VENTURE KAMLOOPS

ECONOMIC IMPACT STUDY 2018

Final Report

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EY

Building a better working world

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1. Executive Summary

1. Executive Summary

The city of Kamloops is located in south-central British Columbia and is the third largest city in the province outside of the Lower Mainland. The region of Kamloops has a population of nearly 104,000 residents and is the natural trade and distribution hub in the southern British Columbia that offers a warm climate with an abundance of recreational opportunities.

With a local labour force of approximately 54,370 residents and an unemployment rate of 7.8%[i], Kamloops has a thriving and diverse local industry.

Ernst & Young LLP ("EY") has been engaged by Venture Kamloops, the economic development arm of the City of Kamloops, to complete a comprehensive economic study on the various factors on the region's economy. As part of the study, the comprehensive analysis reviewed the economic past, present, and projected economic future, including a sample case analysis on the likely economic impacts of the non-medical cannabis sector and the high-technology cluster.

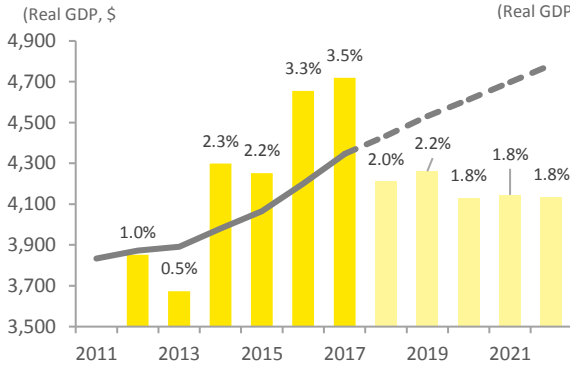
The comprehensive analysis sheds light on the economic diversity of Kamloops, benchmarking the City with other notable Canadian metropolitan regions. A brief overview of the Economic outlook of Kamloops is described further below.

Economic outlook of Kamloops

The Economic outlook of Kamloops appears modest, with a consistent GDP growth of 2% annually to 2022. For example, it appears that GDP for the city will be approximately $4.4 billion in 2018 and up to $4.8 billion in 2022, while having an income per household of just over $110 thousand in 2022. Further, from 2016 to 2022, the construction, accommodation & food, transportation & warehousing, and retail & distribution industries appear to be high growth value added sectors for the City of Kamloops.

The economic diversity of the city of Kamloops is comparable to the province of British Columbia and to that of Canada. This is important as the analysis provides context on how Kamloops would be impacted by upturns and downturns in national business cycles. As a preview, we calculated measures of business diversity and found that Kamloops is considered a well-diversified economy (from an employment perspective), considered to be more diverse than Kelowna but less diverse relative to larger metropolitans such as Vancouver and Toronto. This is important when Kamloops considers benchmarking its performance against other cities and larger metropolitan areas.

Real GDP growth in Kamloops from 2011-2022



Source: EY illustration based on Analysis.

Lastly, we provided sample calculations of the likely economic impact of the emerging non-medicinal cannabis sector and qualitatively described how the tech sector can provide a more efficient and productive economy that may also attract future investments into the city. We also found that using sample operational spending on retail based companies and assuming up to 10 private non-medicinal cannabis operators will be entering Kamloops, will contribute and sustain up to $4.3 million in local GDP and 36 new jobs to the city of Kamloops.

2. Current State Assessment

2.1. Current State of Kamloops

This section provides an overview of the current economic state of Kamloops. We begin by reviewing key economic indicators related to the city of Kamloops as well as its greater region. These indicators relate to demographics, labour market, housing, and household income.

Geographic Profile

The city of Kamloops ("Kamloops") is located in south-central British Columbia at the confluence of the North Thompson and South Thompson rivers near their entrance into Kamloops Lake. Kamloops is the third largest city in the province of British Columbia outside of Vancouver, and is the largest community in the Thompson-Nicola Regional District where the regional district's offices are located (see Figure 1). The Kamloops region is strategically located to be a natural trade and distribution hub in southern British Columbia while offering a warm climate and an abundance of recreational opportunities.

Population

Kamloops has an estimated population of nearly 90,300 residents as of 2016. The city's population is nearly 90% of the total population of the Kamloops Metropolitan Area, and nearly 70% of the entire Thompson-Nicola District population of 132,700 residents. As such, the city of Kamloops, with its 300 km² size, is nearly 100 times more densely populated than the Thompson-Nicola District. The city's high regional density was in part augmented by a population growth of 5.4% from 2011 to 2016, compared to 3.3% for the Thompson-Nicola District. Further, the residents living in the city of Kamloops was on average younger than that of both the metropolitan area and Thompson Nicola District, as well as the average age of the BC province as a whole. This is mainly due to a higher proportion of residents between 0 to 14 years old, cf. Table 1.

Figure 1. Geography of Kamloops

Source: EY illustration.

Table 1. Population indicators for the Kamloops region, 2016

Category	Kamloops	Metro Kamloops	Thompson-Nicola	Province
Population	90,280	103,811	132,663	4,648,055
Population Growth (5-year, %)	5.4	5.1	3.3	5.6
Land Area (km²)	299	5,669	44,449	922,503
Average Age	41.9	42.5	44.0	42.3

Note: Geographic areas are based on Census divisions: *Kamloops* correponds to the census subdivision "CY"; *Metro Kamloops* corresponds to the Census Agglomeration "CA"; Thompson-Nicola is the Regional District "RD"; and *Province* corresponds to the province of British Columbia.

Source: Statistics Canada, 2016 Census Program.

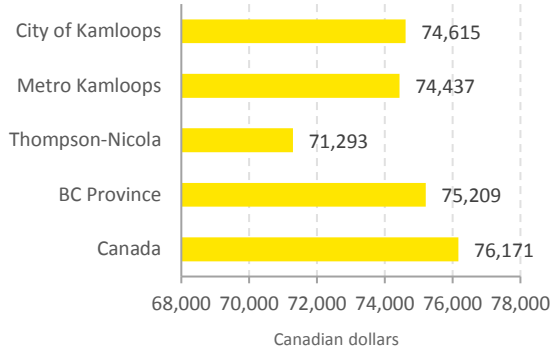
Education

The educational attainment of the local residents in Kamloops is similar to that of the provincial and national level. The vast majority of residents have completed at least secondary education, and the continuous rise of postsecondary graduates in recent decades has led to 62% of Kamloops residents having a postsecondary degree. While this means that the local residents are spending more years away from the job market in pursuit of their degrees, the higher education attainment is necessary to foster employability in an increasing knowledge-based job market. When comparing the major fields of study of postsecondary graduates from Kamloops, we see that degrees in Engineering, Business and Health are the most common, cf. Figure 3. We also note that this breakdown is similar to that of the province as a whole.

Household Income

The household income of a region is often used as an indicator for the standard of living of its local residents. For instance, the average household income after taxes and mandatory contributions reflects the disposable income of households for goods and services. In 2015, the average (after-tax) household income in the city of Kamloops was nearly $75,000. This is notably higher than that of the Thompson-Nicola District, and comparable to that of the Kamloops Metropolitan Area. In a broader perspective, the city's average household income is similar to that of the BC province but lower than that of Canada as a whole. However, the provincial and national income levels are mainly driven by a few households with very large after-tax incomes. If we instead look at medians, we note that the city of Kamloops has a higher median household income (~$65,000) than the BC province (~$61,000) and Canada ($61,000) as a whole.

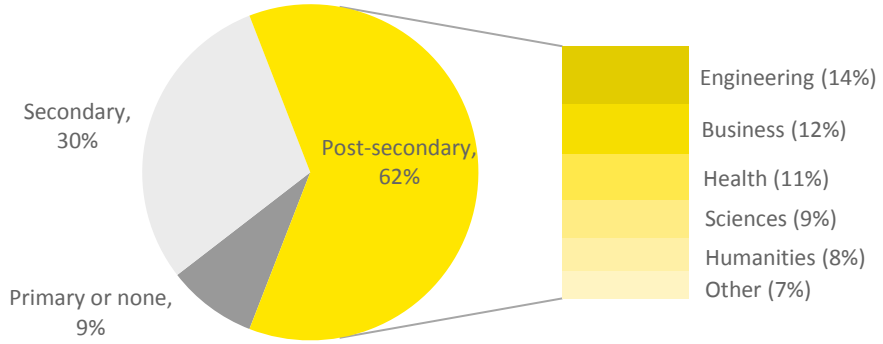
Figure 2. Average household income, 2015



Note: Figure reports after-tax annual household income and values are based on 2015 nominal prices.

Source: Statistics Canada, 2016 Census Program.

Figure 3. Educational attainment for Kamloops residents, 2016



Note: Educational attainment refers to the highest certificate or degree for the city of Kamloops population aged 25 to 64 years in private households. The stacked bar reports a breakdown of major field of study associated with postsecondary educaton using Classification of Instructional Programs (CIP) codes.

Source: Statistics Canada, 2016 Census Program.

Real Estate Market

In 2016, the city of Kamloops has nearly 37,000 occupied private dwellings from which 26,500 dwellings (~72%) were owned and 10,300 (~28%) were rented. This breakdown between owners and renters corresponds to what is similarly observed in the province and Canada as a whole.

The privately owned dwellings in Kamloops have an average value of nearly $400,000, while the average shelter cost for an owned dwelling amounted to approximately $1,000 per month. Compared to the province and Canada, the average value in the city of Kamloops is considerably lower; in particular, compared to an average value of $720,000 in BC. The lower average value of dwellings in Kamloops may in part explain why the average shelter costs also are lower than that of the province and similar to that of Canada as a whole.

The rental market in Kamloops has a low vacancy rate compared to that of the province and Canada. In particular, only 1.1% of rental apartments were on average vacant in 2016, whereas 3.7% of rental apartments in Canada were vacant. Similarly to the privately owned dwellings, also the average monthly shelter costs of a rented dwelling were lower in Kamloops compared to the province as a whole, cf. Table 2.

The intent to build in Kamloops, as measured by the total value of building permits issued, amounted to nearly $225 million in 2017, which is a 40% increase compared to 2016. This increase was mainly a result of an increased number of building permits issued for single-family dwellings (which comprises of 30% of the total value in 2017), as well as an increased number of permits for commercial buildings (which comprises nearly 15% of total value in 2016, while 30% in 2017). Lastly, we note that the total value of building permits for multi-family dwellings did not materially change from 2016 to 2017.

Table 2. Real estate market in Kamloops, 2016

	City of Kamloops	BC Province	Canada
Housing Market			
Number of privately owned dwellings	26,500	1,279,020	9.541,320
Average value of dwelling	$390,396	$720,689	$443,058
Average monthly shelter costs	$1,240	$1,387	$1,313
Rental Market			
Number of rented dwellings	10,315	599,360	4,474,530
Apartment vacancy rate	1.1%	1.4%	3.7%
Average monthly shelter costs	$1,031	$1,149	$1,002

Source: Statistics Canada, 2016 Census Program; CMHC Housing Time Series Database.

Table 3. Building permits in Kamloops

	2016 ($ millions)	2017 ($ millions)
Residential	125.3	149.0
Single-family dwellings	*49.4*	*74.7*
Multi-family dwellings	*54.2*	*54.9*
Other	*21.7*	*19.4*
Commercial	25.6	64.7
Commercial	*21.8*	*37.9*
Institutional	*2.7*	*25.3*
Industrial	*1.1*	*1.6*
Other	6.9	10.4
Total	**157.7**	**224.1**

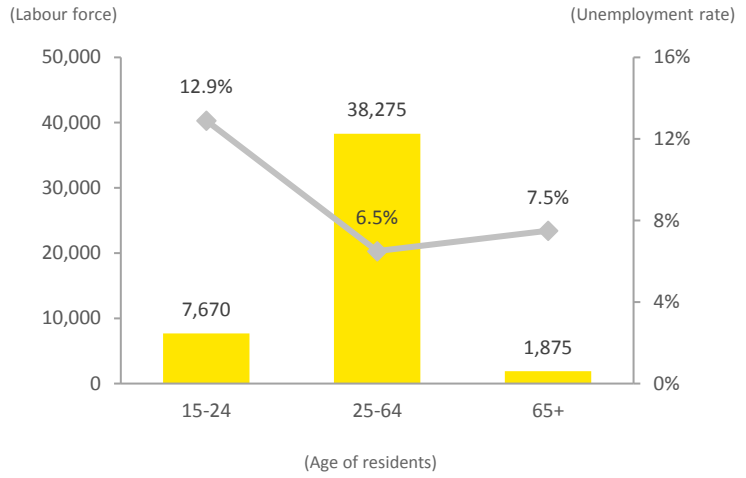
Source: City of Kamloops, Building Inspection Division.

Labour Market

In 2016, the city of Kamloops had a labour force of nearly 48,000 local residents with an unemployment rate of 7.5%. In comparison to 2011, the unemployment rate has decreased by 0.9 percentage points from 8.4%. The unemployment rate is generally affected by higher unemployment among residents among 15-24 and 65+ years of age who collectively comprise nearly 20% of the total labour force. When only considering residents between 25-64 years of age, the unemployment was in 2016 approximately 6.5%, cf. Figure 4.

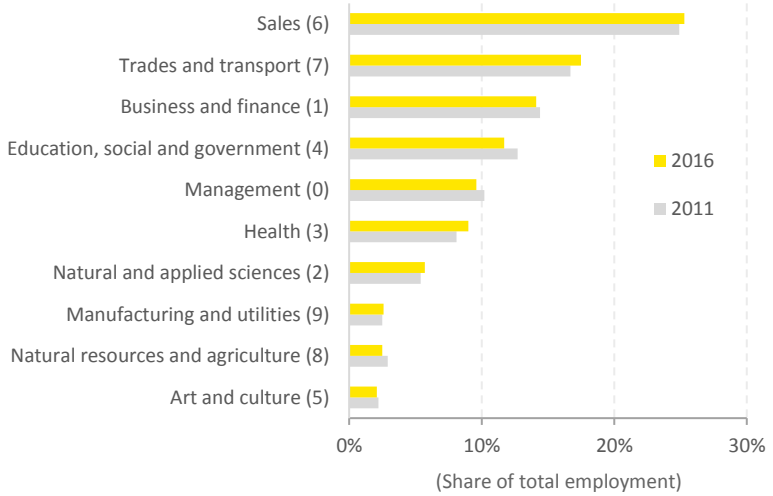
The 2016 working residents is a diverse mix of occupations within the local industry. By far the most common type of occupation relates to sales and services, which consists of 25% of the working residents. Other large categories of occupation include trade and transportation (~18%), business and finance (~14%), occupations in education and government services (~12%), and management services (~10%). The occupations with the lowest share of local employees relates to art and culture (~2%) and natural resources and agriculture (~3%), cf. Figure 5. In a broader perspective, the regions mix of occupation categories is similar to that of the province of British Columbia as a whole. However, the share of residents in Kamloops occupied in trades and transport services are nearly 4 percentage points higher than the province, which has 15% of residents occupied in this category. Conversely, the city's share of jobs within management services as well as art and culture are both 2 percentage points lower than that of the province as a whole.

Figure 4. Labour force and unemployment in Kamloops, 2016



Source: Statistics Canada, 2016 Census Program.

Figure 5. Occupational classifications in Kamloops, 2016

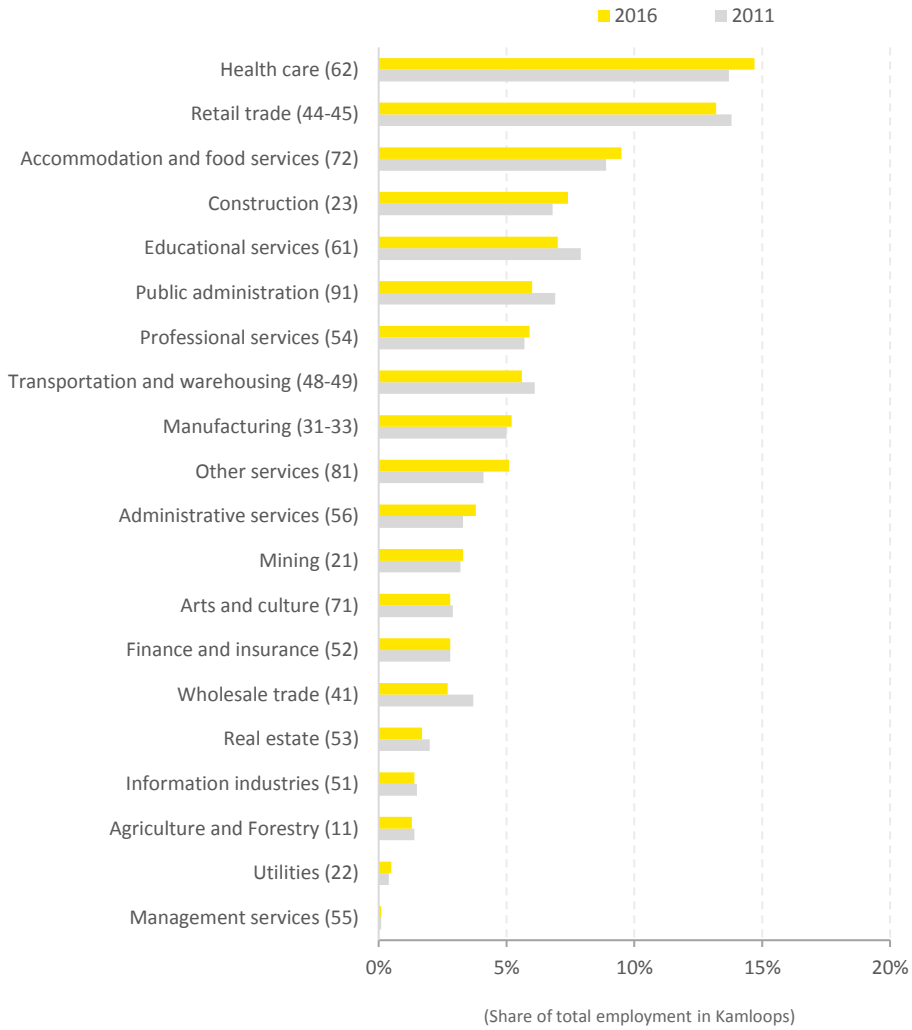


Note: Digits in brackets represents one-digit NOC codes.

Source: Statistics Canada, 2016 Census Program.

Turning our attention instead to which industries employ local residents, we note that the Kamloops's sectoral employment in 2016 was relatively diverse. Specifically, the four largest industries for employment are health care (~15% of total employment), retail trade (~13%), accommodation and food services (~10%), and construction (~7%). Conversely, the employment in industries such as management services and utilities are virtually non-existent in the city (collectively employing 275 people, corresponding to 0.6% of the city's total employment), cf. Figure 6. In comparison to the province of British Columbia as a whole, Kamloops' mix of sectoral employment is in general similar to that of the province. The city however has a 2-3 percentage point higher share of employment in the health care and mining industry, while a 2 percentage point lower share of employment in the professional, scientific and technical service industry, compared to the province as a whole. The higher share of employment within the health care industry is mainly due to Kamloops being the regional health centre for the Thompson-Nicola Regional district with Royal Inland Hospital as one of two tertiary referral hospitals in the Southern Interior. Similarly, the city's higher employment in the mining industry stems from the region's rich mining history and the industry's economic strength in Kamloops for decades. There are numerous metal and mineral mines (i.e. the New Afton and Highland Valley Copper Mine), as well

Figure 6. Sectoral employment in Kamloops, 2016



Note: Digits in brackets represents two-digits NAICS codes.

Source: Statistics Canada, 2016 Census Program.

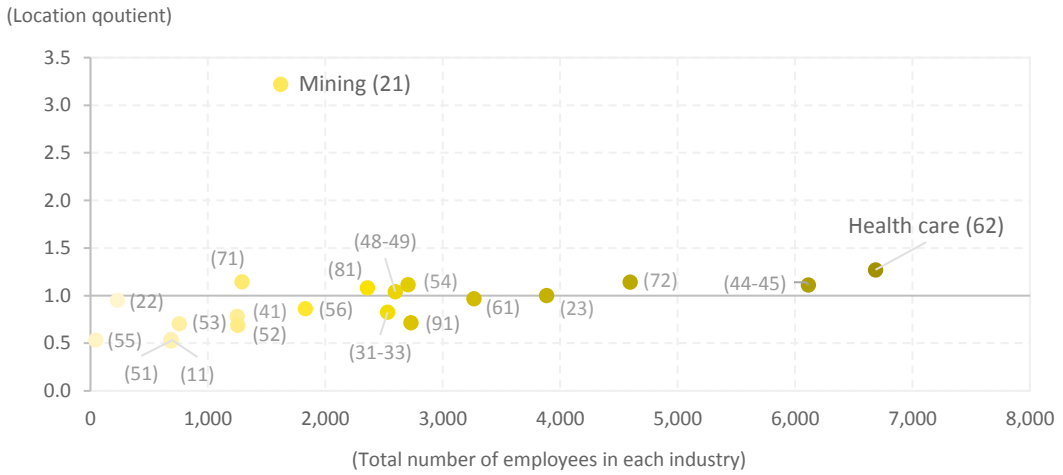
as many proposed mine developments located in the Kamloops area. In fact, these two mines are the two largest employers in Kamloops when excluding health, educational and governmental services.

Local Industry Concentrations

Kamloops is characterized by a couple of local industries that have higher shares of the local employment as compared to that of the same industries in the province as a whole. These local industries are referred to "concentrated industries". An effective way to quantify the local industry concentrations is to calculate the location quotients of each of the local industries in comparison to the province. Note that a location quotient refers to the ratio of employment share in a particular industry in Kamloops to that of the employment share in the same industry for the province. If the location quotient exceeds 1.0 for a given industry, then that industry's employment share exceeds the provincial share and is therefore more concentrated in Kamloops.[2]

Figure 7 presents the estimated location quotients for twenty high-level industry categories (i.e. two-digit NAICS codes) for Kamloops compared to the province of British Columbia. Generally speaking, the figure provides a first indication of the high degree of diversity mix of industries in Kamloops. That is, the employment in Kamloops closely corresponds to those in the province as a whole (i.e. most industries have a location quotient close to 1.0). Nevertheless, Kamloops does have two industries that may be considered concentrated relative to the province. First, the mining industry in Kamloops, with its 1,600 employees, is approximately three times more concentrated than it is in the province as a whole. The majority of the mining industry employees are hired at the Highland Valley Copper and the New Afton mine. Second, the employment in Kamloops' health care industry is 30% more concentrated compared to the province as a whole. As mentioned previously, the majority of the local employees are associated with Interior Health and the Royal Inland Hospital which is the second largest employer in Kamloops after School District #73.

Figure 7. Location quotients of industries in Kamloops, by 2016 employment



Notes: Location quotients are ratios that compare employment shares in particular industries in the city to the employment shares in those same industries in the province. Digits in brackets represents two-digit NAICS codes. Industries are highlighted with explicit names when they have a location qoutient well above 1.

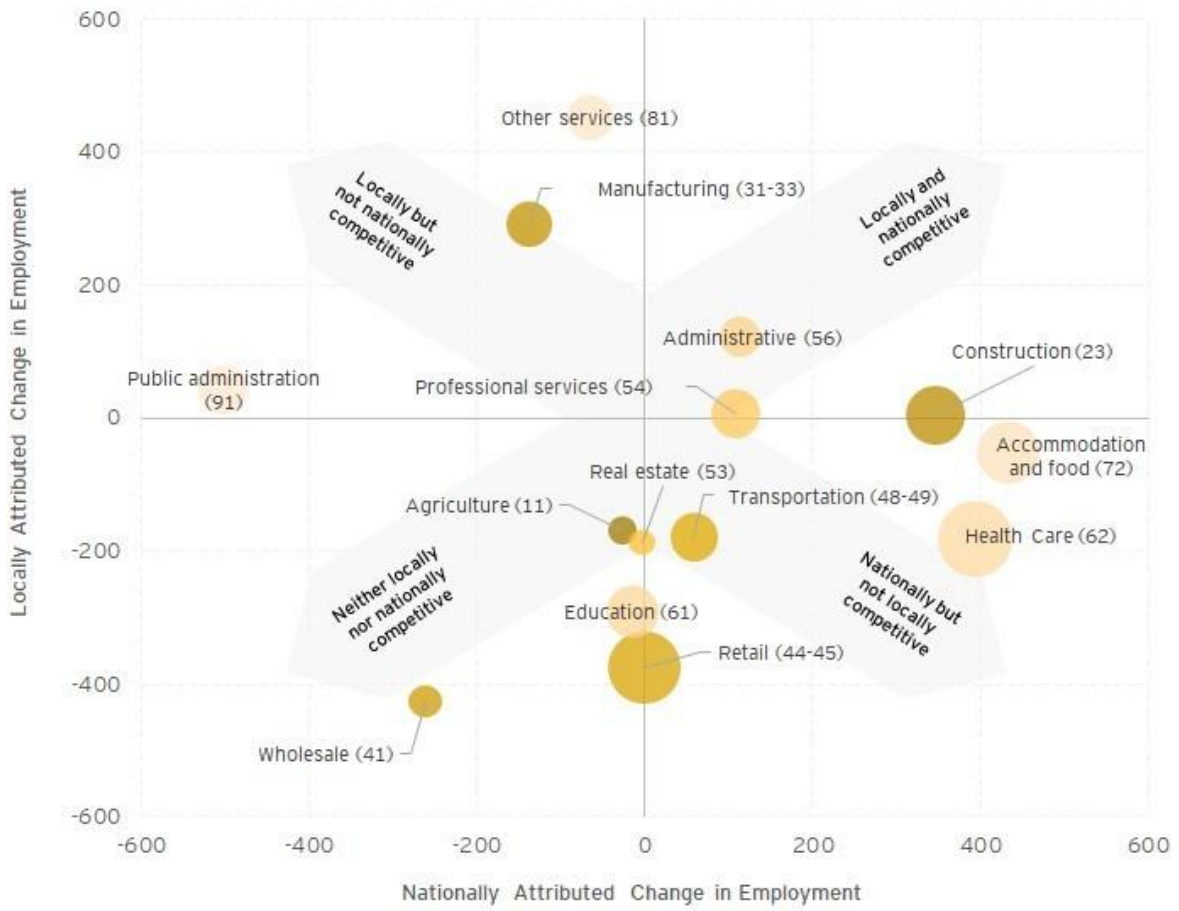
Source: Statistics Canada, 2016 Census Program.

Local Industry Competitiveness

To assess the competitiveness of Kamloops' local industries, we conduct a Shift-Share Analysis ("SSA"). The SSA can be a powerful tool for understanding the dynamics of the local industry growth that illustrates (a) the portion of total change in employment for each industry within Kamloops that can be explained by total growth in employment across all industries at a national level; (b) the portion explained by the performance of a specific industry on a national level; and (c) the portion attributed to unique influences within Kamloops. In other words, the analysis helps us identify how much of the growth in a certain industry is caused by influences within Kamloops that may in turn be analyzed and targeted for strategic initiatives.

Figure 8 shows the change in employment for industries in Kamloops from 2011 to 2016, which can likely be attributed to the "Industry mix effect" of Canada as a whole and the "Local share effect", respectively. The size of the bubbles indicates the industry's employment level in 2016, where the larger the bubble, the higher share of total employment. The Figure suggests that unique influences within Kamloops have attributed to a loss of employment in industries south of the horizontal axis (e.g. Retail, Wholesale, and Agriculture), while a gain in employment in industries north of the horizontal axis (e.g. Manufacturing, Other Services, and Administrative).

Figure 8. Competitiveness of industries in Kamloops, 2016



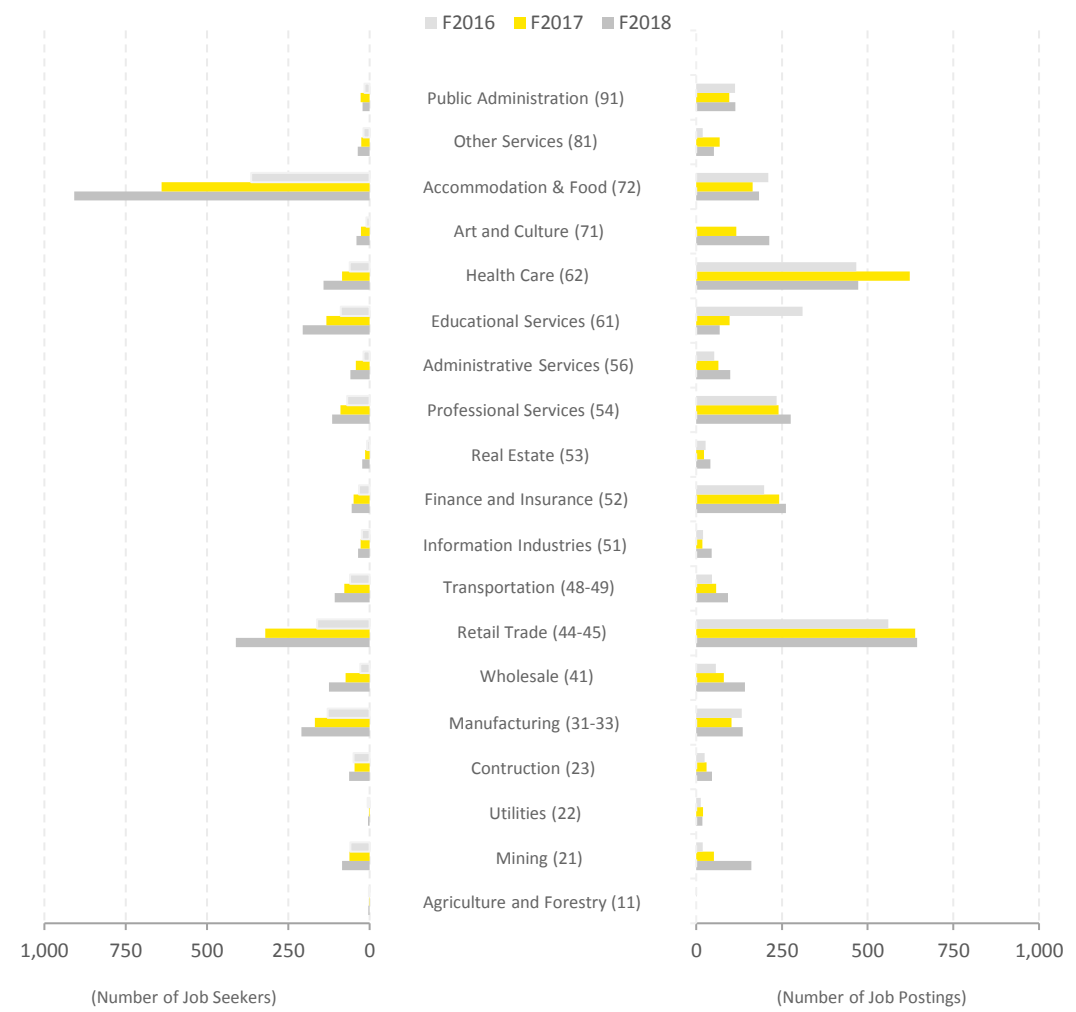
Notes: The two axes represent the change in employment (i.e. number of employees) from 2011 to 2016; the numbers in brackets represent the corresponding NAICS codes; the bubble size indicates the size of the industry in 2016.

Source: EY analyis based on Statistics Canada, 2016 Census Program and 2011 National Household Survey.

Local Job Seekers and Postings

Categorized information on the number of local job seekers and postings as they relate to specific industries may serve as a directional proxy to assess local job markets conditions. Figure 9 presents job postings and job seeker profiles created for the city of Kamloops between the financial years F2016 to F2018 and categorized by industries. First looking at the development over time, we note that the number of both job postings and seeker profiles created have increased over from F2016 to F2018. While the number of job postings for some industries have fluctuated over the three years, the number of job seeker profiles have consistently increased every year across all industries. This development may in part be explained by the steady increase in Kamloops' labour force over the years, but likely also because of the continued adaptation of digital job search, likely marketing efforts in using the local job board, or other developments. However, notably is the development of job seeker profiles related to the accommodation and food industry which went from 360 profiles in F2016 to more than 900 in F2018. On the demand side, however, the number of job postings related to the same industry decreased from 210 to 180 postings. Similar discrepancies are observed between job postings and seekers related to heath care and retail trade where the number of postings are significantly higher than the number of job seeker profiles. While the data

Figure 9. Number of job seekers and postings in Kamloops, by industry



Note: Digits in brackets represents two-digits NAICS codes. The "F2018" refers to financial year between 1st July 2017 to 30th June 2018.

Source: Vicinity Jobs Inc. - provided by Venture Kamloops.

does not address the outcomes of matching postings with seekers, the observed discrepancies may suggest at least some degree of current excess supply of labour for the accommodation and food industry, whereas an excess demand for labour in the health care and retail industries.

Tourism and Visitors

Kamloops is a city that offers a wide range of opportunities to enjoy both nature activities and a rich cultural scene. Some key nature activities include mountain biking, fresh-water fishing, golfing, hiking, and exploring the BC Wildlife Park. As for its cultural scene, the city accommodates an engaging aboriginal museum and hosts numerous sports tournaments and events. In fact, Kamloops' high capacity of world-class sporting and event facilities provides the city with a competitive advantage in attracting event visitors, which has led to the brand development of "Canada's Tournament Capital". As such, tourism is a growing industry in Kamloops and a major economic driver to the local economy. Specifically, it was estimated that the total economic impact of the tourism industry was nearly $450 million in 2017. This contribution was supported by a total of 1.8 million visitors in 2017 (whereof approximately 250,000 visitors were associated with tournaments and events) and their corresponding spending of an estimated $270 million in the local community.[3]

The number of visitors are in part supported by the presence of the local airport: The Davie Fulton Airport (YKA). In 2017, nearly 314,000 passengers travelled through the airport, where the airport operations are estimated to support 860 jobs and generating approximately $75 million in economic activity every year. Looking to the future, the airport management is projecting the economic impact of the airport to further increase as they are planning to launch a new non-stop service to Toronto with Air Canada Rouge beginning in June 2018.[4]

According to Tourism Kamloops, current efforts on expanding the tourism industry is mainly driven by marketing and branding via digital and social platforms with target markets in U.K., Germany, Australia, New Zealand, Northwestern United States, Alberta and BC. While Kamloops brand is effective in attracting visitors, one of the key challenges is to maintain the visitors in the city for several days. Currently, a visitor to Kamloops spends on average 1-2 days in the city. In comparison, Kelowna has a total of 1.9 million visitors in 2017 (i.e. one million more than Kamloops), however the average visitors spends 6 nights in the city. Hence, the economic benefits of tourism to Kelowna amounts to nearly $1.2 billion. According to Tourism Kamloops, the difference between average stay is mainly driven by a lack of signature experiences in Kamloops, i.e. an experience which is uniquely associated with the city.

Tourism Kamloops further perceives that the city's lack of a multi-purpose civic centre has caused the city to surpass significant economic benefits from potential recreational and corporate visitors. In fact, Tourism Kamloops reports to have turned down nearly 200 requests for conferences. Beyond the economic benefits of increased corporate visitors, a potential civic centre may also help support the emerging performing arts industry and smooth out the strong seasonality for the accommodation industry, which is only running full capacity in June, July and August.

2.2. Economic Outlook and Market Trends

This section provides an overview of the projected economic developments in Kamloops as well as the emerging trends and industries.

Provincial Economic Outlook

The economic outlook of the province of British Columbia serves as a broader point of context to the city of Kamloops. The city is closely interlinked with the province's economic development as a whole and one must understand and anticipate the changing nature of key indicators, such as provincial real GDP growth rates, population growth, labour force, and employment, to provide effective initiatives on the local economic development of Kamloops.

Table 4 reports the economic outlook for the province as it relates to real GDP, employment, household income and population from 2011 to 2022. The total price-adjusted market value of all the final goods and services produced in the province (measured by real GDP[5]) was nearly $230 billion CAD in 2017 based on 2007 prices. For comparison, the nominal GDP was in the same year valued at $273 billion based on 2017 prices. The real GDP for the province is projected to grow at nearly 2% annually until 2022. The provincial employment in 2017 is estimated at approximately 2.5 million individuals and is projected to increase to nearly 2.6 million by 2022. The unemployment rate in 2017 is approximately 5.1% and is projected to increase to 5.6% by 2022. The provincial population is expected to grow steadily at 1% annually from 2017 to 2022.

Table 4. Economic Outlook for the Province of British Columbia, 2011-2022

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Real GDP ($ millions, 2007 prices)	189,207	194,256	199,023	206,246	212,822	220,803	229,047	233,866	238,668	242,874	247,203	251,549
Annual change (%)	-	*2.7*	*2.5*	*3.6*	*3.2*	*3.7*	*3.7*	*2.1*	*2.1*	*1.8*	*1.8*	*1.8*
Total employment (000s)	2,228	2,262	2,264	2,278	2,308	2,380	2,467	2,490	2,509	2,523	2,539	2,555
Annual change (%)	-	*1.6*	*0.1*	*0.6*	*1.3*	*3.1*	*3.7*	*0.9*	*0.8*	*0.5*	*0.6*	*0.6*
Unemployment rate (%)	7.5	6.9	6.6	6.1	6.1	6.0	5.1	4.9	5.3	5.4	5.5	5.6
Annual change (%)	-	*-8.0*	*-3.9*	*-8.0*	*0.7*	*-2.3*	*-14.8*	*-3.5*	*6.6*	*3.4*	*0.7*	*1.5*
Average income per household ($000s)	82.3	84.7	88.4	90.4	94.4	98.4	103.6	106.7	109.4	112.5	115.6	118.9
Annual change (%)	-	*2.9*	*4.4*	*2.2*	*4.5*	*4.2*	*5.3*	*3.0*	*2.6*	*2.8*	*2.8*	*2.8*
Population (000s)	4,498	4,542	4,587	4,641	4,692	4,747	4,809	4,869	4,921	4,973	5,025	5,075
Annual change (%)	-	*1.0*	*1.0*	*1.2*	*1.1*	*1.2*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*1.0*

Note: Shaded area represents forecast data. The "Annual change (%)" in italics is the percentage change from the previous year.

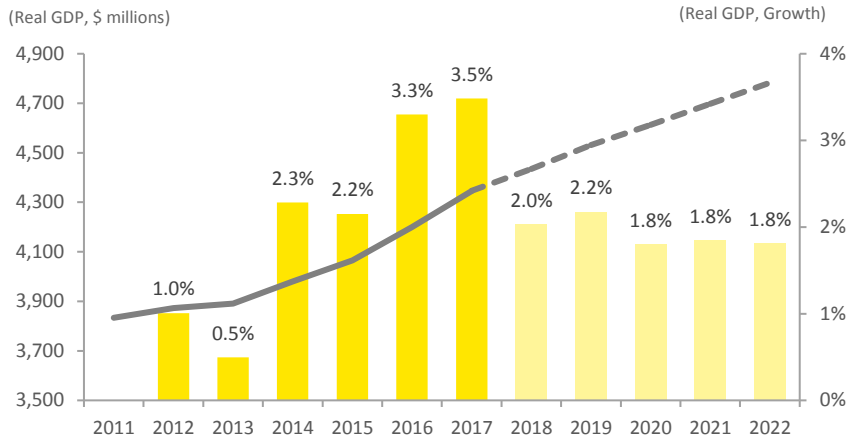
Source: Statistics Canada, Oxford Economics.

Local Economic Outlook

Building on the provincial outlook, we derive a suggestive economic outlook for the city of Kamloops for similar key indicators. Please refer to Appendix A.1 for a detailed description of our methodology used for the local projections.

The real GDP supported by the economic activities within the city of Kamloops is estimated to be approximately $4.3 billion CAD based on 2007 prices. We forecast the local real GDP to increase at approximately 2% annually from 2017 to 2022, converging to a value of nearly $4.8 billion in 2007 prices by 2022. The total employment in Kamloops was estimated to be nearly 49,000 individuals and is projected to increase to nearly 51,000 by 2022. The industry-specific employment levels are also estimated and are presented in the subsequent section. The unemployment rate in 2017 is estimated to be 6.4% and is projected to increase to approximately 7.0% by 2022. The average income per household in Kamloops in 2017

Figure 10. Real GDP growth in Kamloops from 2011-2022



Source: EY illustration based on Table 5.

Table 5. Economic Outlook for Kamloops, 2011-2022

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Real GDP ($ millions, 2007 prices)	3,834	3,872	3,891	3,980	4,066	4,200	4,346	4,435	4,531	4,613	4,698	4,783
Annual change (%)	-	*1.0*	*0.5*	*2.3*	*2.2*	*3.3*	*3.5*	*2.0*	*2.2*	*1.8*	*1.8*	*1.8*
Total employment	45,850	46,217	45,771	45,636	45,776	47,110	48,803	49,357	49,816	50,125	50,488	50,844
Annual change (%)	-	*0.8*	*-1.0*	*-0.3*	*0.3*	*2.9*	*3.6*	*1.1*	*0.9*	*0.6*	*0.7*	*0.7*
Unemployment rate (%)	8.5	8.0	7.8	7.4	7.6	7.5	6.4	6.1	6.6	6.8	6.9	7.0
Annual change (%)	-	*-5.9*	*-2.2*	*-5.3*	*2.4*	*-1.1*	*-15.0*	*-3.9*	*8.2*	*1.9*	*1.9*	*1.8*
Average income per. household ($000s)	77.2	79.5	83.0	84.8	88.8	92.5	97.4	100.3	102.9	105.7	108.7	111.8
Annual change (%)	-	*2.9*	*4.4*	*2.2*	*4.7*	*4.2*	*5.3*	*3.0*	*2.6*	*2.8*	*2.8*	*2.8*
Population	85,678	86,551	87,409	88,438	89,410	90,280	91,459	92,600	93,589	94,578	95,567	96,518
Annual change (%)	-	*1.0*	*1.0*	*1.2*	*1.1*	*1.0*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*1.0*

Note: Shaded area represents forecast data. For each indicator, the first line is the level and the second line "Annual change (%)" in italics is the percentage change from the previous year.

Source: EY analysis based on Statistics Canada – Census Program 2016, 2011 National Household Survey, and Oxford Economics.

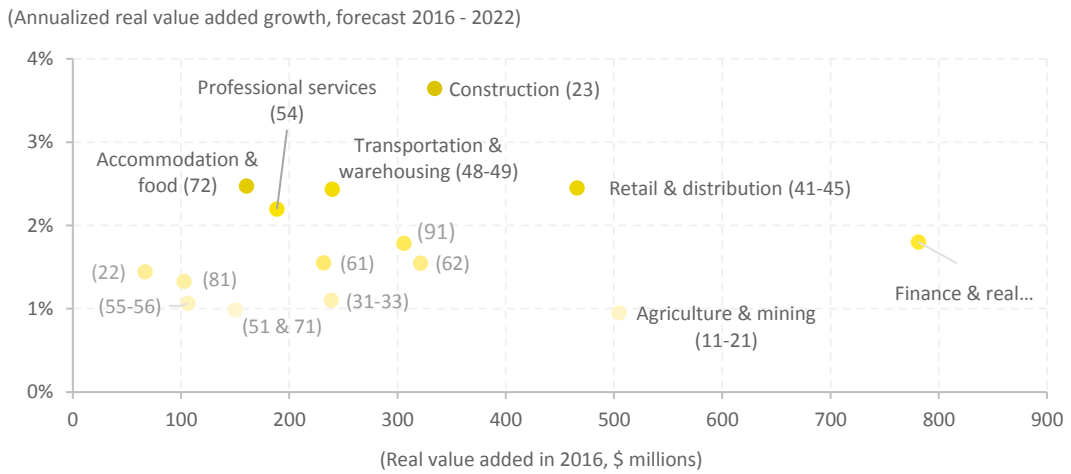
is estimated to amount to approximately $97,000. This is slightly lower than the provincial average of $103,000. The average household income in Kamloops is expected to increase to nearly $112,000 by 2022. Lastly, the local population of Kamloops was estimated to be 91,500 in 2017 and is expected to increase to 96,500 by 2022.

Local Industry Outlook

This section presents industry-specific developments to both employment and value added (i.e. a local industry's contribution to the GDP), which helps drive insights into emerging trends in Kamloops. As a supplement to this section, please refer to Appendix A.2 for detailed summary tables on each industry's estimated employment and value added from 2011 to 2022.

Overall, the sectoral employment in Kamloops is projected to undergo varying degrees of growth from 2016 to 2022. Specifically, the core industries currently with a high share of the total employment (i.e. health, retail, accommodation and food, and construction) are projected to remain their high share of total employment by 2022. Employment in the construction and health industry is projected to increase on average with approximately 2.5% annually from 2016 to 2022, whereas the projected employment growth for the retail industry is more moderate of 0.7% annually. On the opposite, not all industries are projected to undergo positive employment growth. In fact, the employment in the transportation and warehouse, management and administration, and manufacturing industry are projected to decrease on average with 0.2% annually from 2016 up until 2022.

Figure 11. Value added by industry in Kamloops, forecast 2016-2022



Notes: Prices are based on chained 2007 prices. Digits in brackets represents two-digit NAICS codes. Industries are highlighted with explicit names when they have either a high projected annualized value added growth or high value added in 2016.

Source: EY analysis based on Statistics Canada - 2016 Census Program, 2011 National Household Survey and Oxford Economics.

If we instead of employment levels turn our attention to the industry-specific value added, then Figure 11 maps for each industry the estimated value added in 2016 (horizontal axis) against the annualized growth rate in value added from 2016 to 2022 (vertical axis). The industries in Kamloops that support the largest value added in 2016 was the finance & real estate, agriculture & mining, and retail & distribution industries. The industries supporting the lowest value added was utilities, other services, and management & administrative services. Looking to the projected growth in value added, we note that the construction industry is expected to increase its value added with 3.6% annually from 2016 to 2022. Similarly, the accommodation & food, transportation & warehousing, and retail & distribution industries are projected to increase its value added by 2.4% annually from 2016 to 2022.

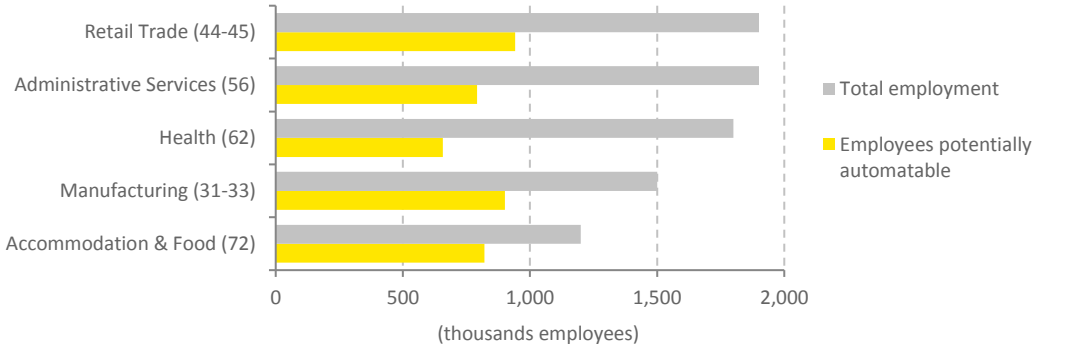
Emerging Trends

This section presents three emerging trends that may pose an opportunity or a threat to the continued growth of Kamloops economy.

I. *Automation*

Recent technological developments in robotics, artificial intelligence, and machine learning are showing early signs of what may inevitably lead to major automation disruptions for the global labour market. Robots and computers can not only perform a large variety of physical work activities faster and more cost efficient than humans, but are also increasingly capable of performing activities that require greater cognitive capabilities, such as making tacit judgments, medical diagnostics, or even driving. It has been estimated that by 2030, as many as 800 million jobs could be lost worldwide to automation.[6] From the perspective of the Canadian labour market, current economic research has suggested that more than 7 million employees (out of the nearly 16 million employee positions considered) could potentially be automated.[7] More specifically, when we look at the potential for automation across industry sectors in Canada, we note that the five largest sectors in terms of employment (i.e. Retail trade, Administrative Services, Health Care, Manufacturing and Accommodation & Food Services) have the potential of automation between 40-70% of the employees by 2030. Figure 12 illustrates in more detail the impact of automation for each of the five largest industry sectors in Canada. The figure illustrates the number of employees that potentially could be displaced by automation.

Figure 12. Potential automation in Canada, by industry employees



Notes: Digits in brackets represents two-digit NAICS codes.

Source: Oxford Economic Forecasting and Statistics Canada.

For example, it is estimated that nearly 50% of employees in the retail trade sector are potentially automatable, which is equivalent to approximately 940,000 employees. Similarly, 61% of employees in the manufacturing sector has the potential to be automated by 2030, which is equivalent to nearly 900,000 employees.

Given that the aforementioned sectors correspond to some of the largest industries in Kamloops (and BC as a whole), the possible employment displacement on the local level may likely be similar to that on the national level. In that case, effective economic development initiatives in Kamloops need to consider the potentially disruptive impact of emerging technological developments in robotics, artificial intelligence, and machine learning.

However, automation may not only pose a threat to the labour force, it may also pose a great opportunity. In some domains, automation can help increase the productivity of workers, which may enable them to accomplish tasks faster, safer and with fewer errors. Further, the technology may in some cases also reduce the physical demands of workers; therefore allowing older/weaker residents to rejoin the labour force. Automation may also create new tasks and

occupations and thus increase the demand for existing or new jobs. As such, automation may pose an opportunity for further labour force growth rather than displacement.

II. Future labour skills and competencies

The current labour market participants must anticipate and adapt to the changing demands in the occupations of the future. According to a 2016 study by the World Economic Forum[8], it is projected that by 2020 more than one-third of the desired core skill sets for most occupations will be comprised of skills not currently considered crucial to the job today. Efforts aimed at closing such future skills gap will increasingly need to be grounded in a solid understanding of both a country's, region's or industry's current skills set and of changing future skills requirements due to disruptive change. The World Economic Forum provides in their report the following example (p. 26):

"*Efforts to place unemployed youth in apprenticeships in certain job categories through targeted skills training may be self-defeating if skill requirements in that job category are likely to be drastically different in just a few years' time. Indeed, in some cases such efforts may be more successful if they disregard current labour market demands and past trends and instead base their models on future expectations.*"

As such, it will become increasingly critical for businesses, labour market policymakers, and individuals to understand the current state of supplied skills set and to accurately forecast, anticipate and prepare for future job contents and skills requirements.

The World Economic Forum propose four short-term recommendations on how businesses may capitalize on new opportunities by increasing their focus on talent development and future workforce strategy:

- *Making use of Data Analytics:* Effective talent acquisition methods must employ analytical tools to spot talent trends and skills gaps, and provides insights that can help organizations align their business, innovation and talent management strategies to maximize available opportunities to capitalize on transformational trends.
- *Increase talent diversity:* Business benefit from higher degrees of workforce diversity whether it being in the realm of gender, age, ethnicity or sexual orientation. Companies need to tackle perceived and well-known barriers for advancing workforce parity.
- *Leverage flexible working arrangements and online talent platforms:* Physical and organizational boundaries are becoming increasingly blurred and companies need to become significantly more agile in how they managing people's work. For example, businesses may increasingly connect and collaborate remotely with freelancers and independent professionals through digital talent platforms. It is important that policymakers proactively updates labour market regulations to complement such new organizational models.

These proposed short-term recommendations can provide guidance to local Kamloops businesses on the benefits of diversity and adaptation of new technologies to further its continued economic growth.

2.3. SWOT Analysis

This section identifies the strengths, weaknesses, opportunities, and threats related to Kamloops current state and economic outlook. The analysis will be based on the gathered information in the previous sections and categorized into six key themes: Demographics, economics, transportation, real estate, business climate, and quality of life.

Demographics

Strengths

- Healthy population growth comparable to the province of British Columbia as a whole.
- Local residents are on average younger than the region and province. This is mostly due to a higher proportion of residents between 0 to 14 years old.
- Well-educated residents with nearly two-thirds having a postsecondary education. Local postgraduates have a diverse range of fields of study closely corresponding to that of the province.
- Diverse occupation mixture of the local workforce which is similar to that of the province as a whole but with higher share of occupations related to trade and transportation.
- A local institution in Thompson Rivers University, which offers over 120 undergraduate and graduate degree options as well as over 50 career diploma and certificate programs.

Weaknesses

- While the average after-tax household income is high in a global context, it is slightly lower compared to that of the province and nation as a whole.

Opportunities

- The presence of Thompson Rivers University as BC's largest north of Vancouver can further strengthen its role as a catalyst for youth attraction as well as skill development of the future workforce.

Threats

- Increased competition on high-skilled labour with provincial, national and global markets may attract critical workforce participants away from the local market.
- The continued growth of Vancouver as the province's commercial, educational and cultural hub may further increase its attraction of youth and highly educated residents from Kamloops.
- High occupations levels of local residents within the transportation industry are at risk of displacement from emerging automation technologies, e.g. self-driving vehicles.

Economics

Strengths

- Kamloops' economy is estimated to have grown 13% from 2011 to 2017 and is projected to continue growing 2% annually until 2022.
- Total employment has increased by 3% from 2011 to 2016.
- Unemployment rate has decreased from 8.0% in 2011 to 7.5% in 2016.
- The mix of industry employment in Kamloops is diversified in that it closely corresponds to that of the province.
- High employment concentrations for the mining and health care industry stimulate local specializations and business attraction to support their respective value chains.

Weaknesses

- Local economy is estimated to have grown slower than that of the province as a whole.
- Total employment in Kamloops has grown slower than that of the province.
- Unemployment rate is higher than the province as a whole.
- 200+ requests to host conferences has recently been turned down by Tourism Kamloops due to lack of a civic centre.

Opportunities

- High growth projections for value added by the construction, accommodation & food, transportation & warehousing, and retail & distribution industries from 2016 to 2022.
- Automation technologies may pose opportunities to help increase productivity of workers as well as expand the workforce participation rate by reducing the physical demands and creating new jobs.
- Emerging industries such as the non-medicinal sector may be able to project up to $4.3 million in regional GDP
- Emerging industries such as the high-tech sector provides sample positive effects to the community (in productivity and knowledge sharing) that benefits the community as a whole.

Threats

- Unemployment is projected to rise to 7.0% by 2022.
- The mining industry is exposed to risk regarding volatile commodity prices, increased environmental regulations, as well as increased scepticism among local community for industry expansion (e.g. the council rejection of the Ajax Mine).
- While mining is a core industry for Kamloops in terms of value added, the industry is projected to have experience low growth in both value added and employment from 2016 to 2022.
- Studies suggest that emerging technologies could potentially automate a wide range of services and thus possibly displacing a large proportion of employees within industries such as retail, manufacturing, health care, and accommodation & food.

Transportation

Strengths

- Extensive transportation infrastructure and market access.
- Serviced by two national highways and located at the intersection of four major highways: Coquihalla (Hwy 5), TransCanada (Hwy 1), Yellowhead (Hwy 5), and Highway 97.
- Serviced by the Canadian National Railway (CNR) and Canadian Pacific Railway (CPR).
- Serviced by Kamloops Airport (YKA) which provide air service throughout North America and internationally. Plans to launch non-stop service to Toronto beginning in June 2018.
- Close proximity to major urban centres (i.e. Vancouver, Edmonton, Prince George) and international ports provides an ideal location for warehousing, distribution, industrial and technology centres.

Weaknesses

- High costs associated with maintenance of existing transportation infrastructure.

Opportunities

- Growth in online retail sale allow for expansion of wholesale and distribution. Kamloops has an advantage for its location.
- Self-driving technologies and other innovations may increase the advantage of Kamloops as a transportation hub in BC in the near future.

Threats

- High levels of employment in transportation and warehousing as well as wholesale distribution is subject to risk of labour displacement from emerging automation technologies, e.g. self-driving freight and robotic whole distribution.

Real Estate

Strengths

- Kamloops offers relatively affordable housing prices compared to both the province and Canada as a whole.
- Average monthly shelter costs for private dwellings are lower than both the province and Canada.
- Average monthly shelter costs for rented dwellings are lower than the province and comparable to Canada.
- Lower vacancy rates in Kamloops' rental market compared to both the province and Canada.
- The value of building permits in Kamloops has increased 40% from 2016 to 2017. This is mostly driven by permits for single-family dwellings and commercial buildings.

Weaknesses

- Limited prime commercial and industrial land available in Kamloops.
- Perceived need for more student housing.
- Homelessness has increased due to lack of social housing availability.
- Rapid increases in housing prices combined with low vacancy rates are often associated with higher income inequality as it may change the distribution of income towards home owners, and away from non-homeowners.
- Increased number of prohibited suites attached to principal units. This has caused shortages of parking as well as health and safety concerns due suites potentially not adhering to building regulations.

Opportunities

- Housing affordability compared to Vancouver's Lower Mainland continues to provide Kamloops with an opportunity for increased residential and commercial real estate demand.

Threats

- Significant increase in permits for high-end single-family dwellings and commercial building without enhanced initiatives to also increase permits for rental properties that help increase the stock of affordable housing may hinder students and low-income individuals to enter the real estate market.

Business Climate

Strengths

- Affordable commercial and industrial land.
- Competitive development costs charges compared to other BC municipalities.
- Competitive residential property taxes while sustaining a steady increase to maintain infrastructure needs.
- Existing business incentive programs and start-up support and resources.
- Extensive and reliable supply of infrastructure.
- Access to a well-educated and skilled labour pool through quality schools, colleges, and university.

Weaknesses

- High property tax rate for heavy industry, light industry and commercial in comparison to other BC municipalities.
- Limited prime commercial and industrial land available in Kamloops.
- Perceived need to streamline and communicate information on business incentive programs and support resources to improve awareness of these service offerings in the business community.
- Stakeholders in the local business community perceive the brand of Kamloops to hinder their ability to attract talented workers and business activities.

Opportunities

- Increased efforts on effectively communicating Kamloops' advantages for business may improve the city's ability to attract businesses from other BC municipalities.
- Initiating a comprehensive branding strategy involving the public and business community may help identify, address and mitigate negative perceptions of the city, which in turn could help local business better attracted talented workers.
- Initiate a feedback program that monitor companies who are interested to establish business activities in Kamloops and identifies key determinants for why they decided to either establish themselves in Kamloops or not.

Threats

- Perceived labour shortage of workers in skilled trades and lack of initiatives to build future talent pipeline.
- Perceived excess supply of newly graduates with business and commerce majors.
- Continued perceived issues with the brand of Kamloops by the local business community may hinder accelerated attraction of talent and business activities.

Quality of Life

Strengths

- Natural setting with an abundance of outdoor recreation opportunities in close proximity
- Hot dry summers, mild winters, and more than 2,000 hours of sunshine annually
- Within a one-hour drive of 200 lakes, provincial parks, 14 golf courses, and a world-class ski resort
- Thriving cosmopolitan centre, rich in arts and culture, shopping and lifestyle amenities
- Excellent health care, schools and affordable housing

Weaknesses

- Increasing crime rates. Kamloops sits 23rd on the list. The Crime Severity Index is at 128, well above the Canadian average of 71, while the Violent Crime Severity Index is at 99, above the Canadian average of 75.
- Stakeholders perceive a current lack of nightlife and music scene catering to young residents.

Opportunities

- Increased efforts on communicating Kamloops' affordable house prices, family-friendly neighbourhoods, and natural beauty may further improve the attraction if residents from other BC municipalities.

Threats

- With climate change posing greater risks of forest fires, Kamloops may suffer from declining air quality, risk of transportation restrictions (e.g. airport temporarily closing), and general safety of the public.

3. Economic Impact Assessment

3.1. Assessing Economic Impacts

To analyse the economic impact of emerging sectors, we will conduct a comprehensive EIA using detailed data from Statistics Canada and sample data from a representative non-medicinal cannabis operator and combine it with our own proprietary EY economic model tools (i.e., Economic models founded on the principles of the Input-Output model). As such, our analysis will allow us to capture the impact of the selected emerging industries to the city of Kamloops.

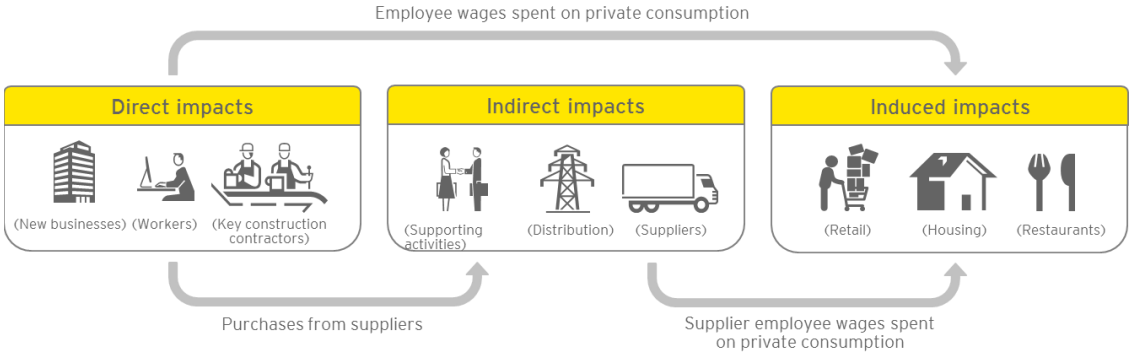
Direct, indirect, and induced Impacts

Using the framework of our Input-Output model, we capture the impacts on the city's economy via three distinct impacts; *direct*, *indirect* and *induced* impacts. These impacts individually, and collectively, represent how the selected emerging sectors ripple throughout the economy.

More specifically, we define the impacts as follows:

- The *direct impact* includes the 'incremental' economic impact supported directly by new businesses' capital investment cost and the post-build operation costs. By *incremental*, we refer only to the directly supported economic impacts from the construction and operations that represent additional value-add to the Kamloops economy.
- The *indirect impact* includes the economic impact from the incremental business activities arising from supporting the business operations. The indirect effect includes, for example, supporting businesses providing security, insurance, and other professional services, in addition to businesses in the construction and supply industries, as well as a number of upstream suppliers.
- The *induced impact* includes the potential employees from the new emerging sectors spend their wages in the Kamloops economy. The induced activity are primarily service-related in industries such as retail trade, transport, accommodation, restaurants, housing and finance.

Figure 13. Sample of Economic Impact flows



Source: EY illustration.

supported economic impact that occurs when

Methodology

A static interprovincial input-output ("I-O") model has been used to assess the economic impact of the emerging sectors on the city of Kamloops. This method was selected due to its flexibility in providing a reliable, cost efficient way to assess regional impacts. In particular, the I-O model first translates direct impacts into indirect and induced economic impacts, which collectively will define the total economic impact for the City of Kamloops. We will express the economic impacts in terms of the following metrics:

- *Gross Domestic Product* ("GDP"): GDP, or local value added, is a measure of the value of all final goods and services produced in a specific region (i.e. the City of Kamloops).
- *Labour income*: Labour income is a component of the local value-added that measures the total employee compensation (value of wages and benefits) and proprietor income.
- *Full-time equivalent employment* ("FTEs"): The number of FTEs measures the number of employees on full-time schedules plus the number of employees on part-time schedules converted to a full-time basis.
- *Regional taxes*: This includes municipal taxes (i.e., local property taxes and business taxes). Note that income taxes are not included.

To estimate the total economic impact of these emerging industries, we first estimate the economic impact to the province of British Columbia using Statistics Canada's most recent interprovincial economic multipliers from 2014. Generally speaking, these multipliers reflect how Statistics Canada tracks the interdependency between all the sectors of the economy. Each of these multipliers is a number that describes the size of the total economic impacts for a given level of spending.

For example, a multiplier of 1.2 suggests that the total economic impact for every dollar spent by adds an *additional* 20 cents to the economy. In other words, for every dollar spent, the economic activity from supporting businesses and consumers generate an additional 20 cents in the local economy. Statistics Canada's I-O model is used by both public and private sector organizations and other researchers and is based on widely accepted methodology for estimating these types of economic linkages.

Please refer to Appendix A.4 for a detail description of the I-O model and its underlying assumptions.

Upon estimating the economic impact of the two emerging industries on the province of British Columbia, we would then adjust the impacts to consider for, among other things, the following:

- Businesses supporting the operations from these two new emerging sectors located outside of Kamloops; and
- Wages and salaries paid to employees from the businesses relocating into Kamloops residing outside of Kamloops and likely spending its salary on businesses outside of Kamloops.

These adjustments are achieved by first calculating the ratio of employment of a certain sector in Kamloops to the total employment of that same sector in British Columbia. This provides a reasonable proxy to assess the concentration of sectors within Kamloops and adjust the total economic impacts for each industry that is likely affected from the operations of businesses from these two new emerging sectors. Given that the I-O model provides detailed descriptions of which industries are predicted to be impacted from the collective expenditures of high-tech and non-medicinal cannabis companies, we would be able to adjust each individual industry based on the concentration of sectors within Kamloops. This would provide an adjusted indirect and

induced impacts, resulting in a regional total economic impact for the City of Kamloops. Figure 14 illustrates an analysis of likely impacts to the City of Kamloops.

Sample Economic impact Analysis

EY conducted a one-hour interview with a representative local Kamloops owner and retailer of hemp based paraphernalia now entering the non-medicinal cannabis industry. The representative owner and operator of hemp-based products has over twenty years' experience operating similar retail stores. The discussion was a combination of closed-end and open-end questions, discussing the likely operational spending of a typical non-medicinal cannabis retail store that will likely be entering the local Kamloops market.

Given the data limitations arising from operating a non-medicinal cannabis shop, information on the dynamics of the Kamloops economy, in addition to the reliance of the estimates provided by the representative, the results of this section should be interpreted as sample economic impact calculations only, and not necessarily the economic impacts arising from the non-medicinal cannabis economy to the City of Kamloops.

For example, as per our discussion with the representative, in addition to using publicly available information, Table 6 sets out assumptions of operational spending of a representative non-medicinal cannabis retailer with five full time employees and an estimated 1,250 square feet of retail space. The estimates were based on discussions with the representative Kamloops stakeholder and using Capital IQ to sourced publicly available financial statements to benchmark likely costs of cannabis retailers.

Figure 14. Sample of Regional Economic Impacts

Source: EY illustration.

Table 6. Sample Operational Spending

	Cost per ft²	Total cost
Retailer		
Salaries and wages	*$86.40*	*108,000*
General and administrative	*246.69*	*308,358*
Other spending	*51.84*	*64,804*
Total	**384.93**	**481,162**

Source: Representative Kamloops stakeholder and Capital IQ.

3.2. Sample Economic Impacts of the Non-Medicinal Cannabis Sector

The following section describes the sample economic impacts arising from the operations of up to ten new non-medicinal cannabis dispensaries. In particular, our economic impact assessment is based on the spending estimates of the dispensaries. The impacts related to GDP, labour income, employment, and output.

For example, the sample calculations suggest that the collective operations of up to ten private new cannabis dispensaries would contribute and sustain an additional 36 new jobs in the city of Kamloops, $1.65 million in wages, nearly $4.3 million in regional GDP, and up to $5.70 million in local output.

Note that during this exercise to assess the regional economic impacts, we separate spending that are locally sourced versus those that are sourced from outside the city of Kamloops (e.g. how much of the labour costs are paid to employees residing in Kamloops compared to outside, and what proportion of spending on purchases of goods and services located in Kamloops compared to outside of Kamloops.). This distinction between local and external spending is important to assess the impact and must be considered for the direct, indirect and induced impacts.

Table 7: Summary of economic impacts from operational spending

Impact	FTEs	Wages ($ mn)	GDP ($ mn)	Output ($ mn)
Direct	30	1.1	2.7	3.7
Indirect	5	.35	1.1	1.5
Induced	1	.2	0.5	0.5
Total	36	1.65	4.3	5.7

Note: Prices are nominal and "mn" refers to units of millions; the figure shows a sample calculation of the total impact of operational spending to the City of Kamloops.

Source: EY sample calculations based on sample operating estimates and Statistics Canada's 2014 interprovincial input-output tables.

Other considerations we adjusted in the sample regional economic impact is the likelihood of the new dispensaries interacting with each other (i.e., purchasing goods and services from one another). More specifically, we adjust for spending to avoid any double counting of economic impacts. This ensures that we likely do not overestimate certain economic impacts that are likely attributable to the opening of new dispensaries but may in fact be incremental rather than duplicative.

As such, the adjustments described above are associated with significant uncertainties and are often subject to subjective assessments due to lack of detailed data availability. As several assumptions are required to perform these adjustments, in addition to the considerable uncertainty with the operational spending estimates, this section merely demonstrates a sample economic analysis that may be conducted should the City of Kamloops decide to pursue a more detailed study of the emerging non-medical cannabis sector with more detailed information and stakeholder consultations.

3.3. Sample overview of the benefits from the High Tech Sector

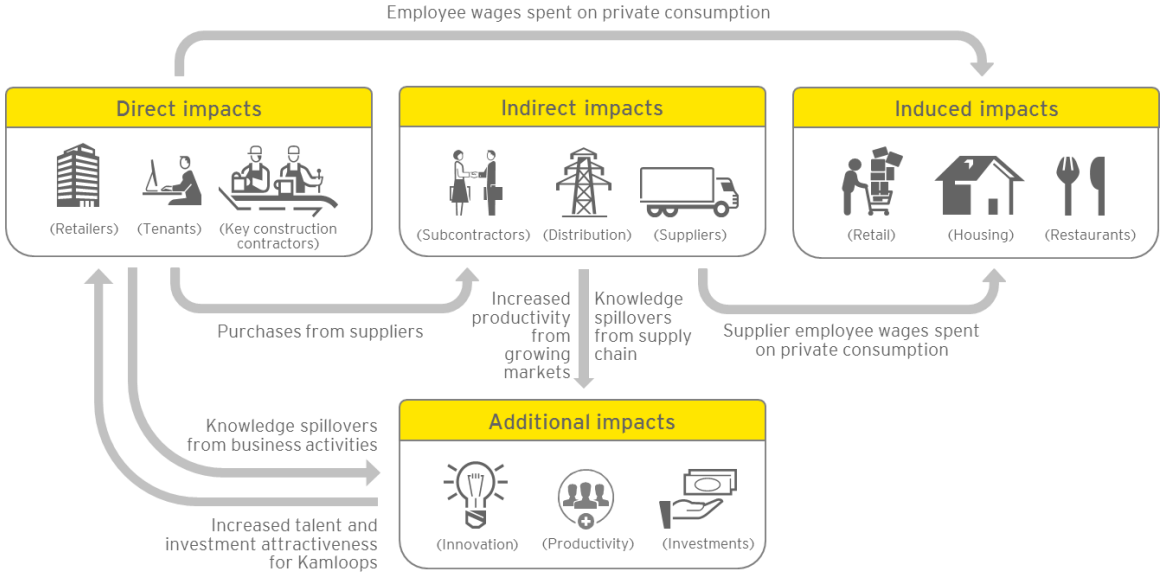
The emergence of the high tech sector provides benefits beyond the operational and capital spending of incubators, innovation hubs, and entrepreneurial activities, namely the benefits of knowledge spillovers, productivity increases, and follow on investments.

For instance, an effective innovation hub has the ability to attract, develop, and retain highly skilled individuals to the city of Kamloops without fear of talent relocating after graduation from post-secondary educational institutions. Figure 15 provides an overview of the additional benefits arising from the emergence of the high-tech sector.

Innovative activity and commercialization

Innovation centres, incubators, and more generally, centres of commercial research provide many positive benefits to the regional economy that are not typically captured in a traditional economic impact study. Aside from operating expenditures, R&D and commercialization of research are typically not considered in a standard economic impact assessment, but are crucial for continued growth and innovative potential in a region. For instance, economic benefits from research labs and incubators produce quantifiable outcomes that can be measured over time. Examples include commercialization outputs such as Intellectual Property (IP) creation (issuance and granting of patents, trademarks, and copyrights), new product development, processes, and/or services provide many economic benefits not only to the region, but to the province and to Canada.

Figure 15. Sample of additional economic Impact flows



Source: EY illustration.

Further, the economic impact of the commercial success of firms can be evaluated by measuring incremental sales, including product and service sales as well as royalties and licensing revenue.

Additionally, the impact of the incubator can be evaluated by tracking the number of new firms that are created or spun off and their commercial success and employment after exiting the incubator.

As these firms graduate from the incubator, they will also generate an additional economic impact on the local economy if they continue to operate in the area, through their direct spending,

employment of local labour and contribution to taxes.

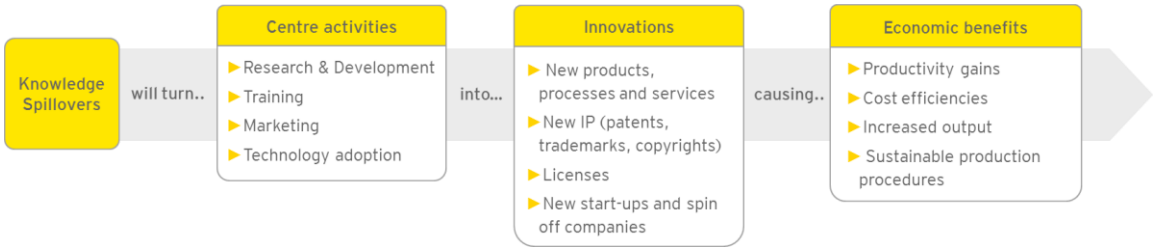
As an example, a study conducted in 2014 to assess the British Columbia tech sector found that while the Finance, Real Estate, and Construction sector are large contributors to economic activity, the economic contributions from the technology sector found to be growing at a similar pace to that of the aforementioned sectors. As Kamloops has a similar industry diversity to that of British Columbia, it may be likely that the growth contributions are likely similar.

From the perspective of innovation, R&D spending also has direct impacts on productivity and economic growth. R&D as an input is tracked closely globally as it is a critical determinant of productivity, and ultimately, economic growth.

Spillovers, local innovation, and productivity

Key anchor institutions within innovation hubs, facilitate knowledge flows and spillovers that translate into increased innovation outcomes and economic impacts. A well-functioning high-tech sector enables start-ups, small businesses, researchers, and retail outlets to mutually benefit from its expertise and work together in a localized space. Indeed, this provides ample opportunities for partnerships and collaborations with local post-secondary institutions and external businesses to help spur innovation, increase productivity and ultimately benefit all aspects of the Kamloops economy.

Figure 16. Economic benefits of knowledge spillovers



Source: EY illustration.

4. Industry Diversity Analysis

4.1. Identification of National Business Cycles

Understanding how national business cycles impact regional economies is important in providing insights on how receptive the current business environment is to economic upturns and downturns and how regions can better prepare to mitigate these potentially large movements in their respective economies.

To do so, we first map out historical annual changes to national and provincial GDP to assess how sensitive the province of British Columbia is relative to national business cycles to then determine the likely impact to Kamloops by providing an in-depth analysis of economic diversity.

For example, Figure 17 illustrates annual percentage changes of national GDP from 1980 to the projected year 2027[9] to identify historical recessions. Notable reductions in annual GDP growth associated with economic downturns identified in the analysis are the early 1990's oil price shock, the minor economic downturn in early 2000's from the tech sector, and the financial crisis from 2008.

Similarly, Figure 17 also illustrates the historical (and projected) percentage changes in GDP for the province of British Columbia. By comparing the percentage changes between Canada and the province of British Columbia over time, we see

Figure 17. Business Cycles and Annual GDP Growth for Canada

Notes: Shaded areas represent recessions.

Source: EY analysis based on Oxford Economics.

that the general business cycle movements are positively correlated, suggesting that the industry mix impacted by business cycles are generally

consistent between the province to that of Canada, as discussed further below. For example, industries typically fall into three categories:

- **Cyclical:** Industries that are highly sensitive to business cycle peaks and troughs. This includes both pro-cyclical and counter-cyclical industries;
- **Defensive:** Industries that are anticyclical, i.e. insensitive to business cycles; and
- **Sensitive:** Industries that have moderate correlations with business cycles.

Table 8 provides an overview of industries that fall into the aforementioned categories. For example, industries that are more sensitive to business cycles are often driven by sectors related to changes in discretionary spending, interest rate movements, and more generally, commodity uncertainty.

The following section will provide a description of the methods we intend assess business diversity and how likely Kamloops is impacted by national business cycles.

Table 8. Examples of Cyclical, Defensive and Sensitive Industries

Cyclical	▶ **Basic Materials:** *Companies that manufacture chemicals, building materials, and paper products. This sector also includes companies engaged in commodities exploration and processing.* ▶ **Consumer Cyclical:** *This sector includes retail stores, auto and auto parts manufacturers, companies engaged in residential construction, lodging facilities, restaurants, and entertainment companies.* ▶ **Financial Services:** *Companies that provide financial services, including banks, savings and loans, asset management companies, credit services, investment brokerage firms, and insurance companies.* ▶ **Real Estate:** *This sector includes mortgage companies, property management companies, and real estate investment trusts.*
Defensive	▶ **Consumer Defensive:** *Companies engaged in the manufacturing of food, beverages, household and personal products, packaging, or tobacco. Also includes companies that provide services such as education & training services.* ▶ **Health Care:** *This sector includes biotechnology, pharmaceuticals, research services, home health care, hospitals, long-term care facilities, and medical equipment and supplies.* ▶ **Utilities:** *Electric, gas, and water utilities.*
Sensitive	▶ **Communication Services:** *Companies that provide communication services using fixed-line networks or those that provide wireless access and services. This sector also includes companies that provide Internet services such as access, navigation and Internet related software and services.* ▶ **Energy:** *Companies that produce or refine oil and gas, oil field services and equipment companies, and pipeline operators. This sector also includes companies engaged in the mining of coal.* ▶ **Industrials:** *Companies that manufacture machinery, handheld tools, and industrial products. This sector also includes aerospace and defense firms as well as companies engaged in transportation and logistic services.* ▶ **Technology:** *Companies engaged in the design, development, and support of computer operating systems and applications. This sector also includes companies that provide computer technology consulting services. Also includes companies engaged in the manufacturing of computer equipment, data storage products, networking products, semiconductors, and components.*

Source: EY Analysis.

4.2. Measures of Industry Diversity

It is widely understood that a well-diversified economy is less prone to business upturns and downturns by spreading economic risk across sectors. For example, even if some industries are suffering, other growing industries may more than offset the slow growth to maintain a healthy balanced economy.

Indeed, having a well-balanced economy is often a precursor to achieve both economic stability and growth. The presence of many industries from a well-diversified economy typically offers a wide array of employment opportunities that helps sustain a consistent level of employability without the concern of job losses from struggling industries. As such, it may be viewed that a diversified economy is more likely to face negative external economic events with minimal economic losses. However, it should also be noted that perfectly diversified economies are not necessarily ideal or desirable.

There are many measures of economic diversity that have been developed over the years, typically with an emphasis on certain aspects of the economy. The following will provide an overview of measures of economic diversity grouped by its emphasis on certain economic theory to growth. These measures of economic diversity are computed using employment data of high-level sectors in Kamloops. Please refer to Appendix A.5 for a detailed description for each economic measure.

Theory of firms

Under this framework, a more diversified economy with a greater number of sectors is typically associated greater competitiveness. As such, there are a number of measures of economic diversity that attempt to capture industry diversity by assessing shares of employment and comparing them across sectors within a region. In this respect, the *Ogive Index*, the *Entropy Index*, and the *Herfindahl Index* offer quantitative insights as to the extent of economic diversity. Specifically, each economic measure uses different formulas to assess the level of economic diversity within the city of Kamloops.

Export based Theory

Under this economic framework, regional economic growth is driven by exports of goods and services to other jurisdictions. The *Hachman Index* compares shares of employment in industries within a region to the distribution of economic activity in a wider geography.

Table 9 summarizes the four different measures of economic diversity for Kamloops. Note that for each measure, it supports our earlier assessment that the City of Kamloops is sufficiently

Table 9. Summary of Economic Diversity for Kamloops

	Estimate	Description
Theory of Firms		
Ogive Index	*57.5%*	A value of zero represents a perfectly diversified economy, where all sectors have the same share of employment
Entropy Index	*2.71*	A value of zero represents a very specialized regional economy, where one sector employs all labour
Herfindahl Index	*7.9%*	A value closer to zero represents a well-diversified economy
Export based Theory		
Hachman Index	*91.4%*	A value of 100 percent represents an economy with an industrial structure identical to that of the province of British Columbia

Source: EY analysis based on Statistics Canada - 2016 Census.

diversified and similar to that of the province of British Columbia.

Comparing Kamloops' diversity index scores with other cities helps uncover the extent of diversity in its economy. Kamloops appears to be more diversified than Kelowna but less than the City of Vancouver, Calgary, Saskatoon and Toronto. Based on employment data from the 2016 Census it is also more similar in industrial structure to the Canadian economy than Vancouver, Calgary, and Toronto.

Table 10. Economic Diversity Across Cities

	Description	Kamloops	Vancouver	Kelowna	Calgary	Saskatoon	Toronto
Ogive Index	A value of zero represents a perfectly diversified economy, where all sectors have the same share of employment	*57.5%*	53.5%	59.9%	43.6%	53.1%	47.6%
Entropy Index	A value of zero represents a very specialized regional economy, where one sector employs all labour	*2.71*	2.71	2.70	2.76	2.73	2.71
Herfindahl Index	A closer to zero represents a well-diversified economy	*7.9%*	7.7%	8.0%	7.2%	7.7%	7.4%
*Hachman Index**	A value of 100 percent represents an economy with an industrial structure identical to that of Canada	*92.4%*	83.3%	93.3%	81.2%	93.2%	86.4%

*Note: Here the Hachman Index is calculated by comparing the industrial structure in each city relative to Canada as a whole.

Source: EY analysis based on Statistics Canada - 2016 Census.

Appendices

A.1 Methodology for Local Economic Projections

The following appendix provides a detailed description of the methodology used to obtain economic projections for the city of Kamloops.

We are restricted to data limitations to that of Statistics Canada which does not provide estimates on GDP or other aggregate economic indicators beyond what is published at the provincial level, and more specifically, data on Kamloops beyond industry employment provided by the 2011 National Household Survey and the 2016 Census program. As such, we do not have comprehensive historical information to rely on when building a forecast model for Kamloops. Given such data limitations, we seek to derive suggestive projections on the development of key economic indicators (e.g. population, employment, GDP, household income) not only for the future growth patterns, but also interpolate suggestive projections for the years between 2011 and 2016.

In the process of deriving such projections, we apply a "top-down" approach where we base our projections on the growth patterns observed for the province of British Columbia as a whole while adjusting these by the Kamloops-specific developments in population, employment and industry composition observations. Alternatively (or as a complement), one could apply a "bottoms-up" approach that develops a regional model for Kamloops which seeks to explain the local interactions between consumers, firms, government as well as trade patterns within these economic agents externally. In an optimal scenario, projections would be derived from both a "top-down" and a "bottoms-up" approach to validate the economics projections. However, due to the unavailability of granular data (and the time and resources required to develop primary data) for the City of Kamloops, we only apply a top-down approach.

Based on existing estimates of provincial real GDP and employment by industry, we derive shares in each industry at the city level based on employment shares by industry that are applicable to Kamloops. The latter dataset can be obtained by an analysis of the Census data, as well as by examining changes in employment by industry and population in Kamloops. Using provincial forecasts of real GDP growth and employment by industry, we can derive estimates of real GDP growth rates and employment by industry for the Kamloops.

It is important to note that such approach produces projections that are suggestive at best and are subjective to significant uncertainties. Further, the approach applies some critical assumptions. As an example, to derive real GDP contributions for each industry in Kamloops, we are required to make assumptions on the average contribution per employee in Kamloops versus that of a typical employee in the province as a whole. For practical purposes, we assume that each employee in Kamloops associated with each industry contribute the same amount to GDP to that of an employee in the province located elsewhere associated with the same industry. In addition, we also assume that the real GDP growth pattern, employment growth pattern, and unemployment rates in Kamloops closely follows what is projected for the province as a whole.

A.2 Detailed Summary Tables for Local Industry Outlook

Table 11. Summary of industry employment projections in Kamloops from 2011 to 2022

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry, fishing & mining (11-21)	2,205	2,214	2,295	2,292	2,257	2,305	2,332	2,341	2,370	2,359	2,351	2,344
Manufacturing (31-33)	2,340	2,434	2,245	2,385	2,553	2,530	2,594	2,609	2,586	2,553	2,521	2,499
Utilities (22)	180	180	186	231	249	230	220	240	242	242	242	242
Construction (23)	3,375	3,475	3,620	3,617	3,713	3,885	4,201	4,435	4,486	4,542	4,618	4,697
Retail & distribution (41-45)	7,900	7,630	7,709	7,439	7,099	7,365	7,455	7,553	7,615	7,653	7,696	7,738
Accommodation & food (72)	4,045	4,222	4,361	4,674	4,680	4,595	4,847	4,740	4,811	4,874	4,937	4,998
Transportation & warehousing (48-49)	2,695	2,744	2,569	2,590	2,607	2,595	2,628	2,478	2,497	2,506	2,517	2,528
Information, culture & recreation (51+71)	2,060	1,974	1,842	1,736	1,732	1,975	2,138	1,983	1,982	1,988	1,994	1,998
Finance and real estate (52-53)	2,155	2,082	2,106	2,056	1,901	2,010	2,311	2,255	2,259	2,273	2,287	2,300
Professional (54)	2,590	2,485	2,555	2,568	2,603	2,730	2,754	2,823	2,862	2,890	2,923	2,955
Management & administrative (55-56)	1,675	1,718	1,769	1,579	1,672	1,875	1,841	1,800	1,811	1,822	1,833	1,844
Public administration (91)	3,035	2,816	2,713	2,623	2,509	2,705	2,657	2,693	2,731	2,750	2,765	2,775
Education (61)	3,540	3,601	3,578	3,449	3,269	3,265	3,284	3,283	3,303	3,323	3,346	3,369
Health (62)	6,135	6,414	6,148	6,186	6,564	6,685	6,965	7,451	7,569	7,656	7,754	7,849
Other services (81)	1,920	2,227	2,076	2,212	2,368	2,360	2,577	2,674	2,691	2,696	2,703	2,708
TOTAL	45,850	46,217	45,771	45,636	45,776	47,110	48,803	49,357	49,816	50,125	50,488	50,844

Note: Shared areas represents employment estimates or forecasts, whereas white colums are actual Census data. Numerics in brackets represents composite NAICS codes.

Source: EY analysis based on Statistics Canada - 2016 Census Program, 2011 National Household Survey, and Oxford Economics.

Table 12. Summary of industry value added projections in Kamloops from 2011 to 2022

($ millions, 2007 prices)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry, fishing & mining (11-21)	500.3	484.5	471.5	491.9	504.6	504.8	496.2	487.4	505.2	514.1	526.7	539.4
Manufacturing (31-33)	205.1	209.1	208.4	219.8	224.3	239.0	249.8	251.5	253.8	255.1	256.1	258.1
Utilities (22)	57.2	59.3	59.5	61.2	65.0	66.9	70.3	72.0	72.6	73.1	73.5	73.9
Construction (23)	256.5	293.4	297.7	329.9	329.3	334.3	367.4	394.5	404.1	411.6	420.5	429.5
Retail & distribution (41-45)	422.9	431.4	439.7	435.1	445.8	466.1	496.1	506.4	518.8	529.8	540.9	552.1
Accommodation & food (72)	114.8	120.4	128.9	143.7	154.0	160.7	168.8	175.2	179.3	183.1	186.9	190.6
Transportation & warehousing (48-49)	226.1	222.3	223.6	226.1	225.6	239.7	256.3	265.4	270.2	274.7	279.2	283.7
Information, culture & recreation (51+71)	163.1	155.4	148.7	147.9	141.1	150.1	151.8	152.2	154.4	156.6	158.7	160.8
Finance and real estate (52-53)	673.9	685.8	702.5	720.3	749.4	781.4	807.3	819.0	834.9	852.0	868.7	885.3
Professional (54)	153.8	158.0	165.6	173.2	178.5	188.6	195.6	200.7	205.6	210.2	214.9	219.6
Management & administrative (55-56)	98.4	102.6	103.7	105.2	107.5	106.5	106.2	107.1	109.2	111.1	112.9	114.7
Public administration (91)	336.4	321.6	312.1	299.7	297.3	306.0	312.3	318.3	326.4	333.7	340.3	346.4
Education (61)	240.1	237.4	232.5	220.0	227.3	231.9	236.1	241.7	246.1	250.1	254.2	258.2
Health (62)	302.5	305.1	305.3	308.6	313.4	321.4	327.6	337.3	343.0	348.1	353.1	357.9
Other services (81)	82.6	86.0	91.6	97.8	102.8	102.8	104.6	105.8	107.5	109.3	111.0	112.7
TOTAL	**3,833.6**	**3,872.2**	**3,891.4**	**3,980.4**	**4,066.0**	**4,200.2**	**4,346.4**	**4,434.7**	**4,531.2**	**4,612.7**	**4,697.8**	**4,782.9**

Note: Numbers in brackets represents composite NAICS codes.

Source: EY analysis based on Statistics Canada - 2016 Census Program, 2011 National Household Survey, and Oxford Economics.

A.3 Stakeholder Consultations

This appendix list the stakeholders interviewed for the purpose of this analysis:

Table 13. Overview of stakeholder interviews

Entity	Contact Name	Title
City of Kamloops	David Trawin	Chief Administrative Officer
Kamloops Innovation	Lincoln Smith	Executive Director
City of Kamloops	Jason Locke	Community Planning and Sustainability Manager
Kamloops Chamber of Commerce	Joshua Knaak	President
Tourism Kamloops	Beverley DeSantis	Chief Executive Officer
Venture Kamloops	Dr. Richard Brownlee	Director, Board of Directors

A.4 The Input-Output Model: Approach and Restrictions

An I-O model is subject to limitations both in concept and implementation. Like any economic model, the I-O model is conceptually an abstraction that attempts to be complex enough to accurately capture and estimate the most significant impacts to the real-life economy caused by an economic activity, yet simple enough to be analytically and intuitively meaningful.

Generally speaking, an I-O model reflects the observed interdependency between all the sectors of the economy. Specifically for Canada, Statistics Canada reports for 236 industrial sectors in the economy: (1) how each sector relies on the other 235 sectors for inputs to their production; and (2) how each sector supplies its products and services to each of the remaining 235 sectors. While an I-O model provides a consistent and intuitive way of measuring the economic effects of an economic activity, users should be aware of the assumptions and limitations of the I-O model's underlying approach, and in turn regard its results merely as approximations. Some of these assumptions include:

- The relationship between industry inputs and outputs is linear and fixed, meaning that a change in demand for the outputs of any industry will result in a proportional change in production. The model cannot account for economies/diseconomies of scale or structural changes in production technologies, an assumption which does not necessarily hold in the actual economy;
- Prices are fixed in the model;
- I-O models are static and does not consider the amount of time required for changes to happen. As such, in the context of this study the model implicitly assumes that all the ripple effects in the economy take place within one year. Changing the timeframe would not affect the magnitude of the effects estimated;
- There are no capacity constraints, and all industries are operating at capacity. This implies that an increase in output results in an increase in demand for labour (rather than simply re-deploying existing labour). It also implies that there is no displacement that may occur in existing industries as new projects are completed;
- I-O models assume that the technology and resource mix (ratios for inputs and production) is the same for all firms within each industry, i.e. the 236 industry categories reported in Statistics Canada's input-output table. As such, our analysis describes industry average effects; and
- The model assumes that the structure of the economy remains unchanged, looking as it did in 2014 (the most recent year of Statistics Canada's latest available input-output table). Any structural changes in the economy since 2014 will therefore lead to changes to the multipliers, which could be implemented once Statistics Canada releases updated input-output tables. As such, the more removed the year of analysis is from the year of the input-output tables used, the greater the uncertainties.
- It is generally acknowledged that the "closed" model (i.e. the I-O model that includes induced impacts) overestimates economic impacts because of the rigid assumptions about labour incomes and consumer spending.

As per the assumptions above, the structure and limitations of I-O models lend themselves to measuring the impacts of projects that are shorter term in nature; generally, they are used to look at shocks to the economy. For longer-term, time series analysis and general equilibrium models are likely more appropriate.

Lastly, EY has relied upon the completeness, accuracy and fair presentation of all information, data, advice, opinions or representations obtained from public sources, and Venture Kamloops (collectively the "Information"). The findings of this report are conditional upon such completeness, accuracy and fair presentation of the Information as EY has not independently verified or audited the Information provided to us.

A.5 Economic Diversity Indices

This Report highlights four measures well suited to describe the extent of economic diversification in the City of Kamloops.[10]

Theory of Firms Framework

Under this framework, economic diversity in a region can be captured by the makeup of industrial sectors in the economy. Regions with more sectors have greater diversity and are associated with a more competitive economy.

Ogive Index:

The Ogive Index measures how a region's economic activity is distributed between its sectors. The Index is calculated as:

$$\sum_{i=1}^{N} \frac{(S_i - \frac{1}{N})^2}{1/N}$$

S_i is the share of economic activity in each sector i as a proportion of total economic activity and N is the total number of sectors in the region. For this Report, share of economic activity is calculated using employment statistics for each sector from the 2016 Census. Based on this measure, the economy is perfectly diversified when every sector has the same share of employment ($S_i = \frac{1}{N}$) and the Ogive Index is equal to zero. The Ogive Index measure is higher as sectoral activity is more unequally distributed in the economy.

Entropy Index:

The Entropy Index is a comparison of the actual distribution of economic activity to a perfectly equal distribution. The index is calculated as:

$$\sum_{i=1}^{N} S_i \ln(\frac{1}{S_i})$$

S_i is the share of economic activity in each sector i as a proportion of total economic activity, N is the total number of sectors in the region and ln is natural logarithm. For this Report, share of economic activity is calculated using employment statistics for each sector from the 2016 Census. Entropy Index values are higher when there is more diversity in economic activity within a region and lower when activity is more specialized in a few sectors. The Entropy Index is equal to zero when only one sector employs all labour in the economy.

Herfindahl Index:

The Herfindahl Index is a commonly used metric for market concentration in an economy. It can similarly be used to measure economic diversity. The index is calculated as:

$$\sum_{i=1}^{N} {S_i}^2$$

S_i is the share of economic activity in each sector i as a proportion of total economic activity and N is the total number of sectors in the region. For this Report, share of economic activity is calculated using employment statistics for each sector from the 2016 Census. The index ranges from values of zero to one. The Herfindahl Index is closer to zero when economic activity is more diversified between sectors and is closer to one when a fewer number of sectors dominate the economy. The Index is equal to one when only one sector employs all labour in the economy.

Export Based Theory Framework

Hachman Index:

The Hachman Index measures how the regional distribution of economic activity compares to that of the wider economy. For this Report, economic activity is measured using employment statistics for each sector from the 2016 Census and Kamloop's industrial structure is compared to that of British Columbia (other studies have compared regional economies to the national distribution). The index is calculated as:

$$\frac{1}{\sum_{i=1}^{N}[\left(\frac{S_i^{Reg}}{S_i^{BC}}\right) x (S_i^{Reg})]}$$

$$= \frac{1}{\sum_{i=1}^{N}[LQ_i \; x \; S_i^{Reg}]}$$

S_i^{Reg} is the share of employment in each sector i in the region as proportion of total employment, S_i^{BC} is the share of employment in each sector i in BC as proportion of total employment in the province, N is the total number of sectors, and LQ_i is the share of employment of a sector in a region relative to the sector's share of employment in BC. The Hachman Index ranges from values between zero and one. An index value of one means that the industrial structure between the region and BC are exactly the same, whereas a value of zero means that they are completely different.

The $LQ_i \left(\frac{S_i^{Reg}}{S_i^{BC}}\right)$ or location quotient is a measure of how specialized a sector is in the region relative to BC. If the share of employment in a sector within a region is higher than that of BC, then its LQ will be above one and the region has a specialization in that sector. Sectors with a LQ greater than one can also be interpreted as being basic sectors in the regional economy which actively exporting their products or services to other regions.

A.6 References and Comments

[i] 2016 Census Canada.

[2] Mathematically speaking, the location quotient is defined as follows: Suppose x is a particular industry's number of jobs in the region, and y is the total number of jobs for all industries in Kamloops. Then x/y is the local "concentration" of employment for the given industry. Now, suppose X and Y are similar data points for the province of British Columbia as a hole. Then the location quotient (or industry concentration) of that industry in Kamloops compared to the province is $(x/y)/(X/Y)$.

[3] Tourism Kamloops, 2017 Annual Report.

[4] Kamloops Airport Report, Economic Benefits to the Region; Kamloops Airport homepage.

[5] The main difference between nominal and real GDP values is that real values are adjusted for inflation, while nominal values are not. As such, the nominal values of GDP can differ over time due to both (1) changes in quantities of goods and services and (2) changes in general price levels. In order to segregate these two changes, real GDP values adjusts for differences in prices levels over time in order to isolate only changes in quantities of goods and services.

[6] McKinsey Global Institute. *A future that works: Automation, employment and productivity*. January 2017.

[7] Mowat Centre, University of Toronto's School of Public Policy and Governance. *Working Without a Net*. November 2016.

[8] World Economic Forum, Global Challenge Insight Report. *The future of jobs: Employment, skills and workforce strategy for the fourth industrial revolution*. January 2016.

[9] Based on Oxford Economics forecasts.

[10] United Nations, Framework Convention on Climate Change. *The concept of economic diversification in the context of response measures.* May 2016.