the degree that elderly couples are able to live longer together in the future, this may delay the point at which the transition from private to other forms of housing, such as seniors' accommodation, occurs.

And lastly, maintainer rates through the family-rearing stages of the lifecycle (namely the 35 to 64 age groups) are expected to be characterized by relative stability, as patterns of family formation and rearing are expected to remain relatively constant in the coming years.

Based on these three general trends, Table 4 also illustrates the shifts that could be expected in the lifecycle pattern of maintaining a home in Revelstoke in the coming years. To determine the future housing requirements of the city's existing usual residents as they grow and age as well as the newcomers who call the City home, trends in these lifecycle housing patterns are applied to the age-specific outlook for the city's usual residents under each scenario.

Within this demographic approach, the difference in total housing occupancy from one year to the next represents net growth in the city's housing stock required to accommodate both net additions to the City's population as well as shifts in its underlying composition.

GROWTH & CHANGE IN REVELSTOKE'S OCCUPIED DWELLING STOCK

Over the next decade (2019 to 2031) the Baseline projection for usual resident population would see the housing stock in the City grow from 3,646 occupied units in 2019 to approximately 4,200 by 2031. Put another way, in order to accommodate the thirteen percent projected growth in the city's population and changes in its composition by 2031, the city's housing stock would have to grow by almost 560 homes (15% growth). The following decade (2031 to 2041) would see the housing stock grow from 4,200 to 4,513, as an additional 313 net new homes would be required between 2031 - 2041.

Annual net additions to the city's housing stock would therefore need to average 46 units over the next 12 years (to 2031), and 31 per year over the following decade to accommodate the growing and changing population under the Baseline scenario.

Of this additional demand, given the strong orientation towards ground oriented accommodation, the bulk of additional housing would be in more traditional ground oriented formats, with almost 681 additions needed over the next 22 years (2019 - 2041, Figure 11).

That being said, apartments would comprise a growing share of the City's housing stock, representing about 21% of additional future demand. This would see the City's share of apartments increase from 12% today to 14% by 2041 as 186 additional units would need to be added in the city to accommodate projected demand to 2041.

FIGURE 11: USUAL RESIDENT & HOUSING ADDITIONS, 2019-2041 (BASELINE)
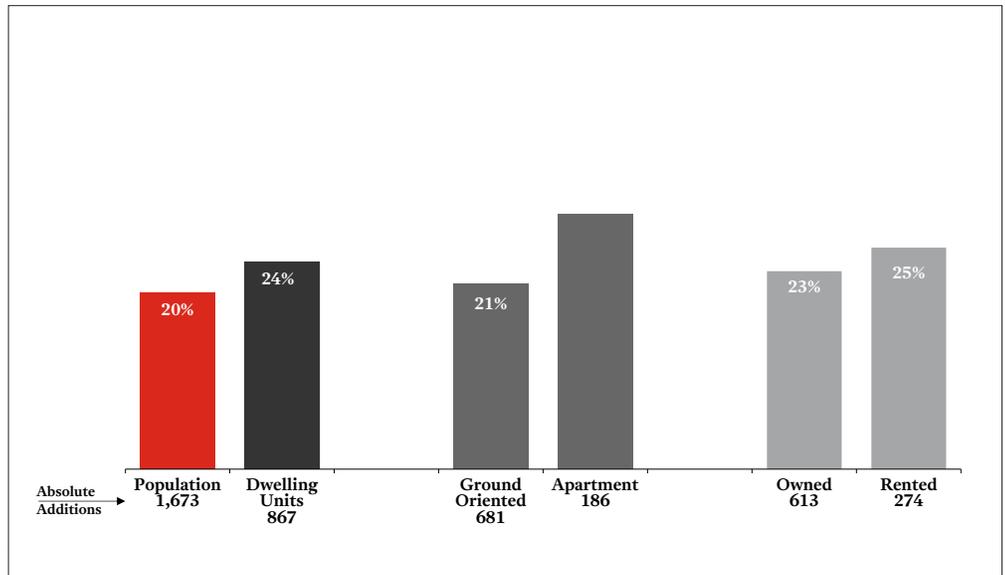
TABLE 5: POPULATION & HOUSING OUTLOOK, REVELSTOKE

	low		baseline		high	
	pop.	housing	pop.	housing	pop.	housing
2016	7,954	3,485	7,954	3,485	7,954	3,485
2019	8,259	3,646	8,259	3,646	8,259	3,646
2031	8,809	4,012	9,359	4,200	9,924	4,392
2041	8,919	4,168	9,932	4,513	10,968	4,865
% chg	8.0%	14.3%	20.3%	23.8%	32.8%	33.4%
# chg	660	522	1,673	867	2,709	1,219
avg/yr	30	24	76	39	123	55

(2019...2041)

With almost three-quarters of the city's existing housing stock being in the ownership side of the market, much like detached housing, owner-occupancy is expected to prevail in the coming years. Over the next 12 years, of the 560-unit growth in total housing occupancy demand, three-quarters is expected to be in owned formats (410 net new units, or 34 per year), with almost 150 expected as rental units (12 units per year). Over the following decade, of the 313-unit increase in demand, 189 net new units are expected to be in ownership formats (roughly 19 per year), and 124 as rental (12 units per year).

other population groups

As indicated throughout the report, long-range projections are typically used to assess a variety of infrastructure, engineering and planning requirements, and a future assessment of other population groups that may be found in the City is required. As a significant portion of the City's economy is focused on the travel and tourism sector, it experiences seasonal fluctuations in certain population groups that may not be experienced by other cities, nor captured in traditional population counts. These two populations include the City's shadow population (residents who may not be captured in traditional counts), and its tourism and visitor-related populations. The approach to considering the potential scale of each of these population groups is considered below before an assessment of total peak population for the City is made.

SHADOW POPULATION

As outlined in the Census section, in addition to the 3,250 dwellings occupied by usual residents in 2016, the Census also reported an additional 230 dwellings that were unoccupied in May of 2016. Of these 230 dwellings, 85 were single family detached dwellings, 70 were attached (row or duplex), and 85 were apartments. In using average structure-type specific person per dwelling unit data for the City, this dwelling stock has the potential accommodated an additional 530 people. By 2019 it is estimated that the scale of population accommodated in the unoccupied housing stock could have reached 560 people.

As the usual resident population, occupied dwelling stock and job base grows in the City in the coming years, the shadow population will also likely grow along with it. Based on the baseline growth scenario for the occupied dwelling stock outlined above, assuming the share of unoccupied to occupied units in the City remains constant over the projection period, the shadow population could grow from an estimated 560 people in 2019 to almost 650 by 2031 and further to just over 700 by 2041.

HOTEL UNITS

Another contributor to the potential peak population in Revelstoke is the visitor population staying in hotels and other accommodations. While these visitors do not stay in the city for periods of time long enough to be considered usual residents or shadow population, they are represent a functioning component of the City's population that will have implications for a variety of long-range planning and engineering initiatives.

⊙ **TABLE 6: HOTEL BEDS IN THE CITY OF REVELSTOKE**

Bed Type	Count	@ 65%	Persons (up to)	Potential Guests
Cot/Sofa	328	505	1	505
Single	155	238	1	238
Double	84	129	2	258
Queen	1,268	1,951	2	3,902
King	593	912	2	1,825
Total	2,428	3,735		6,728

Data obtained from Tourism Revelstoke suggest that there are upwards of 1,190 hotel rooms in the City of Revelstoke, representing a total of 2,428 beds of various sizes (Table 6). These 1,190 rooms are representative of hotels using the Smith Travel Research benchmarking tool, of which Tourism Revelstoke estimates 65% of the hotels in the City use. Based on this estimate, the City of Revelstoke's total hotel capacity is likely in the range of 1,831 hotel rooms. Under the assumption that the remaining 35% of hotels not accounted for on the Smith Travel Research benchmarking tool have the same or a similar composition of bed types, this would represent in the order of 3,735 total beds.

In moving from rooms and beds to an assessment of total potential visitors, the composition of bed-types

was considered and was estimated that upwards of 6,728 guests could be accommodated at any given point in time (Table 6). In addition to the existing hotel stock, there are an additional 325 rooms currently planned or under construction in the city of Revelstoke, which would add an additional 585 potential visitors based on the hotel's average of 1.8 guests per room.

This number is however a maximum based on 100% occupancy of all bed types. Data from the Revelstoke Accommodation Association suggests that the annual occupancy rates for hotel rooms in the City is 60%, while Tourism Revelstoke reports an annual occupancy rate of 62%, with peak occupancy in August over the last 4 years being 86% (on average).

Given these occupancy rates, reasonable estimate would range between 62% and 86% occupancy, suggesting that between 4,171 and 5,786 visitors could occupy the City's hotel rooms at any point in time.

As noted previously however, a 100% occupancy rate for all hotel and STVRs is not a probable scenario for the City. In looking at the occupancy rates reported by the Revelstoke Accommodation Association and Tourism Revelstoke, a 62.3% occupancy rate is a more realistic scenario over the course of a year, peaking at approximately 85.8%. In Table 8 we've applied these occupancy rates to the current hotel and STVR accommodation stock to give a range of occupancy scenarios.

The occupancy rate range is based on the average monthly occupancy rates over the past 4 years. The low occupancy rate (34.8%) is the average rate for November, while the high (85.8%) is the average occupancy over the past 4 Augusts (2016-2019).

SHORT TERM RENTAL UNITS

In addition to traditional hotel rooms, there are also a number of short term vacation rentals (STVR) in the City which offer housing for visitors to the City. Such rentals are typically managed through sites like AirBnB and VRBO which offer alternative accommodations within the City.

Data provided by Destination BC and AirDNA suggest that there were approximately 400 STVR dwellings in Revelstoke (Table 7). In using the Revelstoke Accommodation Association's estimate of 2.5 bedrooms per dwelling (and one bed per bedroom), this would suggest that there could be an additional 1,000 visitor/tourist beds available in the City. As there is no data available regarding how many beds are in each STVR, we can estimate a range based on the hotel data, given that a maximum persons per room would be estimated based on the number of guests per hotel room (3.7), and the minimum being the number of guests per hotel bed (1.8). Using these estimates, the potential number of visitors in STVRs at any given point in time could range between 1,801 and 3,675 people. Similar to the hotel room data, this would represent a maximum based on 100% occupancy. Reducing this peak by average hotel occupancy rates of 62%-86% would suggest between 1,117 and 3,161 visitors in short term vacation rentals at any given point in time.

⊙ **TABLE 7: SHORT TERM VACATION RENTALS, REVELSTOKE**

Short Term Vacation Rentals	Registered	Estimated
# of STVRs	102	400
2.5 rooms/property	3	3
Bedrooms	255	1,000
People per room	2	2
Potential Visitors in STVRs	510	2,000

⊙ **TABLE 8: OCCUPANCY SCENARIOS FOR VISITOR ACCOM.**

	Low 34.8%	Average 62.3%	High 85.8%	Full 100%
Hotel Guests	2,342	4,195	5,771	6,728
STVR Guests	696	1,247	1,716	2,000
Total	3,038	5,442	7,487	8,728

total peak population

The combination of current and projected populations of the usual residents, shadow population as well as tourists brings us to an assessment of total potential peak population for the City. As outlined above, there are a number of scenarios presented for Revelstoke's future usual resident population. BC Stats' projections see the usual resident population of Revelstoke increase from 8,259 in 2019 to 8,919 in 2041.

This projection from BC Stats represents a relatively conservative estimate for the City, and showed a decline in the general working age population over the projection period. The Baseline projection would see the City of Revelstoke's usual residents increase to 9,932 by 2041. The High scenario for the City would result in a total population of 10,968 usual residents by 2041.

As the usual resident population and occupied dwelling stock grows in the City in the coming years, the shadow population will also likely grow and is estimated to increase from 556 people in 2019 to almost 650 by 2031, and further to 703 by 2041.

⊙ **TABLE 9: TOTAL PEAK POPULATION**

	2019	2041					
		low	change	baseline	change	high	change
usual residents	8,259	8,919	*660*	9,932	*1,673*	10,968	*2,709*
shadow population	556	651	*95*	703	*148*	757	*201*
peak tourists	8,728	10,041	*1,313*	10,041	*1,313*	10,041	*1,313*
total peak population	17,542	19,610	*2,068*	20,676	*3,134*	21,765	*4,223*

The usual resident and shadow population in the City would therefore grow from 8,815 in 2019 to between 9,570 and 11,725 people by 2041.

Based on the 2019 hotel room and short term vacation rental (STVR) inventory, the City of Revelstoke could currently accommodate up to a total of 8,728 guests. Again, this is a capacity as opposed to an occupancy trend, and would require every room to be occupied with as many people as it can sleep. If we looked at the average monthly occupancy rate from 2016 to 2019 (62.3%), this would suggest a more realistic capacity of 5,442 with every occupied room accommodating as many guests as it can sleep.

In sum, the total peak population in the City of Revelstoke as of 2019 would be upwards of 17,542 people, comprised of 8,259 usual residents, a shadow population of 556 people, and 8,728 potential visitor/tourists. In looking out to 2041, the City's peak population could grow to between 19,610 (based on BC Stats' scenario), and 21,765 (based on the High usual resident population).

APPENDIX I

TELUS INSIGHTS

The TELUS Insights reports on the number of visitors and residents of the City of Revelstoke during the May to October 2019 and November 2019 April 2020 provide valuable information about the level of and seasonal variations in visitors to the City.

The analysis shows the range across months in visitors to the City and its region, provides metrics of the region of origin of visitors, the length of stay, the growth in the number of visitors over the two year period – and shows the dramatic decline in visitors with the onset of the Covid19 travel restrictions. The goal of the TELUS study was to provide the City of Revelstoke insights for two contexts: destination marketing and city planning.

For this study traffic volumes were calculated by using algorithms that calculate the distance and time between different user events as generated by the TELUS network. Location analytics are possible using this data because spe- cific cell towers have an associated geographic coordinate. By aggregating and de-identifying this data, it is possible to perform geographic and movement analysis for destination marketing purposes.

For the City of Revelstoke, TELUS used a proprietary algorithm to determine the number of people with an assumed home neighbourhood (or residence) in the City of Revelstoke on a monthly basis during a 12 month period between April 2019 and March 2020. TELUS segmented the number of handsets into categories based on how many months they had an assumed home neighbourhood in the City of Revelstoke. Using this approach, the City could see how many people had a residence for more than 6 months out of a year, and better align this number to the concept of a usual resident.

More specifically, TELUS Insights estimates were that in total 23,450 (100%) unique people had a monthly assumed home neighbourhood in the City of Revelstoke for at least one month out of the 12 month period between April 2019 and March 2020. Further, the data showed that 8,850 (38%) of unique people had an assumed home neighbourhood in Revelstoke for a quarter or less of the year (1-3 consecutive months). Looking more broadly, TELUS estimated there were 13,020 (56%) of unique people had an assumed home neighbourhood in Revelstoke for less than half of the year (1-6 consecutive months). This could be short term or seasonal residents.

In looking to more common definitions of usual place of residence, 10,430 (44%) of unique people had an assumed home neighbourhood in Revelstoke for more than half of the year (7-12 consecutive months). This could be long term residents.

Finally, 7,770 (37%) of unique people had an assumed home neighbourhood in Revelstoke for more 3 quarters of the year (10-12 consecutive months), and 8,450 (36%) (10-12 months non-consecutive). This segment of the resident population is the most likely to be a permanent resident that would consider Revelstoke to be their usual place of residence.

In considering the longer timeframes of the people that had a regular residence in the City of Revelstoke between 10-12 months, the most recent assessment of the TELUS data would put the current estimates of resident population in the City within a reasonable range of traditional estimates of usual resident population.

RESIDENT POPULATION BENCHMARKING

As noted in the introduction, several datasets were considered in order to gauge the scale of resident population reported as per the Census and BC Stats and to provide some context as to the potential variation in Revelstoke's population due to seasonality. These sources ranged from data on municipal finances and spending, to water treatment and ICBC Vehicle registrations. Details of each data set and findings have been included below.

MUNICIPAL FINANCES

As per the Ministry of Finance's most recent data on Municipal expenditures, the City of Revelstoke compares favourably on a number of fronts when expenditures are adjusted for the scale of local resident population.

For example, when expenditure on services that are population dependent such as water and sewer expenditures are considered, the City (at $145 spent for water services in 2018 per capita and $90 for sewer services) falls close to both the average of the communities under consideration as well as expenditures seen for all communities in the province with populations that range between 5,000 and 10,000 residents. Similarly, with regard to other direct population driven expenditures and a 2018 resident population estimate of 8,164 as per BC Stats, the City benchmarks closely to the range of other communities selected as well as the average for all BC communities with populations that ranged between 5,000 and 10,000 residents.

ICBC VEHICLE REGISTRATIONS

ICBC data show that in 2019 there were 3,485 vehicles registered for personal use in the City of Revelstoke. A total 2019 municipal population of 8,259 as per BC Stats would put per capita passenger vehicle registrations at 0.42 per resident, slightly above the average for the selected communities (0.42) and almost exactly at the BC-wide average (0.43).

WATER TREATMENT

The water treatment data were instructive in two aspects. First as a means to benchmark total annual resident population, and secondly as a means to gauge any variance in monthly production and consumption that may indicate seasonal population shifts.

Table 12 shows the range of annual water treatment levels for the selection of communities in the province. These water treatment data reflect all uses within the municipal boundaries (residential, commercial & industrial) and have been provided by each municipalities engineering services department. While each municipality defines and/or measures it's water treatment values differently (some defining it as consumption or usage and others as treatment or production), it's important to note that the volume of water flowing through each municipalities' treatment system will be relatively

⊙ TABLE 10: PER CAPITA MUNICIPAL EXPENDITURES, 2019

Municipality	General Govt.	Protective Services	Solid Waste & Recycling	Water Services	Sewer Services
Trail	$357	$247	$46	$192	$89
Castlegar	$271	$311	$61	$118	$102
Gibsons	$399	$42	$141	$197	$202
Kelowna	$194	$424	$94	$63	$86
Kamloops	$257	$515	$85	$91	$51
Nelson	$271	$608	$19	$124	$161
Nanaimo	$168	$488	$50	$89	$39
Revelstoke	**$255**	**$434**	**$48**	**$145**	**$90**
Average of above	**$274**	**$377**	**$71**	**$125**	**$104**
Av. of Cities 5-10,000 pop	**$279**	**$307**	**$66**	**$143**	**$112**

⊙ TABLE 11: ICBC PASSENGER VEHICLE REGISTRATIONS, 2019

Municipality	Personal Use	Business Use	Other Use	Municipal Population	Per Capita Personal Use
Kelowna	66,527	7,037	4,714	142,146	0.47
Nanaimo	49,583	6,955	1,784	99,856	0.50
Trail	3,911	376	223	8,171	0.48
Nelson	5,336	464	232	11,359	0.47
Castlegar	3,993	297	253	8,625	0.46
Kamloops	40,755	4,093	2,429	100,046	0.41
Revelstoke	**3,458**	**246**	**436**	**8,259**	**0.42**
Average of above					0.46
BC average	2,180,079	260,787	105,857	5,071,336	0.43

consistent regardless of how the water flows are classified.

As with the above variables, to compare the amount of water treated between communities, the total volume of water flowing through municipal services can be divided by usual resident population to arrive at a per capita measure which can then be instructive as to the levels of population using the system.

In looking at the range of treatment volumes per resident, this selection of BC municipalities consume an average of 214 meters cubed of water per person each year. Trail and Castlegar have notably higher treatment levels than the rest of the municipalities, which are largely attributable to unique industrial uses such as the Celgar pulp mill in Castlegar or the Teck Resources smelter in Trail. On the lower-end of the usage spectrum, Kelowna and Nanaimo had lower consumption levels, potentially the result of them being larger communities where conservation policies are more prevalent. In considering the data for the City of Revelstoke, at 210 cubic meters per Capita, the City sits close to the average treatment volumes of 214 meters cubed per capita for this selection of BC municipalities.

It is interesting to note that Statistics Canada collects provincial water treatment data as part of its **Survey of Drinking Water Plants**[8] , which shows the BC-wide average for water treatment per capita (for all uses) was 188 cubic meters per person per annum, 13% below that seen in Revelstoke. This average however is reflective of many jurisdictions where water metering for both residential and industrial uses has been put in place. Similarly, the Canadian average for treatment per capita (for all uses as well) fell even lower to 156 cubic meters per person per annum. Again, this level of consumption is reflective of many jurisdictions where availability and treatment of water is a much more difficult task than within the province of BC.

⊘ **TABLE 12: ANNUAL WATER CONSUMPTION/TREATMENT**

Municapality (year)	Annual Treatment (m3)	Population (in year)	Treatment/ Population (m3)	Liters per Capita
Trail 2016	2,826,670	7,988	354	353,865
Castlegar 2019	2,711,403	8,625	314	314,366
Sunshine Coast 2017	4,783,690	22,485	213	212,750
Revelstoke 2019	**1,733,886**	**8,259**	**210**	**209,939**
Kelowna 2019	15,604,828	75,370*	207	207,043
Kamloops 2016	18,607,531	94,276	197	197,373
Nelson 2019	1,954,943	11,359	172	172,105
Nanaimo	13,894,000	97,619	142	142,329
Average			226	226,221
BC 2017	818,500,000	4,460,902	183	183,483
Canada 2017	4,888,000,000	31,373,194	156	155,802

* City of Kelowna trade area basin population

The monthly data for water treatment in the City can also be considered as an indication of how variations in usage occur throughout the year due to seasonality. As with most communities, significant increases in use is seen through the summer months; much of this increase can be attributed to residential lawn and garden watering and agricultural production on the commercial side.

Changes in the pattern of water consumption through the winter months, where water consumption is much more consistent and closely related to aspects of personal consumption, can be a good indicator of potential fluctuations in the overall number of people using the system. In the Revelstoke context, changes in treatment levels through these winter months would likely be due to winter seasonal fluctuations in population.

As an example, Figure 12 shows monthly average water treatment for the City of Revelstoke over the past four years. A strong seasonal pattern is evident where treatment volumes peak in the warmer summer months of July and August and taper off to November which is typically the lowest fall level of water treatment for the City. In looking to the November through to April period, the volume of water treatment in the City has historically increased (albeit by a much smaller increment than during the summer peak months) to winter peaks in December to March. December treatment levels were (on average) 9% above the November average, while January was 15% above, February 8% above and March 11% above. While some of this variation may be attributed to shifts in individual consumption patterns of residents, given the winter resort nature of the City, the seasonality of water treatment through these winter months can largely be attributed to the seasonal pattern of travel,
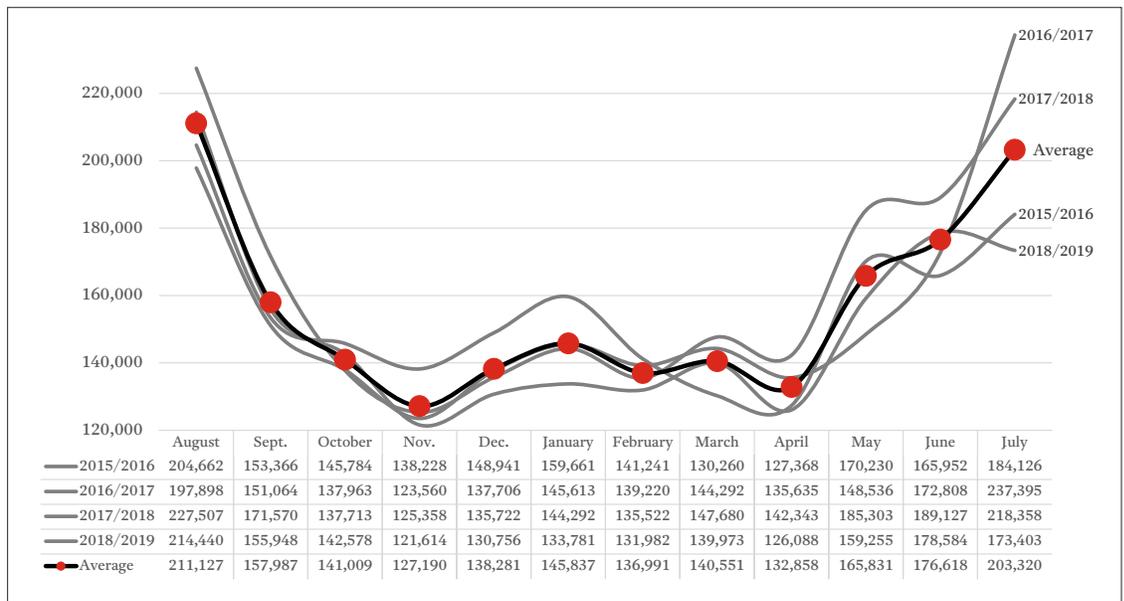
tourism and employment that characterizes the City.

As a point of comparison, historical monthly data were also available for the City of Kelowna. While a similar summer peak in water production was seen, no winter peak is seen. In fact, the lowest month of production for Kelowna has generally been the month of February. This would further point to the winter seasonality in Revelstoke's treatment levels being generated more by variation in the number of people in the City during these months than increases in individual consumption patterns.

⊙ **FIGURE 12: MONTHLY WATER TREATMENT IN CUBIC METERS, CITY OF REVELSTOKE**

	August	Sept.	October	Nov.	Dec.	January	February	March	April	May	June	July
2015/2016	204,662	153,366	145,784	138,228	148,941	159,661	141,241	130,260	127,368	170,230	165,952	184,126
2016/2017	197,898	151,064	137,963	123,560	137,706	145,613	139,220	144,292	135,635	148,536	172,808	237,395
2017/2018	227,507	171,570	137,713	125,358	135,722	144,292	135,522	147,680	142,343	185,303	189,127	218,358
2018/2019	214,440	155,948	142,578	121,614	130,756	133,781	131,982	139,973	126,088	159,255	178,584	173,403
Average	211,127	157,987	141,009	127,190	138,281	145,837	136,991	140,551	132,858	165,831	176,618	203,320

ENDNOTES

1   https://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/
        population-estimates/about-population-estimates

2   https://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/
        population-projections

3   https://www12.statcan.gc.ca/census-recensement/2016/ref/98-304/app-ann1-5-eng.cfm
4   https://www.statcan.gc.ca/eng/hp/estima, and https://www150.statcan.gc.ca/n1/
        pub/91f0015m/91f0015m1998005-eng.pdf

5   https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5310

6   https://www12.statcan.gc.ca/census-recensement/2016/ref/98-306/ch1-eng.cfm

7   https://www2.gov.bc.ca/assets/gov/data/statistics/people-population-community/population/pop_
        small_area_population_projections_people_1999.pdf

The Report merely states "In order to distinguish visitors from residents, a proprietary Assumed Home Neighbourhood algorithm is used. This algorithm takes into account many factors about the device, over a period of 60 days ending at the completion of the study period. Using this larger trailing data set, a location with a significant amount of time spent is identified and categorized as the assumed home neighbourhood." It does not say what this means in terms of who is included as a resident.

"Usual place of residence in Canada" refers to the dwelling in which the person usually lives. It is used to identify the person as a member of a particular household and, potentially, family (depending on the composition of the household). A person is considered to be a member of the household at their usual place of residence, only.
- For persons with one residence, that residence is their usual place of residence.
- For persons with no residence, their usual place of residence is where they stayed on some specified date.
- For persons with more than one residence in Canada, their usual place of residence is the place where the person spends the major part of the year, with the following exceptions:
  › The usual residence of spouses or common-law partners who stay elsewhere while working or studying is the residence where their family lives, if they return periodically.
  › The usual residence of students is that of their parents, if they return to live with their parents during the year even if they live elsewhere while attending school or working at a summer job.
  › The usual residence of persons who have lived in an institutional collective dwelling for six months or more is the institutional collective dwelling in which they currently reside. Institutional Collective dwellings include correctional institutions, hospitals, nursing homes, chronic and long-term care hospitals and related institutions. The usual residence of persons who have lived in an institutional collective dwelling for less than six months is the private dwelling to which they can return. If they do not have a private dwelling to which they can return, then the institutional collective dwelling is their usual place of residence.
- For persons who spend equal time at each residence (as in some cases of joint custody), their usual place of residence is determined by where they stayed on some specified date.
- For persons with a residence in Canada and a residence outside Canada, their Canadian residence is their usual place of residence.
- Canadian government employees, including Canadian Armed Forces personnel, residing outside Canada for all of the reference period are out of scope for most surveys. The census, which does include them, determines a geographic location for their usual place of residence using the address they used for election purposes or their last permanent address.
- In the context of the Census of Population, person refers to Canadian citizens, landed immigrants (permanent residents), persons asking for refugee status (refugee claimants), persons from another country with a work or study permit and family members living here with them. Foreign residents are excluded.

The Length of Stay is how long a visitor stayed in a Study Area for a unique trip. Lengths of stay are grouped by the amount of time spent. The groups are 8-24 hrs, 25-72 hours.

Also not directly addressed is where visitors for less than 8 hours are tabulated: while important in the tourism context, these are probably not included in the "Unique Monthly Resident" count.

8   https://www150.statcan.gc.ca/n1/en/catalogue/16-403-X