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Strategic Industries Analytics Project

Discovering Opportunities in
the Metro Vancouver Region's
Export Industries

November 2023

INVEST
VANCOUVER

Opportunity, Amplified. In a region like no other.

About Us

Invest Vancouver is the economic development leadership service for the Metro Vancouver region. By working to secure strategic investment, promote the region to a global audience, and advise decision-makers through forward-thinking economic research and policy analysis, Invest Vancouver is amplifying opportunity and advancing shared prosperity for all residents in the region.

Foreword

Data is essential to inform decisions and recommendations that will support sound policy changes and strong investment attraction for a resilient economy. The Strategic Industries Analytics project is a deep-dive into twenty years of data for key industries that are driving prosperity in the region. This report delivers region-specific data that hasn't existed before. At Invest Vancouver, we focus our activities on select key industries in the region that are export-oriented, support the creation of quality jobs, and in which the region offers identifiable productive advantages to attract foreign direct investment to the region.

The composition of our regional economy has changed over the past twenty years, reinforcing that we need to be flexible and adapt to market changes. Over the same time period, the Metro Vancouver region has driven employment growth in the province, and is the third largest Canadian metropolitan area by employment and GDP. In the global context, however, the regional economy is small, suggesting a need for coordinated efforts in economic development and investment attraction.

As we position our region for success in a rapidly evolving global economy, we need to continue to grow our understanding of the key industries shaping the Metro Vancouver region's economic ecosystem to identify opportunities that deliver prosperity for all of the region's 2.8 million residents. This report is key to this work because it analyzes newly created regional datasets to reveal the components driving our key industries' growth in the region. It identifies the "rising stars" in the regional economy and sets the foundation for further investigation. Without data, and specifically data that paints a picture of our regional economy, it is challenging to pinpoint and advance strategic initiatives to help us grow and amplify opportunities within the region.

For Invest Vancouver, these findings enable us to further our understanding of the industries driving prosperity in the region. It is a starting point to provoke further investigation, discussion, and collaboration among public and private sector stakeholders and advance investment attraction for a resilient regional economy.



Jacquie Griffiths
President, Invest Vancouver

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Executive Summary

Purpose: There is a critical need for granular data covering some of the Metro Vancouver region's export-oriented industries to support data-driven identification of economic development opportunities and to guide investment attraction efforts. Such data is not available from government sources. The Strategic Industries Analytics (SIA) project fills this need with regional datasets for components of selected industries covering gross domestic product (GDP), employment, labour hours, and capital stock. Analysis of these datasets supports a granular understanding of key industries. Invest Vancouver is releasing the results to provoke further investigation, discussion, and collaboration among public and private sector stakeholders and will use the analysis to narrow its focus and guide future investment attraction efforts.

Roadmap: The report consists of the three sections. The first section introduces Invest Vancouver's key industries, explains the need for a data-driven understanding, and introduces the SIA project. The second section provides a brief overview of the Metro Vancouver regional economy, which serves as context for the SIA analysis. The final section presents detailed findings based on analysis of the SIA datasets.

Section I – Starting Point: Invest Vancouver's Key Industries

Invest Vancouver focuses its activities on a subset of the overall economy: growing export-oriented industries that support quality jobs and in which the region offers firms an identifiable strategic or productive advantage. The initial set of key industries include: Transportation & Logistics; Digital Media & Entertainment; Life Sciences; Apparel; Agritech; the Green Economy (encompassing firms working on decarbonisation, sustainability, and the circular economy); and High-tech.

There is a scarcity of detailed, region-specific data necessary to develop a deeper understanding of these export-oriented industries. The SIA project used statistical techniques and information from multiple Statistics Canada tables to generate comprehensive, region-specific data sets. For individual industry components, the quarterly time series datasets cover the years 2001 through 2020 for GDP and capital stock, and 2001 through 2021 for employment and labour hours. This data allows for a much more granular examination of long-term trends in the key industries. The SIA project did not cover Agritech and the Green Economy because it is not possible to isolate these industries in the classification system used to organize firm-level government data.

Section II – Setting the Stage: An Overview of the Metro Vancouver Regional Economy

The SIA datasets make it possible to compare relative performance among and across industries and industry components. Since the goal is to identify areas of exceptional growth for further assessment, it is also important to consider the trajectory of the regional economy. All else being equal, it is less impressive for an industry's contribution to GDP to grow by 14% amidst a 20% increase in the overall economy, compared to the same growth during a period in which the overall economy managed just 2%. Employment trends are one useful gauge for such comparisons. Employment growth in the region has outpaced population growth, which is reflected in the rising labour force participation rate. Overall, the regional economy has been adding jobs at a faster rate than the rest of the province and the country as a whole. This outperformance in employment extends across all sectors of the economy.

Services-producing sectors dominate regional employment (accounting for 83% of all workers), while goods-producing sectors (agriculture, resource extraction, utilities, construction, and manufacturing) account for 15% of workers. The distribution of workers among sectors of the economy has shifted over the past two decades, with a rising share of employment concentrated in health care and social assistance; professional, scientific, and technical services; and construction.

The Metro Vancouver region is driving employment growth in the province and is the third largest Canadian metropolitan area by employment and GDP. In the global context, however, the regional economy is small, suggesting a need for coordinated economic development and investment attraction.

Section III – SIA Findings

The SIA project enables a deeper understanding of export-oriented industries in the Metro Vancouver region that create quality jobs and in which the region offers firms comparative advantages. The project covers Apparel, Digital Media & Entertainment, High-tech Goods, High-tech Services, Life Sciences, and Transportation & Logistics. The previously unavailable data allows Invest Vancouver and other stakeholders to examine trends in these industries and identify potential investment attraction targets. Analysis of the SIA project data reveals that High-tech Services, Digital Media & Entertainment, and Life Sciences are the top performers (based on percentage change in GDP, employment, and labour hours) among the industries covered.

High-tech Services are flourishing in the region, particularly in industry components such as computer systems design; engineering services; software; environmental consulting services; data processing, hosting, and related services; and other scientific and technical consulting services. Employment growth in Digital Media & Entertainment also outperformed the regional economy and greatly accelerated with the

pandemic recovery. Content-producing components (production, post-production, video game design, development, and publishing) are driving growth in Digital Media & Entertainment. The Life Sciences industry is growing faster than the broader regional economy, as described in the April 2023 Invest Vancouver report based on SIA data, “Life Sciences in Metro Vancouver: Shaping a Globally Prominent R&D Hub.”

GDP growth in Transportation & Logistics matched the regional economy, while job growth lagged slightly. However, the economic impact of this industry extends far beyond its direct impact and it enables activity in unrelated industries. Geography and trade infrastructure investments have combined to bestow the industry with a durable competitive advantage.

In High-tech Goods, the picture is mixed. Employment increased rapidly in all other electrical equipment, but fell in almost half of the other components. Most of the industry components are small, whether measured by contribution to GDP or employment. In Apparel, the data suggest an industry in decline. While true of the physical manufacture of garments in the region, this paints an incomplete picture because the data fail to capture headquarters activity and high-tech fabric design.

Although past performance is not necessarily indicative of future results and emerging opportunities may not yet be visible in the data, industry components that have outperformed in job creation over the past two decades are an excellent place to look for regional strengths. This information contributes to data-driven investment attraction, especially when combined with additional quantitative analysis and qualitative research into areas such as occupation trends and talent pipelines, the share of exported goods and services, productivity trends, and addressable markets and barriers to export.



Section I – Key Industries and the Need for Data

The SIA project is part of an ongoing effort to foster a deeper understanding of the regional economy and to identify industry components that offer the greatest opportunities for investment attraction and job creation. This section briefly summarizes the industry selection criteria, describes the initial set of industries, and introduces the SIA project.

Invest Vancouver focuses on export-oriented, growing industries with quality jobs

Invest Vancouver's mandate includes supporting investment attraction in order to facilitate the creation of quality jobs. Invest Vancouver focuses its activities on a subset of the many industries that contribute to the region's prosperity. Specifically, Invest Vancouver concentrates on growing, export-oriented industries that support quality jobs and in which the region offers firms an identifiable productive advantages.¹

Export-oriented industries are high-priority targets for economic development. Firms producing exportable goods and services bolster a region's standard of living through the wages they offer employees and their net contributions to government tax revenue. Their growth is not constrained by the performance and size of the local economy. Only the effectiveness and competitiveness of an exportable product, such as a medical therapy, will limit the growth of the firm making it. (This contrasts with a population serving business such as a medical office, where the size of the local population caps total demand.) Furthermore, attracting exporting firms to the region does not necessarily displace existing ones. A new fintech firm that sells software to institutions across Canada, for

example, can succeed without taking market share from local incumbents, unlike a new entrant to the already saturated local grocery market.

Invest Vancouver focuses on growing industries, or ones with potential to grow given the right catalyst. An industry that is growing in the region might indicate existing or emerging competitive advantages, such as labour market pooling, supportive institutions, industrial specialization, research competencies, infrastructure, and favourable government policy or incentives.

Invest Vancouver targets industries that participate in broader global trends and that benefit from economic tailwinds. For example, a combination of ageing populations, rapid innovation, and the need to relieve overburdened health systems is boosting demand for products and services from firms in life sciences. Similarly, the need to mitigate risks and impacts associated with climate change is driving the adoption of clean tech. Promoting industries with abundant opportunities and a long runway for growth enhances the potential for regional prosperity.

Sustained and inclusive regional prosperity depends on translating economic growth into high-quality employment: it is essential to support industries that generate quality jobs. Globally competitive industries often require a skilled and therefore well-compensated workforce. When firms and individuals in these industries purchase goods and services from other firms in the region, it generates positive spillover in other sectors, and the multiplier effect adds to the regional economy.

¹ Throughout this discussion, "industry" means a collection of firms engaged in broadly similar economic activities, as understood by the firms themselves and their investors.

Invest Vancouver's initial set of key industries

Invest Vancouver's initial set of industries includes Transportation & Logistics; Digital Media & Entertainment; Life Sciences; Apparel; Agritech; the Green Economy (encompassing firms working on decarbonisation, sustainability, and the circular economy); and High-tech.

The Strategic Industries Analytics (SIA) project fills a critical need for a data-driven understanding of key industries

A scarcity of detailed, region-specific data previously hindered an in-depth, region-specific investigation of key industries. The available data have been insufficiently granular, not available at the regional level, and reported infrequently or incompletely. The SIA project used statistical techniques and information from multiple Statistics Canada tables to generate comprehensive, region-specific data sets that allow for the examination of long-term trends in Invest Vancouver's key industries, and an enhanced, evidence-based understanding of the regional economy. The SIA project complements Invest Vancouver's qualitative research and other research, adding another layer of analysis to the assessment of potential areas of opportunity.

The project covers five of the seven key industries: **Apparel, Digital Media & Entertainment, High-tech,**

Life Sciences, and **Transportation & Logistics.** High-tech is divided into two separate industries, **High-tech Services** and **High-tech Goods**, based on the assumption that these two groups differ meaningfully in their relation to the factors of production, particularly their capital and land requirements.² Two industries, Agritech and the Green Economy, are not included in the project because they cannot be isolated in the available government data. Invest Vancouver will use other approaches to investigate those industries.

Each industry is comprised of multiple components, which correspond to *national industries*, i.e. the most specific category in the North American Industry Classification System (NAICS) that organizes this data. The full list of *national industries* covered by the SIA project is in Appendix I. For ease of exposition, the report uses "**industry components**" to refer to these *national industries*. Video game design and development, for example, is an industry component of Digital Media & Entertainment.

Building on standard Statistics Canada tables, the project produced quarterly time-series datasets specific to the Metro Vancouver region covering contribution to GDP and capital stock (2001-2020), as well as employment and labour hours (2001-2021), for each industry component.³ The results are imperfect, particularly for GDP where the Statistics Canada data is frequently suppressed for privacy reasons. Nonetheless, the data is the best available for identifying long-term trends in specific industry components within the region.

² Invest Vancouver followed the BC Stats definition of "high tech": the High-tech Services, High-tech Goods, Life Sciences, and Digital Media & Entertainment industries cover the industry components included in the Profile of the British Columbia Technology Sector: 2020 Edition (March 2021).

³ **GDP:** Table 36-10-0402-01 GDP at basic prices, by industry (BC Annual); Table 36-10-0434-01 GDP at basic prices, by industry, monthly (Canada Monthly). **Employment:** A Statistics Canada custom tabulation of employment data based on the Survey of Employment, Payrolls and Hours (SEPH). **Labour hours:** Table 14-10-0211-01 Standard work week for salaried employees, by industry (BC); Table 14-10-0255-01 Average weekly hours for employees paid by the hour, by industry (BC); Table 14-10-0201-01 Employment by industry, monthly (BC hourly and salary employment, 4-digit NAICS level). **Capital Stock:** Table 34-10-0163-01 Flows and stocks of fixed non-residential and residential capital, by sector and asset (BC Quarterly); Table 36-10-0096-01 Flows and stocks of fixed non-residential capital, by industry and type of asset (BC Annual).

Section II – An Overview of the Regional Economy

The SIA project describes the 20-year trends in GDP and employment across multiple key industries and their respective industry components. Before examining such trends, however, it helps to have some context. To understand whether the growth in a particular industry component over the past two decades is exceptional, ordinary, or lagging, requires an understanding of the trajectory of the regional economy during the same period. This section offers a snapshot of the Metro Vancouver regional economy, highlighting its growing population, expanding employment, and rising GDP.

The population of the Metro Vancouver region is growing

The population of the Metro Vancouver region was 2.81 million people in 2022, a 35% increase from 2001. The region's population is growing faster than the rest of the province (which saw its population increase by 23%) and Canada as a whole (25%).⁴ Examining the components of population change reveals that international migration is driving the growth.

Domestically, natural population growth (births minus deaths) is slightly positive and declining. Net migration from the rest of Canada is variable but generally positive. Offsetting these increases, more people left the region for other parts of British Columbia than the

reverse every year during the period. Since 2016, the net outflow has been at least 10,000 people per year. On balance, the domestic contribution to population change has been near or below zero since 2018, leaving immigration as the prime driver of regional population growth.⁵

While the population has been growing, the regional economy has been expanding even more quickly, whether measured by employment or GDP.

The regional economy is adding jobs faster than the rest of the British Columbia and Canada as a whole

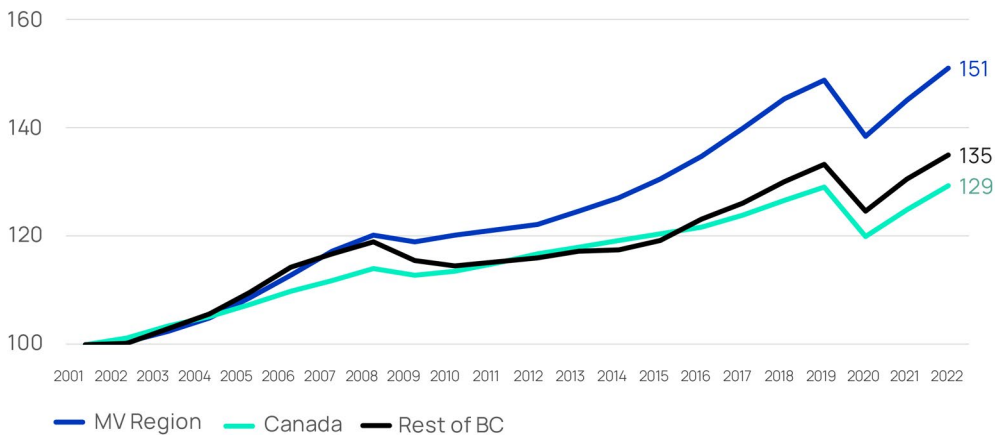
Employment growth is particularly useful for understanding the regional economy because detailed data is readily available, and employment is an important gauge of the health of an economy. Figure 2.1 compares the cumulative percentage change in employment in the Metro Vancouver region, the rest of British Columbia (outside the region), and Canada as a whole, relative to total employment in the first quarter of 2001. The comparison includes employees in the private and public sectors, as well as the self-employed.⁶ The regional economy is adding jobs faster than the rest of the province and Canada.

⁴ Population data from Lightcast.

⁵ Components of population change from Statistics Canada Table 17-10-0136-01.

⁶ The "self-employed" are incorporated and unincorporated working owners, self-employed persons who do not have a business, and persons working in a family business without pay. (See Statistics Canada Table 14-10-0288-01.)

Figure 2.1: Cumulative percentage change in employment, 2001-2022 (2001 = 100)



SOURCE: LIGHTCAST

Employment Trend Analysis

- The region and the rest of British Columbia were both adding jobs faster than the national economy in the run-up to the global financial crisis in 2008. Coming out of the crisis, the trend continued for the region, while the employment gains in the rest of the province more closely tracked the changes nationally. From 2008 to 2022, regional employment increased 25.6%, compared to 13.5% in the rest of British Columbia, and 13.4% in Canada.
- The region's employment growth was higher in every sector compared to the country as a whole. Compared to the rest of the province, the region was ahead in every sector except public administration. For the full details, see Figure A2 in Appendix II.
- Population growth and expanding labour force participation underpinned the region's employment growth. Employment growth in Metro Vancouver outpaced population growth, 2001-2022: 51% for employment compared to 35% for population. Rising labour force participation rates, particularly among the oldest cohorts (people aged 55 to 64 and 65 and older) have made this possible.⁷

Employment in the region is dominated by services-producing sectors

In 2022, there were just under 1.7 million workers in the Metro Vancouver region, including public and private sector employees and the self-employed. The largest sectors of the Metro Vancouver regional economy in 2022 by employment were: healthcare and social assistance (10.7%); professional, scientific, and technical services (10.4%); retail trade (10.2%); construction (7.8%); accommodation and food services (7.5%); and educational services (6.8%). See Figure A3 in Appendix.

The regional employment mix is similar to the national landscape, with a greater share in professional, scientific, and technical services, reflecting the region's large knowledge-based economy. Conversely, manufacturing and public administration account for a smaller share of employment in the region than in the nation.

Goods-producing sectors represent 15% of regional employment, while services-producing sectors account for 83%, as shown in Figure 2.2.⁸ Agriculture and resource extraction are important sectors

⁷ Vancouver Census Metropolitan Area Labour Participation Rates, 2006-2022. Statistics Canada (Table: 14-10-0385-01). See Figure A1 in Appendix II for details.

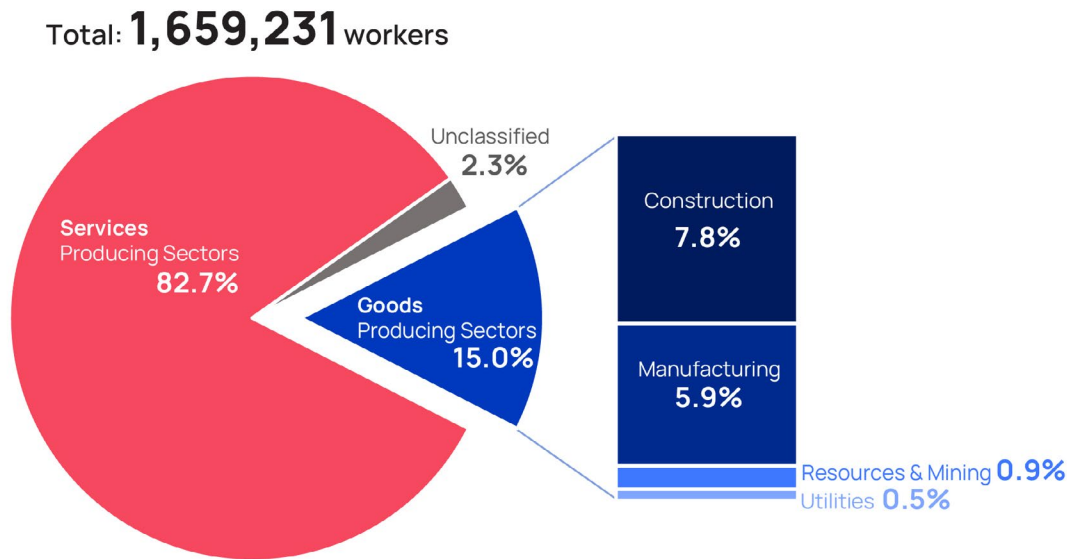
⁸ Agriculture, resource extraction, utilities, construction, and manufacturing are goods-producing sectors. Everything else is a services-producing sector. (Statistics Canada NAICS 2022 Version 1.0 for Goods and services producing industries).



provincially, but directly contribute less than one percent of jobs in the region. (Activity in resources and mining elsewhere in the province sustains additional indirect employment in the region in sectors such as

professional, scientific, and technical services, and transportation and warehousing.) For the breakdown of employment within the services-producing sectors, see Figure A4 in Appendix II.

Figure 2.2: Employment share in the Metro Vancouver region in 2022



SOURCE: LIGHTCAST

The share of employment by sector has been shifting over time. Health care and social assistance was the largest sector by employment in 2022, up from the third position in 2001. Professional, scientific, and technical services ranked second in 2022, up two spots from fourth in 2001. (High-tech Services is part of this sector, as is the research and development component of the Life Sciences.) The biggest changes were in construction and manufacturing. Construction leapt from tenth largest sector by employment to fourth, while manufacturing fell from second to seventh. (The overall decline in the manufacturing sector masks considerable variation among industries. Employment fell precipitously

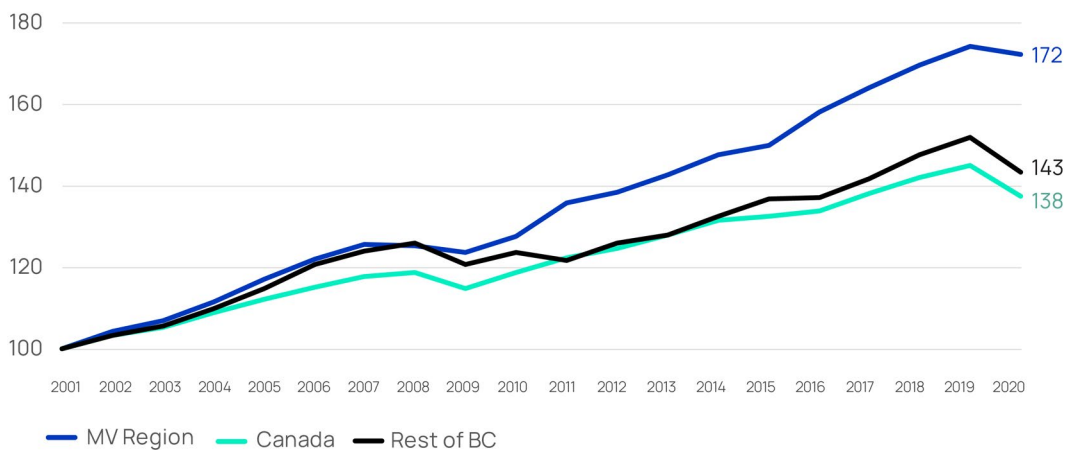
in the manufacturing components of Apparel; slightly in many components of High-tech Goods, and grew rapidly in three components of the Life Sciences: measuring, medical, and controlling devices manufacturing; medical equipment and supplies manufacturing; and pharmaceuticals and medicine manufacturing.) See Appendix II for a side-by-side comparison of the ranking of the largest sectors by employment in the region in 2001 and 2022 (Figure A5) and a related view of the shifting composition of the economy through the lens of employment by occupation (Figure A6).

The growing population is supported by a resilient regional economy

There are multiple approaches to studying economic performance. GDP is a common indicator, particularly for the national and provincial economies. In the fourth quarter of 2020, annualized regional GDP was \$140.7

billion (measured in chained 2012 dollars).⁹ Figure 2.3 compares the cumulative change in the GDP of the Metro Vancouver region to the rest of the province (outside the region) and the country as a whole. This regional trend line (estimated as part of the SIA project) is important as a baseline comparison for the industry component GDP contributions found in Section III of the report.

Figure 2.3: Cumulative percentage change in GDP, 2001-2020
Metro Vancouver region, rest of British Columbia, and Canada (2001 = 100)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT, STATISTICS CANADA. TABLE 36-10-0402-01.

GDP growth, 2001-2020, was greater in the regional economy (72%) than in the rest of the province (43%) and the country as a whole (38%). Most of the outperformance was in the period after the global financial crisis (2008-2009). While SIA GDP data cover 2001 through 2020, the region's economy rebounded in 2021 and 2022, surpassing pre-pandemic levels.¹⁰ The Metro Vancouver regional economy has also performed well relative to the other large metro areas in Canada, both in overall growth (see Figure A7 in Appendix II) and in per capita GDP (Figure A8).



⁹ Statistics Canada adjusts the GDP figures to account for inflation using chained dollars (a methodology that employs a shifting basket of goods to reflect consumer responses to price changes), starting with the base year 2012.

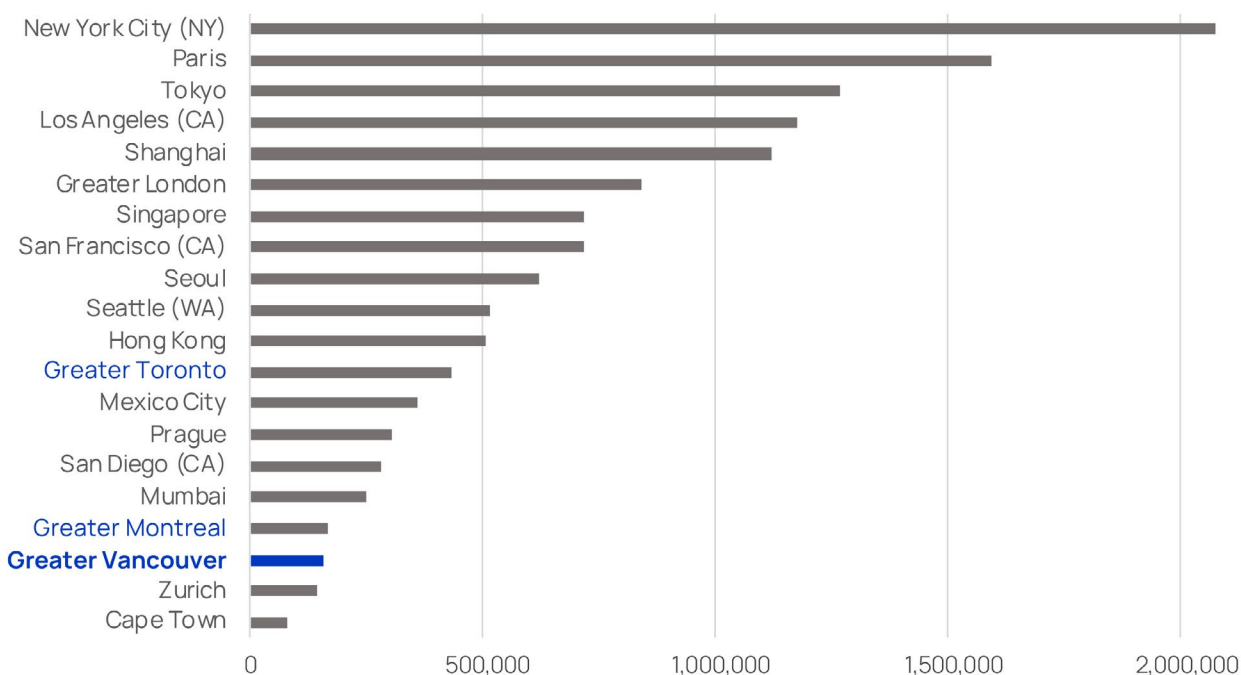
¹⁰ GDP growth in 2021 and 2022 exceeded the decline in 2020: <https://vancouvereconomic.com/economic-snapshot/>.



For all its resilience and robust employment growth, the Metro Vancouver economy remains a modest player on the global stage

Figure 2.4 shows the regional GDP of the three largest metro areas in Canada alongside major US cities, a selection of the most prominent global cities, and a few smaller international cities closer in size to our own region.

Figure 2.4: Regional GDP comparison (PPP, millions of International dollars)



SOURCE: FDI BENCHMARK FROM THE FINANCIAL TIMES LTD

In the Canadian context, the Metro Vancouver region is significant as the third largest metropolitan area by population and GDP. Yet, the entire province of British Columbia has fewer people than the Toronto region. With a population of 5.4 million people, British Columbia is about the size of Norway. It would rank 23rd among US states, trailing Wisconsin, Colorado, and Minnesota and just ahead of South Carolina, meaning both the region and the province are comparatively small markets in the global context.

The relatively small size of Metro Vancouver and British Columbia economies underscores the importance of unified collaboration on economic development and investment attraction between municipal, regional, provincial, federal entities, and the business community. A data-driven understanding of the growing areas of the regional economy can inform such efforts.

Section III – SIA Findings

Life Sciences, High-tech Services, and Digital Media & Entertainment lead the pack

The SIA project provides a deeper, data-driven, understanding of key export-oriented industries that create quality jobs and in which the region offers firms comparative advantages. The project covers Apparel, Digital Media & Entertainment, High-tech Goods, High-tech Services, Life Sciences, and Transportation & Logistics, examining specific components within these industries, to determine what is driving their growth. This, in turn, supports a data-informed approach to investment attraction efforts.

To better understand the relative strength of growth in these industries, this section starts with an overview of the changes in contribution to GDP, employment, labour hours, and capital stock over the past two decades. Based on percentage increase since 2001, Life Sciences, High-tech Services, and Digital Media & Entertainment stand out for increasing contributions to GDP and employment.

This section presents a closer look at High-tech Services and Digital Media & Entertainment. (For an in-depth analysis of the Life Sciences industry based on SIA data, see Invest Vancouver's April 2023 report "Life Sciences in Metro Vancouver: Shaping a Globally Prominent R&D Hub.") High-tech Services are flourishing in the region, particularly in components such as computer systems design; engineering services; software; environmental consulting services; data processing, hosting, and related services; and other scientific and technical consulting services. Employment growth in Digital Media & Entertainment also outperformed the regional economy and greatly

accelerated with the pandemic recovery. Content-producing components (production, post-production, video game design, development, and publishing) are driving growth in Digital Media & Entertainment.

GDP growth in Transportation & Logistics matched the regional economy, while job growth lagged slightly. However, the economic impact of this industry extends far beyond its direct impact and it enables activity in unrelated industries.¹¹ Geography and trade infrastructure investments have combined to bestow the industry with a durable competitive advantage. For deeper insights into Transportation & Logistics, this section also looks at changes in employment and GDP in the industry by mode: air and ocean transportation, rail, trucking, warehousing, and support services.

In High-tech Goods, the picture is mixed. Employment increased 269% in all other electrical equipment to 1,818, but employment fell in almost half of the other components. Most of the industry components are small, whether measured by contribution to GDP or employment, and only two components employed more than 1,000 people. In Apparel, the data suggest an industry in decline.¹² However, the NAICS-based data does not capture the full vibrancy of the Apparel industry in the region, which includes the headquarters of Lululemon, Arc'teryx, Herschel, John Fluevog, Aritzia, Indochino, Sugoi, Reigning Champ, and more. Upon closer investigation, headquarters employment for some prominent local firms, for example, are included under retail trade, while high-tech fabric and garment producers are mixed in with industrial design. As such, figures for Apparel, which present an incomplete and possibly misleading picture of the industry, are not included.

¹¹ The Port of Vancouver, for example, sustains 115,300 direct, indirect, and induced jobs across Canada. (portvancouver.com)

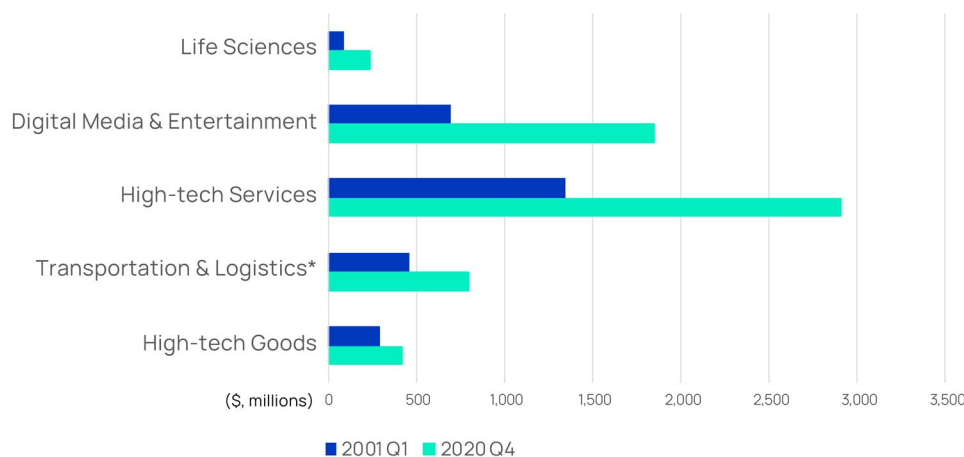
¹² This is undoubtedly true for the cut-and-sew, physical production of garments, which has been falling both in contribution to GDP and employment.



GDP comparison reveals High-tech Services and Digital Media & Entertainment as significant drivers of growth

High-tech Services and Digital Media & Entertainment are the largest contributors to GDP among the key industries in absolute terms. Figure 3.1 shows the contribution to regional GDP in millions of inflation-adjusted dollars in the first quarter of 2001 and the final quarter of 2020 (which were the most recent available).

Figure 3.1: Contribution to regional GDP ranked by percentage change, 2001-2020 (millions of chained 2012 dollars)



*Transportation & Logistics data is from 2019 Q4.

SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

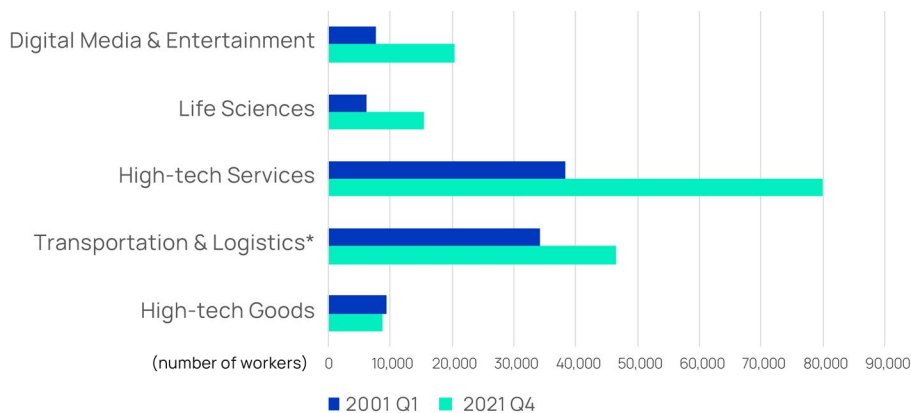
Among these industries in the Metro Vancouver region:

- High-tech Services made the largest contribution to GDP (\$2.91 billion). Its contribution increased much faster than the overall economy, growing 116% from 2001 to 2020, compared to the region's 74% increase.
- Life Sciences had the largest percentage increase in contribution to GDP, rising 175% to \$240 million.
- Digital Media & Entertainment increased 167% to \$1.85 billion, giving it the second largest contribution to regional GDP and the second fastest growth.
- The regional contribution to GDP from Transportation & Logistics increased 74%, 2001-2019, to \$803 million. The effects of the pandemic were noticeable in the GDP data for this industry, particularly in the air transportation components. The use of year-end 2019 figures (the last quarter before the start of the pandemic) avoids distorting the long-term trend with an outlier endpoint.
- High-Tech Goods trailed the regional economy, rising 43%.

Employment increased in four of the key industries

Figure 3.2 shows the total employment in each industry in the first quarter of 2001 and the fourth quarter of 2021, ranked by the percentage increase. Total employment includes public and private employees, and the self-employed.

Figure 3.2: Regional employment by industry ranked by percentage change, 2001-2021



*Transportation & logistics uses 2019 Q4 employment figures for air transportation

SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Among these industries in the Metro Vancouver region:

- High-tech Services is the largest source of employment among the selected industries, and had the third largest percentage increase, rising 109% to 79,908 workers from 2001 to year-end 2021. During the same period, regional employment increased by 57%.¹³
- Digital Media & Entertainment and Life Sciences had the largest percentage increases in employment. The number of people working in Digital Media & Entertainment increased 163% to 20,509, while employment in Life Sciences rose 154% to 15,519.
- Transportation & Logistics, a large source of jobs in the region, is also growing; employment increased by 36% over the past two decades to 46,516 in 2021.¹⁴
- The employment decline in High-tech Goods is consistent with the observation in Section II of the report that the manufacturing sector (which partially overlaps with High-tech Goods) fell from second to seventh largest sector by employment, 2001-2022. The decline in High-Tech Goods does not reflect the potential for growth in the Green Economy (in areas such as watertech and clean transportation) and Agritech.

¹³ Figure 2.1 reports a different change in employment (51%) in part due to slightly different starting and ending points, but mostly owing to the inclusion of self-employed workers. The SIA employment data, based on the Statistics Canada Survey of Employment, Payroll, and Hours (SEPH), does not include the self-employed, so the change in the SEPH-derived regional total (57%) is the appropriate comparison for SIA industry components.

¹⁴ In 2021, air transportation was still struggling with the impacts of the pandemic. The Transportation & Logistics total incorporates employment figures for air transportation from year-end 2019, which show a slight decline since 2001.

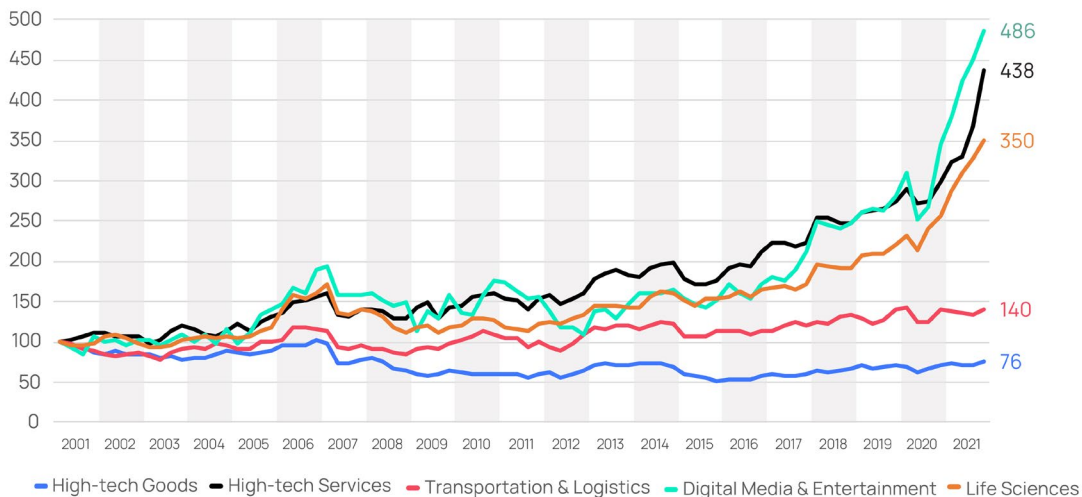


Trends in total labour hours strongly suggest that Digital Media & Entertainment, High-tech Services, and Life Sciences are flourishing in the region

A simple count of the workers in an industry doesn't always provide a complete picture of employment dynamics. For instance, one industry might be rapidly adding many part-time workers, while another is

transitioning workers from part-time to full-time roles. Even if the first industry shows quicker employment growth in numbers, the latter might actually represent a greater increase in total work hours. Such differences show up in the total labour hours in an industry, a measure of labour input using the weighted average of the weekly hours worked by both hourly and salaried employees, multiplied by 52 weeks in a year. Figure 3.3 shows the cumulative percentage change in total labour hours by industry from 2001 to 2021 in the Metro Vancouver region.

Figure 3.3: Cumulative percentage change in total labour hours by industry, 2001-2021 (2001 = 100)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Among these industries in the Metro Vancouver region:

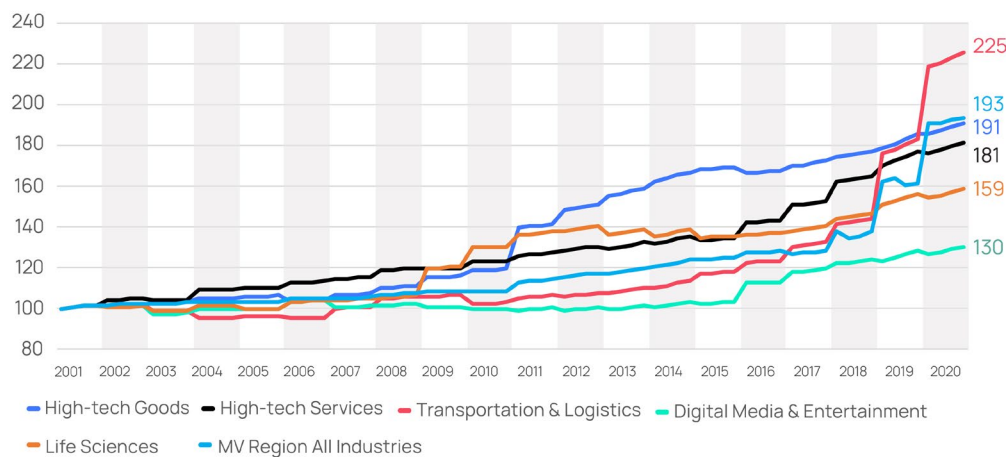
- The three industries with the largest cumulative percentage increase in labour hours, 2001-2021, were Digital Media & Entertainment, High-tech Services, and Life Sciences.
- Total labour hours in Digital Media & Entertainment increased 386% to 460 million hours in 2021. During the same period, total labour hours in High-tech Services increased 338%, to 2.75 billion hours, while in Life Sciences the increase was 250% to 556 million hours.
- Total labour hours in Transportation & Logistics increased from 850 million hours in 2001 to 1.19 billion hours in 2021, a 40% increase.
- Total labour hours fell 24% to 269 million hours in High-tech Goods, a sharper decline than is visible in the employment numbers, which reflect the number of workers.

Transportation & Logistics, High-tech Goods and High-tech Services had the largest percentage increases in capital stock

Figure 3.4 compares the cumulative percentage change in total capital stock in the Metro Vancouver Region by industry, from 2001 to 2020. Total capital

stock is a measure of the total real and intellectual assets used by a firm in the production of goods and services. Total capital stock includes non-residential buildings, engineering construction, and machinery and equipment, as well as intellectual property.¹⁵ Capital is important because of its link to productivity. In general, adding capital translates to increased output; if the amount of capital per worker increases then it should make the labour more productive.

Figure 3.4: Cumulative percentage change in total capital stock by industry, 2001-2020 (2001 = 100)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Among these industries in the Metro Vancouver region:

- While employment and GDP growth was comparatively slow in Transportation & Logistics, the industry saw the largest percentage increase in capital stock, with a 125% rise to \$118.3 billion in 2020.
- Capital stock increased 93% across all industries in the region, 2001-2020. High-tech Goods (with an increase of 91%) and High-tech Services (81%) add capital stock, roughly in line with the regional economy, while Life Sciences (59%) and Digital Media & Entertainment (30%) were far lower.
- High-tech Service, Life Sciences, and Digital Media & Entertainment all managed robust growth in GDP and employment despite lackluster increase in capital stock. Given the role of capital in improving labour productivity, there may be an opportunity to accelerate further growth in these industries with greater investment.

¹⁵ Capital is one of the major factors of production, i.e. the building blocks used to produce goods and services. (The others are land, labour, and entrepreneurship.) In this context, money does not count as capital, though it can be used to acquire capital, which depreciates over time.

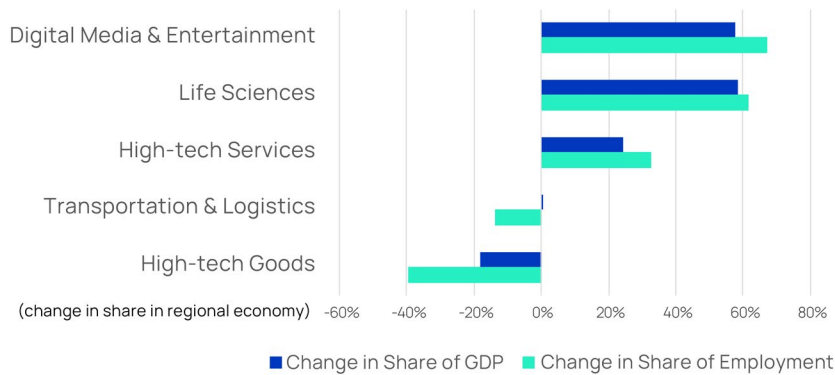


Digital Media & Entertainment, Life Sciences, and High-tech Services grew faster than the regional economy

Figure 3.5 illustrates the evolution of GDP and employment shares for key industries over the past two decades in relation to the entire region. The change in GDP is based on a comparison of an

industry's share of the regional total between 2001 and 2020, with the exception of Transportation & Logistics, which uses data from 2019. For employment, the comparison is between the industry's share of the regional total in 2001 and 2021. As an example, the High-tech Services contribution to regional GDP grew by approximately 24%, moving from 1.66% in 2001 to 2.07% in 2020. Similarly, its employment share increased by 33%, from 4.65% in 2001 to 6.18% in 2021.

Figure 3.5: Change in share of regional economy ranked by percentage change since 2001



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Among these industries in the Metro Vancouver region:

- Digital Media & Entertainment contribution to GDP as a share of the regional total increased by almost 60%, 2001-2020, and its share of total regional employment increased by 67%.
- For the Life Sciences, the share of total regional GDP increased by almost 58%, and its share of total regional employment increased by 62%.
- In absolute terms, employment in Transportation & Logistics increased by 36%, 2001-2021, but its share of the regional total fell as other sectors grew even faster. Its share of regional GDP was almost unchanged, meaning it grew at about the same rate as the overall economy.

Thus, Digital Media & Entertainment, Life Sciences, and High-tech Services are the top performers (based on percentage change in GDP, employment, and labour hours) among the industries covered by the SIA project.

The next section of the report delves into a detailed analysis for three industries: Digital Media & Entertainment, High-tech Services, and Transportation & Logistics.



Content production fuels regional Digital Media & Entertainment

Digital Media & Entertainment has been one of the top performers over the past two decades, measured by both GDP and employment growth. However, the summary statistics mask considerable variation within the industry, which includes nine components. Four of the components, each employing more than 3,000 people in the region, are growing rapidly: production, post-production, video game design and development, and video game publishing.

The contribution from motion picture and video distribution has been mixed: the component makes a large and growing contribution to GDP, yet employs a small number of people. (Firms in this component primarily engage in the acquisition of distribution rights and the distributing of film and video productions.)

In the remaining four components, the contribution to regional GDP has been falling. Television broadcasting is the largest of these four by employment, but employment has remained flat. The remaining three components are very small: sound recording studios, other sound recording industries, and pay and specialty television each employ fewer than 100 people.

This section provides a closer look at the four fastest growing components: **video game publishing, production, post-production, and video game design and development**.¹⁶

¹⁶ Production means the production (or production and distribution) of motion pictures, videos, television programs, and commercials. Post-production services includes special effects, graphics, and animation.



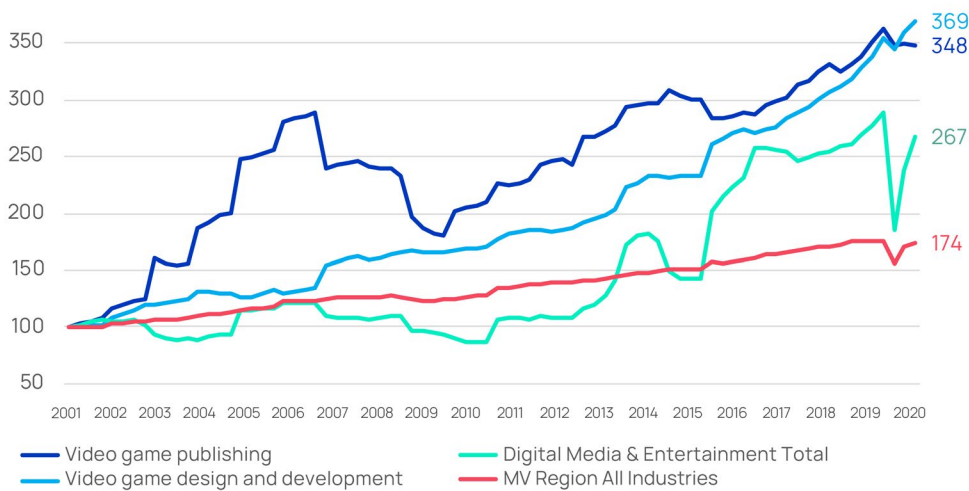
Digital Media & Entertainment contribution to GDP outpaces the regional economy, led by gaming

The contribution to regional GDP from Digital Media & Entertainment as a group increased 167% to \$1.8 billion. The growth easily outpaced the 74% increase in the regional economy from 2001-2020, as shown in Figure 3.6. Production and post-production, combined, made up nearly 40% of the industry's

contribution to GDP in 2020. These components are the biggest contributors, and there is insufficient data to distinguish their cumulative percentage change from the industry total.

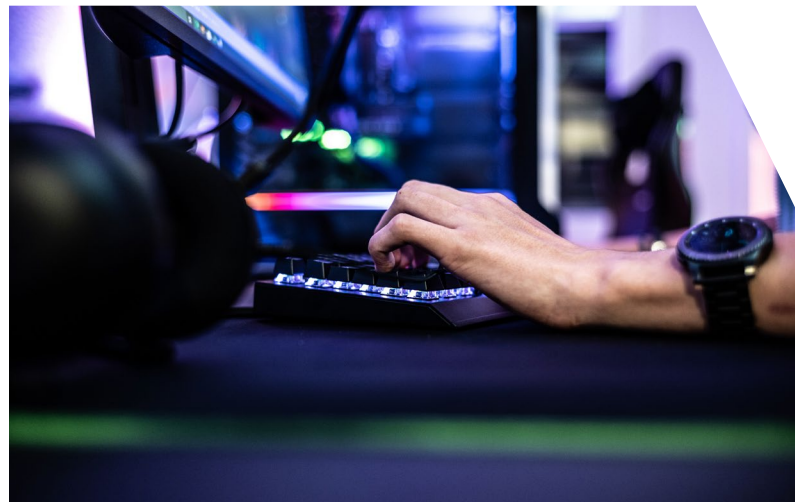
Film and television production benefit from tax credits, and there is another tax credit for digital animation, visual effects and post-production. The video game design and development component of Digital Media & Entertainment also benefits from the tax credit.

Figure 3.6: Fastest growing components of Digital Media & Entertainment by cumulative percentage change in contribution to GDP (2001=100)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Starting from a small base, the largest percentage gains were in the video game-related components. The contribution to regional GDP from video game design and development increased 269% to \$29.3 million in 2020, while the contribution from video game publishing increased 248% to \$11.26 million.

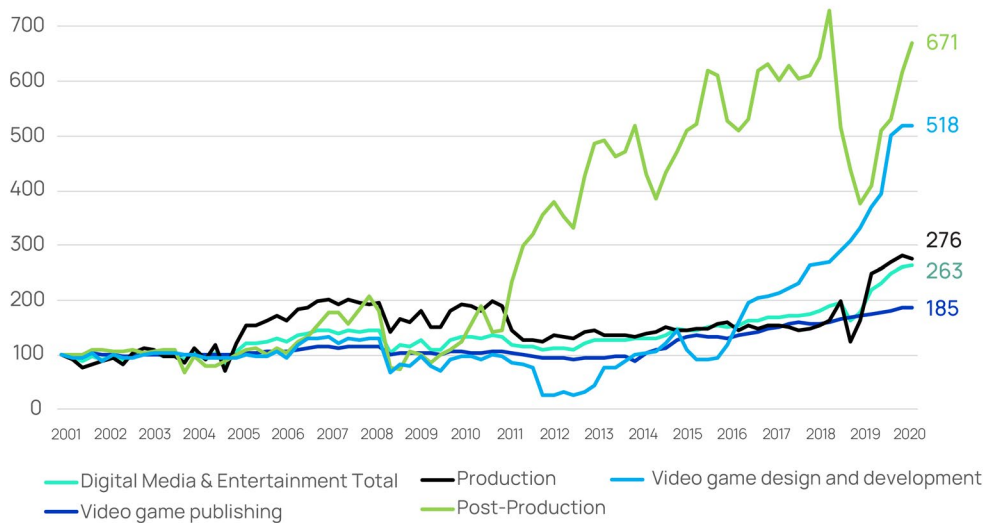


Digital Media & Entertainment employment growth has accelerated since 2014

The 163% increase in employment in Digital Media & Entertainment, 2001-2021, was much greater than the 57% increase in the region as a whole.¹⁷ Employment

growth has been particularly robust since 2014 and greatly accelerated with the pandemic recovery. The content-producing components of Digital Media & Entertainment, shown in Figure 3.7, had the greatest cumulative percentage change in employment in the industry, 2001-2021. The starting values in 2001 have been set to 100 to allow easy comparison of the relative changes in employment.

Figure 3.7: Fastest growing components of Digital Media & Entertainment by cumulative percentage change in employment (2001 = 100)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Digital Media & Entertainment highlights in the Metro Vancouver region:

- From a small base (just 489 people in 2001), post-production employment increased almost seven-fold to 3,283 in 2021. Post-production employment has been subject to wild fluctuations, but the overall trend has been rapid growth since 2011. Post-production includes animation and visual effects from firms such as Western FX Studios, the Sequence Group, Goldtooth, Method Studios, Zoic, Sony Picture Imageworks, Image Engine, and Industrial Light & Magic (ILM).
- Despite occasional periods of slower growth, jobs in video game design and development surged 418% to 3,981 at firms such as Eastside Games, Phoenix Labs, and Electronic Arts.
- The region grew as a film and television production center, with production jobs rising 176% to 8,828.
- Video game publishing jobs saw a comparatively modest increase of 85% to 3,077.

¹⁷ The percentage increase in employment in the Digital Media & Entertainment industry was remarkable. For additional context, see Figure A2 in Appendix II for employment growth by sector in the region.



High-tech Services is flourishing in the region

This section focuses on the fast-growing High-tech Services industry, looking at changes in employment, GDP, and comparing its growth to the regional economy as a whole.

Figure 3.8 shows employment and GDP for all fourteen components of High-tech Services, ranked by

percentage change in employment since 2001. Overall employment in High-tech Services increased 109%, with the greatest percentage growth in environmental consulting services, data processing services, and computer systems design. While environmental consulting services saw the most significant increase in employment at 278%, its increase in GDP contribution, at 96%, is comparatively modest among this group.

Figure 3.8: Employment (2021), contribution to regional GDP (2020), and percentage change since 2001 for components of High-tech Services

High-tech Services	Employment 2021 Q4	GDP 2020 Q4*	Change in Employment	Change in GDP
Environmental consulting services	2,524	\$42.8	278%	96%
Data processing, hosting & related services	3,666	\$103.3	208%	368%
Computer systems design & related	30,677	\$918.3	193%	269%
Software publishers (except video game publishers)	7,090	\$144.8	133%	248%
Other scientific & technical consulting services	2,144	\$111.6	104%	96%
Engineering services	14,644	\$441.4	84%	126%
Telecommunications resellers	1,656	\$120.7	82%	41%
Surveying and mapping (except geophysical) services	1,004	\$41.5	73%	126%
Internet broadcasting & web search portals	870	\$79.4	67%	95%
Other telecommunications	1,967	\$290.1	57%	41%
Geophysical surveying & mapping services	212	\$19.0	54%	126%
Wired & wireless telecommunications (except satellite)	13,067	\$270.0	32%	51%
All other telecommunications	311	\$290.1	-8%	41%
Satellite telecommunications	76	\$36.4	-67%	91%
Total	79,908	\$2,909.4	109%	116%

*millions of chained 2012 dollars

SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Computer system design and related services is the giant of High-tech Services in the Metro Vancouver region, accounting for almost 32% of its contribution to regional GDP, and 38% of its employment. Firms in this group provide expertise such as writing, modifying, testing, and supporting software to meet the needs of a particular customer; planning and

designing computer systems that integrate hardware, software and communications technologies; managing clients' computer and data processing facilities; and other information technology-related advice and services.¹⁸

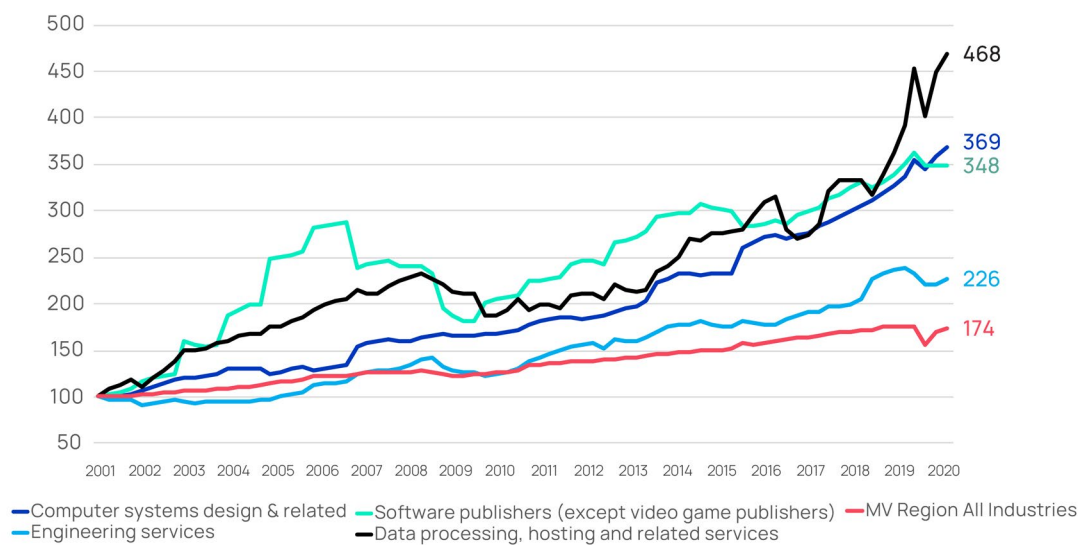
¹⁸ Statistics Canada. NAICS 541514 Computer systems design and related services (except video game design and development).

High-tech Services consistently outperform the regional economy

Regional GDP from all industries increased 74% to \$140.68 billion, while High-tech Services as a group increased 116% to \$2.91 billion. The top performers in High-tech Services were computer systems design, and related, engineering services, software publishers, and data processing, hosting, and related services.

Figure 3.9 compares the cumulative percentage change in contribution to regional GDP from the top performing components of High-tech Services with the total regional economy, 2001-2020. All starting values in 2001 are set to 100, making the relative changes easy to compare.

Figure 3.9: Fastest growing components of High-tech Services by cumulative percentage change in contribution to GDP (2001 = 100)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

High-tech Services highlights in the Metro Vancouver region:

- The component with the largest percentage increase in contribution to GDP was data processing, hosting, and related services, which increased 368%, 2001-2020, to \$103 million.
- Computer systems design, and related increased 269% to \$918 million and software publishers (except video game publishers) increased 248% to \$145 million in 2020.
- Engineering services increased 126% to \$441 million in 2020.

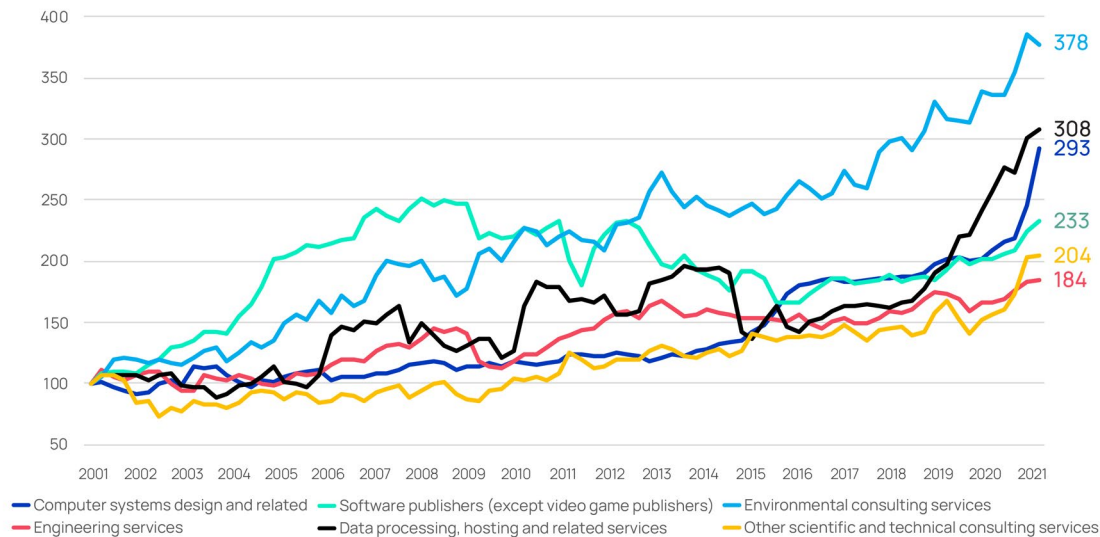


High-tech Services were more resilient to the economic impact of the pandemic than the regional economy as a whole

High-tech Services employment increased from 38,271 jobs in 2001 to 79,908 jobs in 2021, a 109% increase, almost double the 57% increase in employment in the regional economy. While there was a small dip in employment due to the COVID-19 pandemic,

High-tech Services were more resilient than the overall economy, quickly recovering and growing at a faster rate than previously. Figure 3.10 shows the six components of High-tech Services with the greatest percentage increase in employment, 2001-2021. (As shown in Figure 3.8, all but two High-tech Services components have seen employment growth over the past two decades.) The starting values in 2001 have been set to 100 to allow easy comparison of the relative changes in employment.

Figure 3.10: Fastest growing components of High-tech Services by cumulative percentage change in employment (2001 = 100)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

High-tech Services highlights in the Metro Vancouver region:

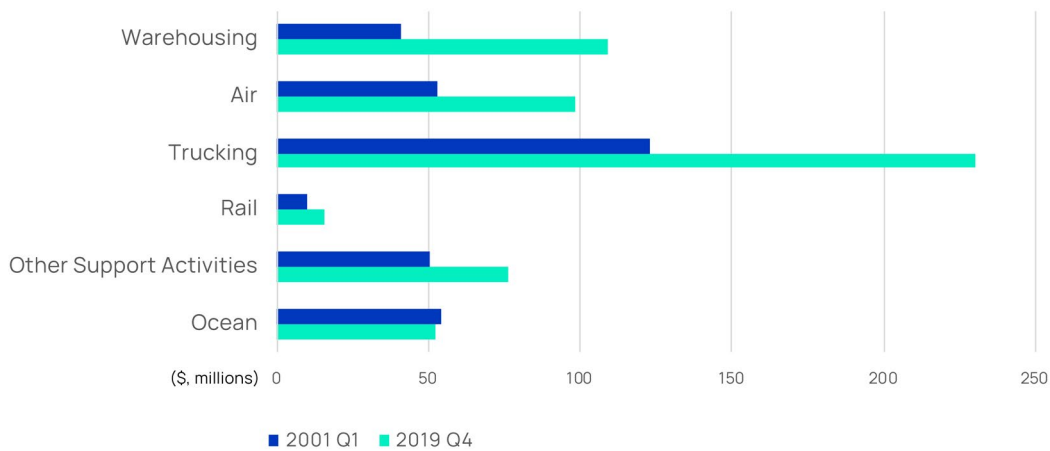
- Reflecting the increasing focus on environmental issues throughout the period, environmental consulting services saw the largest percentage increase (278%) among High-tech Services components, growing to 2,524 jobs in 2021.
- The next largest increases were in data processing, hosting and related services (208%) and computer system design (193%), which had 3,666 and 30,677 jobs, respectively, in 2021. Engineering services increased 84% to 14,644 jobs in 2021.
- Software publishers (except video game publishers) increased 133% to 7,090 jobs while other scientific and technical consulting services increased 104% to 2,144 jobs in 2021.

The ports and airport give the Metro Vancouver region a natural advantage in Transportation & Logistics

The Metro Vancouver region is home to the largest port in Canada and the nation's second busiest international airport by passenger traffic. These assets and the related infrastructure create a strategic advantage in Transportation & Logistics not reflected in the data, and serve as catalysts for economic activity in other sectors. To investigate this important industry, the SIA project included

29 components encompassing warehousing, air, rail, ocean, trucking, and support activities.¹⁹ Figure 3.11 shows the contribution to regional GDP of the Transportation & Logistics industry, 2001-2019, by mode. Among the industries covered by the SIA project, the impact of the COVID-19 pandemic was greatest in Transportation and Logistics, with air transportation hit the hardest. Using fourth quarter 2019 numbers (the last pre-pandemic) instead of fourth quarter 2020 (the latest available at the time), keeps the focus on the long-term dynamics of the regional economy (and not the pandemic-induced downturn).

Figure 3.11: Transportation & Logistics contribution to regional GDP by mode, 2001 and 2019, ranked by percentage change (millions of chained 2012 dollars)



SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Transportation & Logistics highlights in the Metro Vancouver region:

- The largest growth can be seen in warehousing, which increased from \$41 million in 2001 to \$109 million in 2019, a 168% increase. The increase in the prominence of warehousing reflects the shift to e-commerce and online retailers over traditional brick and mortar stores.
- Trucking and air were relatively similar, experiencing an 87% and 85% increase, respectively, while rail increased 59%.
- The only decrease was in ocean transportation, which decreased from \$54 million in 2001 to \$52 million in 2019, a 4% decrease. Activity at the port, on the other hand, increased substantially, particularly in container traffic and bulk cargo.

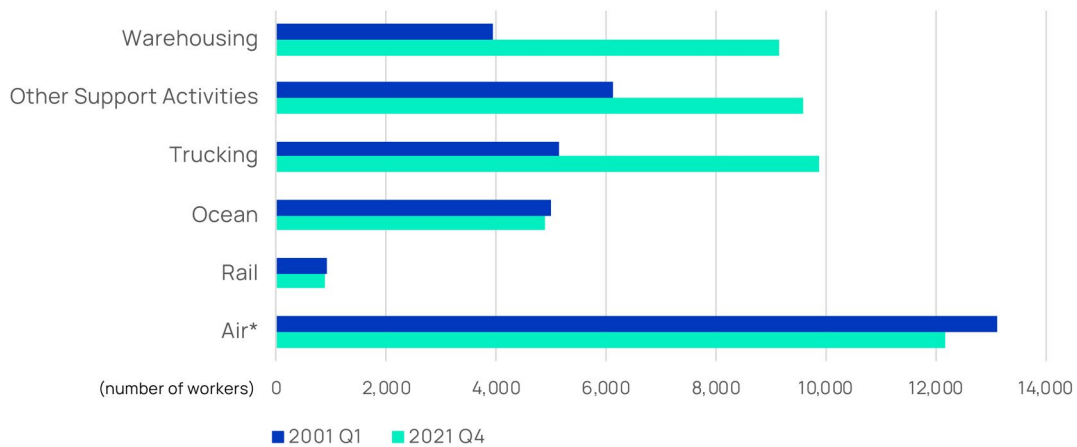
¹⁹ Predominantly population-serving components, such as taxi and bus services, were not included. The 29 included components necessarily capture considerable population-serving activity, as it is not possible to separate international from domestic activity, let alone outbound from inbound flows.



Transportation & Logistics is a major employer with rapid growth in warehousing, support activities, and trucking

Figure 3.12 shows the contribution to regional employment from the Transportation & Logistics industry, 2001-2021, by mode, except for air, which uses 2019 year-end figures.

Figure 3.12: Transportation & Logistics employment by mode, ranked by percentage change 2001-2021



*Air transportation based on 2019 Q4

SOURCE: INVEST VANCOUVER STRATEGIC INDUSTRIES ANALYTICS PROJECT

Transportation & Logistics highlights in the Metro Vancouver region:

- Despite the increase seen in the air industry's contribution to GDP, employment decreased 7% to 12,186 in 2019.
- The largest employment growth was in warehousing, which saw a 132% increase to 9,134 in 2021.
- Trucking employment grew 92% to 9,858 in 2021.
- Other support activities increased 56% to 9,570 in 2021.
- Rail and ocean transportation both saw small decreases in employment over the period, 3% and 2% respectively. Which suggests both got more efficient, as the volume of containers moving through the Port of Vancouver increased dramatically and bulk cargo tonnage handled increased as well.

Conclusion

Data from the SIA project reveal the strong performance of the Life Sciences, Digital Media & Entertainment, and High-tech Services industries in the Metro Vancouver region. Granular data covering components of Digital Media & Entertainment show that content generation – production, post-production, video game design and development, and video game publishing – is driving the growth in that industry. Similarly, High-Tech Services are powering growth in high-tech in the region, particularly computer systems design and related, engineering services, software publishers, environmental consulting services, data processing, hosting, and related services, and other scientific & technical consulting services.

Invest Vancouver will use insights gained from the SIA project in strategic planning and industry development efforts, while recognizing that this type of research is a starting point rather than the finish line. This information contributes to data-driven investment attraction, especially when combined with additional quantitative analysis and qualitative research into areas such as occupation trends and talent pipelines, the share of exported goods and services, productivity trends, and addressable markets and barriers to export.

Exploring trends over the past two decades is a great way to identify potential areas of strength, but has its limitations. Transportation & Logistics may not be growing as fast, for example, but has an unassailable comparative advantage not reflected in the data and underpins other sectors of the economy. Similarly, some smaller industry components may be pivotal to an industry supply chain and supporting them might unlock even greater gains. Finally, some opportunities are simply not visible in the data, since the Green Economy and parts of Apparel cannot be isolated in government data. Going forward, Invest Vancouver will continue to deepen its understanding of the regional economy using other research methods.



Appendix I – SIA Industry Components

Government agencies gather and organize firm-level statistical data using North American Industry Classification System (NAICS). The NAICS hierarchy, from broadest to most specific, is *sector* (2-digit code), *subsector* (3-digit code), *industry group* (4-digit code), *NAICS industry* (5-digit code), and *national industry* (6-digit code). For example, the *sector* (2-digit NAICS code) “retail trade” narrows to multiple *national industries* (6-digit NAICS codes), such as “motorcycle dealers”, and “beer, wine and liquor dealers”.

NAICS effectively captures the activities of industries that have remained structurally consistent over time, such as agriculture, mining, construction, wholesale

trade, educational services, and healthcare. Industries that have emerged or changed rapidly in recent decades are less well covered. The ‘life sciences industry,’ for example, is not included as a distinct category at any level of the hierarchy. The export-oriented parts of the Life Sciences industry are scattered across the manufacturing; professional, scientific, and technical services; and information sectors. Using the appropriate 6-digit *national industries* to capture the activity in an industry is imperfect, but it is the best available alternative.

Below, we provide a list of the *national industries* covered in the report, where we describe them as “industry components”.

Apparel	Digital Media & Entertainment
Hosiery and sock mills (31511)	Producing and/or distributing motion pictures, videos, television programs or commercial (512110)
Other clothing knitting mills (31519)	Video game publishing (511212)
Cut and sew clothing contracting (31521)	Post production services that includes special effects, graphics and animation (512190)
Men's and boys' cut and sew clothing mfg (31522)	Pay and specialty television (515210)
Women's, girls' and infants' cut and sew clothing manufacturing (31524)	Video game design and development services (541515)
Clothing accessories and other clothing manufacturing (315990)	Sound recording studios (512240)
Other cut and sew clothing manufacturing (31528)	Motion picture and video distribution (512120)
Other specialized design services (541490)	Other sound recording industries (512290)
Fur and leather clothing manufacturing (315281)	Television broadcasting (515120)

Life Sciences
Pharmaceuticals and Medicine manufacturing (325410)
Measuring, medical and controlling devices manufacturing (334512)
Medical equipment and supplies (339110)
Research and development in the physical, engineering and life sciences (541710)

High-tech Goods	High-tech Services
Other Basic Inorganic Chemicals (325189)	Software publishers (except video game publishers) (511211)
Commercial and Service Industry (333310)	Wired and wireless telecommunications carriers (except satellite) (517310)
Telephone apparatus Manufacturing (334210)	Telecommunications Resellers (517911)
Other communications equipment mfg (334290)	All other telecommunications (517919)
Comm. and energy wire and cable mfg (335920)	Data processing, hosting and related services (518210)
Computer and peripheral (334110)	Internet broadcasting and web search portals (519130)
Audio and video equipment (334310)	Engineering services (541330)
Semiconductor and other electronic components (334410)	Geophysical surveying and mapping services (541360)
Navigational and guidance instruments (334511)	Surveying and mapping (except geophysical) services (541370)
Measuring, medical and controlling devices manufacturing (334512)	Computer systems design and related (except other scientific and technical consulting (541514)
Manufacturing and reproducing magnetic and optical media (334610)	Environmental consulting services (541620)
Switchgear and switchboard, and relay and industrial control apparatus (335315)	Other scientific and technical consulting services (541690)
All other electrical equipment and component (335990)	Other telecommunications (517910)
Other electric power generation (221119)	Satellite telecommunications (517410)
Steam and air-conditioning supply (221330)	
Turbine and turbine generator set unit mfg (333611)	
Other engine and power transmission equipment manufacturing (333619)	
Battery manufacturing (335910)	
Radio and television broadcasting and wireless communications equipment manufacturing (334220)	
Aerospace product and parts manufacturing (336410)	





Transportation & Logistics	
Marine shipping agencies (488511)	Scheduled air transportation (481110)
General freight trucking, local & long distance (484110)	Non-scheduled chartered air trans. (481214)
General freight trucking, long distance, truck-load (484121)	Air traffic control (488111)
General freight trucking, long distance, less than truck-load (484122)	Other airport operations (488119)
Bulk liquids trucking, long distance (484231)	Short-haul freight rail transportation (482112)
Dry bulk materials trucking, long distance (484232)	Mainline freight rail transportation (482113)
Forest products trucking, long distance (484233)	Support activities for rail transportation (488210)
Other specialized trucking, long distance (484239)	Water transportation (except by ferries) (483115)
Other support activities for road transportation (488490)	Water transportation by ferries (483116)
Other freight transportation arrangement (488519)	Port and harbour operations (488310)
Other support activities for transportation (488990)	Marine cargo handling (488320)
Other support activities for air transportation (488190)	Other navigational services to shipping (488339)
General warehousing and storage (493110)	Other support activities for water trans. (488390)
Refrigerated warehousing and storage (493120)	Other warehousing and storage (493190)
Farm product warehousing and storage (493130)	

Appendix II – Additional Information on the Regional Economy

This section provides additional detail on the performance and changing composition of the Metro Vancouver regional economy. It includes:

- **Figure A1: Labour force participation rates the Metro Vancouver region**

Labour force participation rates (2022) and change (since 2006) by age cohort in the Metro Vancouver region.

- **Figure A2: Percentage change in employment by sector, 2001-2022**

Compares changes in employment by sector in the Metro Vancouver region, the rest of British Columbia, and nationally.

- **Figure A3: Largest sectors by 2022 employment share, MV and Canada**

The largest sectors by employment in the Metro Vancouver region, and the corresponding share of these sectors in the national economy.

- **Figure A4: Employment by sector in the Metro Vancouver region in 2022**

A detailed breakdown of the composition of the

regional economy by employment: the number of workers and the share of total regional employment in each of 20 sectors.

- **Figure A5: Largest sectors in the region, ranked by employment in 2001 and 2022**

Changing composition of the economy over time with a side-by-side comparison of the largest sectors in the region in 2001 and 2022.

- **Figure A6: Occupations in the Metro Vancouver region ranked by 2022 employment**

Another view of the composition of the regional economy based on employment by occupation and the percentage change since 2001.

- **Figure A7: Cumulative percentage change in nominal GDP by census metropolitan areas**

Change in nominal GDP, 2009-2019, for the five largest Canadian census metropolitan areas

- **Figure A8: Cumulative percentage change in nominal GDP/capita by census metropolitan areas**

Change in nominal GDP per capita, 2009-2019, for the five largest Canadian census metropolitan areas

Figure A1: Vancouver Census Metropolitan Area labour participation rates, 2006-2022

Cohort	Share of Labour Force in 2022	Participation Rate		Percentage Change, 2006-2022
		2006	2022	
15 to 24 years	13.70%	63.1	63.3	0.32%
25 to 54 years	65.42%	84.3	88.1	4.51%
55 to 64 years	16.14%	60	69.9	16.50%
65 years and over	4.74%	9.3	16.7	79.57%

Source: Statistics Canada (Table: 14-10-0385-01)



The region's relative employment outperformance is visible across the entire economy

Figure A2 shows percentage change in employment by sector, 2001-2022, in the Metro Vancouver region, the rest of the province (outside the region), and in Canada as a whole.

Figure A2: Percentage change in employment by sector, 2001-2022, ranked by percentage change in the Metro Vancouver region

Description	MV	Rest of BC	Canada
Construction	124.9%	86.7%	73.1%
Mining, quarrying, and oil and gas extraction	98.6%	90.5%	42.7%
Professional, scientific, and technical services	86.3%	70.7%	61.5%
Health care and social assistance	73.2%	65.8%	67.0%
Admin + support, waste mgmt., and remediation services	65.2%	63.0%	41.6%
Information and cultural industries	62.1%	17.2%	13.4%
Real estate and rental and leasing	62.1%	50.4%	45.6%
Management of companies and enterprises	58.6%	48.9%	31.6%
Educational services	52.7%	28.8%	41.5%
Arts, entertainment and recreation	51.3%	40.5%	30.9%
Accommodation and food services	50.0%	21.7%	22.6%
Finance and insurance	44.9%	30.6%	41.3%
Utilities	43.8%	27.7%	18.5%
Public administration	41.1%	46.3%	37.5%
Retail trade	40.9%	23.5%	22.7%
Transportation and warehousing	37.0%	24.4%	35.0%
Other services (except public administration)	17.4%	13.1%	7.3%
Wholesale trade	16.5%	9.5%	8.6%
Manufacturing	-6.5%	-17.0%	-22.1%
Agriculture, forestry, fishing and hunting	-16.6%	-18.2%	-27.4%

SOURCE: LIGHTCAST

- The Metro Vancouver region had a higher percentage change in employment than the country as a whole across every sector. Compared to the

rest of the province, the region was ahead in every sector besides Public administration.

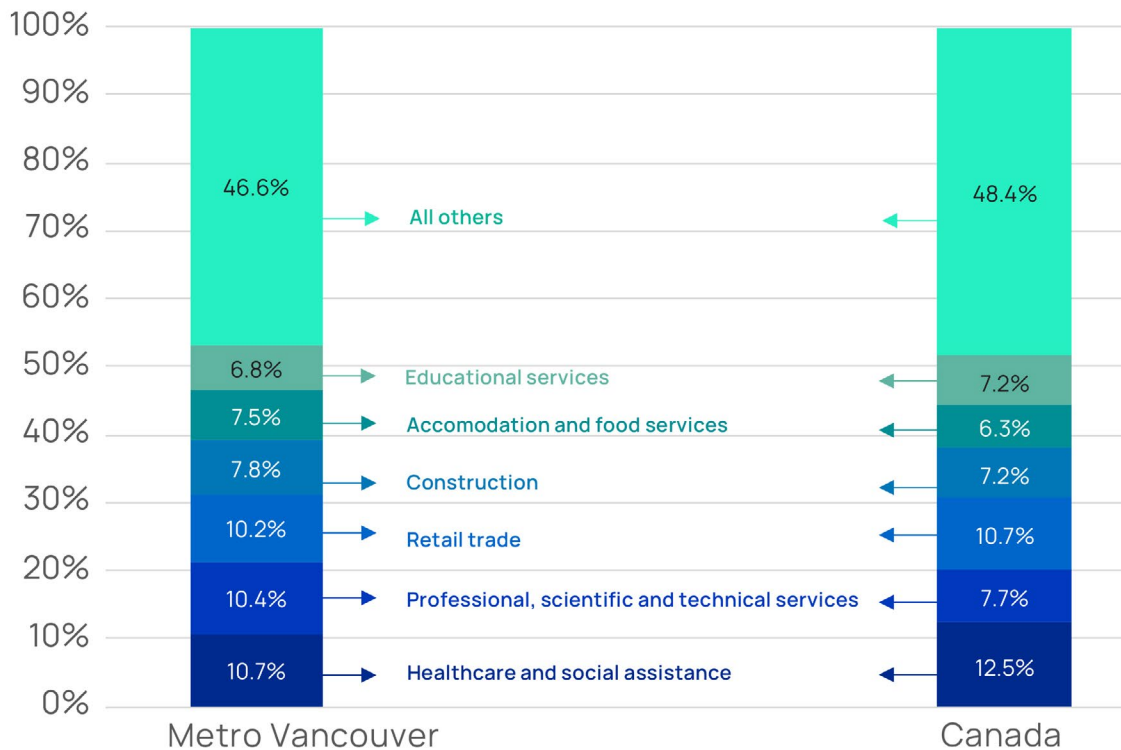
- Even in sectors that were shedding employment, the region was losing jobs at a slower rate. In Manufacturing, for example, the Metro Vancouver region ended the period with 6.5% fewer jobs than it had at the outset, compared to losses of 17.0% in the rest of British Columbia and 22.1% across Canada.
- Construction had the highest percentage change in employment overall, and the regional gains (125%) were considerably higher than in the rest of British Columbia (87%) and the country as a whole (73%). Information and cultural industries also stands out for the 62% increase in employment in the region, or more than triple the growth observed in the rest of British Columbia and Canada.
- Considering employment share is crucial to contextualizing this growth. For instance, while the

mining sector nearly doubled its employment, it started from a small base and now accounts for 0.3% of regional employment. In contrast, transportation and warehousing saw a modest 37% increase but constitutes 5.6% of the regional total.

The share of employment by sector reveals the composition of the regional economy

Figure A3 shows the six largest sectors of the regional economy by share of employment and the corresponding share in the national economy. The regional economy is similar to the nation as a whole, but with a greater emphasis on professional, scientific, and technical services and less on manufacturing.

Figure A3: Largest sectors by 2022 employment share in the Metro Vancouver region and corresponding share of the national economy



SOURCE: LIGHTCAST



- Health care and social assistance is the largest sector by employment regionally and nationally, and accounts for roughly 1 in 10 jobs in the region.
- The defining characteristic of firms in professional, scientific, and technical services is that they sell expertise, such as accounting and consulting services.²⁰ Their primary input is worker skills, rather than equipment and materials. The sector is more significant in the region (10.4% of total employment) than it is nationally (7.7% of total employment).
- The region also diverges from the national economy in manufacturing and public administration. Manufacturing is the third largest sector by employment nationally, accounting for 8.0% of total employment, compared to sixth largest (5.9%) regionally. Public administration is the sixth largest sector by employment nationally (6.4%), and thirteenth largest in the region (3.8%).
- The share of employment in retail and construction in the region is similar to the share nationally, while there is slightly more employment in accommodation and food services in the region than there is nationally.

²⁰ The NAICS sector professional, scientific, and technical services includes legal services; accounting, tax preparation, bookkeeping and payroll services; architectural, engineering and related services; specialized design services; computer systems design and related services; management, scientific and technical consulting services; scientific research and development services; and advertising, public relations, and related services.



Employment in the region is dominated by services-producing sectors

Figure A4 shows total employment (including the self-employed) by sector in the Metro Vancouver region. Goods-producing sectors represent 15.0% of regional employment, while services-producing sectors account for 82.7%.

Figure A4: Employment by sector in the Metro Vancouver region in 2022

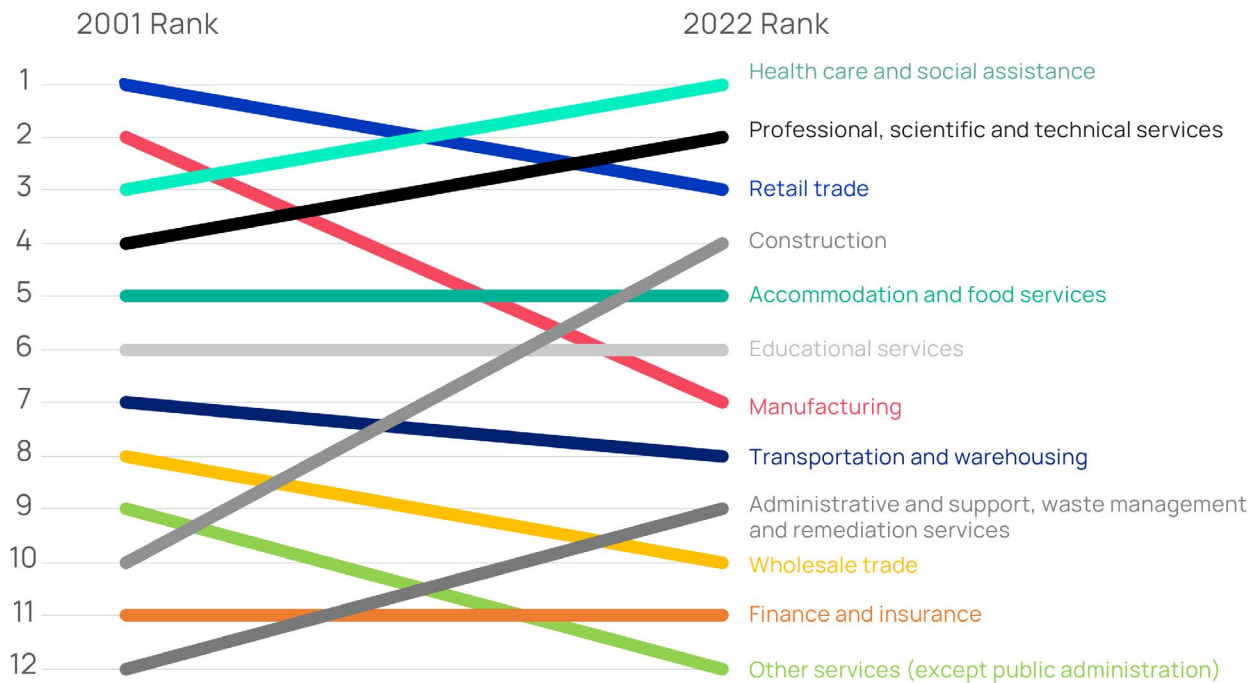
Sector	Number of Workers	Share of Total
All Goods-Producing Sectors (NAICS 11-33)	249,246	15.0%
Resources & Mining	15,291	0.9%
· Agriculture, forestry, fishing and hunting (11)	10,734	0.7%
· Mining, quarrying, and oil and gas extraction (21)	4,557	0.3%
Utilities (22)	7,643	0.5%
Construction (23)	129,028	7.8%
Manufacturing (31-33)	97,284	5.9%
All Services-Producing Sectors (NAICS 41-91)	1,372,590	82.7%
Trade and Transportation	342,355	20.6%
· Wholesale trade (41)	79,458	4.8%
· Retail trade (44-45)	169,296	10.2%
· Transportation & warehousing (48-49)	93,601	5.6%
Information (51)	51,668	3.1%
Financial Activities	123,236	7.4%
· Finance and insurance (52)	76,326	4.6%
· Real estate and rental and leasing (53)	46,909	2.8%
Professional and Business Services	273,082	16.5%
· Professional, scientific, and technical services (54)	172,248	10.4%
· Management of companies and enterprises (55)	16,251	1.0%
· Admin + support, waste mgmt., and remediation services (56)	84,583	5.1%
Education and Health Services	291,557	17.6%
· Educational services (61)	113,277	6.8%
· Health care and social assistance (62)	178,280	10.7%
Leisure and Hospitality	157,834	9.5%
· Arts, entertainment, and recreation (71)	34,063	2.1%
· Accommodation and food services (72)	123,771	7.5%
Other Services (except Public Administration) (81)	69,252	4.2%
Public Administration (91)	63,606	3.8%
Unclassified	37,395	2.3%
TOTAL	1,659,231	100.0%



Regional economic restructuring is reflected in shifting sector employment rankings

Figure A5 compares the 2001 and 2022 rankings of the twelve largest sectors by employment in the Metro Vancouver regional economy.

Figure A5: Largest sectors in the Metro Vancouver region, ranked by employment in 2001 and 2022



SOURCE: LIGHTCAST

- Major shifts occurred in the construction and manufacturing sectors. Construction soared from tenth to become the fourth-largest employment sector, with its regional employment share jumping from 5.2% in 2001 to 7.8% in 2022. Conversely, manufacturing slid from second to seventh place, as its employment share dropped from 9.5% in 2001 to 5.9% in 2022. It is worth noting that employment in manufacturing in the region declined by less than in the rest of the province or country (as shown in Figure A2). However, the rapid growth of other sectors in the region exacerbated its relative decline.

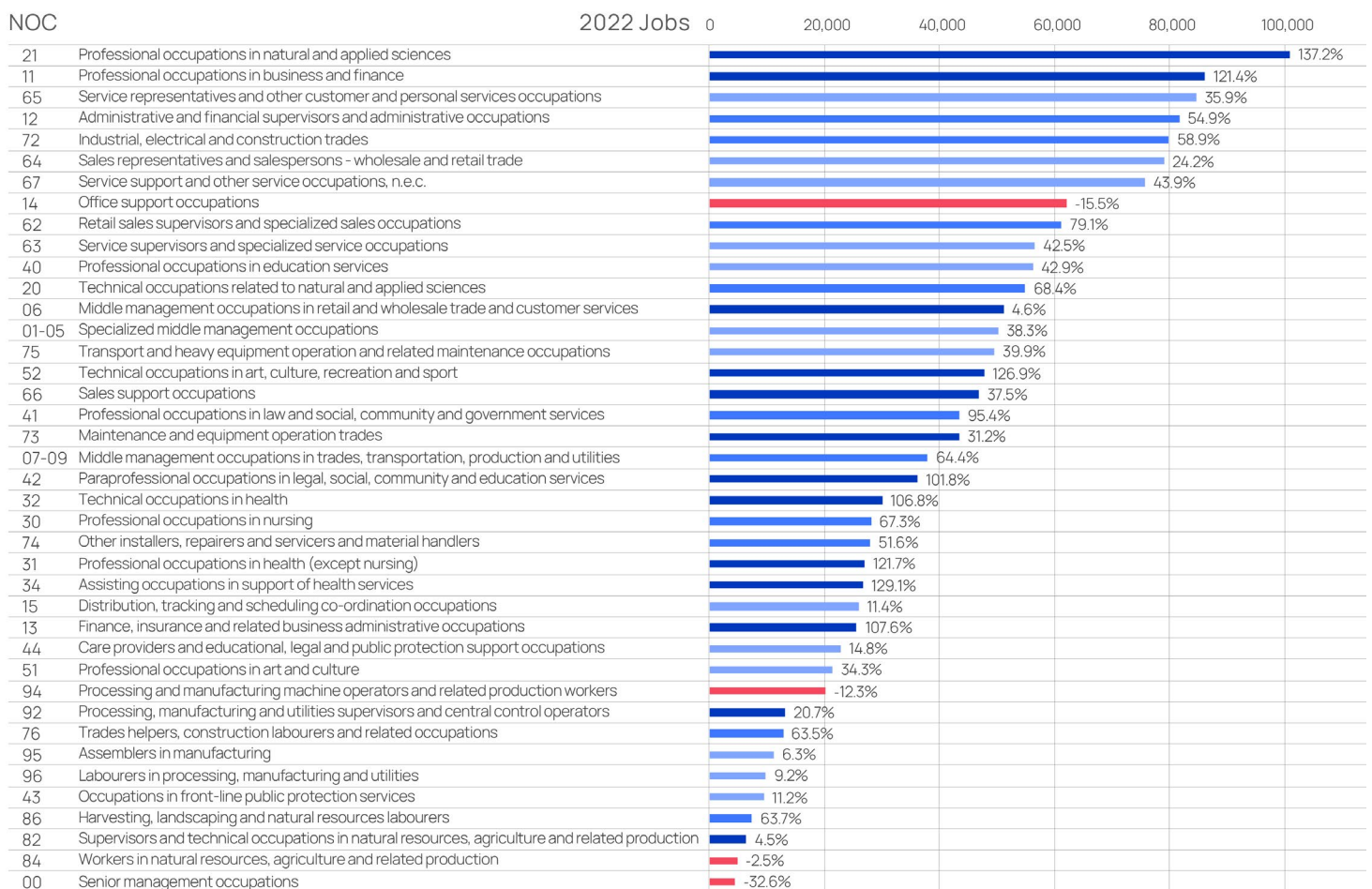
- Health care and social assistance sector took the top spot as the largest sector by employment in 2022, up from the third position in 2001.
- The strong employment growth in professional, scientific, and technical services propelled the sector to second in 2022, up two spots from fourth in 2001.
- Employment in retail trade increased by roughly 40%, but other sectors grew faster so its share of regional employment fell from 10.9% in 2001 to 10.2% in 2022, dropping it from the largest sector by employment to third.

Employment by occupation further reveals the transformation of the economy

The ongoing transformation of the economy sometimes cuts across industries, which can be visible in occupational data. Figure A6 presents occupation groups in the Metro Vancouver region, categorized by 2-digit National Occupational Classification (NOC) and ranked by 2022 employment. The length of the bars indicates the number of

workers in each occupation, with the corresponding number indicated on the horizontal axis at the bottom of the chart. The color gradient, ranging from dark blue (high growth) to red (contraction), illustrates the percentage change in employment since 2001. The bar representing professional occupations in natural and applied sciences at the top of the chart, for example, indicates employment of just over 100,000 in 2022. The bar is dark blue, because it was also the fastest growing occupation group, with employment increasing 137.2% since 2001.

Figure A6: Occupations in the Metro Vancouver region ranked by 2022 employment



Bar length indicates the number of jobs

Bar colour saturation and label (%) indicate change in employment since 2001

SOURCE: LIGHTCAST



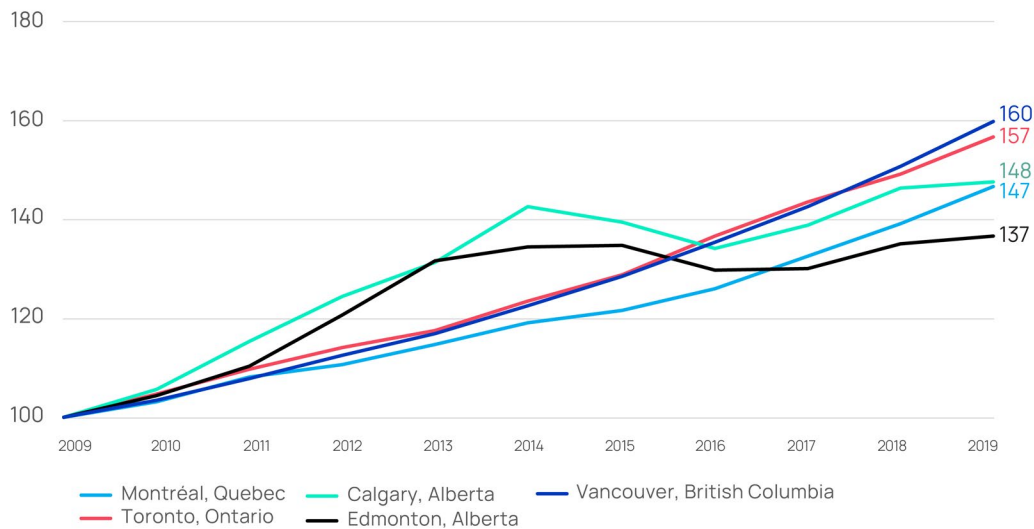
- The two largest occupation groups were among the top five fastest growing occupations based on percentage change in employment, 2001-2022.
- Professional occupations in natural and applied sciences is the largest occupation group, and had the greatest percentage gain in employment. It is comprised of computer and information systems professionals (by far the largest category); followed by engineers; architects, urban planners

and surveyors; physical science professionals; life sciences professionals; and mathematicians, statisticians, and actuaries.

- Professional occupations in business and finance is the second largest occupation group, and had the fifth largest gain. It is comprised of auditors, accountants, and investment professionals; and human resources and business service professionals.

The region leads in nominal GDP growth among the largest metro areas in Canada

Figure A7: Cumulative percentage change in nominal GDP, 2009-2019, in the largest census metropolitan areas in Canada (2009 = 100)



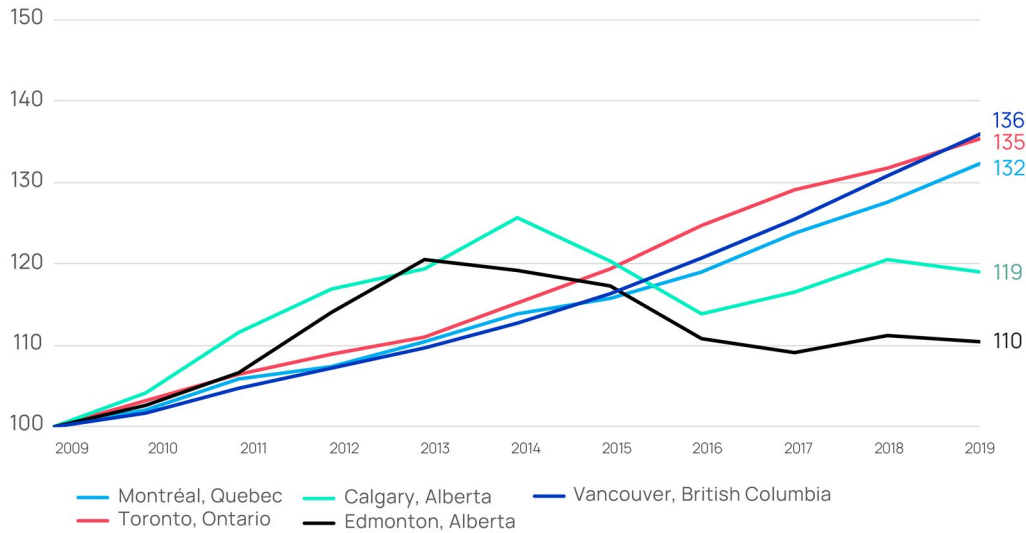
SOURCE: STATISTICS CANADA. TABLE 36-10-0468-0

- Regional (i.e. census metropolitan area) GDP data from Statistics Canada provides nominal (not adjusted for inflation) GDP for the years 2009 through 2019.

- During this period, the Vancouver census metropolitan area had the largest increase in nominal GDP, rising 60% to \$163 billion in 2019. The Metro Vancouver region had the 3rd largest GDP, behind Toronto (\$442 billion) and Montreal (\$234 billion).

The region also leads in per capita GDP growth among the largest metro areas in Canada

Figure A8: Cumulative percentage change in nominal GDP per capita, 2009-2019, in the largest census metropolitan areas in Canada (2009 = 100)



SOURCE: STATISTICS CANADA. TABLES 36-10-0468-0 AND 17-10-0135-01.

- On a per capita basis, the Metro Vancouver region edged out Toronto for the largest increase (36% v 35%, respectively) in nominal GDP during the period 2009 to 2019.
- Despite the growth, the Metro Vancouver region had the second lowest per capita GDP among the five largest metro areas in Canada at \$60,339 per person in 2019. Calgary was first (\$73,466), followed by Toronto (\$68,418), and Edmonton (\$63,464).
- The rising per capita GDP in the Metro Vancouver region reflects unsustainable increases in labour force participation rates. While no regional forecast of per capita GDP is available, the provincial forecast anticipates a decline in provincial GDP per capita in 2023, followed by flat growth in 2024 and 2025.²¹

21 Forecasts based on BC Budget 2023: <https://bccbc.com/insight/going-nowhere-the-stagnation-of-real-incomes-in-canada-and-b-c/>



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Invest Vancouver is the economic development leadership service for the Metro Vancouver region, representing 21 municipalities, one electoral area, and one Treaty First Nation. The service was created to advance equitable opportunity and more broadly shared prosperity for all residents of the region. This report has been prepared to enhance our region's global competitiveness and inform investment attraction efforts.

Invest Vancouver supports investment attraction and job creation in key export-oriented industries, conducting research, discerning the factors driving their growth, identifying gaps along product-service value chains, and articulating the underlying competitive advantages of the Metro Vancouver region. Through the identification of opportunities and challenges faced by firms in these industries, Invest Vancouver develops recommendations to inform policy and to influence decision makers in strengthening the regional value proposition across key industries in order to increase the region's global competitiveness. Our data-driven, objective research aims to provide actionable intelligence to position the 2.8 million residents of this regional economy for success in a rapidly evolving global landscape.

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