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CUSTOM REPORT

Greater Vancouver Economic Scorecard 2016

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Executive Summary

At a Glance

- The past and future success of Greater Vancouver's economy is closely linked to its growing ties with Asia, and the transportation sector is a key industry cluster.
- The overall results of this scorecard offer mixed news for Greater Vancouver—the region places 9th in a ranking of 20 global metro regions that assesses their relative attractiveness to both highly skilled talent and business investment.
- Poor performances on some indicators highlight significant challenges faced by the region to maintain its economic vitality.
- Greater Vancouver's challenges include poor housing affordability, fewer head offices than regions of comparable size, limited supply of land for port expansion to enable trade, inadequate investment in road and public transit infrastructure, relatively low levels of labour productivity and average household incomes, a high marginal effective tax rate on capital, and educational attainment rates that fall short of the scorecard's leaders.

This report assesses how Greater Vancouver performs in relation to 19 other international metropolitan regions on key economic and social indicators. To achieve this, we first look *back* to assess the changes that have shaped the Greater Vancouver region and identify the industries that have contributed to its success. In light of this understanding, we then look *forward* to consider the trends that will continue to shape Greater Vancouver in coming years and decades. And we ask: is the metro region competitive and attractive to both businesses and people, to enable it continue to prosper and grow? To find out, we benchmark Greater Vancouver against 19 other global metro regions, quantifying the metro region's relative strengths and weaknesses on a wide range of social and economic indicators.

Throughout this report, we discuss and compare metro regions across the world. Greater Vancouver is defined as the Vancouver census metropolitan area (CMA), which encompasses 39 census subdivisions including the City of Vancouver. Greater Vancouver is Canada's third-largest metro region, in population and economic activity, behind Toronto and Montréal. It boasts nearly 2.5 million residents and, in 2014, produced goods and services valued at $119 billion—58 per cent of British Columbia's real GDP.

Greater Vancouver's real GDP per capita growth has outpaced the national average since 2005. Over the past five years (2010–14), the metro region's annual average real GDP per capita growth was 1.9 per cent, 0.5 percentage points above the national average of 1.4 per cent. The region's recent economic success can be largely attributed to strong in-migration, an influx of new businesses and private investment, and the growing importance of its role as Canada's Pacific gateway to Asia.

There's no doubt that Greater Vancouver's economy has benefitted from its close and growing ties with Asia—the importance of transportation and warehousing is evident in our cluster analysis, with the industry coming out on top in terms of its recent performance. Inflows of foreign investment are also likely partly responsible for the region's boom in residential real estate, although evidence for this is

hard to come by. But Greater Vancouver has a lot more going for it. Financial services, insurance, tourism, and information technology are some of the sectors, or industry clusters, where the metro region has demonstrated its competitive advantage (relative to the rest of Canada). Overall, the services sector has dominated the labour market—both on the high and lower end of the skills spectrum. In recent years, professional, scientific, and technical services employment—largely knowledge-based occupations—has been on the rise. Today, this broad sector is Greater Vancouver's third largest employer.

But the region's past performance does not guarantee future success. Looking ahead, globalization will continue to increase competition among the world's countries and the metro regions within them. This process is driven by several factors, including lower trade and investment barriers and rapid advances in transportation and information communications technologies. The information technology revolution has also accelerated the shift to the knowledge economy, increasing the demand for more highly skilled workers. This is happening at the same time that many developed countries are experiencing a demographic shift—aging populations are leaving the workforce in significant numbers. The situation will leave Canada and its metro regions competing for global talent.

Canada's aging workforce poses a particular challenge, as the number of baby boomers leaving the workforce will accelerate for at least another 15 years. In 2015, for every one worker hired, employers also had to replace 1.5 workers who retired—a ratio that will only climb going forward. In addition, wages across Canada have increased substantially above inflation over the past decade, while productivity growth has waned. Canada's and more specifically Greater Vancouver's employers are being challenged to remain competitive globally as labour costs have climbed.

Against this backdrop, it is essential for metro regions to know their strengths and weaknesses and how they stack up against other globally competitive metro areas in this race for talent and investment. This report benchmarks Greater Vancouver against other global metro regions. The results of Greater Vancouver's scorecard are based on 32 indicators grouped into two categories: Economy and Social. The Economy category measures local economic performance and business environment, while the Social category attempts to capture some of the social and environmental complexities that distinguish a great metro region from a mediocre one. Of course, it is a combination of success on all fronts that makes a region attractive to people and private investment.

Greater Vancouver's Traded Clusters

The importance of Greater Vancouver's role as Canada's gateway to Asia cannot be overstated. Vancouver International Airport and the Port of Vancouver have the geographic edge—both being the closest large North American facility in their respective industry to many fast-growth Asian markets. Vancouver's airport offers 110 non-stop destinations worldwide, served by 53 different airlines. Top global freight companies operate at the airport, and skyrocketing volumes of e-commerce have boosted activity at the brand-new mail processing facility—which currently handles over 30,000 parcels daily arriving from Asia. Likewise, the Port of Vancouver is Canada's largest, busiest, and most diversified port, connecting the country to more than 160 trading economies annually, mainly those in the Asia-Pacific region.

Indeed, trade with Asia should receive a boost once the recently signed Trans-Pacific Partnership (TPP) deal is ratified. In fact, the countries in the TPP accounted for almost two-thirds of British Columbia's international exports in 2014. Many of these goods are shipped through the Port of Vancouver. In addition, Canada is currently negotiating a comprehensive trade agreement with India, another big and growing destination for goods moving through the Port of Vancouver. Despite concerns about slowing Chinese growth, both India and China are poised to generate continued robust growth in real income per household. And while both countries will remain sources of growing demand for Canada's resources, more and more, they are transitioning to consumer economies, presenting new opportunities for Canadian businesses to provide goods and services that are higher up the value chain.

At the same time, it is important to note that the United States remains B.C.'s largest trading partner, with B.C. exporting nearly $18 billion of merchandise to the U.S. in 2014, and it will remain so for the foreseeable future, given the size of the U.S. economy and its proximity to British Columbia. Although the importance of the U.S. to B.C. had been trending downward until 2011, this trend has started to reverse, in line with a weakening Canadian dollar vis-à-vis the U.S. greenback and a slowly improving U.S. economy. Indeed, B.C.'s export volumes to the U.S. jumped by over 15 per cent in 2014 and a further 3.7 per cent in 2015. The continued weakness of the Canadian dollar and a healthy U.S. economy point to further strengthening in the province's export volumes to the U.S., at least in the near term.

The cluster analysis conducted for this study confirmed that the transportation sector is one of the key traded clusters in Greater Vancouver. Traded clusters are groups of related industries that service markets beyond the region in which they are located. The analysis also identified four other traded clusters that are key drivers of growth: finance, high-tech, information and culture, and tourism.

Greater Vancouver is an attractive destination for tourists from across Canada and the world, making the tourism segment an important cluster. While many of the visitors are Canadian, growth in the number of international visitors has been solid. In particular, Asia's influence on tourism is growing. The number of Chinese tourists visiting Metro Vancouver reached 230,000 in 2014, up from 89,000 in 2009 when Canada was granted Approved Destination Status by the Chinese government. A weaker Canadian dollar vis-à-vis the greenback is also helping to boost U.S. visits. Overall, cruise ships, convention capacity, and the Whistler "effect" helped spur more than 8.9 million people to visit and stay at least one night in Metro Vancouver in 2014. Spending by tourists on accommodations, food, travel, and activities has a significant impact on Greater Vancouver's economy, generating billions of dollars in revenue and supporting thousands of jobs each year.

The information and cultural sector is the third most important traded industry cluster in our list of five. We focus on motion picture and sound recording industries—an important and growing industry in Greater Vancouver. Generous provincial and federal tax incentives, proximity to Los Angeles, skilled crews, industry infrastructure, and attractive scenery have made Greater Vancouver and British Columbia more generally a popular location for foreign film and television production spending. Over the past few years, foreign producers have spent roughly $1.1 billion annually in B.C.—an amount that is likely to escalate, as the depreciated loonie has significantly lowered the costs for U.S. producers filming in Canada. Currently, Greater Vancouver ranks fourth in North America in motion picture and television production spending—behind Los Angeles, New York, and Toronto. While many other jurisdictions in Canada and the United States are offering tax credits and subsidies to attract producer spending, the weak Canadian dollar coupled with the expertise of the local workforce in film, television, and visual effects should help Vancouver maintain its status as "Hollywood North."

Greater Vancouver's information and communications technology (ICT) sector is rapidly expanding—boasting well-established global companies like TELUS and a steady stream of new start-ups. Over the past five years, employment has risen by 4 per cent annually, to top 58,000 jobs in 2014—4.5 per cent of Greater Vancouver's total employment. Specifically, two high-tech-related sectors—computer and electronic manufacturing and computer system design services—have been identified as traded clusters. Existing high-tech companies are attracted to Greater Vancouver by the highly skilled workers that who call Vancouver home, many of whom are graduates of the many post-secondary institutions (universities, institutes, and colleges) that have campuses in the region, such as the University of British Columbia (UBC), Simon Fraser University (SFU), and the British Columbia Institute of Technology (BCIT).

Our final cluster is finance and insurance. Vancouver's finance sector has been quickly rising in prominence internationally, with Vancouver ranking 14th as a global financial hub, three spots below Toronto and ahead of Montréal. In 2014, 41,900 people worked in finance, while 20,400 people worked in the insurance industry. Greater Vancouver's well-educated workforce, strong economic growth, and investments in transportation infrastructure are thought to be adding to the success of finance and insurance firms. The future for the region's finance and insurance sectors looks bright. Continued trade with the Asia-Pacific region in the coming years should help Greater Vancouver's finance sector grow in importance on the world stage. In particular, rising trade with China opens up the possibility that Vancouver could become a direct trade settlement hub using Chinese currency, the renminbi (RMB). Canada's insurance industry has also been taking advantage of underserved markets in China and Asia.

Greater Vancouver has posted a robust economic performance in recent years—with real GDP surpassing 3 per cent growth in four of the past five years. The region has benefited from its close ties with, and proximity to, China and other fast-growth Asian markets. Growth in transportation infrastructure has bolstered gateway activity and attracted significant private investment. The economy has also benefited from the highly skilled workforce supplied by its many educational institutions and from its attractiveness to interprovincial and international migrants. Greater Vancouver's continued success will likely depend on these very same factors—its ability to continue to draw private investment and skilled workers, competing globally with other metro regions.

Schoolhouse Scoring for Benchmarking

One of the main purposes of this report is to assess, through benchmarking, Greater Vancouver's relative performance and potential in attracting labour and business investment against 19 other global metro regions. Given the strategic importance of transportation to Vancouver's economy, as confirmed by the cluster analysis, 18 of these 19 comparator regions were selected because they are also major transportation gateways. Calgary, the lone metro region without an outsized transportation sector, is included in the rankings because its relative proximity to Vancouver makes it a key competitive measuring stick.

The results of the Vancouver scorecard are based on 32 indicators grouped into two categories: Economy and Social. We used a report card–style ranking of A–B–C–D to assess the performance of metropolitan areas for each indicator. We assigned letter grades using the following method: for each indicator, we calculated the difference between the top and bottom performer and divided this figure by four. A metropolitan area received a scorecard ranking of "A" on a given indicator if its score was in the top quartile, a "B" if its score was in the second quartile, a "C" if its score was in the third quartile, and a "D if its score was in the bottom quartile. A metropolitan area was assigned an "n.a." if data were unavailable for that indicator. (See page 36 and Appendix 2 for detailed methodology.)

Singapore tops the overall rankings. (See Table E1.) The city-state's strategic location on the vital Strait of Malacca shipping route gives it the largest port relative to the size of its economy among our Asian metro areas and helps it achieve a top Economy category ranking. Singapore's performance is less robust in the Social category.

A European metro area with a rich cultural heritage, Copenhagen, sits in second place and performs better in the Social category than in Economy. In contrast, Hong Kong and Calgary, which come in third and fourth place, draw much of their strength from a strong performance among the economy-oriented indicators. On the other hand, U.S. high-tech powerhouse Seattle, our fifth-rated metro area, performs strongly in both Economy and Social, ranking no worse than sixth in both categories.

The Big Picture: Singapore Ranks First

Table E1

Overall Ranking

Ranking	*Metropolitan area*
1	Singapore
2	Copenhagen
3	Hong Kong
4	Calgary*
5	Seattle
6	Barcelona
7	Sydney
8	San Francisco
9	**Greater Vancouver**
10	Toronto
11	Portland
12	Seoul
13	Rotterdam
14	Montréal
15	Houston*
16	Halifax
17	Manchester
18	Shanghai
19	Los Angeles
20	Miami

* Results for Calgary and Houston do not take into account the impact of steeply lower oil and gas prices.

The bottom five are similarly disparate, with one metro area each from Canada (Halifax), Europe (Manchester), and Asia (Shanghai) and two from the United States (Los Angeles and Miami). Miami is our report's bottom-ranked region, with a last-place finish in Economy and an only marginally better 18th-place finish in Social.

Greater Vancouver ranks ninth overall in the scorecard, the combination of a seventh-place finish in the Social category and a ninth-place spot in Economy. Despite its relatively high Social ranking, the category still highlights three factors that hurt the region's liveability—poor housing affordability, inadequate public transit and road infrastructure, and educational attainment rates that fall short of the scorecard's leaders.

Economy: Vancouver Places in the Middle of the Pack

Singapore's top spot in the Economy category is partly due to its first-place finishes on three indicators: real GDP per capita growth, employment growth, and the unemployment rate. Two other Asian metro areas—Hong Kong and Shanghai—round out the top three. (See Table E2.) Several U.S. metros also earn high grades in the Economy rankings: Houston—an oil industry hub—as well as Seattle and San

Francisco—high-tech hubs—finish in the top 10. Calgary ranks fourth, making it the top-ranked Canadian metro region. But given that this benchmarking analysis is backward looking, neither Houston's nor Calgary's ranking take into account the negative impact of steeply lower oil and gas prices.

At the same time, U.S. metro areas also account for three of the bottom five metro regions, with Miami finishing last. In particular, Los Angeles, Manchester, and Miami are this category's three "D"-rated metro areas. These three regions were collectively awarded "A"s for only six Economy indicators, set against 33 "D"s. Miami's low rankings can be largely attributed to the disproportionate force with which it was hit by the 2008–09 global recession. In fact, some of the effects still linger today. For example, Miami's real GDP per capita and labour productivity both fell over 2009–13.

Table E2
Economy Ranking

Ranking	*Metropolitan area*	*Grade*
1	Singapore	A
2	Hong Kong	A
3	Shanghai	A
4	Calgary*	A
5	Seattle	B
6	Copenhagen	B
7	Houston*	B
8	San Francisco	B
9	**Greater Vancouver**	**B**
10	Seoul	C
11	Sydney	C
12	Rotterdam	C
13	Toronto	C
14	Halifax	C
15	Barcelona	C
16	Montréal	C
17	Portland	C
18	Los Angeles	D
19	Manchester	D
20	Miami	D

* Results for Calgary and Houston do not take into account the impact of steeply lower oil and gas prices.

Greater Vancouver finishes in ninth place with a "B" grade in the Economy category. The metro region's tax environment offers a mixed picture. True, Greater Vancouver earns an "A" grade on KPMG's total tax index, which measures the total taxes paid by similar corporations in a particular location and industry, calculated as a percentage of total taxes paid by similar corporations across the United States. (See Table E3.) The metro region's high marks on this indicator are also a result of its lower statutory labour costs (payroll-based taxes) relative to its U.S. comparators. But at the same time, Greater Vancouver has the highest marginal effective tax rate on capital investment for businesses among the five Canadian

metro regions in the scorecard, earning a "C" grade on this indicator. The marginal effective tax rate (METR) represents the proportion of the rate of return from a new investment that is used to pay corporate income taxes, sales taxes on capital purchases, and other capital-related taxes, such as financial-transaction taxes and asset-based taxes. The METR gauges a region's competitiveness in attracting capital investment. Payroll taxes do not affect the METR because they raise the cost of labour and not capital. Thus, Greater Vancouver does well on one tax indicator (KPMG's total tax index) and not on the other (METR on capital). Greater Vancouver's poor showing on the METR can be attributed to British Columbia continuing to levy an unharmonized retail sales tax, which results in a significant tax on capital purchases.

The results of the Economy ranking also reveal that Greater Vancouver suffers from relatively low levels of real GDP per capita and labour productivity, its small market size, and its low share of high-tech workers. Greater Vancouver ranks fourth (out of 11 metro areas for which data are available) on venture capital investment per $1 million per GDP, but it remains well behind leaders San Francisco, Houston, and Seattle.

Table E3
Greater Vancouver's Economy Performance

Indicator	*Grade*	*Ranking*
KPMG's total tax index	A	3 (12)
Office rents ($ per square foot)	A	5 (17)
Port cargo tonnage per $1 million of GDP	B	3 (19)
Labour productivity growth	B	7 (20)
Employment growth	B	11 (20)
Venture capital investment per $1 million of GDP	C	4 (11)
Port container traffic (TEUs) per $1 million GDP	C	5 (19)
Real GDP per capita growth	C	7 (20)
Number of cruise vessel calls	C	7 (18)
After-tax income growth	C	8 (19)
Number of participants at international association meetings	C	8 (19)
Inbound airport cargo tonnage per $1 million of GDP	C	9 (20)
High-tech employment share	C	9 (19)
Unemployment rate	C	10 (20)
Inbound airport seats per capita	C	10 (20)
Marginal effective tax rate on capital investment for businesses	C	10 (17)
International visitors	C	11 (20)
Labour productivity	C	12 (20)
After-tax income per capita	C	13 (20)
Real GDP per capita	C	14 (20)
Market size	D	16 (20)

On a positive note, Greater Vancouver performs well on the transportation-oriented indicators. In particular, Greater Vancouver can boast North America's top-ranked port for both container traffic and

tonnage, relative to the size of its economy. Moreover, Greater Vancouver is home to Canada's largest cruise port. Activity at Greater Vancouver's airport is more middle of the pack.

Finally, Greater Vancouver also gets good grades for its affordable office rents, which on a square foot basis trail only Montréal's among North American metro regions. But this is offset by very poor housing affordability, which limits Vancouver's attractiveness to the highly skilled workers that businesses seek.

Social: Vancouver's Liveability Shines Through

The Social category contributes to our understanding of how 20 metro areas are performing on 11 measures of a metro region's socio-economic, environmental, and quality of life attributes. These measures underpin a region's ability to lure educated, creative, and diverse people. Such individuals are much in demand to fill cities now and will continue to be in the future. These people will consider regional quality-of-life attributes, such as those evaluated here, as they choose where to locate.

Table E4
Social Ranking

Ranking	*Metropolitan area*	*Grade*
1	Barcelona	A
2	Copenhagen	A
3	Sydney	A
4	Portland	A
5	Toronto	A
6	Seattle	A
7	**Greater Vancouver**	**B**
8	Manchester	B
9	Montréal	B
10	San Francisco	B
11	Calgary	B
12	Hong Kong	B
13	Rotterdam	B
14	Seoul	B
15	Halifax	B
16	Singapore	B
17	Los Angeles	B
18	Miami	C
19	Houston	C
20	Shanghai	D

Two European metro areas emerge at the top of the field in the Social category: Barcelona and Copenhagen. (See Table E4.) Barcelona, the top-ranked metro region, has the best climate in the scorecard and earns two more "A" grades for a low homicide rate and low income inequality. Although Copenhagen has the worst climate, it more than makes up for it with high numbers of people aged 25 to 34, high numbers of people with at least a bachelor's degree, and high numbers of people working in the cultural sector. Rounding out the top five are Sydney, Portland, and Toronto.

The bottom three metro areas—Miami, Houston, and Shanghai—share some common vulnerabilities. In particular, they all have long commute times (all get "C" or worse) and relatively unequal income distributions (all get "D"s). Miami and Houston also suffer from relatively high homicide rates (both get "D"s). One bright spot for these three cities is that they rate fairly highly for a "comfortable climate" (all are rated "B" or above).

Greater Vancouver ranks seventh overall with a "B" grade, placing it higher than all its Canadian counterparts except Toronto. It gets high scores for its clean air, large proportion of foreign-born residents, and low homicide rate—all of which are attractive to potential residents. (See Table E5.) Its ranking confirms that Greater Vancouver is one of the world's most liveable metro regions.

But anyone contemplating a move to the region faces exorbitant housing costs. This limits Greater Vancouver's attraction to younger people who could represent its future. In fact, its lone "D" grade in the Social category is in housing affordability. It ranks 15th out of the 17 metro regions for which data were available—only Shanghai and Hong Kong are less affordable. This represents a major barrier to retaining and attracting talent and therefore business investment. Unfortunately, the identification of causes and remedies for this clear and present danger is highly controversial.

The area also needs to rethink its regional public transit plans after a taxing-and-funding proposal was rejected in a referendum in 2015. Indeed, Greater Vancouver receives "C" grades for its proportion of the workforce that non-car commutes and for its average travel time to work.

Table E5
Greater Vancouver's Social Performance

Indicator	*Grade*	*Ranking*
Air quality	A	1 (20)
Proportion of population foreign born	A	2 (19)
Homicide rate	A	9 (20)
Proportion of population employed in cultural occupations	B	10 (20)
Climate	B	12 (20)
Proportion of population with at least a bachelor's degree	C	9 (20)
Non-car commuting	C	8 (17)
Average travel time to and from work	C	10 (19)
Income inequality	C	11 (20)
Proportion of population aged 25–34	D	7 (19)
Housing affordability	D	15 (17)

Greater Vancouver's Outlook Bright, but Challenges Remain

Greater Vancouver's near-term economic outlook appears bright. Its many traded clusters seem poised to take advantage of growing trade, in both goods and services, with Asian markets. A low-flying loonie should also help it leverage economic activity with a healthy U.S. economy. However, the region's longer term performance will depend on the ability of its leaders to deal with seven important challenges revealed in our study:

1) underinvestment in public transit and road infrastructure
2) poor housing affordability
3) land scarcity for port expansion
4) low labour productivity levels
5) educational attainment rates that fall short of the scorecard leaders
6) high marginal effective tax rate on capital for businesses
7) fewer head offices than cities of comparable size

Long commute times are adding to Greater Vancouver's difficulties in attracting high-end talent. Failure to address the inadequate investment in transit and road infrastructure could keep talented people and business investment away.

The benchmarking analysis showed that Greater Vancouver's performance in this area is relatively poor—it records C grades for the average commute time to and from work and for the proportion of the workforce that non-car commutes. Therefore, cementing Greater Vancouver's status as a Canadian economic leader requires a commitment to invest in its roads and public transit infrastructure.

Indeed, infrastructure investment has been shown to influence private-sector competitiveness, especially if it involves reducing commute times for employees and for trucking goods throughout the region. In this regard, the Mayors' Council 10-year Vision for Metro Vancouver and the provincial government's 10-year B.C. on the Move plan are steps in the right direction. But a funding solution for these critical plans remains elusive. Failure to address deteriorating housing affordability and inadequate investment in transit and road infrastructure could keep talented people and business investment away.

One of the highest profile challenges facing Greater Vancouver is the deteriorating affordability of housing. Concerns have been raised that foreign investment is a key factor behind skyrocketing home prices, but data to study such claims are lacking because foreign purchases of real estate have not been officially tracked. Lack of available land for new residential development is another key factor behind rising home prices. This will be a difficult issue to resolve, given that the region is bordered by the Pacific Ocean to the west, the North Shore Mountains to the north, the U.S. border to the south, and the Agricultural Land Reserve to the east.

The limited availability of land also threatens to constrain non-residential development. While office rents remain reasonable compared with international jurisdictions, land constraints in the Lower Mainland are putting at risk future expansions at the Port of Vancouver—an outcome that could significantly affect the region's competitive advantage as a gateway.

Greater Vancouver's poor ranking in a number of other economic indicators also needs to be addressed. In particular, the metro region's labour productivity level is middle of the pack. Productivity—the efficiency with which goods and services are produced—is fundamental to maintaining and growing a region's income and standard of living. Private capital investment is a key driver of productivity at the firm level. Unfortunately, as highlighted in this benchmarking analysis, British Columbia has one of the country's highest marginal effective tax rates on capital for businesses, which acts as a disincentive to

invest in the province. This stems largely from the fact that British Columbia is one of only three provinces that still levies an unharmonized retail sales tax, while the remaining provinces have moved to a value-added consumption tax system by harmonizing their sales tax with the federal GST.

Infrastructure investment has also been shown to boost private sector competitiveness, especially if it involves reducing commute times for employees and times to truck goods throughout the region. Innovation can be fostered through a more competitive environment that encourages foreign investment and reduces regulatory and other barriers to the free movement of people, goods, and capital.

Human capital is another key determinant of labour productivity—a fully employed, highly educated, and highly skilled workforce will invariably generate higher incomes. Greater Vancouver boasts many post-secondary institutions that draw students from outside the province and the country. Post-secondary institutions also funnel graduating students into the private sector, as many who study in Vancouver choose to work in the region or elsewhere in B.C. after completing their degrees. The fact that employment prospects have become increasingly tied to possessing more education, thanks to the rise of the knowledge economy, suggests that regions with high-quality post-secondary educational institutions have an advantage over those that do not. However, despite its many post-secondary institutions, Greater Vancouver earns a "C" grade in terms of its population 25 or over with a bachelor's degree or higher. The region may be disadvantaged on this benchmark by its relatively grey population, but clearly more work needs to be done to lift human capital.

Moreover, Greater Vancouver would do well to lift the skills and education of its Aboriginal citizens. Across Canada and in Greater Vancouver, Aboriginal educational attainment rates are abysmally low, leading to high unemployment rates and lower wages than non-Aboriginal populations. According to Statistics Canada's 2011 National Household Survey, the gap in university attainment is particularly wide—in Greater Vancouver, only 14 per cent of Aboriginal people had at least a bachelor's degree in 2011 compared with 34.5 per cent of non-Aboriginal people. Improving the Aboriginal population's educational attainment rates would not only improve their economic well-being but would have the added benefit of lifting Vancouver's employment rates and the region's economic potential.

Greater Vancouver also performs relatively poorly when it comes to attracting head offices. Head office activity is an important measure in evaluating a region's attractiveness to businesses. In particular, head offices provide well-paying jobs and can stimulate local business investment. In 2013, Greater Vancouver had 242 head offices, ranking far below Toronto and Montréal, and only slightly ahead of Calgary. Results for employment per head office are even more disappointing, as Vancouver ranks far behind Toronto, Calgary, and Montréal. Given that Greater Vancouver is already home to almost all of the head offices of large B.C.-based corporations—including mining, forestry, and energy companies whose business assets are located in other parts of the province—any additional head offices would have to come from Greater Vancouver attracting those of out-of-province (or out-of-country) companies. An important step in this direction was taken in early 2015 with the creation of HQ Vancouver—an investment partnership between the Government of Canada, the province of British Columbia, and the Business Council of British Columbia aimed at luring Asian businesses into relocating

their head offices to Vancouver. HQ Vancouver has had early success in attracting headquarters to relocate, including Aikang Capital Inc. and Sony Pictures Imageworks.

But we do not want to pull any punches. Addressing these challenges will be extremely difficult, given their complexity and the local government fragmentation within Greater Vancouver. Moreover, many of these challenges are interconnected, so they need to be addressed simultaneously. They also tend to be regional in scope and could not be successfully addressed without the partnership of Metro Vancouver, the province, First Nations, and the federal government.

Therefore, one prerequisite for successfully addressing these challenges would be greater regional coordination among the municipalities that make up Greater Vancouver. For example, poor transit infrastructure and low productivity levels are problems that are not specific to a single municipality—they affect the entire Greater Vancouver region. If these problems are ever to be resolved, the region's municipalities will have to come together to discuss these issues and develop a coordinated plan to tackle them. Not only would this increase the chances that these issues will be resolved, it would also allow the Greater Vancouver metro region to better leverage its competitive strengths.

1. Introduction

Chapter Summary

- Global trends suggest that international competition for highly skilled workers among countries, regions, and cities will only intensify.
- This report benchmarks Greater Vancouver's relative attractiveness to both skilled workers and business investment compared with 19 other global metro regions.
- The report also looks back on the factors that have contributed to Greater Vancouver's economic success and looks forward to the factors that will determine its future.

Globalization continues to increase competition among the world's countries and the cities within them. This process is being driven by several factors, including regional and multilateral action that has reduced the barriers to international trade and investment. It is also being driven by rapid advances in transportation and information communications technologies, which give firms a greater ability to separate the production of goods and services into global value chains. The winners of this race will be those that can provide the highest value at the lowest sustainable cost.

The information technology revolution has also accelerated the shift to the knowledge economy—work that is directly based on the production, distribution, and use of information. Employment in the knowledge economy, which is more cognitive in nature, is characterized by increasing demand for more highly skilled workers.

This is happening at the same time that many developed countries are experiencing a demographic shift—aging populations are leaving the workforce in significant numbers. In Canada, for example, the 2011 census showed that for the first time, there were more people in the age group 55 to 64, where people are frequently about to leave the labour force, than in the age group 15 to 24, where people are often about to enter it.[1] Against this backdrop, international competition for highly skilled workers among countries, regions, and cities will only intensify. Successful cities will be those that offer great career opportunities and a high quality of life and, thus, attract both talented people and business investment.

Over the past decade, there have also been significant changes in Canada's trading patterns. While Canadian trade has been traditionally geared toward the U.S., that pattern is gradually shifting. Canadian trade with the U.S. has stagnated over the past decade, while trade with other countries has strengthened. The U.S. is still Canada's largest trading partner and will remain so in the foreseeable future, given its geographic proximity and its economic size. However, the importance of the U.S. to Canada has been trending downward. On the other hand, Canada's trade with Asia has been growing for decades, surpassing trade with Europe in 2010. In fact, Asia is now Canada's second largest trading partner. Asia's insatiable thirst for natural resources partly underpins this growth.

[1] Statistics Canada, "2011 Census: Age and Sex."

Given that population aging is dampening economic growth prospects in many developed countries, Canada will need to continue to pursue greater trade opportunities with non-traditional markets like Asia. Indeed, although Asian economic growth is slowing somewhat, it will remain a key engine of global economic growth. The ongoing removal of trade barriers—the most recent example being the signing of the Trans-Pacific Partnership (which still needs to be ratified by member countries before going into force)—could further strengthen Canada's trade relationship with the region.

A key reason for Greater Vancouver's recent economic success—economic growth has been well above the national average over the past 10 years—is its strong trade ties with Asia. Indeed, this report features a cluster analysis that confirms that the transportation sector is one of five key traded clusters that help drive economic activity in Greater Vancouver. Vancouver's geographic location on the West Coast, combined with major truck and rail routes to a number of North American cities, makes it an excellent gateway for the movement of goods to and from the United States, the Pacific Rim, and several other countries around the world. Indeed, the Port of Vancouver has a geographic advantage over other large North American ports to Asia. Similarly, Vancouver International Airport is the closest large North American airport to Asia, and no other airport on the continent offers more direct flights to Asian cities.

Given these global trends, it is essential for metro regions to know their strengths and weaknesses and how they stack up against other globally competitive metro areas in the race for talent and investment. Therefore, one of the main purposes of this report is to benchmark Greater Vancouver's relative performance and potential in attracting labour and business investment against other global metro regions.

The benchmarking analysis features 32 internationally comparable indicators for Greater Vancouver and 19 other global metro regions. Given the critical importance of the transportation sector to Vancouver's economy, the comparator regions selected for the benchmarking analysis, aside from Calgary, are also well-known transportation gateways. In addition, 5 of the 32 indicators assess relative performance at local seaports and airports. They, along with 16 other indicators, are grouped into an Economy category that assesses general economic performance, while the 11 remaining indicators are grouped into a Social category that assesses liveability.

The report closes by looking forward: we consider the trends that will continue to shape Greater Vancouver in the coming years and decades. The region's past performance does not guarantee future success. In fact, the benchmarking analysis reveals many of the region's challenges, which, if not addressed, could act as headwinds to growth. But the region is also blessed with great opportunity. In particular, with Asia expected to remain one of the main engines of global economic growth, Greater Vancouver is uniquely positioned to take advantage of this opportunity thanks to its strong and growing links to the Asia-Pacific region.

2. Defining Greater Vancouver and Its Comparators

Chapter Summary

- The geographical unit of analysis in this report is the metropolitan area.
- The Vancouver census metropolitan area, referred to as Greater Vancouver in this report, includes 39 census subdivisions, with the City of Vancouver at its core.
- Given the strategic importance of transportation to Vancouver's economy, 18 of the 19 comparator regions were selected, in part, because they are also major transportation gateways.

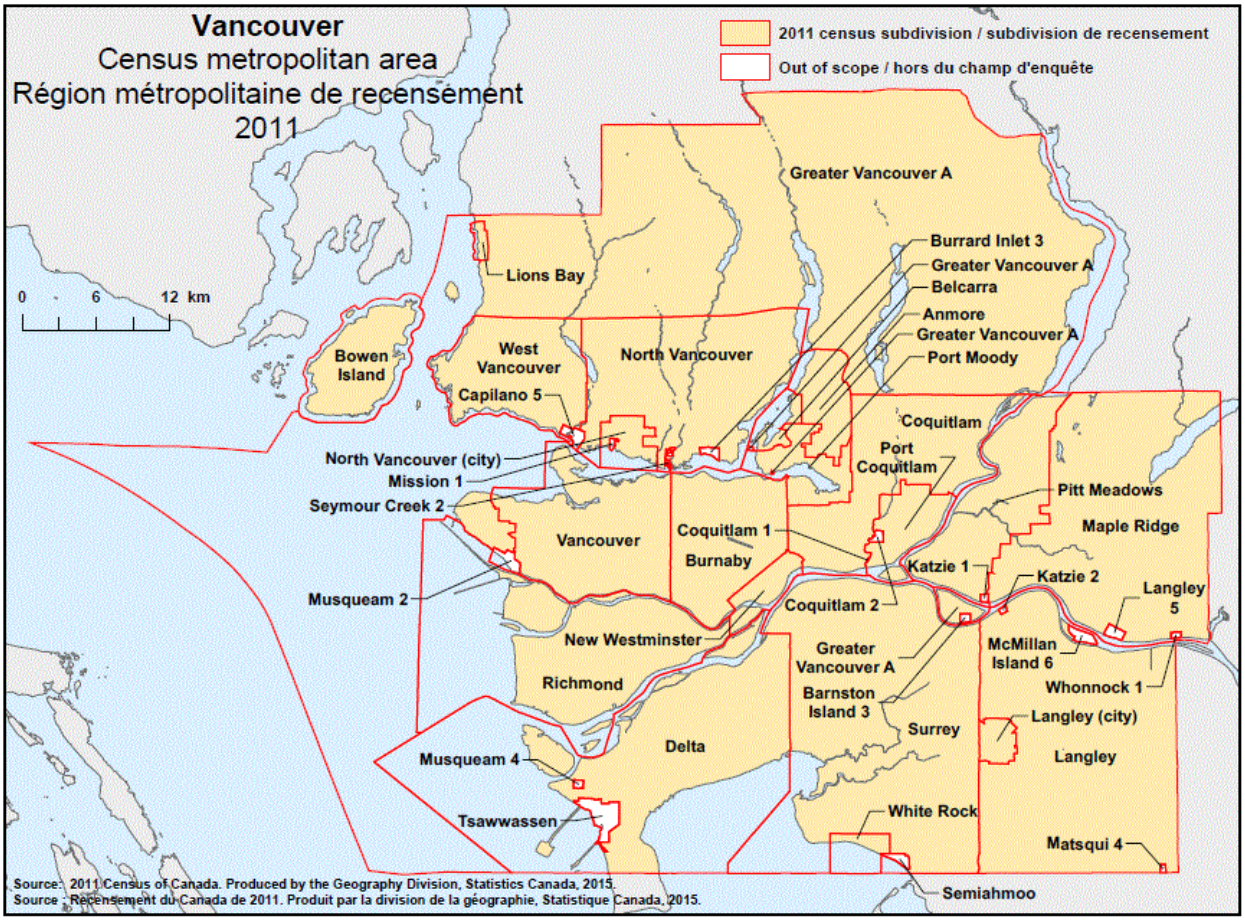
Except where explicitly stated otherwise, the geographical unit of analysis in this report is the metropolitan area, known as census metropolitan areas (CMAs) in Canada, metropolitan statistical areas (MSAs) in the United States, and functional urban areas (FUAs) in Europe. Data for this report's Asian comparators are also measured at the metropolitan-area level.

A census metropolitan area is formed by one or more adjacent municipalities centred on a population centre (known as the core). A CMA must have a total population of at least 100,000 of which 50,000 or more must live in the core. To be included in the CMA, other adjacent municipalities must have a high degree of integration with the core, as measured by commuting flows derived from the latest census data. MSAs and FUAs are defined in very similar ways.

The Vancouver CMA includes 39 census subdivisions (see Table 1), that cover a land area of 2,882.55 square kilometres. In 2011, the population of the Vancouver CMA was 2,313,328, with 603,502 of those people residing in the core. Large population centres in the CMA include Vancouver, Surrey, Burnaby, Richmond, Coquitlam, Langley, and Delta. The map in Figure 1 provides a visual representation of the Vancouver CMA.

Exhibit E1

Map of Vancouver Census Metropolitan Area



Source: Statistics Canada.

Table 1
Greater Vancouver's Census Subdivisions

Census subdivision name	Population (2015)
1. Vancouver	648,608
2. Surrey	526,004
3. Burnaby	238,209
4. Richmond	207,773
5. Coquitlam	144,668
6. Langley, District Municipality	116,863
7. Delta	100,652
8. North Vancouver, District Municipality	85,974
9. Maple Ridge	81,247
10. New Westminster	71,665
11. Port Coquitlam	60,264
12. North Vancouver, City of	54,258
13. West Vancouver	41,728
14. Port Moody	34,554
15. Langley, City of	27,738
16. Pitt Meadows	19,652
17. White Rock	19,327
18. Greater Vancouver A (electoral area)*	13,035
19. Bowen Island	3,546
20. Anmore	2,243
21. Lions Bay	1,332
22. Belcarra	623
IR*	
23. Capilano 5	2,700
24. Musqueam 2	1,569
25. Burrard Inlet 3	1,472
26. Tsawwassen	720
27. Mission 1	574
28. Matsqui 4	498
29. Katzie 1	229
30. Semiahmoo	108
31. Seymour Creek 2	107
32. McMillan Island 6	68
33. Coquitlam 1	39
34. Musqueam 4	5
35. Coquitlam 2	5
36. Katzie 2	0
37. Whonnock 1	0
38. Barnston Island 3	0
39. Langley 5	0
* Population is for 2011.	

Source: Statistics Canada.

In this report, whenever we use the terms “Greater Vancouver” or the “region of Vancouver” we are referring to the Vancouver CMA. In the few cases where we cite secondary sources that report data based on Greater Vancouver Regional District (GVRD) boundaries, we use the term “Metro Vancouver.” However, it should be noted that the CMA and GVRD boundaries are nearly identical. Finally, to further reduce confusion, whenever we refer to the city of Vancouver and not the wider metro area, we explicitly use the term “City of Vancouver.”

The report features data on 20 metropolitan regions, including Greater Vancouver. Given the strategic importance of transportation to Vancouver’s economy, 18 of the 19 comparator regions were selected, in part, because they are also major transportation gateways. Calgary, the lone metro region without an outsized transportation sector, is included in the rankings because its relative proximity to Vancouver makes it a key competitive measuring stick. The report’s regions and their 2014 populations are reported in Table 2.

Table 2
Population of Metro Areas, 2014

Metropolitan area	Population
Shanghai	24,536,000
Seoul	24,489,000
Los Angeles	13,262,220
Hong Kong	7,291,000
Houston	6,490,180
Toronto	6,055,724
Miami	5,929,819
Singapore	5,587,000
Barcelona	5,427,322
Sydney	4,620,000
San Francisco	4,594,060
Montréal	4,027,121
Seattle	3,671,478
Manchester	2,775,000
Greater Vancouver	**2,470,289**
Portland	2,348,247
Copenhagen	1,749,000
Rotterdam	1,418,000
Calgary	1,406,721
Halifax	414,398

3. Historical Overview: Greater Vancouver's Economy Has Been Solid and Steady

Chapter Summary

- Greater Vancouver's real GDP per capita growth outpaced the national average between 2010 and 2014.
- The impact of the housing market on the region's economy is clear: the construction sector and the finance, insurance, and real estate industry have been the two biggest drivers of economic growth since 2005.
- Four out of five jobs in Greater Vancouver are in the services sector.
- Two of the biggest job creators over the past 10 years have been health care and education.
- The professional, scientific, and technical services sector, which includes many knowledge-based occupations, has been another major job creator.

Greater Vancouver is Canada's third most populated metro region and third largest economy, behind Toronto and Montréal. Some 2.47 million people called the region home in 2014, while the real value of all the goods and services produced in the region amounted to $119 billion. The metro region accounts for 58.4 per cent of total British Columbia output and 7.3 per cent of total Canadian output. Total employment stood at 1.276 million in 2014, 56 per cent of provincial employment and 7.2 per cent of national employment.

Not only is Greater Vancouver the largest metro region in British Columbia, it is also the primary business and professional services centre for the province. Indeed, Greater Vancouver is home to almost all the head offices of large B.C.-based companies, including forestry and mining companies. It is also the location for the lion's share of specialized health care services and advanced education and research institutions.

3.1 Greater Vancouver's Economy Has Outpaced B.C.'s and Canada's

Table 3 compares real GDP per capita growth in Vancouver, British Columbia, and Canada over 1990–2014. Clearly, Greater Vancouver's economy has strengthened over time. Over the entire 25 years, real GDP per capita in Greater Vancouver climbed more slowly than in the country as a whole (1.1 per cent per year versus 1.2 per cent per year). But Greater Vancouver's real GDP per capita growth has outpaced the national average since 2005. Over the past five years (2010–14), the metro region's annual average real GDP per capita growth was 1.9 per cent, 0.5 percentage points above the national average of 1.4 per cent.

The region's economy also outpaced that of British Columbia's between 2010 and 2014, although by a lesser extent, as B.C. experienced average annual per capita real GDP growth of 1.6 per cent, 0.3 percentage points slower than Greater Vancouver's.

In contrast, job growth in Greater Vancouver has outpaced the national average since 1990. Specifically, average annual employment growth in the metro region was 1.9 per cent from 1990 to 2014, compared to 1.3 per cent at the national level. The gap in job growth has also been maintained over time.

Table 3

Average Annual Compound Growth Rates, 1990 to 2014
(per cent)

		25-year	10-year	5-year
	Vancouver	1.1	1.2	1.9
GDP growth per capita	British Columbia	1.1	1.1	1.6
	Canada	1.2	0.8	1.4
	Vancouver	1.9	1.5	1.5
Employment growth	British Columbia	1.7	1.2	0.8
	Canada	1.3	1.1	1.2

Sources: The Conference Board of Canada; Statistics Canada.

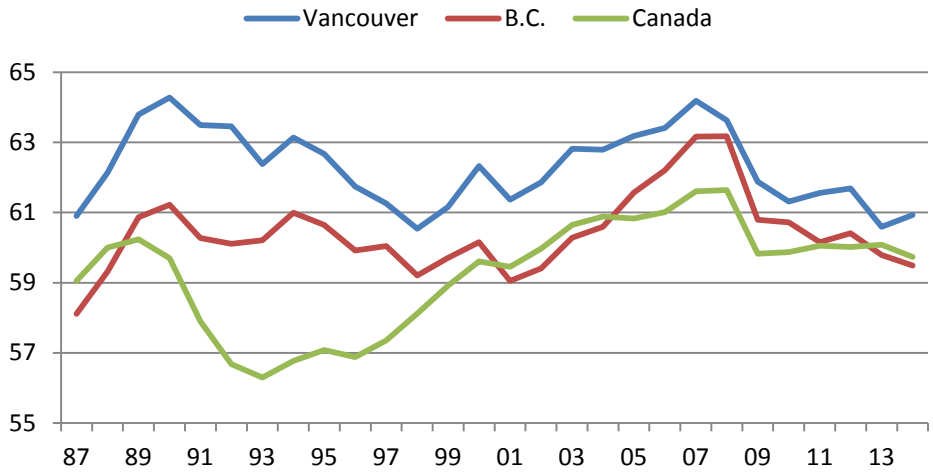
Similarly, the pace of job creation in Greater Vancouver has also been stronger than in B.C. as a whole. The provincial average between 1990 and 2014 came in at 1.7 per cent per year. Of the 770,000 jobs that were created in B.C. over this 25-year span, 478,000, or 62 per cent, were created in Greater Vancouver.

Although Greater Vancouver enjoyed strong job growth between 2010 and 2014, it is important to note that the employment rate (total employment divided by the population aged 15 years and over) still remains below its pre-recession peak. This trend has also been repeated in the province and the country as a whole. Specifically, Greater Vancouver's employment rate stood at 61 per cent in 2014, down from 64.2 per cent in 2007. (See Chart 1.) Part of the drop reflects rising retirement rates, as the oldest of the baby boomers started turning 65 in 2011. But it also suggests that the metro region's labour market still has not fully healed from the 2008–09 recession. In particular, disaggregating the employment rate numbers by age category shows that unemployment among young workers, those aged 15–24 years old, has remained stubbornly high. Accordingly, the lower employment rate has been caused by a mixture of structural and cyclical factors.

Chart 1

Employment Rates

(employment as a percentage share of population aged 15 years and over)



Sources: The Conference Board of Canada; Statistics Canada.

3.2 Professional Services Among Key Local Growth Drivers

The economic growth leader in Greater Vancouver over the past 25 years has been professional services and technical services. (See Table 4.) Output in this sector grew by a vigorous 4.6 per cent year from 1990 to 2014. This industry includes well-paying, high-quality occupations, including legal services, accounting, architectural services, engineering, computer system design, and research and development. Accordingly, its share of output has increased from 4.3 per cent in 1989 to 6.4 per cent in 2014.

The rise of professional, scientific, and technical services reflects the growing importance of the knowledge economy, a trend under way across the globe. Knowledge-based jobs are those that are directly based on the production, distribution, and use of knowledge and information. Employment in the knowledge-based economy is characterized by increasing demand for more highly skilled workers. Since the 1980s, new work has been getting much more cognitive in nature, a trend tied to the information and communications technology (ICT) revolution.

Over the last 10 years, the economic growth leader has been construction. Output advanced by an average of 4.2 per cent per year from 2005 to 2014 and an even stronger 4.6 per cent annually from 2009 to 2014. The region's hot housing market has been a major story driving residential construction activity. However, non-residential investment growth has been even more robust. Between 2005 and 2014, residential building permits increased by 2.8 per cent per year, while non-residential building permits grew by 6.9 per cent annually.

The finance, insurance, and real estate industry, Greater Vancouver's largest sector in GDP terms, has also seen strong growth in recent years. The growth in this sector reflects the increasing importance of the Vancouver region as an international financial centre, but also rising activity in the region's real

estate sector. (The finance, insurance, and real estate sector includes output generated from owner-occupied dwellings, an industry in which homeowners are considered landlords renting their houses to themselves.)

The transportation and warehousing sector, the region's fifth largest industry in 2014 and a key cluster, has seen steady growth just slightly below the overall average. From 2005 to 2014, economic growth averaged 2.4 per cent per year. But in the last five years more specifically, growth has picked up to average 3.6 per cent annually.

Finally, manufacturing posted the slowest growth from 1990 to 2014, eking out an average annual gain of 1.1 per cent. However, even with this slow growth, the sector remains the region's third largest in terms of GDP. The local manufacturing story is not unique, as the same trend has been under way nationwide. Several factors have hurt the industry, including rising foreign competition and a strong Canadian dollar over much of the 2000s.

Table 4

Average Annual Compound GDP Growth Rates, Greater Vancouver, 1990–2014
(per cent)

	25-year	10-year	5-year
All industries	3.0	2.7	3.3
Primary and utilities	2.2	3.0	6.7
Construction	2.7	4.2	4.6
Manufacturing	1.1	0.5	3.4
Wholesale trade	3.7	3.4	6.2
Retail trade	2.7	2.9	2.9
Transportation and warehousing	2.4	2.5	3.6
Information and cultural industries	3.9	1.2	0.7
Finance, insurance, and real estate	4.1	3.7	3.9
Professional, scientific, and technical services	4.6	2.9	2.6
Administrative and support, waste management services	2.3	2.4	1.3
Educational services	2.8	1.9	0.4
Health care and social assistance	2.3	2.1	2.7
Arts, entertainment, and recreation	2.8	1.5	0.7
Accommodation and food services	1.9	2.2	2.7
Other services (except public administration)	3.6	1.4	0.5
Public administration	2.3	2.2	2.4

Source: The Conference Board of Canada.

3.3 Services Sector Responsible for Vast Majority of Job Gains

Greater Vancouver's economy has created 478,000 new jobs since 1990, the vast majority of which have been created in the services sector. (See Chart 2.) In fact, nearly 421,000 of these jobs, accounting for 88 per cent of the total, have been services-producing jobs. At the same time, almost all of the job gains on the goods side have been in construction, with very few jobs created in resources, manufacturing, and utilities. Accordingly, services' share of total employment has been slowly increasing, rising from 80 per cent in 1989 to 83 per cent in 2014. In other words, four out of five jobs in the region are services sector jobs. (A more detailed breakdown of employment changes is shown in Appendix 4.) It should be noted, however, that a proportion of Greater Vancouver's services sector jobs are supported by activity that originates in the natural resources sector and other segments of the goods economy. The public sector has been Greater Vancouver's biggest job creator since 1990, accounting for 131,000 net new jobs. Of the three industries that make up the public sector—health care, education, and public administration—the vast majority of the job gains have been in health care and education. However, public sector job growth has been slower in recent years because of provincial government fiscal restraint.

At 136,600 employees in 2014, the health care and social assistance sector is Greater Vancouver's second largest employer, behind only retail trade. The metro region is home to many health centres and hospitals, including three of B.C.'s largest academic and teaching health science centres—Vancouver General Hospital, UBC Hospital, and GF Strong Rehabilitation Centre. With the population growing older,

demand for health care services will continue to expand in the years to come, and thus employment will surely climb further.

Chart 2

Most Jobs Created in Services Sector, 1990 to 2014
(employment gains, 000s)

Source: Statistics Canada.

The education sector, which employed 96,500 people in 2014, is another major local job creator. The importance of this industry should not come as a surprise since the region is home to a number of respected and international post-secondary institutions, most notably the University of British Columbia (UBC), Simon Fraser University (SFU), and the British Columbia Institute of Technology. (See Table 5.)

Although education is part of the public sector, as it is largely government funded, it affects the local business sector in a number of ways. First, post-secondary institutions channel highly skilled workers to both the public and private sectors, as many who study in Greater Vancouver choose to work in the region or elsewhere in B.C. after completing their degrees. Post-secondary institutions also generate services exports by attracting international students to the region. For example, 11,000 of UBC's students in 2014, or more than 21 per cent of its total student population, were from outside Canada. Because of its international appeal, UBC also generates export activity through visiting scholars, conferences, parent visits, and attractions such as the Museum of Anthropology and the Chan Centre for the Performing Arts.

The second largest job creation has come from other services, which include administrative and support services; information and culture; arts, entertainment, and recreation; and accommodation and food. Since 1990, these industries have been responsible for the creation of 82,700 jobs. Employment growth has been strong in all of these industries, except for information and culture. In fact, 1,800 jobs have

disappeared in information and culture since 2005. This softness is most likely the result of the massive restructuring that has been taking place in the publishing industry, sparked by the rise of the Internet.

Table 5

Greater Vancouver's Universities, Institutes, Colleges, and Academies

University, institute, college, or academy
1. University of British Columbia
2. Simon Fraser University
3. BC Institute of Technology
4. Capilano University
5. Douglas College
6. Justice Institute
7. Kwantlen Polytechnic University
8. Langara College
9. Emily Carr University of Art and Design
10. Vancouver Community College
11. Trinity Western University
12. Carey Theological College
13. Columbia College
14. Corpus Christi College
15. Eton College
16. Native Education College
17. New Image College
18. Nimbus School of Recording Arts
19. Saint Mark's College
20. Vancouver Institute of Media Arts
21. Vancouver Career College
22. Vancouver College of Art and Design
23. Vancouver Community College
24. Vancouver Film School
25. Educacentre College
26. Sprott Shaw College (Vancouver Campus)
27. Acsenda School of Management, Vancouver

The professional, scientific, and technical services sector, which includes many knowledge-based occupations, has been another major job creator, accounting for 62,000 net new jobs since 1990. It is currently Greater Vancouver's third largest employer, with 123,000 people working in this industry in 2014. Within professional services, the computer system design services subsector has seen the most job gains over the past five years, an indication that the high-tech sector is on the rise.

Although transportation and warehousing is fairly low down the list in terms of job creation since 1990, this sector has actually been Greater Vancouver's biggest job creator over the past five years. In fact, nearly 17,000 jobs have been created in this key industry since 2009, highlighting how important growing trade with Asia has been to the local economy. However, B.C.'s export volumes to Asia stagnated in 2014, and given lingering concerns about a slowdown in the Chinese economy, export

volumes to Asia in the near term are unlikely to exhibit the pace of growth recorded prior to 2014. That said, major private sector port investments continue to be made, suggesting that Canadian firms remain confident that the country's trade relationship with China and the wider Asian region will continue to grow strongly. Also, B.C.'s export volumes to the United States, the province's largest trading partner, jumped by over 15 per cent in 2014. Given the continued weakness of the Canadian dollar vis-à-vis the U.S. greenback and healthy U.S. economic activity, B.C.'s exports to the United States should further strengthen over the near term.

The construction sector—the lone goods sector to post significant job growth—topped 100,000 employees last year, up from 55,500 in 1989. In the last 10 years alone, 31,600 construction jobs have been created. As a result, the construction sector is now the region's third largest employer.

In contrast, things have also not been rosy in the region's manufacturing industry. In fact, a total of 18,800 manufacturing jobs have disappeared since 2005, although employment has increased by 4,400 in the last five years. To be fair, however, many cities across Canada and the developed world have also experienced big declines in manufacturing employment in recent years. In fact, this is part of a long-term trend of manufacturing moving out of high-cost, developed countries to low-cost, developing ones. At the same time, technological advances and automation are reducing the need for manufacturing labour.

4. Greater Vancouver's Traded Clusters

Chapter Summary

- A traded cluster is a group of firms and institutions that are located near one another and draw productive advantage from their mutual proximity and connections; they also serve markets beyond the region in which they are located.
- Five traded clusters emerge for Greater Vancouver: transportation, high-tech, tourism, finance and insurance, and information and culture.
- The metro region's status as Canada's gateway to Asia is a key reason why transportation is the region's largest traded cluster.
- The region is an attractive destination for tourists from across Canada and the world.
- Greater Vancouver has developed a niche in television and film production.
- High-tech is a growing industry in Greater Vancouver, with several start-ups being born out of research conducted at local post-secondary institutions.
- The finance and insurance industry cluster has been growing in international prominence.

Having described the evolution of Greater Vancouver's economy over the past 25 years, we now report the results of our cluster analysis. An industry cluster is a group of firms and institutions that are located near one another and that draw productive advantage from their mutual proximity and connections. A particular type of cluster—a traded cluster—is what interests us here. Traded clusters are groups of related industries that service the markets beyond the region in which they are located. Traded clusters are key drivers of regional economic growth. Examples of famous traded clusters include the high-tech industry in Silicon Valley and the TV and film industry in Hollywood. Cluster analysis can help diagnose a region's economic strengths and challenges and identify realistic ways to shape the region's economic future.[2]

We take an empirical approach to identifying clusters, using statistical tools to reveal industries that account for a disproportionately large share of economic output as well as those that have experienced relatively strong growth. In other words, we compute location quotients and conduct a shift-share analysis, both prerequisites for cluster identification. Both of these techniques and the empirical results are detailed in Appendix 3.

Using employment by industry data, our analysis found that 16 out of 59 industries were candidates to be traded clusters. From these 16, we removed 5 industries that largely serve the domestic market, leaving us with 11 industries.

We removed one additional industry from this list—clothing apparel production—because it has suffered significant declines in employment over the past 10 years. It sneaks onto the list as a candidate for a traded cluster only because employment declines in the rest of the country have been even more severe.

[2] Cortright, "Making Sense of Clusters."

That said, despite the major restructuring over the past decade, the clothing apparel industry has managed to carve out a niche in Greater Vancouver, particularly in athletic and performance apparel. Indeed, a number of large clothing companies that do business internationally are headquartered in Vancouver, including lululemon athletica, Mountain Equipment Co-op, and Arc'teryx Equipment. Although much of the manufacturing has been moved offshore, Vancouver-based clothing companies still add to the economy through head office employment, design, and other higher-value jobs.

Our final step was to group the 10 remaining industries into five broad traded clusters for Greater Vancouver:

1) transportation (air transportation, postal and courier services, other transportation and storage)
2) tourism (transit and sightseeing transportation, accommodation services)
3) information and cultural industries
4) high-tech (computer and electronic product manufacturing, computer system design services)
5) finance and insurance

The following analysis takes a closer look at these five traded clusters, starting with arguably the most important cluster in Greater Vancouver and the reason why the region is referred to as a global gateway: transportation.

4.1 Transportation

The transportation and warehousing sector plays a key role in Greater Vancouver's economy. The region's geographic location on the West Coast, combined with major truck and rail routes to a number of North American cities, makes it an excellent location for the movement of goods to and from the United States, the Pacific Rim, and several other countries around the world. Indeed, the Port of Vancouver is the closest large North American port to Asia. Similarly, Vancouver International Airport is the closest North American airport to Asia, and no other airport on the continent offers more direct flights to Asian cities.

Among the 16 broad industries tracked by The Conference Board of Canada, Greater Vancouver's transportation and warehousing sector has consistently had the highest location quotient (LQ)—that is, its share of employment in Greater Vancouver relative to its share in Canada as a whole is higher than that of the other broad industries. Local growth in this sector has also been stronger than its national counterpart, qualifying the transportation and warehousing sector as a cluster in the Vancouver region.

This result is confirmed using more detailed employment data. Among the five sub-industries that make up the transportation and warehousing industry, all but truck transportation appear on the list of clusters in Greater Vancouver. These four industries are air transportation, transit and sightseeing transportation, postal and courier services, and other transportation and storage. As shown in the list above, we group transit and sightseeing transportation with the tourism industry. That leaves three sub-industries to focus on in more detail in this section.

Air transportation and other transportation and storage, respectively, boast the highest location quotients among the 10 industries that make up Greater Vancouver's five key clusters. Air

transportation includes activity at Vancouver International Airport, while other transportation and storage includes activity at the Port of Vancouver—two of the region's biggest employers. Their high location quotients tell us that Greater Vancouver has proportionately more workers in these two industries than Canada as a whole.

The postal and courier services sector is the third industry we have grouped within the transportation cluster. The growth of e-commerce is helping fuel the postal and courier service business in Greater Vancouver. Indeed, just last year Canada Post opened a new $200-million processing plant at Vancouver International Airport designed to be the gateway for e-commerce shipments from Asia.

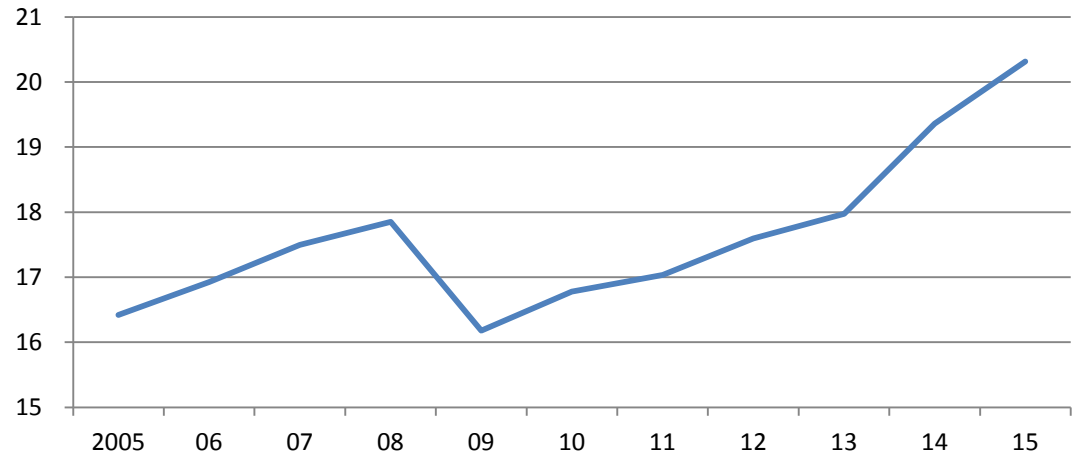
Given the significance of both the Vancouver International Airport and the Port of Vancouver, we now discuss in greater detail their impact on the regional economy, looking at their past performance as well as future plans.

4.1.1 Vancouver International Airport

Vancouver International Airport (YVR) is Canada's second busiest airport. Its vision is to be a world-class, sustainable gateway between Asia and the Americas. YVR experienced growth of over one million passengers in both 2014 and 2015, setting a new passenger record of over 20 million in 2015. In 2015, YVR also saw over 271,000 tonnes of cargo get on and off aircraft. (See charts 3 and 4.)

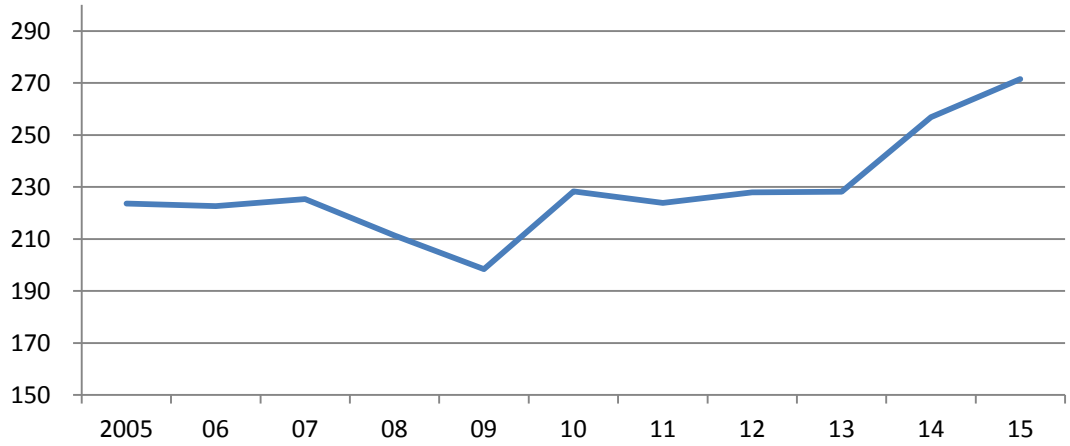
Chart 3

Total Enplaned and Deplaned Air Passengers at Vancouver International Airport, 2005–15 (millions)



Source: Vancouver Airport Authority.

Chart 4
Total Vancouver International Airport Cargo Volumes, 2005–15
(tonnes, 000s)



Source: Vancouver Airport Authority.

Over 400 businesses operate at YVR, employing over 23,000 people. Direct jobs at YVR generate over $1.1 billion in wages, for a GDP impact of $1.7 billion on the overall Canadian economy. YVR also generates over $700 million in tax revenues for federal, provincial, and local governments. A daily new international flight adds between 100 and 200 person-years of direct employment at the airport and a further 150 to 300 jobs in B.C.'s tourism sector—hotels, restaurants, shops, and tourist attractions.

YVR is served by 54 airlines linking Vancouver to over 121 non-stop destinations worldwide. Of particular note is the breadth of YVR's service to China, with four Mainland Chinese carriers, along with Air Canada, providing some 45 weekly flights to Mainland China—66 weekly flights to China if Hong Kong is included. In addition to service to Beijing and Shanghai, YVR has direct service to Guangzhou, Chengdu, Shenyang, and Kunming. The Vancouver Airport Authority also maintains a marketing office in Hong Kong that works directly with Asian airlines and the travel trade to support existing services, attract new services, and raise destination awareness of British Columbia. YVR has also seen expanded service to Europe, with the introduction of direct service to Paris in 2015 joining its variety of services to London, Frankfurt, Munich, Amsterdam, and other cities. YVR's direct service to Mexico City facilitates onward connections throughout Latin America. In 2016, YVR introduced YVRConnect, a competitive new fees and charge regime for airlines to help promote future growth in airline services.

The airport has a well-established logistics network serving B.C. exporters with top global freight forwarders (third-party logistic providers that arrange the shipment of cargo to international destinations) operating at the airport. UPS has a regional hub at YVR, and FedEx, DHL, and Purolator all have YVR operations to facilitate easy movement of air and ground cargo. Canada Post also operates a major sorting facility, which serves as its third hub for international mail, in addition to Toronto and Montréal. The plant is designed to handle a growing amount of e-commerce from Asia and already handles over 30,000 parcels daily from Asian markets.

The airport is in the midst of implementing a $1.8-billion, 10-year gateway strategy, announced in 2012, to build better connections for British Columbians. Already complete is a major upgrade to the domestic terminal for travellers flying within Canada. Well under way is a project that will shorten and improve connections for passengers transiting between international—including the United States—and domestic flights. This project also includes a new high-speed baggage system that will move bags swiftly throughout the terminal complex, ensuring that they too can make fast connections.

In 2015, YVR was voted the top airport in North America in the Skytrax Awards, which are based on an independent survey of 13 million passengers from 108 countries. YVR is the only airport to have ever received this honour for six consecutive years.

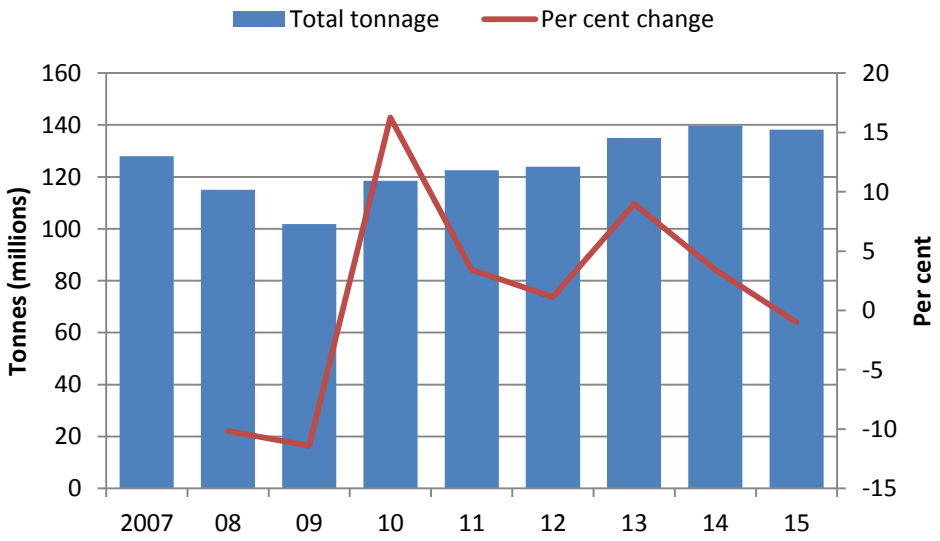
4.1.2 Port of Vancouver

The Port of Vancouver, formed in 2008 through amalgamation of the Vancouver Port Authority, Fraser River Port Authority, and the North Fraser Port Authority, is Canada's largest seaport, connecting Canada to more than 170 trading economies, mainly in the Asia-Pacific region, making the Port of Vancouver a key hub in the global supply chain and Asia-Pacific gateway.[3]

According to economic impact studies, the port handled about 19 per cent of Canada's total trade in 2011, amounting to a total value of imported and exported commodities to and from Canada of $894 billion.[4] It is also the third largest tonnage port in North America. The trade and port-related activities have a significant economic impact on the region, the province and Canada.

Chart 5

Total Inbound and Outbound Cargo Handled by the Port of Vancouver, 2007–15



Source: Port of Vancouver.

[3] Port Metro Vancouver, *About Us*.
[4] InterVISTAS Consulting, *2012 Port Metro Vancouver Economic Impact Study,* 9.

The amount of cargo moving through the port steadily increased from 2009 to 2014, before edging down by 1 per cent in 2015. (See Chart 5.) From 2010 to 2015, the total tonnage of imports and exports handled by the port grew at an average annual compound rate of 5.2 per cent. In 2014, the port moved a record amount of cargo totalling over 139 million tonnes.[5]

The majority of goods moving through the Port of Vancouver are natural resources outbound to Asia. China is the port's largest trading destination, followed by Japan, South Korea, the United States, and India. Metallurgical steel-making coal was the top good to move through the port in 2014, followed by forest products, grains, and chemicals, basic metals, and minerals.[6]

Because of the port's critical role in Canada's supply chain and as one of the largest ports in North America, it comes as no surprise that its operations have a significant impact on the economies of Greater Vancouver, B.C., and Canada. The port and directly related supply chain jobs employed 35,100 people in Metro Vancouver in 2012, generating almost $2.1 billion in wages for the region with an average annual salary of $67,000. Direct employment includes all jobs involved in moving goods to or through the Port of Vancouver or located on port land. These jobs can be at onsite or offsite businesses that relate directly to the Port of Vancouver trade and shipping.[7] The employment directly related to port activity expands beyond the Greater Vancouver area. In B.C. as a whole, direct employment was estimated at 38,200 jobs earning $2.3 billion in wages annually. Across Canada, 45,200 jobs were directly related to port activities, generating more than $2.8 billion in wages, for an average wage of $67,000. The vast majority (70 per cent) of the 10,100 offsite jobs are in the rail industry, providing transportation of cargo to and from Vancouver.[8]

The economic impact of the Port of Vancouver extends beyond employment related directly to ongoing operations, as other sectors of the economy depend on and are connected to the performance of the port. Indirect employment, which is employment in non-port industries that provide services to port industries, is estimated at 36,300 jobs across Canada, earning $2.1 billion in annual wages. Employment is also created because of spending by individuals employed directly and indirectly by port terminals, tenants, and related businesses. This induced employment is estimated at 17,400 jobs across Canada, generating annual wages of almost $1.2 billion.[9] When taking into account direct, indirect, and induced employment, port-related activity creates an estimated 98,800 jobs across the country that generate $6.1 billion in annual wages.

Ongoing operations at the Port of Vancouver contribute significantly to regional GDP. In 2012, the direct GDP impact in Metro Vancouver was estimated at $3 billion,[10] which accounted for about 2.7 per cent of Metro Vancouver's total GDP.[11] The port's direct impact in B.C. was estimated to be 1.6 per cent of the

[5] Ibid., 1.
[6] Port Metro Vancouver, *About Us*.
[7] InterVISTAS Consulting, *2012 Port Metro Vancouver Economic Impact Study,* 4, 50.
[8] Ibid., 15–20.
[9] Ibid, 24–26.
[10] Ibid., vii.
[11] We use Conference Board of Canada GDP data for the Vancouver CMA to calculate the relative impact of Port of Vancouver operations on the region's economy.

province's GDP or $3.5 billion. In addition, it accounted for half of all of B.C.'s GDP generated in the transportation and warehousing industry. Canada-wide, the Port of Vancouver's direct GDP impact was $4.5 billion. Its overall GDP impact (direct, indirect, and induced) equalled $6.7 billion in B.C. and $9.7 billion in Canada as a whole.

Although economic growth in China has been easing, the Asia-Pacific region remains one of the biggest growth engines of the global economy. This, along with the recently signed Trans-Pacific Partnership (TPP) trade agreement, suggests that activity through the port will continue to rise in the years to come.

According to the International Monetary Fund's economic outlook, the global economy is expected to strengthen gradually over the next five years.[12] This growth is expected to result in total trade through the Port of Vancouver being nearly 40 per cent above its 2011 level by 2018.[13]

The port is poised to meet this rising demand through multiple expansion plans. Terminal operators are also investing in the future of the gateway, with many efficiencies, improvements, and expansions under way. These projects mean that the port's economic impact flows not only through the transportation and warehousing sectors but also through construction and subsequent increased trade throughput.

The Port of Vancouver's expansion plans include an expansion to the Centerm container terminal, needed to help address an anticipated shortfall in future container capacity. Plans also include the Roberts Bank Terminal 2 Project—a proposed new three-berth container terminal at Roberts Bank in Delta, B.C., that would provide 2.4 million twenty-foot-equivalent units (TEUs) of container capacity. Third, as part of the port's container capacity improvement program, upgrades to existing infrastructure will increase Deltaport's container capacity by 600,000 TEUs, to a total of 2.4 million TEUs. Fourth, a new container examination facility on Tsawwassen First Nation industrial lands is being built to ensure the efficient movement of container traffic at Roberts Bank and to meet Canada Border Services Agency (CBSA) inspection targets. Finally, the port authority is also considering or has granted several permits for tenant-led projects to boost capacity.

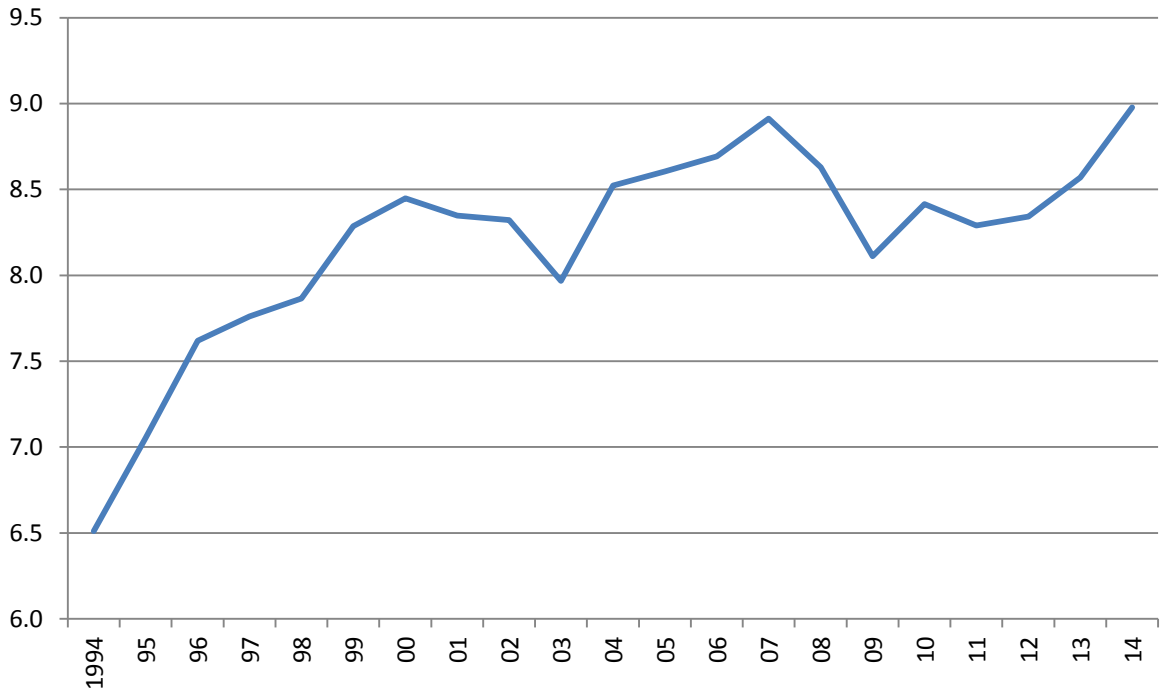
[12] Port Metro Vancouver, *Financial Report 2014*.
[13] Port Metro Vancouver, *Land Use Plan*, http://www.portmetrovancouver.com/wp-content/uploads/2015/06/port-metro-vancouver-land-use-plan-english.pdf, 29

4.2 Tourism

The tourism industry has also been identified as a major cluster in the Vancouver region. The impact of the tourism industry as a cluster is far-reaching. For data purposes, tourism is composed of a number of major industries, including accommodation services, food and beverage, transportation (transit and sightseeing as well as air, road, and maritime transportation), sightseeing, attractions, entertainment, and retail, along with the suppliers to these industries.

Greater Vancouver is a popular tourist destination worldwide and one of the most visited cities in Canada. More than 9 million made overnight visits to Metro Vancouver in 2015. (See Chart 6.) The demand for tourist goods and services, including accommodation, food, travel, and activities, has a significant impact on Metro Vancouver's economy, generating thousands of jobs and billions of dollars in revenue each year.

Chart 6
Total Overnight Visitors to Metro Vancouver, 1994–14
(millions)



Source: Tourism Vancouver.

4.2.1 Overnight Visitors Have Substantial Economic Impact

In 2013, overnight visitors spent $3.5 billion in Metro Vancouver, generating direct, indirect, and induced industry output of $6.1 billion. Industry output is defined as the sum total of all economic activity that has taken place as a result of visitor spending, including spin-off activity as those dollars move through the economy; it includes visitor spending. Tourism spending supported employment of

66,558 full-time equivalent jobs (including direct, indirect, and induced employment).[14] (See Table 6.) But these numbers were down from 2008. In fact, overnight visitor spending fell for nearly four straight years between 2009 and 2012, before recovering to 2009 levels in 2013. The reasons behind this decline include the global financial crisis, near-parity Canada–U.S. exchange rates, and tougher U.S. rules stemming from the Western Hemisphere Travel Initiative requiring a passport to cross the Canada–U.S. border.

Table 6
Economic Impact of Overnight Visitors to Metro Vancouver

	2008	2009	2010	2011	2012	2013	Average
Total spending (billions)	$3.87	$3.52	$3.57	$3.51	$3.36	$3.52	$3.56
per cent change		*-9.0*	*1.4*	*-1.7*	*-4.3*	*4.8*	*-1.8*
Industry output (billions)	$7.57	$6.17	$6.23	$5.97	$5.82	$6.10	$6.31
per cent change		*-18.5*	*1.0*	*-4.2*	*-2.5*	*4.8*	*-3.9*
Provincial and federal taxes related to spending (billions)	$1.24	$1.46	$1.52	$1.52	$1.54	$1.56	$1.47
per cent change		*17.7*	*4.1*	*0.0*	*1.3*	*1.3*	*4.9*
Employment (# of jobs)	87,524	76,102	75,887	68,462	65,775	66,558	73,385
per cent change		*-13.1*	*-0.3*	*-9.8*	*-3.9*	*1.2*	*-5.2*
Wages and salaries created by initial visitor spending (billions)	$2.87	$2.09	$2.13	$2.04	$2.16	$2.26	$2.26
per cent change		*-27.2*	*1.9*	*-4.2*	*5.9*	*4.6*	*-3.8*

Source: Tourism Vancouver.

But things are looking up. After a record-setting 8.9 million overnight visitors in 2014, it is estimated that over 9 million overnight visitors came to Metro Vancouver in 2015—a second consecutive year of record-breaking visitor volumes. Last year's numbers were boosted by the FIFA Women's World Cup, as Vancouver shared hosting duties with other Canadian cities; the gold medal game was also held in Vancouver. Vancouver also benefited from strong convention, cruise, and festival seasons that attracted additional visitors. More generally, the sector is benefitting from increased consumer confidence in the U.S. and a Canadian exchange rate that is favourable to international travellers. Improved air access has also facilitated the increase in visits.

Greater Vancouver is an attractive destination for tourists from across Canada and the world. The majority of overnight visitors who stayed in Metro Vancouver in 2014 (62 per cent) were from Canada. About half of these visitors were from B.C. This was followed by American tourists (22 per cent), visitors from Asia and the Pacific (10 per cent), and European visitors (4.5 per cent).

China has emerged as one of the major sources of tourists to Metro Vancouver. In fact, the number of tourists from China has been surging ever since Canada was granted Approved Destination Status (ADS)

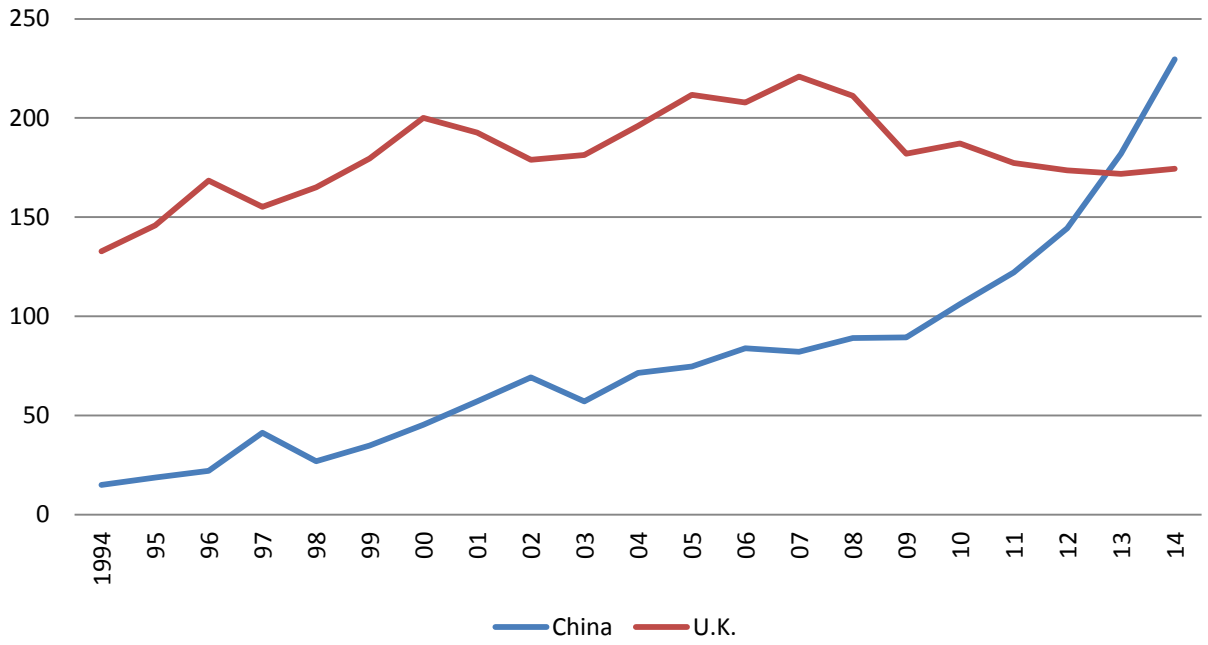
[14] Tourism Vancouver, *Tourism Data for Metro Vancouver*, 9.

at the end of 2009. China's ADS policy allows its citizens to take pleasure trips abroad on group package tours to countries that have negotiated an ADS agreement. Overnight visits from China to Vancouver have since increased substantially, growing at an average annual rate of 21 per cent between 2010 and 2014. In 2013, China surpassed the United Kingdom as the second largest source of tourists for Greater Vancouver. (See Chart 7.) The Chinese market has grown rapidly over the last few years, highlighting its importance as a target market for the tourism industry. However, this growth may slow as China's economy slows.

Chart 7

Annual Overnight Visitor Volume to Metro Vancouver from China and the United Kingdom, 1994–2014

(000s)



Source: Tourism Vancouver.

4.2.2 Greater Vancouver Is Canada's Top Cruise Port

Not only is Greater Vancouver a popular destination for overnight visitors, it is also the largest cruise port in Canada. More than 805,000 cruise passengers landed in Vancouver in 2015, one-third of all cruise port traffic in the country. They spent an estimated $120 million on lodging, tours, transportation, food, beverages, and other retail goods while in the region. In addition, cruise passengers spent nearly $134 million on airfare to and from the metro region to embark on or debark from their cruises. In B.C. as a whole, the cruise industry accounted for $790 million in direct spending, created $259 million in wage income, and employed more than 6,800 in 2012. In total, when we include economic activity indirectly created by cruises in related industries such as transportation and accommodation, the B.C.

cruise industry generated slightly less than $1.6 billion in economic output, $532 million in wage income, and more than 12,000 jobs in 2012.[15]

While cruises do generate a significant amount of revenue for Greater Vancouver and B.C., there is room for improvement. Since 2003, Metro Vancouver has seen a decline in cruise passenger volume due to increased competition with Seattle over the Alaska cruise market. Specifically, cruise passenger volume dropped from 953,000 in 2003 to 579,000 in 2010, a decrease of nearly 40 per cent.[16] However, the cruise market has been improving in recent years, with over 812,000 passengers embarking on cruises from Vancouver in 2013 and 2014 and over 805,000 in 2015.[17] These numbers are expected to improve further in 2016, when it is predicted that 829,000 passengers will arrive in Vancouver, the highest visitor volume since 898,000 passengers arrived in 2009.[18]

4.2.3 Conventions Add to Tourism Numbers

Tourism activity is also generated by people who travel to Vancouver to attend conventions. In fact, between 2009 and 2013, conventions attracted an annual average of over $324 million in overnight visitor spending in Metro Vancouver and accounted for about 9 per cent of total overnight visitor spending. In 2013 alone, conventions generated total industry output (that is, all economic activity that has taken place as a result of convention visitor spending, including spin-off activity as those dollars move through the economy; it includes convention visitor spending) of nearly $425 million and supported nearly 5,000 jobs (including direct, indirect, and induced employment). (See Table 7.)

Table 7
Economic Impact of Conventions in Metro Vancouver, 2009–13

	2009	2010	2011	2012	2013	Average
Total spending ($ millions)	298.8	435.4	376.1	270.5	240.3	324.2
per cent change		*45.7*	*-13.6*	*-28.1*	*-11.2*	*-1.8*
Industry output ($ millions)	518.3	755.8	647.1	478.2	424.8	564.8
per cent change		*45.8*	*-14.4*	*-26.1*	*-11.2*	*-1.5*
Taxes related to initial convention visitor spending (all levels of government, $ billions)	114.6	198.3	165.5	133.4	114.3	145.2
per cent change		*73.0*	*-16.5*	*-19.4*	*-14.3*	*5.7*
Employment (jobs)	6,757	9,636	7,650	5,779	4,958	6,956
per cent change		*42.6*	*-20.6*	*-24.5*	*-14.2*	*-4.2*

Source: Tourism Vancouver.

4.2.4 The Whistler Effect

One of the big benefits of vacationing in Vancouver is its proximity to the Resort Municipality of Whistler, one of B.C.'s and indeed Canada's most popular tourist destinations as well as *Ski Magazine's*

[15] Business Research and Economic Advisors, *The Economic Contribution of the International Cruise Industry*, 4, 53–55, 61.
[16] Port Metro Vancouver, *About Us*.
[17] Ibid.
[18] Korstrom, "Vancouver's 2016 Cruise Season Expected to Be Busiest Since 2009."

first-ranked overall resort for 2016.[19] In 2014, Whistler and the surrounding area hosted approximately 2.7 million unique visitors, who spent $1.2 billion—about 85 to 90 per cent of total consumer spending in Whistler of $1.44 billion. Of this amount, it is estimated that nearly $880 million was spent by international visitors, something that has a significant impact on the balance of trade for B.C.'s economy (international tourists spending money in B.C. is categorized as an export). Overall tourism export revenue in Whistler accounted for about 25 per cent of all tourism export revenue in the province.[20]

Given Whistler's status as a premier ski resort, it is not surprising that spending is higher in the winter than in the summer, although the total number of visits is higher in the summer. About two-thirds of total visitor spending occurs in the winter, with this disparity particularly large for accommodation spending. Winter visitors spend $208 million on accommodation annually, almost twice as much as summer visitors, who spend about $111 million.[21] In the winter, people are likely to plan longer overnight and weekend trips ski and snowboard. In the summer, day trips to Whistler and the surrounding region are somewhat more common. In the winter, 63 per cent purchased overnight accommodation, while only 60 per cent did so in the summer.[22]

The overall effect of visitors on Whistler's economy cannot be overstated. Indeed, tourism activity generates more than half of Whistler's overall GDP ($800 million out of a total $1.5 billion). Whistler's draw also boosts tourism in Vancouver, as travellers to Whistler usually spend time in Vancouver—hence, the "Whistler effect" on Vancouver tourism.

[19] Tourism Whistler, *About Whistler.*
[20] Economic Partnership Initiative, *Resort Municipality of Whistler research 2016*.
[21] Ibid., 15.
[22] Ibid., 13.

4.3 Information and Cultural Industries

The information and cultural sector is the third traded industry cluster in our list of five. It had a location quotient of 1.35 in 2014, meaning this sector's share of total employment in Greater Vancouver was 35 per cent higher than that of the national average. In 2014, 34,500 people worked in this industry in the Vancouver region.

Information and cultural industries includes the following subsectors: publishing industries (newspapers, magazines, and books), motion picture and sound recording industries, radio and television broadcasting, telecommunications, and data processing services. These latter two industries are also considered to be part of the high-tech sector, which we will save for the next section. For this section, we focus on the television, sound recording, and motion picture industries, especially including visual effects (VFX) and animation. This is an important and growing industry in Greater Vancouver and is the reason why the region shares the nickname "Hollywood North" with Toronto.

Greater Vancouver is one of the major production centres for North American television and film—currently fourth in terms of total production spending behind Los Angeles, New York, and Toronto. Television and film companies are drawn to Vancouver because of its scenery, its proximity to Los Angeles, and its competitive tax incentives, which are essentially government subsidies that lower production costs. In fact, the industry is becoming increasingly reliant on the help of the federal and provincial governments, as several other provinces, including Quebec and Ontario, and states like Florida and Texas have also been offering their own tax credits or subsidies in recent years, increasing competition in the industry. The proliferation of tax credits and subsidies raises questions about the sustainability of such policies because they tend to create a race to the bottom, where ever-increasing incentives are required to distinguish one jurisdiction from another.

The weaker Canadian dollar as of late is also helping to attract international businesses, since the lower dollar reduces production costs in foreign currencies. Several big film companies have studios in Vancouver, including North Shore Studios (formerly Lionsgate Studios), Ironwood Studios, Mammoth, ABC, and Sony's Imageworks subsidiary. According to the Vancouver Economic Commission, there are usually 30 or more television shows and 30 or more movies being filmed in any given year.[23]

Also, according to the Vancouver Economic Commission, some 80 per cent of all direct and indirect jobs created by the film and television industry in British Columbia are in Metro Vancouver. Statistics from the Canadian Media Production Association shows total direct and indirect full-time equivalent employment for the province totalled 34,000 in 2013–14, with about 27,000 of these jobs in Vancouver. (See Chart 8.)

[23] Vancouver Economic Commission, *Film and Television Production*.

Chart 8

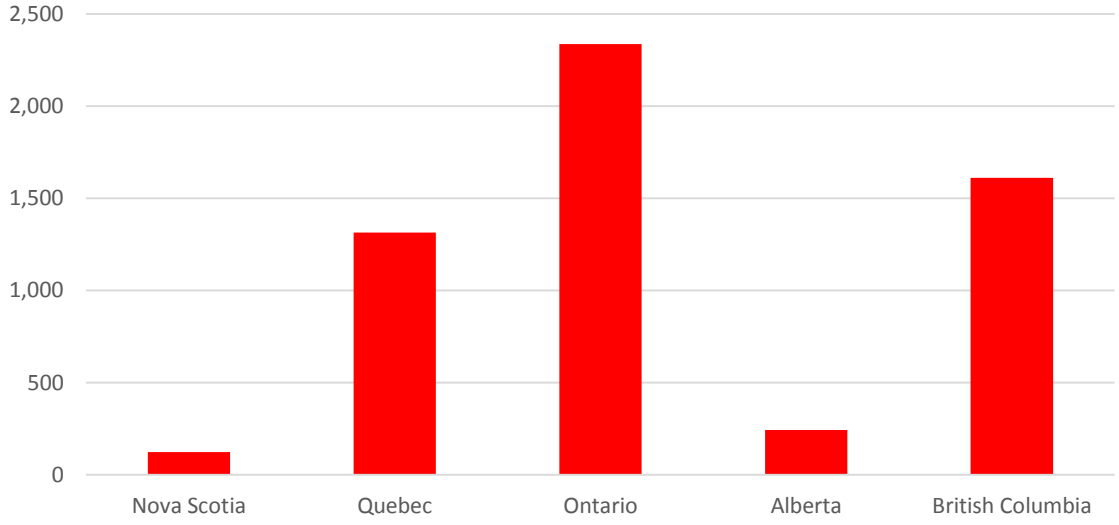
Total Jobs in Television Production in British Columbia
($ millions)

Source: Canadian Media Production Association.

British Columbia accounted for $1.6 billion of total Canadian film and television production spending in 2013–14, 27 per cent of the total. This made B.C. the second most popular location for production, behind only Ontario. (See Chart 9).

Chart 9

Film and Television Production Spending, Top Five Provinces, 2013–14
($ millions)



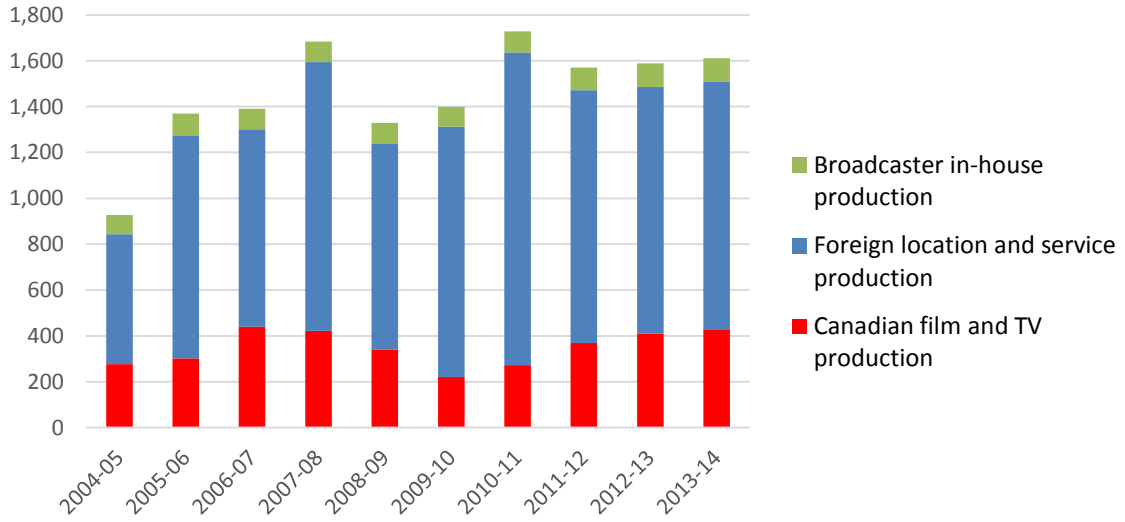
Source: Canadian Media Production Association.

Foreign location and service production—that is, feature films and television programs filmed in Canada by foreign producers of Canadian service producers—has been responsible for the lion's share of total film and television production spending in British Columbia. It accounted for nearly 70 per cent of total spending between 2004–05 and 2013–14. The remaining 30 per cent of total spending was by Canadian film and television production (all film and television production made by Canadian production companies) and broadcaster in-house production (television programs made internally by private conventional television broadcasters). (See Chart 10.) In comparison, foreign location and service production accounted for less than 16 per cent of total spending in Ontario.

Foreign location and services production spending in British Columbia has averaged about $1.1 billion per year since peaking at $1.4 billion in 2010–11. This lower level of spending is due in part to tougher competition from other provinces and states that have introduced or increased film tax credits. Until recently, the strong Canadian dollar has also hurt.

Chart 10

Film and Television Production Spending, British Columbia ($ millions)



Source: Canadian Media Production Association.

Even though production spending has been fairly flat, there is one area that has continued to see strong growth in recent years: computer animation and visual effects production. New companies have joined existing companies to work in the Vancouver area. Indeed, international films have come to Vancouver over the last few years just for their visual effects include *Divergent*, *The Great Gatsby*, and *The Amazing Spiderman 2*.

Fortunately, Greater Vancouver's television and film industry appears to be on the upswing. Recent big-budget films produced in Vancouver and British Columbia include *Fifty Shades of Grey*, *Godzilla*, *Tomorrowland*, *Star Trek 3*, and *Tron 3*. Major television shows filmed in the area included *Arrow* and

Once Upon a Time.[24] Meanwhile, new television shows being shot locally include *Supernatural* and *Fear the Walking Dead*.[25] Factors behind this renewed optimism include the extension of some film tax credits that were supposed to end in 2014: the digital animation or visual effects (DAVE) tax credits, introduced in 2010, have been extended to 2018. In addition, even though some movie production has been moving to other provinces and states that have introduced their own film tax credits, companies are now coming back to Vancouver because of the expertise of the local workforce. Finally, the lower Canadian dollar is making it more profitable for international companies to do business in Canada.

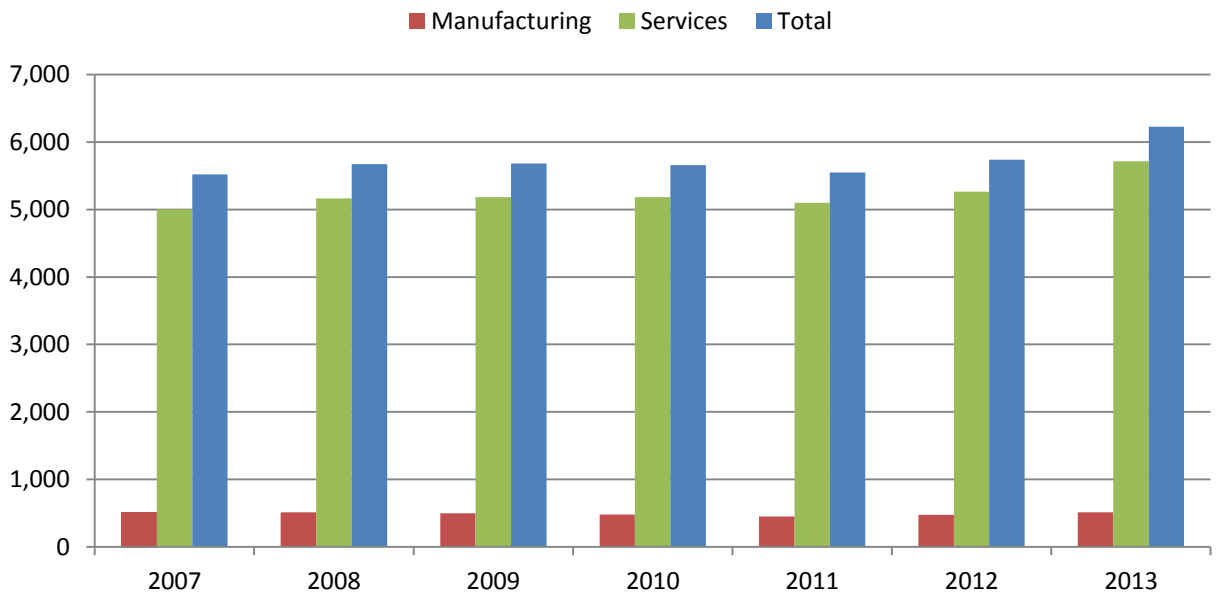
[24] Bailey, "Film or Famine."
[25] Korstrom, "Busiest Summer Ever for B.C.'s Film Sector."

4.4 High-Tech Industry

The fourth major cluster in Greater Vancouver is the high-tech sector, which has been playing a growing role in the region's economy. In particular, two high-tech-related sectors have been identified as clusters: computer and electronic manufacturing and computer system design services. Computer and electronic product manufacturing includes establishments primarily engaged in the production of goods such as computers, communications equipment, and audio and video equipment. The computer systems design services industry includes establishments primarily engaged in services such as the following: designing computer systems that integrate hardware, software, and communication technologies; on-site management and operation of clients' computer and data processing facilities; and providing advice in the field of information technologies.

Chart 11
High-Tech Businesses in Greater Vancouver

(number of businesses)



Source: BC Stats.

Greater Vancouver's overall information and communications technology (ICT) sector is a rapidly expanding part of the region's economy. The number of high-tech businesses grew by 1.9 per cent per year from 2009 to 2013. (See Chart 11.) There were a total of 6,226 high-tech businesses in Greater Vancouver in 2013.

Employment in the high-tech sector has also been strong, rising from 28,000 in 1990 to 58,200 in 2014. As a result, the ICT sector's share of total employment in Greater Vancouver has been climbing. In 2014, 4.5 per cent of people employed in the Vancouver region worked in the ICT sector, up from 3.7 per cent in 1987.

In the past five years alone, employment has risen by 4 per cent per year. (See Table 8.) More jobs have been created in ICT manufacturing than in ICT services since 2010, even though ICT manufacturing is a much smaller industry. In fact, 4,500 jobs have been created in ICT manufacturing since 2010, while 3,300 have been created in ICT services.

Table 8
Total ICT Employment in Greater Vancouver (000s)

	2009	2010	2011	2012	2013	2014
Total computers and telecommunications	**50.6**	**47.8**	**49.8**	**57.4**	**56.4**	**58.2**
Total manufacturing	**1.8**	**4.5**	**4.4**	**5.1**	**4.9**	**6.3**
Commercial and services industry machinery manufacturing	0.0	0.0	0.4	0.0	0.0	0.4
Computer and peripheral equipment manufacturing	0.0	1.0	1.0	0.5	0.6	1.4
Communications equipment manufacturing	0.4	0.9	0.0	1.1	1.0	1.2
Semiconductor and other electronic component manufacturing	0.0	1.0	1.1	2.4	1.5	2.0
Manufacturing and reproducing magnetic and optical media	0.0	0.0	0.5	0.0	0.0	0.0
Total services	**48.6**	**43.3**	**45.4**	**52.4**	**51.5**	**51.9**
Computer & communication equipment and supplies wholesaling distribution	4.7	3.4	2.9	3.4	2.5	1.3
Software publishers	2.4	1.2	3.1	4.0	3.6	2.9
Wired telecommunications carriers	13.8	11.6	11.8	11.9	12.0	13.3
Wireless telecommunications carriers (except satellite)	0.0	0.0	0.0	0.5	0.0	0.0
Other telecommunications	0.0	0.5	0.0	0.0	0.0	0.0
Data processing, hosting, and related services	1.2	0.0	0.0	0.0	1.3	0.0
Computer systems design and related services	24.0	22.9	25.3	29.2	30.1	31.1
Electronic and precision equipment repair and maintenance	0.0	0.4	0.5	2.0	0.0	0.8

Source: Statistics Canada.

Greater Vancouver is home to a number of both established and new ICT companies, including some of the industry's major global players. TELUS Corp., Canada's second-largest telecommunications company, employs 7,000 people in Metro Vancouver and almost 43,000 across the country.[26] Since 2007, Microsoft's Vancouver Development Center has employed a multinational group of software developers who work on more than 50 per cent of all products and services offered by Microsoft.[27] In addition, Amazon plans to expand its Vancouver office and move 1,000 employees into the new TELUS Garden in downtown Vancouver.[28] MacDonald, Dettwiler and Associates Ltd. (MDA), founded in Richmond, B.C., in 1969, employs 4,800 people in the U.S., Canada, and internationally in the design of communications, surveillance, and intelligence technology.

In addition to hosting these long-established ICT companies, Greater Vancouver has generated a number of new and growing companies. These include Hootsuite, designers of social media management software, Global Relay, the world leader in cloud-based messaging, archiving, and search

[26] Littlemore, "Vancouver's High-Tech Makeover."
[27] Microsoft, *Vancouver Development Center*.
[28] Littlemore, "Vancouver's High-Tech Makeover."

technology for the financial sector,[29] and Avigilon, a designer and manufacturer of video surveillance software and equipment, to name only a few. Vancouver is also home to 1QBit, a Vancouver company that develops quantum computing software. Established in 2013, 1QBit was named by the World Economic Forum as one of the world's top 49 most promising tech pioneers for 2015.[30]

What accounts for this strong growth? First, existing high-tech companies are attracted to Greater Vancouver by the highly skilled workers who call the region home, many of whom are graduates of the many post-secondary institutions that have campuses in the region, such as the University of British Columbia (UBC), Simon Fraser University, and the British Columbia Institute of Technology (BCIT).

Second, high-tech firms are attracted by the rising availability of downtown commercial space, thanks to a recent surge in construction—millions of square feet are being added over 2015 and 2016. And while costs for this downtown space are among the highest in Canada, they are still well below those in places like San Francisco. Indeed, our benchmarking analysis shows that office rents were US$114 per square foot in San Francisco in the first quarter of 2015, compared with just US$54.50 per square foot in downtown Vancouver.

Finally, Greater Vancouver's high-tech sector is helped by its proximity to both Seattle, home of Amazon and Microsoft, and Silicon Valley.

[29] Global Relay, *About Us*.
[30] Shaw, "Vancouver Company Named Among World's Most Promising Tech Pioneers."

4.5 Finance and Insurance

Our final traded cluster is finance and insurance, two components of the broader finance, insurance, and real estate sector, Greater Vancouver's largest industry. In 2014, 93,000 people worked in the overall finance, insurance, and real estate industry. Of this amount, 41,900 people worked in finance, the biggest subsector, while 20,400 people worked in the insurance subsector.

Table 9
Global Financial Centres Index, Top 20 Cities, 2014

Centre	Rank	Rating
New York	1	778
London	2	777
Hong Kong	3	756
Singapore	4	746
San Francisco	5	719
Tokyo	6	718
Zurich	7	717
Seoul	8	715
Boston	9	705
Washington, D.C.	10	704
Toronto	11	703
Chicago	12	702
Geneva	13	701
Greater Vancouver	**14**	**700**
Luxembourg	15	697
Frankfurt	16	695
Dubai	17	694
Montréal	18	693
Abu Dhabi	19	692
Shanghai	20	690

Source: Z/Yen Group.

Vancouver's finance sector has been rising in prominence internationally. London think tank Z/Yen calculates a global financial centres index,[31] a measure of the competitiveness of a region's finance sector, that takes into account factors such as the business environment, human capital, and financial sector development. The top 20 centres in 2014 are shown in Table 9. Vancouver ranked 14th overall, finishing only three spots below Toronto and four spots ahead of Montréal, the other two Canadian cities in the rankings. Vancouver has been flying up the rankings. In fact, when the index was first calculated in 2007, Vancouver finished in 27th place.

[31] Global Financial Centres Index is based on over 29,000 financial centre assessments from an online questionnaire together with over 100 indexes from organizations such as the World Bank, the Organisation for Economic Co-operation and Development (OECD), and the Economist Intelligence Unit. From Wikipedia, *Global Financial Centres Index*.

Vancouver hosts regional offices for all five of Canada's major banks and the headquarters of the country's biggest independent investment bank, Canaccord. Many credit unions are based in Vancouver as well, including Vancouver City Savings Credit Union (Vancity), Canada's largest community credit union. A growing number of international banks also have operations in the region. For instance, Vancouver hosts the Canadian headquarters of HSBC, one of the largest banking groups in the world, as well as other international banks, such as the Agriculture Bank of China, the State Bank of India, and Mizuho Financial Group. According to AdvantageBC International Business Centre, the region is also among the top-10 wealth management centres in the world. For example, the Industrial and Commercial Bank of China opened its wealth management headquarters in the city in 2013.[32]

A 2014 industry update report from the Chartered Professional Accountants of British Columbia cited several reasons for Vancouver's rise as a global competitor in the financial industry.[33] The region's solid economy is one draw, as is the provincial government's strong financial position—the province maintains a triple-A rating. Second, Vancouver's investment in its rail, roads, airport, and port capacity has improved the region's competitiveness to move goods. International banks have also been attracted by Vancouver's competitive tax rates. In the past eight years, there have been over 100 tax cuts in the province of British Columbia, leaving it with some of the lowest rates in North America. In 2014, KPMG's total tax index, which appears as an indicator in our scorecard's Economy category, found that Vancouver's corporate taxes were 45.5 per cent lower than those of the United States. British Columbia also expanded its International Business Activity program in 2014 to subsidiaries of foreign banks, giving them authority to carry on business in Canada and giving specialists they employ a refund of the B.C. income tax paid on income related to the company's international business carried on in B.C.,[34] providing further incentive for international businesses to locate in Vancouver. Finally, the presence of an educated, multilingual workforce with global connections is another factor behind the growth of the region's finance sector.[35]

The future for Greater Vancouver's finance sector looks bright. As the region's commodity trade with the Asia-Pacific region grows in the coming years, Vancouver's finance sector will become even more important on the world stage. In particular, rising trade with China opens up the possibility that Vancouver could become a direct trade settlement hub using Chinese currency, the renminbi (RMB). (Toronto became North America's first renminbi hub 2015.) AdvantageBC recently commissioned a report outlining the benefits of such a system, including lower transaction costs on currency exchanges, increased convenience and timeliness of currency exchange, and the possibility of additional financial services.[36] Thus, it would ultimately have the effect of increasing trade even further between the two countries.

[32] AdvantageBC, *Financial Centre*.
[33] Chartered Professional Accountants of British Columbia, *Industry Update: Focusing on Members in Industry*.
[34] Government of British Columbia, *International Business Activity.*
[35] B.C. Ministry of Finance, *International Financial Sector Report Released.*
[36] MMK Consulting, *Potential Benefits of a Canadian-Based RMB Settlement Centre*.

5. Greater Vancouver Scorecard: Schoolhouse Scoring for Benchmarking

Chapter Summary

- Report card rankings of A–B–C–D are used to assess each metro area's performance in each of the two categories (Economy and Social) and on each of the 32 indicators.
- Obvious outliers were removed when computing the rankings for each indicator and for each category.
- The overall ranking is calculated as an average of the Economy and Social category scores.

The Greater Vancouver scorecard is based on 32 indicators grouped into two categories: Economy and Social. The Economy category measures local economic performance and business environment, while the Social category captures some of the social and environmental complexities that distinguish a great metro region from a mediocre one.

This study uses a report card–style ranking of A–B–C–D to assess the performance of metropolitan areas for each indicator. We assigned a letter grade using the following method: for each indicator, we calculated the difference between the top and bottom performer and divided this figure by four. A metropolitan area received a scorecard ranking of "A" on a given indicator if its score was in the top quartile, a "B" if its score was in the second quartile, a "C" if its score was in the third quartile, and a "D if its score was in the bottom quartile. A metropolitan area was assigned an "n.a." if the data were unavailable for that indicator.

Each indicator was also carefully screened for outliers. In a handful of cases, one metro region scored so well that it left nearly every other metro area with a "C" or "D" grade. Conversely, some scores were so poor that they left nearly every other metro area with an "A" or "B" grade. In these rare cases, influential observations were eliminated using the following method: 1) the outlier was attributed a letter grade (an "A" or a "D" depending on whether it negatively or positively influenced the grades); 2) the top and bottom performers were identified among the remaining metro regions, and the scoring method described above was applied.

The overall category rankings are formulated as an average of the individual indicators. No attempt was made to give explicit weights to indicators according to importance: we are implicitly giving equal weight to each indicator. We assigned a grade level to the overall category performance using the same method described above.

The overall ranking is calculated as an average of the Economy and Social category scores.

The Conference Board of Canada is well known for its benchmarking reports, having completed similar exercises evaluating Toronto and Montréal. It is important to note that the rankings achieved in each report depend on the criteria for selecting indicators and other comparator cities, so results may vary between them.

For a more detailed description of the benchmarking methodology, please see Appendix 2.

6. The Big Picture: Singapore Ranks First

Chapter Summary

- Singapore is the top-performing metro area, drawing much of its strength from a first-place ranking in the Economy category.
- Copenhagen, Hong Kong, Calgary, and Seattle round out the top five.
- Greater Vancouver ranks in ninth place.
- Shanghai, Los Angeles, and Miami rank at the bottom, with all earning an overall "D" grade in one of the two categories.

Table 10
Overall Ranking

Ranking	*Metropolitan area*
1.	Singapore
2.	Copenhagen
3.	Hong Kong
4.	Calgary*
5.	Seattle
6.	Barcelona
7.	Sydney
8.	San Francisco
9.	**Greater Vancouver**
10.	Toronto
11.	Portland
12.	Seoul
13.	Rotterdam
14.	Montréal
15.	Houston*
16.	Halifax
17.	Manchester
18.	Shanghai
19.	Los Angeles
20.	Miami

*Results for Calgary and Houston do not take into account the impact of steeply lower oil and gas prices.

Singapore, the island country often referred to as the Lion City or Garden City, tops the overall rankings. (See Table 10.) Strategically located on the Strait of Malacca, it is a vital international shipping route on the southernmost tip of Asia. This fact underpins Singapore's top ranking in the Economy category. It receives eight "A" grades in this category and is the top-ranked metro area on three indicators—real GDP per capita growth, employment growth, and unemployment rate. Singapore's port activity, while solid, is dwarfed by euro-giant Rotterdam. Still, it is the largest port relative to the size of its economy among our Asian comparators, measured in terms of both its container traffic and its overall tonnage. The busy local airport also gets an "A" for its inbound tonnage. Singapore's performance is less robust in the Social category, where it ranks 16th.

A European metro area with a rich cultural heritage, **Copenhagen**, sits in 2nd place and performs better in the Social category than in Economy. In contrast, **Hong Kong** and **Calgary**, which come in 3rd and 4th place, draw much of their strength from a strong performance among the economy-oriented indicators. On the other hand, U.S. high-tech powerhouse **Seattle,** our 5th-rated metro area, performs strongly in both Economy and Social, ranking no worse than 6th in both categories.

Barcelona and **Sydney** come next, placing 6th and 7th respectively, with both metro regions boasting a strong Social performance that is offset by a less impressive Economy outcome. In Barcelona's case, the gap in performance between the two categories is particularly stark—it finishes 1st with an "A" grade in Social and places 15th with a "C" grade in Economy. In contrast, **San Francisco**, which ranks in 8th place overall, is a more well-rounded performer with "B" grades in both categories.

Greater Vancouver, the focus of this report, lands in 9th spot. The metro region earns relatively high marks in the Social category, where it places 7th with a "B" grade. Although this performance aligns with a well-earned reputation for being one of the world's most liveable regions, a few of indicators draw attention to trouble spots that hurt the region's appeal, particularly poor housing affordability and congestion. Greater Vancouver's Economy performance is middle-of-the pack and highlights areas of concern, specifically low levels of labour productivity, low per capita after-tax incomes, and a high marginal tax rate on capital for businesses. On a positive note, the metro region ranks relatively high on all five transportation-oriented indicators, confirming the region's status as a transportation gateway.

Toronto and **Portland** sit in 10th and 11th place, respectively. Both regions earn "A" grades in the Social category but are left with "C" grades in the Economy category. The three metro regions that follow in the rankings—**Seoul, Rotterdam**, and **Montréal**—also get higher grades in Social than in Economy. On the other hand, the 15th-ranked metro region, **Houston**, does much better in the Economy category, helping to offset a second-to-last ranking in the Social category.

Finally, the five bottom-ranked metro areas feature three North American metro regions along with one from Asia and one from Europe. **Halifax**, with a "B" in Social and a "C" in Economy, finishes in 16th place. **Manchester**, which earns a "D" grade in Economy and a "B" in Social, ranks 17th overall. **Shanghai**, which comes in 18th place overall, struggles mightily in the Social category, ranking dead last, and an "A" grade in the Economy category cannot make up for it. **Los Angeles**, with a "D" grade in Economy and a "B" in Social, finishes 19th. **Miami**, with a last-place ranking in the Economy category and an 18th-place ranking in the "Social" category, is our report's overall last-place finisher.

7. Economy

Chapter Summary

- Asian metro regions (Singapore, Hong Kong, and Shanghai) and North American metro regions (Calgary, Seattle, Houston, and San Francisco) dominate the top of the field in the Economy category.
- Greater Vancouver places 9th and earns a "B" grade.
- Greater Vancouver performs well on most of the transportation-oriented indicators, confirming its status as a transportation gateway.
- Greater Vancouver's outcomes on indicators that measure general economic performance are less impressive.
- Areas of particular concern for Greater Vancouver include low productivity levels, low per capita after-tax incomes, and high marginal tax rates on capital for businesses.
- Los Angeles, Manchester, and Miami rank at the bottom, all earning an overall "D" grade.

Table 11
Economy Rankings and Grades

	Value	*Grade*
Singapore	0.65	A
Hong Kong	0.52	A
Shanghai	0.51	A
Calgary*	0.49	A
Seattle	0.45	B
Copenhagen	0.45	B
Houston*	0.44	B
San Francisco	0.44	B
Greater Vancouver	**0.43**	**B**
Seoul	0.40	C
Sydney	0.39	C
Rotterdam	0.39	C
Toronto	0.39	C
Halifax	0.37	C
Barcelona	0.37	C
Montréal	0.36	C
Portland	0.36	C
Los Angeles	0.33	D
Manchester	0.30	D
Miami	0.29	D

*Results for Calgary and Houston do not take into account the impact of steeply lower oil and gas prices.

The 21 indicators in the Economy category portray a broad cross-section of economic performance with the goal of determining each region's relative attractiveness to both business investment and highly skilled workers. (See Table 12.) Of course, workers also base their location decisions on quality of life, which is the subject of the next chapter. The indicators that attempt to gauge a metropolitan area's current economic and wealth performance include real gross domestic product (GDP) per capita, after-

tax income per capita, labour productivity (real GDP per worker), employment and the unemployment rate, market size, and various indicators of the cost of doing business, including KPMG's total tax index, which compares the total tax burden faced by corporations in each city, including income taxes, capital taxes, sales taxes, property taxes, miscellaneous local business taxes, and statutory labour costs.

Five indicators attempt to gauge a metropolitan area's transportation performance. It is well known that improvements in transportation infrastructure can help boost both trade and general economic performance. Moving goods and people in a timely and efficient manner decreases costs and lifts productivity for a variety of economic agents. In this context, the five transportation indicators are designed to assess a cross-section of freight and passenger movements.

Greater Vancouver's location on Canada's West Coast, facing the burgeoning Pacific Rim, merely enhances transportation's local importance. Estimates from the Conference Board's Metropolitan Outlook Service suggest that the transportation and warehousing industry generates just over 6 per cent of Greater Vancouver's real GDP, well above the 4 per cent national figure. Most other regions selected for this benchmarking analysis also qualify as transportation sector gateways.

The Economy category also includes a forward-looking wealth indicator—venture capital investment per US$1 million of GDP—as well as two tourism indicators—number of international visitors and number of participants in international association meetings. Tourism activity provides significant economic benefits to the host region, as it boosts consumer spending and generates employment opportunities in a variety of economic sectors, such as wholesale and retail trade and personal services. Tourists, through their purchases, also generate tax revenues for the host economy that can be used to fund infrastructure projects and government-provided services.

Data for the key economic indicators are, for the most part, drawn from a base year of 2013 or 2014 to allow for comparability among all metro regions. Where dollar values are used in level terms, they are reported in US$ PPP (purchasing power parity).

Asian metros earn high grades in the Economy rankings: Singapore, Hong Kong, and Shanghai occupy the top three spots, with Seoul also ranking in the top 10. Sydney finishes in the middle of the pack in 11th place. U.S. metros also perform well, with Seattle and San Francisco—high-tech centres—and Houston—an oil industry hub—ranking in the top 10. Unquestionably, Houston has greatly benefited from being America's oil hub. However, given that this benchmarking analysis is backward looking, the results do not take into account the impact of the severe drop in crude oil prices. Indeed, Houston's recent economic performance and near-term outlook are much less impressive. Nevertheless, American metropolitan statistical areas typically have high GDP per capita and after-tax income per capita. In other words, these regions have high standards of living. They also rank highly in productivity and the venture capital indicator. They perform less well measured by employment growth and the unemployment rate.

The results for the Canadian metro areas are mixed. The top Canadian performer is Calgary, which ranks 4th with an "A" grade. But similar to Houston, Calgary's economy has weakened significantly in the face of steeply lower oil and gas prices—something that the rankings in this scorecard does not reflect.

Greater Vancouver is Canada's lone "B"-rated metro region, ranking in 9th place. The remaining metro areas—Toronto (13th), Halifax (14th), and Montréal (16th)—all earn "C" grades.

The results for the European metro areas are equally mixed. Copenhagen is Europe's top performer, ranking 6th with a "B" grade. Rotterdam and Barcelona earn "C" grades, with the former placing 12th and the later ranking 15th. Finally, Manchester struggles with a 19th-place finish and a "D" grade.

Table 12
Economy Category Indicators

Indicators
Real gross domestic product (GDP) per capita
Real GDP per capita growth
Labour productivity
Labour productivity growth
Disposable income per capita
Disposable income per capita growth
Employment growth
Unemployment rate
Inbound airport cargo tonnage capacity per $1 million of GDP
Port cargo tonnage per $1 million of GDP
High-tech employment (share of total employment)
Total tax index
Marginal effective tax rate on capital investment for businesses
Average downtown office rents
Venture capital investment per $1 million of GDP
Market size
Number of international visitors
Number of participants in international association meetings
Inbound airplane seat capacity per capita
Port container throughput per $1 million of GDP
Number of cruise vessel calls

7.1 Who's Best?

Singapore is the Economy category's overall leader. (See Table 11.) The area's ranking is buoyed by first-place finishes on three indicators: real GDP per capita growth, employment growth, and unemployment rate (an astonishing 2 per cent). The region also earns "A" grades for its inbound airport cargo tonnage capacity, its port container traffic, and its port cargo tonnage. Singapore's strong performance in both port indicators is not surprising, given that it is home to the second busiest port in the world .The city-state is also a major tourism hub, earning "A" grades on the two tourism indicators included in the scorecard. Singapore boasts over 20 million international visitors annually, more than three times as

many as third-place finisher Shanghai. On the other hand, the metro area suffers a "D" grade for its market size because it is surrounded by relatively poor countries, and earns "C" grades for its real GDP per capita, its after tax income per capita, and its level of labour productivity. Singapore's number of cruise vessel calls also rates "C," although it ranked third on this indicator. Data for four indicators—disposable income per capita growth, total tax index, venture capital investment as a share of GDP, and marginal effective tax rate on capital investment for businesses—were unavailable for Singapore.

Hong Kong is the second-best metro area in economic performance and also earns an "A" grade. It is top-ranked for its number of international visitors and also earns "A" grades for its unemployment rate, for its inbound airport cargo tonnage capacity, and for its port container throughput. Hong Kong achieves high marks on many of the transportation-oriented indicators despite experiencing fierce competition from other cities on the Pearl River Delta that are steadily strengthening as logistical hubs. Indeed, two cities neighbouring Hong Kong—Shenzhen and Guangzhou—rank among China's largest ports. In 2013, Shenzhen handled more container traffic than Hong Kong, while Guangzhou handled more port cargo. Hong Kong's seven "B" scores are in real GDP per capita growth, after-tax income per capita growth, employment growth, labour productivity levels and growth, inbound aircraft seat capacity, and number of participants in international association meetings. On a negative note, Hong Kong receives five "C" grades and two "D" grades for its number of cruise vessel calls and its sky-high downtown office rents, which are double that of its closest competitor. Hong Kong was missing data on three indicators: its total tax index, its marginal effective tax rate on capital investment for businesses, and its venture capital investment per US$1 million of GDP.

Shanghai ranks third in the Economy category and also receives an "A" grade. Shanghai is top-ranked in after-tax income growth and labour productivity growth, and also earns "A" grades for its real GDP per capita growth (reflecting the area's low starting point), its port container throughput, and its volume of international visitors. However, the metro area's ranking is pulled down by three "D" grades. Indeed, it comes in last among all our regions in real GDP per capita, after-tax income per capita, and labour productivity. Shanghai gets an additional "D" grade for its per capita number of inbound airline seats. Despite being home to the busiest port in the world, Shanghai only gets a "B" grade for its port cargo tonnage when scaled to the size of its economy. Data on three indicators—venture capital investment per US$1 million of GDP, marginal effective tax rate on capital investment for businesses, and total tax index—were missing for Shanghai.

Calgary, Canada's petroleum capital, is the top-rated Canadian metro area, posting an "A" grade and placing fourth on economic performance. Its ranking is buoyed by "A" grades in real GDP per capita, labour productivity levels, employment growth, marginal tax rate on capital investment, and downtown office rents. But given that this is a backward-looking ranking, Calgary's performance in this category does not fully reflect the impact of steeply lower oil and gas prices that started in late 2014. Indeed, The Conference Board of Canada estimates that Calgary's real GDP fell by 2.4 per cent in 2015, and further declines are anticipated for 2016—something that the rankings in this scorecard do not reflect. Also, despite its high overall finish in the Economy category, there are still disappointments, including "D" grades for its venture capital investment, its international visitors, its airport cargo tonnage capacity, and its market size. Calgary is unique in this report for being the only comparator region without a

seaport. As such, data for port container throughput, port cargo tonnage, and cruise vessel calls were unavailable for Calgary. Calgary was also missing data on its total tax index and its number of participants in international association meetings. Similar to Houston, Calgary has benefitted greatly from being Canada's oil industry hub.

Seattle enters the ranking in fifth place and is our first "B"-rated city. While Seattle does not rank first in any of the Economy indicators, it earns "A" grades in real GDP per capita, after-tax income per capita, labour productivity levels, high-tech employment share (unsurprisingly, since it is home to the headquarters of tech giants Microsoft and Amazon), and downtown office rents. However, these are partially offset by "D" grades given for its market size, its cruise vessel calls, its port container traffic, its port cargo tonnage, and its marginal tax rate on capital investment for businesses. Seattle rates "B" in four indicators and "C" in six indicators. Data for the number of international visitors were missing for Seattle.

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
Real gross domestic product (GDP) per capita # metro areas ranked: 20	GDP is the overall value of goods and services produced within the metro region. Real GDP is divided by total population to get real GDP per capita. Data are from 2013, based on 2007 dollars and reported in US$ PPP.	Real GDP per capita is commonly used to compare relative wealth among regions. A metro area with high real GDP per capita will have a high standard of living, making it more attractive to people and businesses.	**Greater Vancouver** places 14th on this indicator and gets a "C" grade. Four of five Canadian metro areas, including Vancouver, rank below their U.S. counterparts. Calgary is the one exception and the only Canadian CMA to receive an "A" grade. San Francisco, Houston, and Seattle take the top three spots, all with real GDP per capita of over $70,000. At the other end of the spectrum, Shanghai ranks last, with a GDP per capita a little over a quarter of San Francisco's.	1.	San Francisco	77,575	A	11.	Miami	43,605	C
				2.	Houston	73,520	A	12.	Singapore	43,073	C
				3.	Seattle	71,889	A	13.	Toronto	39,859	C
				4.	Calgary	66,301	A	**14.**	**Vancouver**	**37,655**	**C**
				5.	Portland	62,726	B	15.	Halifax	35,474	C
				6.	Sydney	60,334	B	16.	Montréal	32,679	D
				7.	Los Angeles	57,702	B	17.	Seoul	32,147	D
				8.	Hong Kong	45,422	C	18.	Barcelona	28,836	D
				9.	Copenhagen	44,062	C	19.	Manchester	24,268	D
				10.	Rotterdam	43,748	C	20.	Shanghai	20,240	D
Real GDP per capita growth # metro areas ranked: 20	The average annual increase in real GDP per capita over a five-year period, from 2009 to 2013.	Real GDP per capita growth is one way to measure the change in the standard of living. Stronger growth tends to generate higher profits for firms, higher wages for workers, and higher revenues for	With a five-year average annual growth rate of 0.7 per cent, **Greater Vancouver** is tied with Halifax as the top-ranked Canadian CMA. With a "C" grade, Vancouver's real GDP per capita growth is less than a quarter that of top-ranked Singapore. European metro areas struggle on this indicator, with all four posting declines between 2009 and 2013.	1.	Singapore	3.3	A	11.	Montréal	0.0	C
				2.	Shanghai	3.0	A	12.	Toronto	0.0	C
				3.	Seoul	1.8	B	13.	Sydney	-0.1	C
				4.	Houston	1.6	B	14.	Copenhagen	-0.6	D
				5.	Portland	1.1	B	15.	San Francisco	-0.6	D
				6.	Hong Kong	1.0	B	16.	Barcelona	-1.0	D
				7.	**Vancouver**	**0.7**	**C**	17.	Manchester	-1.0	D
				8.	Halifax	0.7	C	18.	Los Angeles	-1.1	D

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
		governments.		9.	Seattle	0.1	C	19.	Rotterdam	-1.2	D
				10.	Calgary	0.1	C	20.	Miami	-1.7	D
Labour productivity # metro areas ranked: 20	Labour productivity is a ratio calculated by dividing real GDP by employment. Data for all metros are for 2013, based on 2007 dollars and reported in US$ PPP.	Metro areas with high levels of productivity tend to offer high wages for workers and/or high profits for firms. A metro area with high labour productivity will be more attractive to both people and businesses.	**Greater Vancouver** comes in 12th place, with a "C" grade, ahead of Halifax and Montréal, but behind Calgary and Toronto. All U.S. CMAs boast higher levels of labour productivity than Vancouver. Four of the six "A" regions are American, with Houston ranking first. All of these regions have a productivity level over $100,000. Sydney and Calgary account for the other two "A"s. Manchester and Shanghai finish in the bottom two positions.	1.	Houston	122,123	A	11.	Miami	74,786	C
				2.	Sydney	118,732	A	**12.**	**Vancouver**	**73,600**	**C**
				3.	San Francisco	118,673	A	13.	Copenhagen	72,618	C
				4.	Calgary	115,516	A	14.	Singapore	69,360	C
				5.	Seattle	112,540	A	15.	Barcelona	69,288	C
				6.	Portland	104,530	A	16.	Halifax	65,429	C
				7.	Los Angeles	95,501	B	17.	Montréal	64,147	C
				8.	Hong Kong	85,884	B	18.	Seoul	63,726	C
				9.	Rotterdam	81,347	C	19.	Manchester	55,183	D
				10.	Toronto	76,925	C	20.	Shanghai	42,980	D
Labour productivity growth # metro areas ranked: 20	The average annual increase in labour productivity over a five-year period, from 2009 to 2013.	Labour productivity growth is the only sustainable way to raise living standards over the long	Shanghai, with average annual labour productivity growth of 3.9 per cent, is the leader in this indicator and gets the lone "A" grade. **Greater Vancouver** does relatively well against that backdrop. It is ranked 7th and	1.	Shanghai	3.9	A	11.	Copenhagen	0.8	C
				2.	Barcelona	2.4	B	12.	Halifax	0.6	C
				3.	Singapore	2.3	B	13.	Toronto	0.1	C

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
		term. High productivity growth increases the competitiveness of firms and fosters greater purchasing power for households. A metro region with high productivity growth is more attractive to people and businesses.	earns a "B" grade, leading all Canadian CMAs. Five cities suffered productivity declines, including three U.S. metro areas. Miami ranks last, suffering a 1.2 per cent productivity decline.	4.	Portland	2.2	B	14.	Rotterdam	0.0	D
				5.	Houston	1.9	B	15.	Montréal	0.0	D
				6.	Hong Kong	1.7	B	16.	Sydney	-0.1	D
				7.	**Vancouver**	**1.4**	**B**	17.	San Francisco	-0.3	D
				8.	Seattle	1.3	C	18.	Manchester	-0.4	D
				9.	Seoul	1.2	C	19.	Los Angeles	-1.1	D
				10.	Calgary	1.1	C	20.	Miami	-1.2	D
Employment growth # metro areas ranked: 20	Five-year average annual growth in total employment, measured from 2009 to 2013.	Strong employment growth means greater opportunities for work, making a metro region more attractive to people.	Although three metro areas earn "A" grades, Singapore stands out with an average annual compound growth rate of 3.2 per cent—far ahead of second-place Houston. Calgary rounds out the metro areas scoring an "A." Apart from Calgary, all Canadian comparator cities get "B"s. **Greater Vancouver** ranks 12th, behind Toronto, Montréal and Halifax. European CMAs dominate the bottom of the field, with Rotterdam, Copenhagen,	1.	Singapore	3.2	A	11.	Miami	0.9	B
				2.	Houston	1.9	A	**12.**	**Vancouver**	**0.9**	**B**
				3.	Calgary	1.7	A	13.	Seoul	0.7	B
				4.	Shanghai	1.5	B	14.	Los Angeles	0.7	B
				5.	Toronto	1.5	B	15.	Manchester	0.6	B
				6.	Montréal	1.3	B	16.	Seattle	0.3	B
				7.	Sydney	1.2	B	17.	Portland	0.3	B

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
			and Barcelona all posting employment declines. However, among these three regions, only Barcelona gets a "D."	8.	Hong Kong	1.2	B	18.	Rotterdam	-0.4	C
				9.	Halifax	1.1	B	19.	Copenhagen	-0.4	C
				10.	San Francisco	1.0	B	20.	Barcelona	-3.4	D
Unemploy-ment rate # metro areas ranked: 20	The percentage of the labour force not working, based on 2014 data. Shanghai data are for 2013.	A metro region with a lower unemployment rate has a tighter labour market, making it more likely that someone without a job will find employment. Such places are more likely to attract people.	With an unemployment rate of 2 per cent, Singapore is the runaway leader in this indicator. Hong Kong comes in a distant second and is the only other metro region to earn an "A" grade. Two other Asian regions—Shanghai and Seoul—round out the top four. **Greater Vancouver** is right in the middle of the pack, ranking 10th with a "C." At 5.9 per cent, Vancouver's unemployment rate is almost triple that of Singapore. Still, it ranks far ahead of Toronto and Montréal. Barcelona sits in last place, with a whopping 20 per cent unemployment rate.	1.	Singapore	2.0	A	11.	Halifax	6.0	C
				2.	Hong Kong	3.3	A	12.	Portland	6.3	C
				3.	Shanghai	4.2	B	13.	Miami	6.3	C
				4.	Seoul	4.5	B	14.	Copenhagen	7.1	C
				5.	Houston	4.9	B	15.	Manchester	7.4	C
				6.	Calgary	5.1	B	16.	Los Angeles	7.6	D
				7.	Seattle	5.2	B	17.	Toronto	8.0	D
				8.	San Francisco	5.2	B	18.	Montréal	8.2	D
				9.	Sydney	5.4	B	19.	Rotterdam	9.4	D
				10.	**Vancouver**	**5.9**	**C**	20.	Barcelona	20.0[U]	D
Disposable income per capita* # metro areas ranked: 20	A metro area's average after-tax income is divided by total population to get disposable income per capita.	Metro regions with high average incomes are likely to draw in more	Metro areas in the U.S. dominate the top of the rankings, occupying the top six spots. Calgary, at 8th place, leads all Canadian CMAs, with an	1.	San Francisco	55,175	A	11.	Copenhagen	25,703	C
				2.	Seattle	46,691	A	12.	Toronto	24,676	C
				3.	Houston	44,240	A	**13.**	**Vancouver**	**24,578**	**C**

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
	Data are based on average after-tax income in US$ PPP in 2011.	people.	average disposable income of $32,889. It is the only Canadian region to earn a "B" on this indicator. **Greater Vancouver** ranks 13th, with a "C" grade. At $24,578, Vancouver's disposable income per capita is more than double that of last-place Shanghai but less than half of top-ranked San Francisco. Montréal is the lone Canadian metro region with a "D" grade.	4.	Los Angeles	39,627	B	14.	Halifax	24,120	C
				5.	Miami	39,464	B	15.	Barcelona	23,018	C
				6.	Portland	36,814	B	16.	Montréal	21,397	D
				7.	Sydney	35,092	B	17.	Rotterdam	20,588	D
				8.	Calgary	32,889	B	18.	Seoul	19,859	D
				9.	Hong Kong	29,558	C	19.	Manchester	19,054	D
				10.	Singapore	26,567	C	20.	Shanghai	10,322	D
Disposable income per capita growth # metro areas ranked: 19	Average annual growth of disposable income (after tax) per capita measured over a five-year period, from 2007 to 2011.	Metro regions with strong income growth are more likely to attract more people.	Shanghai, with average annual disposable income per capita growth of 11.9 per cent, overpowers all other metro areas on this indicator and gets the lone "A" grade. Hong Kong ranks a distant second, with a "B." Sydney and Seoul account for the other two "B"s. **Greater Vancouver** fares relatively well on this indicator, ranking in the top 10. Still, it earns only a "C," as do the other Canadian metro areas. Manchester—the only region to post a decline—finishes in the bottom position.	1.	Shanghai	11.9	A	11.	Calgary	2.2	C
				2.	Hong Kong	6.6	B	12.	Seattle	1.9	C
				3.	Sydney	6.2	B	13.	Rotterdam	1.8	C
				4.	Seoul	6.1	B	14.	Portland	1.8	C
				5.	Halifax	3.2	C	15.	Los Angeles	1.6	C
				6.	Copenhagen	3.0	C	16.	Barcelona	1.5	D
				7.	Houston	2.7	C	17.	San Francisco	1.3	D
				8.	**Vancouver**	**2.5**	**C**	18.	Miami	0.6	D
				9.	Montréal	2.5	C	19.	Manchester	-1.9	D
				10.	Toronto	2.4	C	20.	Singapore	n.a.	

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
High-tech employment** # metro areas ranked: 19	The information and communications technology (ICT) sector's share of total employment. Data are from 2013 for Canada, the U.S., Europe, and Shanghai; 2012 for Singapore; 2011 for Sydney; and 2010 for Hong Kong.	This indicator shows the proportion of people working in high-tech jobs. The higher the percentage, the more attractive the metro region to both businesses and highly skilled individuals.	Unsurprisingly, San Francisco and Seattle take the two top spots and are the only metros to earn "A" grades. Beyond San Francisco and Seattle, only two regions do well enough to earn a "B" grade—Copenhagen and Singapore—leaving the remaining 15 metro areas to eke out a "C" or "D" grade. Apart from Halifax, which earns a "D," all Canadian regions get a "C." **Greater Vancouver** ranks 9th, with 4.5 per cent of the workforce employed in the high-tech sector, third among Canadian regions. Montréal is the Canadian leader in this indicator, with a 5.4 per cent share. Still, Vancouver is ahead of Calgary and Halifax.	1. San Francisco 9.1 A 2. Seattle 7.3 A 3. Copenhagen 6.9 B 4. Singapore 6.2 B 5. Montréal 5.4 C 6. Portland 5.3 C 7. Shanghai 5.1 C 8. Toronto 4.9 C 9. **Vancouver** **4.5** **C** 10. Calgary 4.3 C	11. Hong Kong 4.3 C 12. Los Angeles 4.2 C 13. Halifax 3.8 D 14. Sydney 3.0 D 15. Rotterdam 2.8 D 16. Houston 2.7 D 17. Manchester 2.7 D 18. Miami 2.6 D 19. Barcelona 2.0 D 20. Seoul n.a.
Total tax index (TTI) # cities ranked: 12 This indicator is at the city level.	The total taxes paid by similar corporations in a particular location and industry, calculated as a percentage of total taxes paid by similar corporations across the U.S.	The index is designed to compare the total tax burden faced by companies in each city, including income taxes,	Canadian cities do very well in this indicator; they are the top four metros, and all earn "A" grades. (Data were not available for Calgary and seven other metro regions.) **Greater Vancouver** ranks 3rd, behind Halifax and Toronto. Manchester rounds out the "A"	1. Halifax 47.9 A 2. Toronto 51.6 A **3. Vancouver** **54.5** **A** 4. Montréal 55.6 A	11. San Francisco 102.1 D 12. Sydney 114.9 D 13. Barcelona n.a. 14. Singapore n.a.						

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
	Data are from 2014 and are compiled by KPMG.	capital taxes, sales taxes, property taxes, miscellaneous local business taxes, and statutory labour costs. Metro regions with lower tax burdens are more attractive to new business and investment.	cities. U.S. metros lag far behind; Miami, Portland, Houston, and Seattle earn "C"s, while Los Angeles and San Francisco earn "D"s. Sydney has the weakest score among the 12 metro areas for which data were available.	5. Manchester	58.1	A	15. Copenhagen	n.a.			
				6. Miami	91.7	C	16. Calgary	n.a.			
				7. Portland	92.5	C	17. Seoul	n.a.			
				8. Houston	93.2	C	18. Rotterdam	n.a.			
				9. Seattle	95.4	C	19. Shanghai	n.a.			
				10. Los Angeles	100.1	D	20. Hong Kong	n.a.			
Marginal effective tax rate on capital investment for businesses # cities ranked: 17	The tax rate a corporation would pay on one additional dollar of return on capital investment. Data are for 2014.	A high marginal effective tax rate on capital investment makes a region less attractive to corporate investment, reducing economic growth.	Three Canadian metro areas—Halifax, Montréal, and Calgary—emerge at the top of the rankings on this indicator. Toronto also finishes in the top five, earning an "A" grade. **Greater Vancouver**'s ranking is less impressive. It places 10th with a "C" grade. At 27.5 per cent, Greater Vancouver's marginal effective tax rate on capital investment is more than double that of top-ranked Halifax. On a positive note, Greater Vancouver places ahead	1. Halifax	13.4	A	11. Seoul	30.1	D		
				2. Montréal	15.9	A	12. San Francisco	35.3	D		
				3. Calgary	17.0	A	13. Los Angeles	35.3	D		
				4. Rotterdam	17.1	A	14. Portland	35.3	D		
				5. Toronto	18.2	A	15. Seattle	35.3	D		
				6. Copenhagen	18.6	A	16. Miami	35.3	D		
				7. Manchester	23.7	B	17. Houston	35.3	D		

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
			of all U.S metro regions.	8.	Sydney	25.9	C	18.	Hong Kong	n.a.	
				9.	Barcelona	26.0	C	19.	Shanghai	n.a.	
				10.	**Vancouver**	27.5	C	20.	Singapore	n.a.	
Average office rents # cities ranked: 17 This indicator is at the city level.	This is a measure of the total rental cost of downtown Class A office space in US$ per square foot. Data are for the first quarter of 2015.	This indicator is one measure of the cost of doing business. Metro regions with lower office rents are more attractive to new business and investment.	Led by Rotterdam, cities in Europe dominate the top of the field, taking the three top spots. **Greater Vancouver** ranks 5th with an "A," just behind Canadian leader Montréal. Calgary and Toronto also get "A"s. Asian cities do poorly on this indicator, accounting for four of the five bottom-ranked cities. Hong Kong places last. At US$254.23 per square foot, office rents in Hong Kong are almost six times higher than those in Vancouver, which were just US$42.85 in the first quarter of 2015.	1.	Rotterdam	28.68	A	11.	Manchester	72.01	A
				2.	Barcelona	29.60	A	12.	Sydney	87.66	B
				3.	Copenhagen	33.08	A	13.	Seoul	98.67	B
				4.	Montréal	34.76	A	14.	Singapore	107.60	B
				5.	**Vancouver**	**42.85**	**A**	15.	San Francisco	114.00	B
				6.	Calgary	44.58	A	16.	Shanghai	126.39	B
				7.	Los Angeles	47.60	A	17.	Hong Kong	254.23	D
				8.	Toronto	51.54	A	18.	Halifax	n.a.	
				9.	Seattle	51.92	A	19.	Portland	n.a.	
				10.	Houston	62.50	A	20.	Miami	n.a.	
Venture	This indicator measures the	Metro regions	San Francisco, the home of	1.	San Francisco	26,752[U]	A	11.	Miami	580	D

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
capital investment per $1 million of GDP # metro areas ranked: 11	average investment in new start-ups per US$1 million of GDP. Data are an average from 2010 to 2014.	with a healthy venture capital market will yield more start-up activity and thus be more attractive to business and investment.	Silicon Valley, eclipses all other metro areas on this indicator. Houston is a very distant second. **Greater Vancouver** fares poorly, earning a "C" grade, even though it tops all Canadian CMAs. Montréal also receives a "C" grade, while the remaining Canadian cities receive "D" grades.	2.	Houston	5,760	A	12.	Barcelona	n.a.	
				3.	Seattle	4,277	B	13.	Singapore	n.a.	
				4.	**Vancouver**	**2,683**	**C**	14.	Manchester	n.a.	
				5.	Los Angeles	2,557	C	15.	Copenhagen	n.a.	
				6.	Montréal	2,214	C	16.	Seoul	n.a.	
				7.	Portland	2,211	C	17.	Rotterdam	n.a.	
				8.	Toronto	1,413	D	18.	Shanghai	n.a.	
				9.	Halifax	1,069	D	19.	Hong Kong	n.a.	
				10.	Calgary	945	D	20.	Sydney	n.a.	
Market size # metro areas ranked: 20	Total income of the population within a 500-mile radius of the metro area (measured in trillions of US$ PPP). Data are for 2013.	The greater the purchasing power of the broad regional market, the more attractive the metro region is as a place for new business and investment.	One metro region stands out in the field of 20: Rotterdam. It is well ahead, with a market size of US$8.3 trillion, garnering the only "A." Sitting in 2nd place, Toronto is the top Canadian metro area. **Greater Vancouver** does relatively poorly on this indicator, lagging behind all Canadian metro areas, apart from Calgary, ranking 16th overall. At US$744 billion, Vancouver's market size is only about one-eighth the size of	1.	Rotterdam	8,316	A	11.	San Francisco	1,928	D
				2.	Toronto	5,756	B	12.	Houston	1,714	D
				3.	Copenhagen	4,586	B	13.	Halifax	1,032	D
				4.	Manchester	4,534	B	14.	Miami	875	D
				5.	Montréal	4,514	B	15.	Portland	826	D
				6.	Shanghai	4,505	B	**16.**	**Vancouver**	**744**	**D**
				7.	Hong Kong	3,432	C	17.	Seattle	728	D
				8.	Seoul	3,132	C	18.	Sydney	556	D

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
			Toronto's.	9.	Barcelona	2,811	C	19.	Calgary	547	D
				10.	Los Angeles	2,184	D	20.	Singapore	530	D
International visitors # cities ranked: 18 This indicator is at the city level.	The total number of international visitors to the metro area. Data are an average from 2010 to 2013 (in thousands).	International visitors generate employment in a variety of sectors (such as wholesale and retail trade and personal services) and boost consumer spending and government revenues.	Hong Kong and Singapore dwarf the competition in this indicator, with more than three times as many international tourists as third-place Shanghai. Toronto, **Greater Vancouver**, and Montréal are middle-of-the-pack performers, earning "C" grades. Halifax finishes last.	1.	Hong Kong	22,790[U]	A	**11.**	**Vancouver**	**1,927**	**C**
				2.	Singapore	20,479[U]	A	12.	Montréal	1,837	C
				3.	Shanghai	6,235	A	13.	Copenhagen	1,246	D
				4.	Miami	6,182	A	14.	Houston	623	D
				5.	Barcelona	5,378	A	15.	Calgary	586	D
				6.	Los Angeles	4,890	A	**16.**	Manchester	580	D
				7.	Seoul	4,321	B	17.	Rotterdam	491	D
				8.	San Francisco	3,079	C	18.	Halifax	206	D
				9.	Toronto	2,805	C	19.	Portland	n.a.	
				10.	Sydney	2,692	C	20.	Seattle	n.a.	
Number of participants in international association meetings # cities ranked: 19 This indicator	Number of participants in meetings organized or sponsored by international organisations with at least 50 participants. They include both corporate and association meetings.	Participants in international association meetings boost consumer spending in the host city and generate employment in tourist-oriented	With 127,000 participants, Barcelona dominates this indicator. With slightly over 20 per cent of Barcelona's participants, **Greater Vancouver** ranks 8th and gets a "C." Ranking two spots ahead, Toronto is the only Canadian metro area to get an "A." Halifax disappoints with a "D"	1.	Barcelona[U]	127,469	A	11.	Seattle	18,695	C
				2.	Copenhagen	57,551	A	12.	Los Angeles	17,469	C
				3.	Singapore	57,497	A	13.	San Francisco	16,893	C
				4.	Seoul	53,700	A	14.	Rotterdam	16,526	C
				5.	Sydney	53,152	A	15.	Miami	8,647	D
				6.	Toronto	48,978	A	16.	Portland	6,293	D

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
is at the city level.		sectors.	grade.	7.	Hong Kong	41,956	B	17.	Manchester	6,071	D
				8.	**Vancouver**	**28,167**	**C**	18.	Halifax	2,079	D
				9.	Montréal	25,327	C	19.	Houston	1,826	D
				10.	Shanghai	20,401	C	20.	Calgary	n.a.	
Inbound airplane seat capacity per capita # metro areas ranked: 20	Overall seat capacity of incoming non-stop flights to the metro area, divided by total population. Data are for 2014.	The greater the number of inbound airplane seats per capita, the greater the opportunity for business and leisure travel. In particular, higher airport capacity gives businesses a greater opportunity to meet faraway clients face-to-face and provides better access to global supply chains.	Copenhagen dominates the field in this indicator. With 9.2 airplane seats per capita, it is the only metro region to receive an "A" grade. **Greater Vancouver** ranks 10th and tops the metro areas, earning a "C," and finishes behind Calgary and Halifax. In fact, Calgary ranks second overall. Montréal's score is the lowest among all Canadian metro areas, ranking 18th out of 20. Only Seoul and Rotterdam rank lower.	1.	Copenhagen	9.2	A	11.	Manchester	4.6	C
				2.	Calgary	6.5	B	12.	Barcelona	4.3	C
				3.	Singapore	6.5	B	13.	Toronto	4.3	C
				4.	San Francisco	6.1	B	14.	Portland	4.1	C
				5.	Seattle	5.9	B	15.	Miami	4.0	C
				6.	Halifax	5.7	B	16.	Los Angeles	3.2	C
				7.	Sydney	5.5	B	17.	Shanghai	2.3	D
				8.	Hong Kong	5.5	B	18.	Montréal	2.3	D
				9.	Houston	5.0	B	19.	Seoul	1.7	D
				10.	**Vancouver**	**4.9**	**C**	20.	Rotterdam	0.7	D
Inbound	This indicator measures a	This indicator is	With 4 tonnes of cargo per $1	1.	Manchester	10.8	A	11.	Seattle	3.2	C

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
airport cargo tonnage capacity per $1 million of GDP # metro areas ranked: 20	metro area's incoming air freight (in tonnes) capacity on non-stop flights per US$1 million of GDP. Data are for 2014.	used to gauge the performance of a metro area's airport as a cargo gateway.	million of GDP, **Greater Vancouver** is the best-performing metro region in North America. Still, this is only good enough for a 9th-place finish and "C" grade. Asian regions dominate the field, accounting for three of the five best regions, although Manchester is the leader. At the other end of the spectrum, Montréal, Houston, and Rotterdam finish at the bottom.	2.	Hong Kong	10.6	A	12.	Toronto	2.5	D
				3.	Seoul	10.2	A	13.	Sydney	2.4	D
				4.	Singapore	9.5	A	14.	Calgary	2.2	D
				5.	Barcelona	8.2	A	15.	San Francisco	2.2	D
				6.	Copenhagen	7.3	B	16.	Los Angeles	2.0	D
				7.	Shanghai	6.0	B	17.	Portland	1.6	D
				8.	Miami	4.4	C	18.	Montréal	1.5	D
				9.	**Vancouver**	**4.0**	**C**	19.	Houston	0.9	D
				10.	Halifax	3.3	C	20.	Rotterdam	0.0	D
Port container throughput per $1 million of GDP # metro areas ranked: 19	Container throughput is a volume measure expressed in twenty-foot-equivalent units (TEUs) per US$1 million of GDP. Data are for 2013.	Container throughput is a key factor when evaluating the health of a metro area's seaport.	Rotterdam and Singapore are the runaway leaders in this indicator. **Greater Vancouver** is the top-ranked North American metro area, placing 5th overall. But with one-sixth the container throughput per $1 million of GDP as 1st-place Rotterdam, Vancouver gets only a "C" grade. Moreover, Vancouver's container throughput per $1 million of GDP is less than half as much as 4th place Hong Kong's, so a move up in the rankings is not in	1.	Rotterdam	188.4[U]	A	11.	Miami	8.1	D
				2.	Singapore	140.1[U]	A	12.	Sydney	7.7	D
				3.	Shanghai	68.8	A	13.	San Francisco	6.7	D
				4.	Hong Kong	67.4	A	14.	Seoul	6.5	D
				5.	**Vancouver**	**30.8**	**C**	15.	Houston	4.4	D
				6.	Halifax	30.4	C	16.	Copenhagen	1.8	D
				7.	Los Angeles	19.2	C	17.	Portland	1.2	D
				8.	Seattle	13.4	D	18.	Toronto	0.0	D
				9.	Barcelona	10.8	D	19.	Manchester	0.0	D

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
			the cards anytime soon.	10.	Montréal	10.3	D	20.	Calgary	n.a.	
Port cargo tonnage per $1 million of GDP # metro areas ranked: 19	Total trade (imports and exports in tonnes) at each metro area's port(s) per US$1 million of GDP. Data are for 2013, except for San Francisco, Seattle, Miami, and Seoul, where data are for 2012.	Ports able to handle large quantities of cargo are better positioned to thrive, boosting a metro area's attractiveness as a transportation and trade hub.	One metro area, Rotterdam, outshines the rest. Singapore comes in a distant second. **Greater Vancouver** performs relatively well on this indicator, ranking 3rd with a "B" grade, again leading all North American metro areas. The remaining three Canadian CMAs in this ranking get a "D" grade, with Toronto coming in dead last.	1.	Rotterdam	7,115[U]	A	11.	Copenhagen	189	D
				2.	Singapore	2,412	A	12.	Portland	180	D
				3.	**Vancouver**	**1,470**	**B**	13.	Seattle	180	D
				4.	Shanghai	1,426	B	14.	Los Angeles	170	D
				5.	Hong Kong	833	C	15.	Manchester	112	D
				6.	Halifax	592	D	16.	Miami	110	D
				7.	Houston	507	D	17.	Sydney	106	D
				8.	Seoul	406	D	18.	San Francisco	52	D
				9.	Barcelona	264	D	19.	Toronto	8	D
				10.	Montréal	216	D	20.	Calgary	n.a.	
Number of cruise vessel calls # metro areas ranked: 18	Number of cruise vessel calls received by each region's port(s), based on 2014 data. Data for Los Angeles are for 2011.	A high number of cruise vessel landings draw foreign individuals to a metro area, boosting its tourist numbers and port traffic.	Miami's cruise vessel calls are hard to match. At 2,037, they are over 2.6 times higher than those of second-place finisher Barcelona. These two metro areas outshine the rest, leaving the remaining 16 to eke out a "C" or "D" grade. Against this backdrop, **Greater Vancouver** performs relatively well. It is the top-performing Canadian CMA, placing 7th and earning a "C."	1.	Miami	2,037[U]	A	11.	Seattle	179	D
				2.	Barcelona	764	A	12.	Halifax	134	D
				3.	Singapore	335	C	13.	Seoul	96	D
				4.	Copenhagen	313	C	14.	San Francisco	73	D
				5.	Los Angeles	274	C	15.	Montréal	52	D
				6.	Sydney	256	C	16.	Rotterdam	32	D
				7.	**Vancouver**	**243**	**C**	17.	Toronto	6	D

Economy indicators	Definition	Significance	What about Greater Vancouver?	Grades							
			The other three Canadian CMAs benchmarked here are "D" performers.	8.	Shanghai	240	C	18.	Manchester	0	D
				9.	Houston	219	C	19.	Calgary	n.a.	
				10.	Hong Kong	184	D	20.	Portland	n.a.	
Sources: The Conference Board of Canada; Statistics Canada; U.S. Bureau of Labor Statistics; U.S. Bureau of Economic Analysis; Moody's Economy.com; Organisation for Economic Co-operation and Development; Eurostat; International Monetary Fund; KPMG; CBRE; Australian Bureau of Statistics; Shanghai Statistical Yearbook; Government of Hong Kong; Alacra on Demand; Euromonitor International; Singapore Ministry of Manpower; Statistics Singapore; Korean Statistical Information Service, National Bureau of Statistics of China; OAG Aviation Worldwide LLC; American Association of Port Authorities; Cruise Lines International Association; International Congress and Convention Association; D. Chen and J.M. Mintz.												
Results for Calgary and Houston do not take into account the impact of steeply lower oil and gas prices.											
*Disposable income data from Eurostat are available only at the regional level. The boundaries of these "regions" are not strictly defined and vary greatly across European metro areas.											
**Occupational data from the U.S. Bureau of Labor Statistics were partially secure for some metro areas. Data were either missing or not available for various occupational categories. Therefore, the rankings for U.S. metropolitan statistical areas are underestimated.											
U The metro area was considered an outlier and was thus removed when calculating the grades.											

7.2 Focus on Greater Vancouver's Economy

Greater Vancouver's 9th-place finish in this report's Economy rankings is a testament to the region's middle-of-the-pack performance. The region boasts healthy port activity and relatively affordable office rents. But this benchmarking study suggests that Greater Vancouver's economy is being held back by other factors. Real GDP per capita in 2013 was less than half that of the indicator's leader, San Francisco, and also trailed that in two other Canadian metro areas, Calgary and Toronto, although it beat Montréal and Halifax. Per capita GDP growth was similarly modest, averaging 0.7 per cent per year between 2009 and 2013. Although this was well below leader Singapore's 3.3 per cent average annual rate, we cannot expect Vancouver to keep pace with the Asian metro areas on this indicator because their economies are at different stages of development. Moreover, the region's growth was tops among the Canadian regions. Greater Vancouver's economy may be hindered by very poor housing affordability, which detracts from the region's attractiveness to younger workers. Table 13 summarizes the results for Greater Vancouver on each indicator, ordered from highest ranking to lowest.

Table 13
Greater Vancouver's Economy Performance

Indicator	*Grade*	*Ranking*
KPMG's total tax index	A	3 (12)
Office rents (US$ per square foot)	A	5 (17)
Port cargo tonnage per $1 million of GDP	B	3 (19)
Labour productivity growth	B	7 (20)
Employment growth	B	11 (20)
Venture capital investment per $1 million of GDP	C	4 (11)
Port container traffic (TEUs) per $1 million GDP	C	5 (19)
Real GDP per capita growth	C	7 (20)
Number of cruise vessel calls	C	7 (18)
After-tax income growth	C	8 (19)
Number of participants at international association meetings	C	8 (19)
Inbound airport cargo tonnage per $1 million of GDP	C	9 (20)
High-tech employment share	C	9 (19)
Unemployment rate	C	10 (20)
Inbound airport seats per capita	C	10 (20)
Marginal effective tax rate on capital investment for businesses	C	10 (17)
International visitors	C	11 (20)
Labour productivity	C	12 (20)
After-tax income per capita	C	13 (20)
Real GDP per capita	C	14 (20)
Market size	D	16 (20)

Greater Vancouver's tax environment offers a mixed picture. True, Greater Vancouver earns an "A" grade on KPMG's total tax index, which measures the total taxes paid by similar corporations in a particular location and industry, calculated as a percentage of total taxes paid by similar corporations

across the United States. The metro region's high marks on this indicator are a result of its lower statutory labour costs (payroll-based taxes) relative to its U.S. comparators. But at the same time, Greater Vancouver has the highest marginal effective tax rate on capital investment (METR) among the five Canadian metro regions in the scorecard, earning a "C" grade on this indicator. The marginal effective tax rate represents the proportion of the rate of return from a new investment that is used to pay corporate income taxes, sales taxes on capital purchases, and other capital-related taxes, such as financial-transaction taxes and asset-based taxes. The METR gauges a region's competitiveness in attracting capital investment. If all other factors are identical, a lower METR will result in a higher return. Payroll taxes do not affect the METR because they raise the cost of labour and not capital. Thus, Greater Vancouver does well on one tax indicator (KPMG's total tax index) and not on the other (METR on capital). Greater Vancouver's poor showing on the METR can be attributed to British Columbia continuing to levy an unharmonized retail sales tax, which results in a significant tax on capital purchases. (This issue is discussed in greater detail in Chapter 9.)

Besides its disappointing ranking on the marginal effective tax rate, other areas where Greater Vancouver should look for improvement include disposable income and growth, both of which earned the metro region "C" grades. In 2011, Greater Vancouver's after-tax income per capita was only about 45 per cent of leader San Francisco's and only about three-quarters of Calgary's. The metro area did match Toronto in this score, though, and it beat Montréal and Halifax. Its per capita income growth, which clocked in at 2.5 per cent on an average annual rate between 2009 and 2013, was well behind leader Shanghai, which boasted explosive growth of 11.9 per cent per year. But, yet again, it is important to keep in mind that Shanghai and the other Asian metro areas in this report (except Singapore) are at a different stage of development than Greater Vancouver and, as a result, this wide gap in growth is expected. Against its Canadian rivals, Greater Vancouver's advance trailed gains in Halifax and equalled Montréal's, but exceeded the pace in Toronto and Calgary.

Future prosperity depends a great deal on the evolution of labour productivity, so close attention should be paid to the two indicators that focus on this concept: the level of labour productivity and its growth. In level terms, Greater Vancouver ranks 12th and earns a "C" grade. Greater Vancouver's bottom-half ranking in labour productivity could be in part explained by underinvestment in roads and public transit infrastructure, which has created bottlenecks in the movement of goods and people, another area of concern that is revealed in the Social category.

We estimate Greater Vancouver's output per worker at just below US$74,000, or 60 per cent of front-runner Houston's. Calgary and Toronto both do better—Calgary by a wide margin (it is rated "A" in this category), Toronto by a smaller gap (like Greater Vancouver, it is rated "C"). Halifax and Montréal are also rated "C," but their labour productivity levels are both slightly below Greater Vancouver's. Houston and Calgary can largely thank the strong presence of the oil industry, a notoriously capital-intensive sector, for their high productivity levels, something Greater Vancouver can do little about. But other regions also rank high, including San Francisco, Sydney, and Seattle. Therefore, Greater Vancouver would be best served to draw inspiration from them.

Fortunately, Greater Vancouver's productivity growth performance tells a happier story. It earns a "B" grade and places seventh, beating all other Canadian metro areas. From 2009 to 2013, labour productivity growth averaged 1.4 per cent per year in Greater Vancouver. On a negative note, this is only about a third of that in indicator-leader Shanghai, whose labour productivity growth averaged 3.9 per cent annually.

Greater Vancouver's labour market is average. Its job gains and its unemployment rate are both middle of the pack. It is rated "B" in the employment growth indicator over the past five years. Its numeric value here is only about a third that of indicator-leading Singapore and trails the advance in all the other Canadian metro areas. Its unemployment rate, for which it gets a "C," is high by Asian standards, although it is below the rate in all Canadian areas except Calgary.

If a burgeoning high-tech sector foreshadows a bright economic future, Greater Vancouver's looks modest, at best. Despite being Canada's leader, Greater Vancouver's venture capital investment as a share of GDP is dwarfed by San Francisco's, and the share that high-tech jobs make up of total employment is rated "C," behind both Montréal and Toronto. This suggests that while capital is now becoming available, Greater Vancouver has yet to build a full high-tech ecosystem. According to the Vancouver Economic Commission, Vancouver's high-tech sector features three (Slack, Hootsuite, and Avigilon) of Canada's four tech start-ups valued at more than $1 billion, employs more than 75,000 tech professionals in Vancouver, and generates more than $23 billion in revenue and $15 billion in GDP.[37] But local entrepreneurs are said to still struggle to attract top-flight talent, including experienced financial officers and engineers, to what is perceived to be a "second-tier" market.[38]

The region also has a small market size, which measures the total income of the population within a 500-mile radius of the metro area. A small market size makes it more difficult for local businesses to realize economies of scale. Specifically, Greater Vancouver gets a "D" in the market size indicator and trails all Canadian metro areas except Calgary. Toronto's market is nearly eight times the size of Greater Vancouver's, while Montréal's is six times larger. Both Toronto and Montréal benefit from their proximity to major markets in the U.S. Northeast, particularly Boston, New York, Philadelphia, and Washington. In contrast, the markets around Greater Vancouver, like Seattle, Portland, and Victoria, are much smaller. Because of Greater Vancouver's small market size, the region has to be even more competitive and productive than its competitors to make up for the fact that major markets are farther away. Indeed, in an open economy like Canada's, businesses can still realize economies of scale through trade with foreign markets.

Greater Vancouver's performance in tourism is in middle of the pack. Vancouver receives just over 1.9 million international visitors annually, about 10 per cent of Hong Kong's and Singapore's total. These two cities each boast over 20 million international visitors per year. As a result, they are both treated as outliers in this indicator. Against this backdrop, Greater Vancouver is ranked 11th and gets a "C" grade. Moving up to a "B" grade seems unlikely for Greater Vancouver; Seoul, the lone "B"-rated metro region, gets 4.3 million visitors per year. Toronto also attracts more international visitors each year than does

[37] Vancouver Economic Commission, *Our Focus.*
[38] Silcoff, "In Vancouver, a Tech Ecosystem Takes Shape."

Greater Vancouver, although it is the only Canadian metro region to do so. Greater Vancouver ranks fifth among the nine North American cities for which data are available.

Greater Vancouver fares slightly better in attracting international association meeting participants. Greater Vancouver is ranked 8th for this indicator and gets a "C" grade. To move up to a "B" would require effort, because Greater Vancouver trails Hong Kong—the only "B"-rated metro region—by roughly a third. It also trails Toronto by 42 per cent, although it edges out Montréal. Still, Greater Vancouver beats such U.S. sun spots as Miami and Los Angeles by wide margins.

The five indicators that assess the health of a metro region's ports and airports suggest that Greater Vancouver does quite well. Among these indicators, Greater Vancouver's best result is in port cargo tonnage, where it ranks third and gets a "B" grade. Still, its GDP-adjusted volumes trail those of second-place Singapore by nearly 40 per cent and exceed fourth-place Shanghai's by only 3 per cent. Greater Vancouver also does relatively well on port container throughput, ranking fifth and earning a "C" grade, although it is far outstripped by the port container throughput of the four regions slotted ahead of it. Rotterdam and Singapore are in a category by themselves, with Shanghai and Hong Kong making up a second tier. Nonetheless, Greater Vancouver is the highest-ranked North American port measured by this indicator.

Greater Vancouver's cruise market also tells a happy story. The region is Canada's most popular cruise ship landing destination, receiving nearly two times as many cruise ships as Halifax, the next ranked Canadian metro area. Greater Vancouver is also the second most popular west coast cruise ship landing spot in North America, receiving only 31 fewer ships than leader Los Angeles in 2014. Despite this strong performance, Greater Vancouver only gets a "C" for this indicator, but that is primarily because of Barcelona's unmatched performances (we removed Miami's even higher number of cruise vessel calls from the grading calculations). Greater Vancouver would have to triple the number of cruise vessel calls to match Barcelona, this indicator's last "A"-rated metro area.

Activity at Greater Vancouver's airport is more middle of the pack. For inbound airline seat capacity per capita, the region ranks 10th and receives a "C" grade. But at 4.9 seats per capita, it is well within striking range of such "B"-rated regions as Houston (5 seats per capita), Hong Kong (5.5), and Sydney (5.5). Moreover, the city's score is higher than that for Toronto and Montréal, its main Canadian competitors. It also ranks above Los Angeles, home to Los Angeles International Airport (LAX)—the fifth busiest airport in the world by passenger traffic. But as our results show, Los Angeles' performance in this indicator is less impressive than Greater Vancouver's in per capita terms.

Finally, Greater Vancouver does slightly better in inbound airport cargo tonnage capacity per million dollars of GDP, coming in ninth place. At 4 tonnes of cargo per million dollars of GDP in 2014, the airport's cargo capacity pales in comparison with such heavyweight air hubs as Manchester, Hong Kong, and Seoul, where GDP-adjusted freight capacity exceeds 10 tonnes. Still, Greater Vancouver is the second-ranked North American metro area measured by this indicator, beating all four airports on the U.S. West Coast.

8. Social

Chapter Summary

- Six metro areas earn "A" grades in the Social category: Barcelona, Copenhagen, Sydney, Portland, Toronto, and Seattle.
- Each of the top six regions has its own strengths that make it socially attractive, although each one tends to be characterized by low homicide rates, good air quality, and many residents employed in cultural occupations.
- Greater Vancouver places seventh, making it the highest "B"-rated region, thanks to a high foreign-born population share, low homicide rate, and good air quality.
- Greater Vancouver's major drawbacks include its poor housing affordability and long commute times.
- The bottom three regions—Miami, Houston, and Shanghai—share some common vulnerabilities: few residents with university degrees, relatively unequal income distributions, and long commute times.

Table 14
Social Rankings and Grades

	Value	*Grade*
Barcelona	0.60	A
Copenhagen	0.57	A
Sydney	0.56	A
Portland	0.54	A
Toronto	0.54	A
Seattle	0.53	A
Greater Vancouver	**0.52**	**B**
Manchester	0.51	B
Montréal	0.51	B
San Francisco	0.51	B
Calgary	0.51	B
Hong Kong	0.49	B
Rotterdam	0.49	B
Seoul	0.49	B
Halifax	0.49	B
Singapore	0.48	B
Los Angeles	0.44	B
Miami	0.42	C
Houston	0.42	C
Shanghai	0.27	D

The Social category contributes to our understanding of how 20 metro areas are performing on 11 measures of a region's socio-economic, environmental, and quality of life attributes. (See Table 15.) These measures underpin a region's ability to lure educated, creative, and diverse people. Such individuals are much in demand to fill metro regions both now and in the future. These people will consider regional quality-of-life attributes, such as those evaluated here, when they choose where to

locate. Such yardsticks include housing affordability, income distribution, the share of cultural workers, and homicides. Transportation issues are assessed by comparing commute times in each area and the proportion of its employed labour force that does not drive an automobile to work. The area's environment is assessed by its air quality, how moderate its temperature is, and how many days of sunshine it typically receives.

There is an important link between the Economy and Social performance categories that needs to be highlighted. A high quality of life can only be sustained by a strong economy that generates the tax revenues needed to pay for a robust social safety net. A strong economic performance is a prerequisite for a strong social one.

Two European metro areas, Barcelona and Copenhagen, are rated the most attractive according to our criteria, earning two of the category's six "A" grades. (See Table 14.) Sydney finishes a strong third. Three North American metro areas—Portland, Toronto, and Seattle—complete the list of the top six "A"-rated jurisdictions. The 11 "B" metro regions are a disparate group that includes six from North America, four of which are Canadian. The two "C"-graded regions are American: Miami and Houston. Shanghai languishes in last place, earning the lone "D" grade.

While European and Canadian regions top the list with "A"s and "B"s, the scores within these two geographic groupings are relatively varied. Among the Canadian CMAs, Toronto, Greater Vancouver, and Montréal rank in the top 10, Calgary places in the middle of the pack, and Halifax disappoints with a 15th place finish. Still, all five CMAs share some common traits. They all tend to have low homicide rates (four "A"s and one "B") and good air quality (all get "A"s). Except for Vancouver, they have decent housing affordability (Greater Vancouver gets a "D," the others "A" or "B"). On a more negative note, they do less well for the proportion of their population aged 25–34 (all get "D"s), that has a university degree ("C"s and "D"s), and that takes non-car transportation to work ("C"s and "D"s). [39]

European metro areas draw much of their strength from having comparatively equal income distributions (three "A"s and one "B"), low homicide rates ("A"s and "B"s), and a good share of their population employed in cultural occupations (one "A" and three "B"s). However, their scores on most other indicators are more mixed.

The six U.S. metropolitan statistical areas (Portland, Seattle, Los Angeles, San Francisco, Houston, and Miami) frequently have high homicide rates, low non-car usage among commuters, and relatively unequal income distributions. Indeed, all three "D"-graded homicide metro areas (San Francisco, Houston, and Miami) are from the U.S., six of the eight "D"-graded "non-car" regions come from that country (all U.S. areas get a "D"), and the three most unequal regions in terms of income distribution are in the U.S. too (San Francisco, Los Angeles, and Miami). Moreover, the unequal income distributions in the United States appear likely to persist. A 2010 report identified much lower intergenerational economic mobility in the United States, largely due to lower mobility at the very top and the very bottom of the earnings distribution. The study also found that the configuration of family, labour

[39] The proportion of the population aged 25–34 is the only indicator in the Social category that is calculated at the city level, rather than the metro level.

market, and public policy investment and support for children placed disadvantaged American children in much more challenging circumstances.[40]

Portland and Seattle, the lone U.S. metro areas to earn an overall "A" grade, offset poor results in foreign-born population, non-car usage, and income distribution with relatively strong performances in other measures: clean air, number of cultural workers, share of the population with a university degree, and climate. San Francisco does well in these measures too, but its overall score is dragged down by relatively poor housing affordability.

The four Asian metro regions (Singapore, Seoul, Hong Kong, and Shanghai) are a diverse group, meriting three "B"s and one "D." Still, some common threads emerge. None has a particularly high proportion of those aged 25–34—data for Shanghai are missing but the other three are graded "D"—or of those born abroad—again all are graded "C" or "D." All Asian metro areas are rated "D" for the proportion of university-educated adults. On the positive side, they can boast very low homicide rates; all regions merit an "A" on this measure. The regions also have high proportions of non-car commuters—all regions get an "A" on this measure too.

Table 15
Social Category Indicators

Indicators
Proportion of population 25 to 34 years old
Proportion of population that is foreign born
Proportion of population, age 25 and over, with at least a bachelor's degree
Proportion of population employed in cultural occupations
Comfortable climate index
Homicide rate
Housing affordability
Travel to work: public transit, walking, and other non-auto commuting
Commuting time of a round trip to work
Income inequality
Air quality

8.1 Who's Best?

Barcelona, our top-ranked metro area in the Social category, is also Spain's second-most populated region, with close to 5 million residents in its metropolitan area. It has long been a major cultural and economic centre in southwestern Europe. One of the region's three "A" grades was awarded for its "comfortable climate index." The Mediterranean-coast region's temperatures are generally moderate, and it rarely sees frost, allowing Barcelona to emerge at the top of this indicator. A low murder rate and a relatively equal income distribution account for Barcelona's two other "A" grades. The region earns "B" grades for the proportion of its adult population that is university educated—it ranks in the top five

[40] Corak, Curtis, and Phipps, "Economic Mobility, Family Background, and the Well-Being of Children."

metro areas on this measure—and for the proportion of its population employed in cultural occupations. On the other hand, Barcelona's relatively low proportion of those aged 25–34 saddles the area with a "D" grade for this measure. Barcelona lacks data for its housing affordability and its proportion of non-car commuters.

Copenhagen is our second-ranked area in the Social category. The ancient capital city is the cultural, economic, and social centre of Denmark. Like Barcelona, it received a total of three "A" grades, starting with the proportion of its population with at least a bachelor's degree (ranked second with nearly 40 per cent of its adult population having a bachelor's degree). This mark is unsurprising, given that Copenhagen boasts at least four post-secondary institutions with at least 10,000 students each and the city is home to a total student population of 90,000. The region also gets "A"s for the proportion of its population employed in cultural occupations (second behind Los Angeles) and for its low homicide rate. Copenhagen's only "D" grade is in the comfortable climate index, an issue it can do little to solve. The region's relatively northern location and position near the Baltic Sea result in unstable and changing weather patterns that contribute to its low grade on this indicator. Copenhagen was missing data for two indicators: housing affordability and travel to work by transit, walking, and other non-auto commuting.

Sydney is our third-ranked metro area in Social performance. One of the region's highest marks is for the proportion of its population that is foreign born. Australia is a country of immigrants, and Sydney is no exception, with four of every ten residents claiming a birthplace abroad. The region also scores an "A" for its good air quality, an indicator in which it trails only Greater Vancouver. But one indicator in particular sets Sydney apart: the proportion of the population aged 25–34. With a third of its population aged 25–34, Sydney is the youngest of the scorecard's 19 comparator regions and earns the lone "A" grade on this indicator. On the downside, the metro area suffers from long commute times and from a low proportion of people with a bachelor's degree among its adult population; both earn it "D" grades.

Portland, our study's highest-ranked U.S. region, ranks fourth overall in the Society category. The region's moderate Pacific Northwest climate earns it an "A" grade in our comfortable climate index, while its good housing affordability and low air pollution also merit "A" grades. On a negative note, Portland receives "D" grades for its low foreign-born population share and its workers' low use of non-car transportation for commuting.

Toronto, the top-ranked Canadian metro area, comes in fifth place. Canada's largest region is a poster child for multiculturalism, featuring the highest proportion of foreign-born residents among the regions in this report. Nearly half of all Torontonians were born outside Canada. The metro area also gets "A" grades for its low homicide rate and its low air pollution. More negatively, Toronto gets "D"s for the low share of its population aged 25–34 and for its lengthy commute times.

Social performance indicators	Definition	Significance	What about Greater Vancouver?	Grades							
Population 25–34 years old # cities ranked: 19 This indicator is at the city level.	The proportion of the population aged 25–34, with 2014 data for Hong Kong and Singapore, 2013 data for Europe, Sydney, and Seoul, and 2011 data for Canada and the U.S.	This age cohort is highly mobile and tends to be well educated. A metro area with a large proportion of this age grouping will be attractive to other young adults and will be better positioned for the future.	One region—Sydney—stands out in the field of 20. With 33.2 per cent of its population aged 25–34, it earns the only "A" grade. Even second-place Copenhagen, with a 23.6 per cent share, has to settle for a "B." The **City of Vancouver** is the Canadian leader in this indicator, ranking 7th. However, it still earns a "D" grade. The results are even more disappointing for the rest of Canadian metro areas, all of which score "D" grades. Housing affordability woes may help explain Vancouver's poor result.	1.	Sydney	33.2	A	11.	Montréal	17.0	D
				2.	Copenhagen	23.6	B	12.	Calgary	16.7	D
				3.	San Francisco	21.0	C	13.	Rotterdam	16.5	D
				4.	Seattle	20.7	C	14.	Toronto	15.8	D
				5.	Manchester	20.5	C	15.	Miami	15.7	D
				6.	Portland	19.5	C	16.	Barcelona	15.4	D
				7.	**Vancouver**	**18.7**	**D**	17.	Hong Kong	15.1	D
				8.	Seoul	17.9	D	18.	Singapore	14.4	D
				9.	Houston	17.6	D	19.	Halifax	13.9	D
				10.	Los Angeles	17.0	D	20.	Shanghai	n.a.	
Immigrant population # metro areas ranked: 19	The proportion of the population who were foreign-born. Data are from 2013 for the U.S, Seoul, and Shanghai, from 2011 for Canada, Europe, Hong Kong, and Sydney, and from 2010 for Singapore.	Immigration is key to boosting the future workforce. Immigrants are attracted to tolerant and diverse metro regions and regions that already boast a large immigrant	**Greater Vancouver** does well on this indicator, landing in 2nd place with an "A" grade, just behind top performer Toronto. Two other Canadian metro areas—Calgary and Montréal—also land in the top 10. At the other end of the spectrum, six regions earn "D" grades, including Asian giants Hong Kong, Seoul, and Shanghai.	1.	Toronto	47.9	A	11.	Seattle	17.4	C
				2.	**Vancouver**	**42.7**	**A**	12.	Barcelona	16.8	C
				3.	Sydney	40.1	A	13.	Copenhagen	13.4	C
				4.	Miami	38.6	A	14.	Portland	12.6	D
				5.	Los Angeles	33.3	B	15.	Manchester	11.8	D
				6.	San Francisco	29.6	B	16.	Halifax	9.8	D
				7.	Calgary	28.5	B	17.	Hong Kong	7.4	D

Social performance indicators	Definition	Significance	What about Greater Vancouver?	Grades							
		population.		8.	Montréal	24.3	C	18.	Seoul	3.9	D
				9.	Singapore	22.8	C	19.	Shanghai	1.2	D
				10.	Houston	22.5	C	20.	Rotterdam	n.a.	
Population with at least a bachelor's degree # metro areas ranked: 20	The percentage of the population aged 25 and over with at least a bachelor's degree, based on 2013 data for the U.S. and Hong Kong, 2011 data for Canada, Europe, and Sydney, 2010 data for Seoul and Singapore, and 2008 data for Shanghai.	Metro areas with a highly educated population are more attractive to other highly educated people.	**Greater Vancouver** ranks 9th among the 20 metropolitan areas, earning a "C" grade, as just under a third of the region's population aged 25 and over holds at least a bachelor's degree. Two regions—San Francisco and Copenhagen—get "A" grades, while Seattle follows closely behind with a "B." The best-performing Canadian metro area is Toronto. However, it earns only a "C." Calgary follows closely behind and also ranks ahead of Vancouver. Montréal struggles on this indicator, earning a "D" grade.	1.	San Francisco	45.9	A	11.	Manchester	30.1	C
				2.	Copenhagen	39.7	A	12.	Halifax	30.0	C
				3.	Seattle	39.4	B	13.	Miami	29.3	C
				4.	Barcelona	37.4	B	14.	Rotterdam	27.3	D
				5.	Portland	35.1	B	15.	Hong Kong	26.8	D
				6.	Toronto	33.1	C	16.	Montréal	26.5	D
				7.	Calgary	32.6	C	17.	Seoul	25.5	D
				8.	Los Angeles	31.7	C	18.	Sydney	24.1	D
				9.	**Vancouver**	**31.1**	**C**	19.	Singapore	23.4	D
				10.	Houston	30.9	C	20.	Shanghai	22.7	D
Cultural occupations*	The proportion of the workforce employed in cultural occupations, based on 2014 data for Canada and the U.S., 2013 data for	This indicator is a proxy for access to culture. A metro area with a high	**Greater Vancouver** receives a "B" and places 10th on this indicator, with 4.7 per cent of its population employed in cultural occupations. Among Canadian	1.	Los Angeles	6.8	A	11.	Miami	4.6	B
				2.	Copenhagen	5.7	A	12.	Seoul	4.4	B
				3.	Hong Kong	5.6	A	13.	Toronto	4.3	B

Social performance indicators	Definition	Significance	What about Greater Vancouver?	Grades							
# metro areas ranked: 20	Hong Kong, Shanghai, and Seoul, 2012 data for Singapore, and 2011 data for Europe and Sydney.	proportion of cultural workers will be better able to attract people seeking "fun" places to live.	CMAs, only Montréal does better. Four regions—Los Angeles, Copenhagen, Hong Kong, and San Francisco—outshine the rest, garnering the only "A" marks. Thirteen other metro areas do well enough to earn a "B," including four Canadian ones—Montréal, Vancouver, Toronto, and Halifax. Calgary is one of two regions to earn a "C."	4. San Francisco 5.4 A 5. Montréal 5.3 B 6. Seattle 5.2 B 7. Portland 5.1 B 8. Sydney 4.9 B 9. Barcelona 4.9 B **10. Vancouver 4.7 B**			14. Rotterdam 4.2 B 15. Manchester 4.0 B 16. Houston 3.8 B 17. Halifax 3.8 B 18. Calgary 3.1 C 19. Singapore 2.7 C 20. Shanghai 0.8 D		
Comfortable climate Index # metro areas ranked: 20	The comfortable climate index is a measure of how far the average maximum temperature strays from 15°C in the winter and from 25°C in the summer, adjusted for hours of sunshine. Data are averaged from 1971 to 2010.	Climate is an important factor in a metro area's attractiveness. Metro areas with mild weather and lots of sunny days score higher.	**Greater Vancouver** is the highest-ranked Canadian metro area on this indicator, coming in 12th place and earning a "B" grade. Calgary (13th), Halifax (14th), and Toronto (15th) are close behind. Not surprisingly, sun spots Barcelona, San Francisco, and Los Angeles occupy the top three spots with "A" grades. Also receiving "A"s are Shanghai, Houston, Portland, and Seoul. Copenhagen is at the bottom of the ranking and the only region to receive a "D."	1. Barcelona 3.3 A 2. San Francisco 4.6 A 3. Los Angeles 5.9 A 4. Shanghai 9.5 A 5. Houston 10.9 A 6. Portland 11.5 A 7. Seoul 11.8 A 8. Miami 12.9 B 9. Sydney 14.1 B 10. Hong Kong 14.6 B			11. Seattle 14.9 B **12. Vancouver 21.6 B** 13. Calgary 21.9 B 14. Halifax 22.9 C 15. Toronto 23.7 C 16. Rotterdam 23.9 C 17. Singapore 24.4 C 18. Manchester 26.3 C 19. Montréal 26.9 C 20. Copenhagen 41.0 D		

Social performance indicators	Definition	Significance	What about Greater Vancouver?	Grades							
Homicide rate # metro areas ranked: 20	The number of homicides per 100,000 people. Data are an average of 2012–2013.	Metro areas with a low homicide rate offer a safe environment, making them more attractive.	With 1.6 homicides per 100,000 people, **Greater Vancouver** ranks in 9th place and earns an "A" grade. Two Asian metro areas—Singapore and Hong Kong—stand at the top of the field, with less than 1 homicide per 100,000 people. Asian tigers Shanghai and Seoul also receive "A" grades. In contrast, U.S. metro areas do poorly, all placing outside the top 10. Even worse, the bottom four ranked regions, including the only three to earn "D" grades, are American.	1. Singapore	0.3	A	11. Portland	1.9	B
				2. Hong Kong	0.6	A	12. Halifax	2.2	B
				3. Montréal	1.1	A	13. Manchester	2.4	B
				4. Shanghai	1.1	A	14. Rotterdam	2.4	B
				5. Copenhagen	1.2	A	15. Seattle	2.5	B
				6. Barcelona	1.2	A	16. Sydney	3.2	B
				7. Toronto	1.4	A	17. Los Angeles	4.7	C
				8. Calgary	1.6	A	18. San Francisco	5.6	D
				9. Vancouver	**1.6**	**A**	19. Houston	5.8	D
				10. Seoul	1.7	A	20. Miami	6.4	D
Travel to work: transit, walking, and other non-auto commuting # metro areas ranked: 17	The proportion of the employed labour force that does not drive to work, based on 2013 data for the U.S. and Seoul, 2011 data for Canada, Europe, Hong Kong, Shanghai, and Sydney, and 2010 data for Singapore: 2010	A metro area with a high proportion of non-car commuters is more sustainable. A region that offers access to good public transit, bike paths, and	Four Asian metro areas—Hong Kong, Seoul, Singapore, and Shanghai—top the list on this indicator, earning "A" grades. **Greater Vancouver** places in the middle of the pack, in 8th place with a "C" grade. U.S. metro areas dominate the lower half of the list, accounting for six of the eight "D"s. Houston ranks last, with only 5.9 per cent of its population not driving a	1. Hong Kong	88.5	A	11. Halifax	22.1	D
				2. Seoul	77.1	A	12. Calgary	21.9	D
				3. Singapore	75.2	A	13. Seattle	15.9	D
				4. Shanghai	74.8	A	14. Portland	14.1	D
				5. Montréal	29.3	C	15. Los Angeles	11.4	D
				6. Toronto	29.0	C	16. Miami	8.2	D
				7. Manchester	28.2	C	17. Houston	5.9	D

Social performance indicators	Definition	Significance	What about Greater Vancouver?	Grades							
		walking paths, will be more attractive.	car when travelling to work.	**8.**	**Vancouver**	**27.8**	**C**	18.	Rotterdam	n.a.	
				9.	Sydney	26.7	C	19.	Copenhagen	n.a.	
				10.	San Francisco	25.7	D	20.	Barcelona	n.a.	
Commuting time # metro areas ranked: 19	Calculated as the average time (in minutes) of a trip to and from work, based on 2015 data for Copenhagen, 2013 data for the U.S., and Hong Kong, 2012 data for Sydney, 2011 data for Canada, Manchester, and Barcelona, 2010 data for Shanghai and Singapore, and 2009 data for Seoul.	The lower the commute time to work, the more attractive the metro area.	Hong Kong dwarfs the competition in this indicator, earning the lone "A" grade. With a 22 minute round-trip commute, Hong Kongers spend less than half as much time commuting to work as do residents of third-place finisher Halifax. **Greater Vancouver** ranks 10th and earns a "C" grade. Still, it places ahead of Montréal (14th) and Toronto (16th)—the lone Canadian metro area with a "D" grade. Two Asian metro regions—Seoul and Shanghai—rank at the bottom.	1.	Hong Kong	22.0	A	11.	Seattle	57.1	C
				2.	Copenhagen	38.0	B	12.	Houston	58.3	C
				3.	Halifax	47.4	B	13.	Los Angeles	58.3	C
				4.	Singapore	50.0	C	14.	Montréal	59.4	C
				5.	Portland	51.5	C	15.	San Francisco	62.2	D
				6.	Barcelona	53.4	C	16.	Toronto	65.6	D
				7.	Calgary	54.0	C	17.	Sydney	66.0	D
				8.	Miami	55.4	C	18.	Seoul	73.0	D
				9.	Manchester	56.0	C	19.	Shanghai[U]	100.8	D
				10.	**Vancouver**	**56.8**	**C**	20.	Rotterdam	n.a.	
Housing affordability # metro areas ranked: 17	The ratio (expressed as a decimal) of the median house price to the gross annual median household income. Metro areas where house prices are higher can perform well if the level of	Housing affordability is a particularly important factor when deciding where to live. However, high	**Greater Vancouver** performs very poorly in this indicator, earning a "D" grade and placing 15th among 17 comparator regions. Only two Asian regions—Shanghai and Hong Kong—finish lower. In contrast,	1.	Houston	3.50	A	11.	Seoul	7.70	B
				2.	Halifax	3.70	A	12.	Los Angeles	8.00	B
				3.	Calgary	4.20	A	13.	San Francisco	9.20	C
				4.	Montréal	4.30	A	14.	Sydney	9.80	C

Social performance indicators	Definition	Significance	What about Greater Vancouver?	Grades								
	income in that metro area is also relatively high. Data are for 2014.	income levels may compensate for high house prices. Regions with affordable housing receive the best grades.	three Canadian metro areas—Halifax, Calgary, and Montréal—rank in the top five and earn "A" grades. The only metro area that surpasses them in rank is Houston. San Francisco and Sydney earn the only "C"s, while Canada's financial capital, Toronto, tops the "B" ratings.	5.	Manchester	4.70	A	**15.**	**Vancouver**	**10.60**	**D**
				6.	Portland	4.80	A	16.	Shanghai	12.80	D
				7.	Singapore	5.00	A	17.	Hong Kong	17.00[U]	D
				8.	Seattle	5.20	A	18.	Copenhagen	n.a.	
				9.	Miami	5.60	A	19.	Rotterdam	n.a.	
				10.	Toronto	6.50	B	20.	Barcelona	n.a.	
Income inequality # metro areas ranked: 20	Income inequality is defined using the Gini coefficient. The Gini coefficient represents the income distribution of a metro area. A Gini coefficient of 0 represents perfect income equality (that is, every person in the society has the same amount of income). A Gini coefficient of 1 represents perfect inequality (that is, one person has all the income and the rest of the society has none). Data are based on 2014, except for Canada and the	The higher the income inequality, the lower the ranking a metro area receives.	European metro areas dominate the field in this indicator, as they earn three out of four "A"s. The only European to not receive an "A" is Copenhagen, which instead gets a "B." **Greater Vancouver** emerges as the Canadian metro with the highest level of income inequality, placing 11th and earning a "C" grade. U.S. metros San Francisco, Los Angeles, and Miami occupy the bottom three spots.	1.	Manchester	0.32	A	**11.**	**Vancouver**	**0.44**	**C**
				2.	Seoul	0.33	A	12.	Portland	0.45	C
				3.	Barcelona	0.35	A	13.	Seattle	0.46	C
				4.	Rotterdam	0.35	A	14.	Singapore	0.46	C
				5.	Sydney	0.39	B	15.	Shanghai	0.47	D
				6.	Copenhagen	0.39	B	16.	Houston	0.49	D
				7.	Halifax	0.39	B	17.	Hong Kong	0.49	D
				8.	Montréal	0.40	B	18.	San Francisco	0.49	D
				9.	Toronto	0.42	C	19.	Los Angeles	0.50	D

Social performance indicators	Definition	Significance	What about Greater Vancouver?	Grades							
	U.S., where data are from 2013.			10.	Calgary	0.43	C	20.	Miami	0.51	D
Air quality # metro areas ranked: 20	Air quality is measured as the average accumulation of fine particulate matter that is 2.5 microns in diameter and less ($PM_{2.5}$). Units are in mg per cubic metre (mg/m^3). Data are for 2012.	High pollution levels may lead to health problems for a region's residents. Metro areas with good air quality are more attractive.	**Greater Vancouver** ranks first, with the best air quality among the 20 comparator regions. In fact, Canadian metro areas establish a high standard when it comes to clean air, with all five receiving "A" grades. At the other end of the spectrum, Los Angeles and three Asian metro regions—Hong Kong, Seoul, and Shanghai—place in the bottom four. However, only Shanghai's air quality is low enough to garner a "D" grade.	**1.**	**Vancouver**	**4**	**A**	11.	Houston	13	B
				2.	Sydney	5	A	12.	Manchester	14	B
				3.	Portland	7	A	13.	Barcelona	16	B
				4.	Toronto	8	A	14.	Singapore	17	B
				5.	Miami	8	A	15.	Copenhagen	17	B
				6.	Halifax	8	A	16.	Rotterdam	17	B
				7.	San Francisco	10	A	17.	Los Angeles	20	B
				8.	Seattle	10	A	18.	Hong Kong	21	C
				9.	Montréal	11	A	19.	Seoul	22	C
				10.	Calgary	11	A	20.	Shanghai	36	D

Sources: Australia Census 2011; Statistics Australia; University of Canberra; Statistics Canada; Statistics Canada Census 2011; National Household Survey 2011; 2013 Canadian Income Survey; U.S. Bureau of Labor Statistics; Moody's Economy.com; American Community Survey; Eurostat; Office for National Statistics; Euromonitor International; Shanghai Statistical Yearbook; Government of Hong Kong; Hong Kong Census; Weather Network; Demographia International; The Economist; World Health Organization; Singapore Ministry of Manpower; Statistics Singapore; Singapore Census 2010; Korean Statistical Information Service; Chemosphere; Elsevier; Statistics Denmark; INRIX.

*Occupational data from the U.S. Bureau of Labor Statistics were partially secure for some metro areas. Data were either missing or not available for various occupational categories. Therefore, the rankings for U.S. metropolitan statistical areas are underestimated.

U The metro area was considered an outlier and was thus removed when calculating the grades.

8.2 Focus on Greater Vancouver's Social Performance

Greater Vancouver's seventh-place ranking and "B" grade in the Social category demonstrates that it is one of the world's most liveable areas but still has some vulnerabilities that need to be addressed. On the scale of zero to one by which we rank the metro regions, its numeric grade is 0.52—that is, 0.08 points or 8 percentage points behind the leader Barcelona and only 1 percentage point behind Seattle, the region ranking immediately ahead of Greater Vancouver and the last "A"-graded metro region in the Social category. Table 16 summarizes the results for Greater Vancouver on all 11 Social indicators.

Table 16
Greater Vancouver's Social Performance

Indicator	*Grade*	*Ranking*
Air quality	A	1 (20)
Proportion of population foreign born	A	2 (19)
Homicide rate	A	9 (20)
Proportion of population employed in cultural occupations	B	10 (20)
Climate	B	12 (20)
Proportion of population with at least a bachelor's degree	C	9 (20)
Non-car commuting	C	8 (17)
Average travel time to and from work	C	10 (19)
Income inequality	C	11 (20)
Proportion of population aged 25–34	D	7 (19)
Housing affordability	D	15 (17)

As befits a mid-ranked metro area, Greater Vancouver earns three "A" grades and two "D" grades, along with two "B" grades and four "C" grades. (See Table 16.) The "A" Greater Vancouver earns for its high proportion of foreign-born residents is actually a mixed blessing. On one hand, immigration is critical to boost the future workforce. A metro area with a high proportion of foreign-born residents can be seen as more diverse and welcoming to newcomers. But in Greater Vancouver, foreign demand is said to underpin large price increases for homes, making the metro area's housing the most pricey and unaffordable in Canada and earning the region a "D" grade. The issue is hotly debated. Some say foreign demand is negligible or confined to high-end houses. Others say foreigners are ubiquitous and boost housing demand across the price spectrum. A lack of data clouds the issue, although many oblique attempts to assess and quantify it, along with casual observation, suggest at least some foreign influence. The "foreign ownership" issue has attracted widespread media attention, and the provincial government announced steps in its 2016 budget to gather data on the citizenship and residence of foreign purchasers. (See box "Greater Vancouver's Poor Housing Affordability" for a more detailed analysis of Greater Vancouver's housing affordability woes.)

Poor housing affordability likely also underpins the City of Vancouver's "D" grade for the low share of 25–34 year olds among its population. The 25–34 age group is held to represent the mobile, educated, and creative core of the talented labour pool. Only 18.7 per cent of the population falls into this age group, leaving the city in seventh spot measured by this indicator and putting it almost 15 percentage points below Sydney, the leader in this indicator. Although the region is geographically attractive, high

housing costs deter some young people from moving there. This could significantly dampen Greater Vancouver's future economic performance, despite the fact that the cost of doing business is relatively low.

Greater Vancouver also gets an "A" for its clean air, an indicator in which it tops all metro areas. This is a big plus for Greater Vancouver because air pollution can be a significant problem for metro regions. The City of Vancouver has ambitious green goals, starting with support for electric vehicles.[41] A 2008 amendment to Vancouver's building bylaw requires 20 per cent of parking spaces in apartments and all parking spaces in houses to support electric vehicles. In 2013, another bylaw amendment stipulated that 10 per cent of parking stalls in mixed-use and commercial buildings must be ready for electric vehicles. The city has also started trials of public charging stations.

Greater Vancouver's final "A" is for its relatively low homicide rate. At 1.6 per 100,000 residents, it is above that in Toronto and Montréal, tied with Calgary and below Halifax among Canadian census metropolitan areas. But it is below that of any U.S. jurisdiction and only a quarter of that in Miami, our report's bottom-ranked area. Like most other regions, Greater Vancouver's homicide rate has fallen significantly during the past 20 years and is roughly half its early-1990s level. [42]

Greater Vancouver also gets a decent grade on its comfortable climate index. Although it ranks only 12th on the list with a "B," it is Canada's top-ranked CMA largely thanks to its mild winters. For instance, between 1981 and 2010, Greater Vancouver's average January temperature was 4.1 degrees Celsius, compared with –5.5 in Toronto.[43] The mild weather that Vancouver enjoys, however, is offset somewhat by fewer sunny days.

Greater Vancouver is working to improve in several areas, including its relatively poor grades in the average travel time to work and the relatively low proportion of its commuters who use public transit. For instance, the provincial government and the regional transit authority TransLink are spending $1.43 billion to extend the SkyTrain service to the region's Tri-Cities. When complete, Greater Vancouver will have the longest fully automated rapid transit system in the world.

However, even further improvements would have been possible if a mail-in referendum had not been soundly defeated by the region's residents last spring. The referendum pitched a new 0.5 per cent "congestion improvement tax" to fund a transportation and transit plan. Passing the initiative would have raised substantial sums, perhaps $7.5 billion over 10 years, for public transit. The plan was overwhelmingly rejected by suburban voters, although even a majority of urban voters voted "no" too. Its failure highlights the need for better regional transit coordination among the different municipalities—maybe even some form of regional government.

The proportion of the adult population with at least a bachelor's degree and the share employed in cultural occupations are two indicators of skill and creativity in the workforce. Greater Vancouver merits

[41] City of Vancouver, *Electric Vehicles*.
[42] Statistics Canada, *Table 253-0004*.
[43] Environment Canada, *Canadian Climate Normals.*

only a “C” grade for bachelor’s degrees, although it gets a “B” for cultural workers. Only 31 per cent of its adults have a bachelor’s degree, well below the 46 per cent figure achieved by indicator-leader San Francisco. Roughly 5 per cent of Greater Vancouver’s population is employed in cultural occupations, while indicator-leader Los Angeles boasts 6.8 per cent.

Finally, the gap in income between rich and poor is frequently seen as a defining issue in the 21st century and Greater Vancouver is only average by this measure, coming in 11th place and rating a “C” score. Its Gini coefficient of 0.44 is the highest of all Canadian CMAs. (A lower Gini coefficient is better—0 means a region’s income is equally distributed, while a score of 1 means one person earns everything and the rest nothing.) However, Canadian leader Halifax does only slightly better at 0.39.

Greater Vancouver's Poor Housing Affordability

Greater Vancouver's housing market is well known for its poor housing affordability. Within Canada, the area's ratio of house prices to per capita incomes is in a class by itself and has been for years. In 2014, this ratio, expressed as a decimal, was 19.5 in Greater Vancouver, compared with 13.4 in Toronto and 6.9 in Halifax.

Debate continues to rage in Greater Vancouver over the extent to which foreign purchasers are responsible for this. Two camps have emerged. One, which includes the B.C. Real Estate Association,[i] believe foreign buyers exert little or no influence. The opposing position is encapsulated in separate work by Andy Yan of University of British Columbia[ii] and David Ley, also of UBC.[iii]

Despite one's current position, what is clear is that more data needs to be collected if the debate is to be settled. On that front, the federal government is allocating $500,000 to Statistics Canada to find better data about foreign property buyers. At the same time, gathering foreign investment data on Canada's housing market remains a top priority for Canada Mortgage and Housing Corporation (CMHC). Although its fall 2015 foreign investor survey indicated that the share of foreign ownership in the Vancouver CMA's condominium apartments was just 3.5 per cent, CMHC admits that these results represent only "one piece of the puzzle of foreign investment in Canada.[iv]

Other factors, of course, account for Greater Vancouver's expensive housing, including its mild climate and proximity to the ocean and mountains. At the same time, the ocean and mountains, along with the U.S. border and agricultural and park lands, act as considerable barriers to spatial expansion and, in turn, housing supply growth.

However, it seems clear to us that outflows of wealth from China have at least some influence on the Greater Vancouver housing market. In previous research on this issue,[v] the Conference Board noted that "standard tests find significant correlations between China's real GDP growth and three important market yardsticks: existing home sales, existing home price growth, and total housing starts. By contrast, local employment growth is significantly correlated to none of these, and the five-year mortgage rate related only to resale variables. This could mean that a substantial proportion of Greater Vancouver real estate purchasers do not need local jobs to buy a home and that many do not need a mortgage to buy a new home. On the other hand, better economic health in China gives its residents wealth to spend on Greater Vancouver housing."

In 2014, GDP growth in China slowed, but the Greater Vancouver housing market strengthened modestly. Indeed, the region's average resale price grew 5.8 per cent that year, up from 5.2 per cent in 2013. This coincided with a pickup in employment growth, a modest easing in the five-year mortgage rate, and a tightening market for existing single-family homes. Still, despite this emergence of local factors in 2014, the broad statistical conclusions we reached in 2013 remain valid. To us, there seems clear evidence that better times in China produce stronger Greater Vancouver housing markets.

Accordingly, that country's moderating growth rate may ultimately prompt an easing of Greater Vancouver's red-hot housing price advances. Just not this year.

This leads to the question about what can be done to alleviate Greater Vancouver's extremely poor affordability. One solution is for price growth to be curtailed. This would require either a reduction in demand for homes or an increase in supply. If foreign demand is the culprit for high prices, this could be reined in by placing restrictions on non-residents' ability to buy homes, an approach that has been attempted by countries like Australia and Denmark. At the same time, housing supply could be boosted by policies that support intensification (building up) and that increase residential land availability (building out). Another possible solution is for there to be significant gains in local incomes.

Unfortunately, these prospects appear daunting in Greater Vancouver's case. To reach the average price-income ratio of this report's other four CMAs, Greater Vancouver house prices would need to be cut in half or local incomes would need to double. Even to match Toronto, its closest comparator, Greater Vancouver's average house price would have to drop by nearly a third or its average incomes would have to rise by 45 per cent.

[i] British Columbia Real Estate Association, *Market Implications of Foreign Buyers*.
[ii] Gold, "New Study: Vancouver Housing Market Fuelled by Chinese Buyers."
[iii] Gold, "Denying Flood of Foreign Money Makes Solving Housing Crisis Even Harder."
[iv] Canada Mortgage and Housing Corporation, *Housing Market Insight—Canada*.
[v] Wiebe, *"Vancouver Housing Markets Cannot Fully Escape the Chinese Dragon."*

9. Greater Vancouver's Economic Outlook

Chapter Summary

- Economic growth in the Greater Vancouver region in 2015 was an estimated 3.4 per cent—the fastest of any major Canadian metro area.
- Greater Vancouver's outlook over the next few years is equally bright, buoyed by a low Canadian dollar and a strengthening U.S. economy—two factors that bode well for exports.
- Still, the region faces challenges that could hamper private investment and discourage workers from migrating there.
- The main challenges include deteriorating housing affordability, land scarcity that could prevent further expansion of trade through Vancouver's port, underinvestment in transit infrastructure, and middling labour productivity growth.

Greater Vancouver is well positioned for continued economic success. In the preceding chapters, we looked at the region's past strong economic growth, leveraged by its proximity to Asia and the competitive advantage of its five key economic clusters. The near-term economic outlook is solid, based on the opportunities available to these same clusters—transportation, financial and insurance services, information and cultural industries, high-tech, tourism, and likely others. But to maximize its potential, Greater Vancouver needs to address the many issues that are hurting its attractiveness to private investment and people—issues that were revealed in the benchmarking analysis.

9.1 Poised for Success

Greater Vancouver's economy advanced by an estimated 3.4 per cent in 2015, the strongest growth among all major Canadian metro areas. The outlook over the next few years for both British Columbia and Greater Vancouver is bright, even though risks remain. The domestic economy is being bolstered by the effects of buoyant housing markets, propped up, to an uncertain extent, by the effects of foreign buying. Solid employment growth and a surge in tourism are adding to the strength in the domestic economy. Indeed, the services sector outlook is very positive, as strength is expected to persist in many of the same industries that have been posting healthy growth in recent years.

The manufacturing sector did better in 2015 than in recent years, and the strength should continue, thanks to a weaker Canadian dollar and a healthy U.S. economy, which have brightened the export picture. Manufacturing also got a boost from the start of production last year on an $8-billion contract to build non-combat ships for the federal government at Seaspan's North Vancouver site—as production ramps up, this will continue to add to the strength in manufacturing.

The rising demand for goods, both at home and abroad, will provide a solid base for growth in the transportation and warehousing sector. Data through the first half of 2015 showed that British Columbia saw gains across a wide range of exports, including aircraft, motor vehicles, and machinery and equipment. Provincial exports have been doing well. In fact, B.C.'s export volumes to the United States, B.C.'s main trading partner, grew by an average of 6.8 per cent per year between 2010 and 2014.

Fortunately, this trend is expected to continue, again thanks to a low Canadian dollar, which makes exported goods cheaper, and a healthy U.S. economy. On the other hand, B.C.'s trade with Asia stagnated in 2014. With ongoing concerns about slowing Chinese growth, B.C.'s export volumes with Asia in the near term are unlikely to exhibit the pace of growth recorded prior to 2014 (B.C.'s export volumes to Asia climbed by 6.5 per cent per year from 2005 to 2013). However, over the longer term, the Trans-Pacific Partnership trade agreement, if ratified, could help boost exports. (See box "Region's Long-Term Outlook Buoyed by Trans-Pacific Partnership.")

Over the longer term, Greater Vancouver and British Columbia are challenged by a slower rate of population growth and the aging of the population. Provincial population growth is expected to average 1 per cent per year over the next 20 years as total population increases from 4.68 million in 2015 to 5.74 million in 2035. This marks a significant deceleration in the historical rate of population growth for the province and will result in B.C. having the slowest population growth west of Quebec over the next two decades.

The aging of the huge baby-boom generation (those aged between 50 and 69 years old in 2016) is expected to dramatically alter the province's population age profile in coming years. The age distribution of the population will become increasingly skewed toward the older cohorts as the share of those 65 and over climbs from 17.5 per cent in 2015 to 26.6 per cent 2035.

An aging population, combined with a marked reduction in the number of births, will lead to a decline in the province's natural rate of increase (defined as the number of births minus the number of deaths). Though advances in medical technology will extend life expectancy, an increasingly large senior population will ultimately lead to a rising death rate. The annual number of deaths in the province is expected to climb much faster than the number of births over the next two decades. This will eventually result in a negative natural increase in the population.

Finally, women now in their prime child-bearing years will be replaced by a smaller cohort. The problem posed by a shrinking population of women of child-bearing age will be amplified by British Columbia's low fertility rate (the average number of children born to a woman during her lifetime). At 1.43, B.C. has the lowest fertility rate in all of Canada. More importantly, the province's fertility rate is significantly below the standard replacement rate of 2.1. With a smaller cohort of women having fewer babies, the natural rate of population increase will decelerate over the forecast, as growth in the number of deaths will be greater than growth in the number of births.

As a result, population growth will come predominately from immigration. But even with rising immigration, the rate of population increases will slow, meaning that B.C.'s potential output growth, and thus Greater Vancouver's, will also slow. Although, along with Alberta and Ontario, British Columbia is expected to post strong economic growth over the long term, real GDP growth is expected to average only around 2 per cent per year from 2021 to 2035. Therefore, the aging population poses a dual challenge for the province—slower economic growth will limit government revenues, while an aging population continues to place upward pressure on health care budgets.

Region's Long-Term Outlook Buoyed by Trans-Pacific Partnership

Greater Vancouver's long-term outlook brightened significantly when 12 Pacific Rim countries, including Canada, signed the Trans-Pacific Partnership (TPP) trade agreement on February 4, 2016. The TPP, which has been under negotiation since 2011, is a comprehensive agreement on issues of economic policy, including the reduction or elimination of tariffs and trade barriers, changes to labour and environmental laws, and investor-state dispute settlement. Along with Canada, the other signatories are Brunei, Chile, New Zealand, and Singapore (members of the original Trans-Pacific Strategic Economic Partnership Agreement, of which the TPP is an extension), as well as Australia, Japan, Malaysia, Mexico, Peru, Vietnam, and the United States.

While a number of interest groups, such as environmentalists, farmers, and labour groups, have been protesting the treaty, partly because of the secrecy of negotiations but also because of its potential impact on their industries due to increased competition from higher imports, the agreement has now been signed. However it still requires ratification by the countries involved before going into effect.

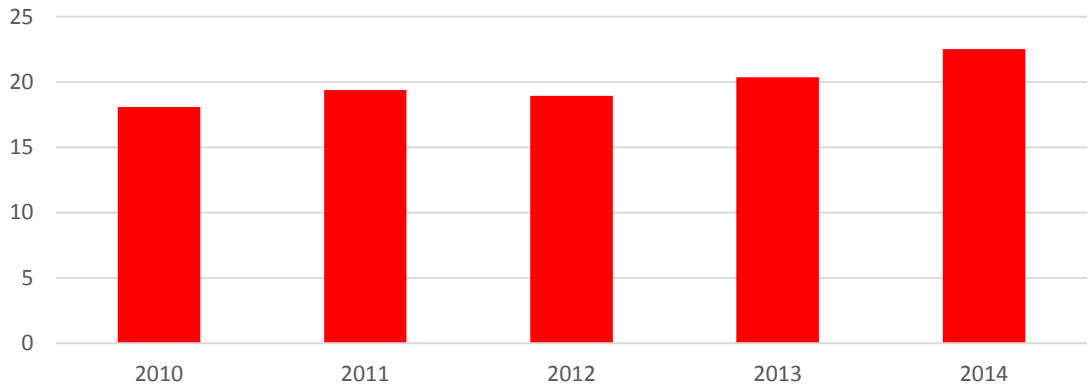
Unfortunately, there has not been enough time to fully determine what the TPP's precise impact will be on the Canadian economy in general and on the B.C. and Greater Vancouver economies in particular. That said, the impact for Greater Vancouver and B.C. should be significant, given that tariffs will be eliminated on almost all of B.C.'s key exports. Moreover, the province will now have preferential and duty-free market access on most industrial goods (e.g., steel and iron products), on fish and seafood products, agriculture and agri-food products, and wood and forestry products. The TPP also allows for improved market access commitments for temporary entry of highly skilled Canadian business people, access for service suppliers in key sectors, and predictable, non-discriminatory rules for Canadian investors.[vi]

The dollar amount of goods exported from British Columbia to countries in the TPP topped $22 billion in 2014. (See Chart 12.) This represented almost two-thirds of the province's international exports. A little more than 16 per cent of these exports went to Japan alone. Indeed, the inclusion of Japan in this trade deal is especially important for Greater Vancouver given Japan's status as the third biggest economy in the world.[vii]

Chart 12

B.C. Exports to TPP Countries

(C$ billions)



Source: Global Affairs Canada.

[vi] Global Affairs Canada, *Advantages of the Trans-Pacific Partnership Agreement.*
[vii] Hoekstra and Carman, "B.C. Expected to Gain in Trans-Pacific Partnership Trade Pact."

9.2 Challenges Remain

As the benchmarking analysis shows, Greater Vancouver is not without challenges that could act as headwinds to economic growth if they are not addressed. We focus on seven key challenges.

Challenge 1: Lack of Investment in Public Transit and Roads

Long commute times are adding to Greater Vancouver's difficulties in attracting high-end talent. Although significant investments have been poured into local ports and the airport to facilitate the movement of goods and to boost trade, just as important to the health of an economy is the movement of people. The benchmarking analysis shows that Greater Vancouver's performance in this area is relatively poor—it gets "C" grades for the average commute time to and from work and for the proportion of the workforce that non-car commutes. Therefore, cementing Greater Vancouver's status as a Canadian economic leader requires a commitment to invest in its roads and public transit infrastructure. Indeed, infrastructure investment has been shown to influence private sector competitiveness, especially if it involves reducing commute times for employees and for trucking goods throughout the region. This link is evidenced in Statistics Canada's finding that a one-dollar increase in the net public capital stock generates approximately 17 cents in average private sector cost savings.[44] In this regard, the Mayors' Council 10-year Vision for Metro Vancouver and the provincial government's 10-year B.C. on the Move plan are steps in the right direction. But a funding solution for these critical plans remains elusive.

Challenge 2: Housing Affordability

One major challenge that presents one of the biggest concern to the region's attractiveness is the deteriorating affordability of housing. Elevated home prices limit the region's attractiveness to younger people who represent its future. Affordability is a major barrier to retaining and attracting talent and could therefore hinder business investment. Concerns have been raised that foreign investment is a key factor behind skyrocketing home prices, but data to study such claims are lacking because foreign purchases of real estate have not been officially tracked. Lack of available land for new residential development is another key factor behind rising home prices. This will be a difficult issue to resolve, given that the region is bordered by the Pacific Ocean to the west, the North Shore Mountains to the north, the U.S. border to the south, and the Agricultural Land Reserve to the east.

Challenge 3: Land Scarcity for Enabling Trade

The importance of the transportation sector to Greater Vancouver economic vitality is a recurring theme throughout this report. The Port of Vancouver has continually been upgraded and expanded to manage growing Canadian trade with Asia, but further investments could be hindered by land scarcity and local opposition. Indeed, the supply of vacant land suitable for trade and goods movement could be exhausted within 10 years, based on the inventory of trade-enabling industrial land.[45] This will be a difficult issue to resolve, given that the region is bordered by the Pacific Ocean to the west, the North

[44] Gu and MacDonald, *The Impact of Public Infrastructure on Canadian Multifactor Productivity Estimates*, 15.
[45] Site Economics Ltd., *The Industrial Land Market and Trade Growth in Metro Vancouver*.

Shore Mountains to the north, the U.S. border to the south, and the Agricultural Land Reserve to the east. Moreover, high house prices and general lot scarcity are giving developers strong incentives to find buildable land anywhere. Waterfront locations, obviously, are especially desirable, even more so when they are near downtown. Land around Vancouver's port could be a particular target of developers. And, if a few multi-family residential projects spring up there, more could follow, since the newly arrived residents may then object to being surrounded by warehouses and industry. This could conflict with Greater Vancouver's role as a burgeoning gateway to Asia and the jobs and wealth this trade creates. Denied nearby storage space, companies might seek other ports to move their goods.

Challenge 4: Low Productivity Levels

Greater Vancouver suffers from relatively low levels of labour productivity, although its recent performance on labour productivity growth is encouraging. Labour productivity is an important determinant of a region's per capita income. Indeed, an economy that can produce more output with the same amount of inputs will generate more wealth for its citizens. Increases in labour productivity may also lead to higher tax revenues for governments, allowing them to offer their citizens more services.

Greater Vancouver can claim to be one of the best North American metro areas when it comes to labour productivity growth. With 1.4 per cent growth between 2009 and 2013, Greater Vancouver ranks behind only Portland and Houston, earning a "B" grade. But Greater Vancouver disappoints with a "C" grade when it comes to its productivity level. Indeed, at US$73,600 in output per worker, Greater Vancouver's productivity level is the third lowest in North America. This suggests that goods and services might be produced in more efficient ways—more could be produced with the same amount of worker effort—allowing for improved income and prosperity.

Productivity levels may also be affected by a region's natural endowments—Calgary's high labour productivity level largely stems from the fact that it is in a province flush with oil. Better to compare with San Francisco, which ranks ahead of Calgary in labour productivity levels likely because of its ability to transform research into commercial intellectual property. San Francisco—the home of Silicon Valley—has developed a world-leading innovation and start-up ecosystem that has driven its productivity to very high levels. (For more information of British Columbia's innovation performance, see box "British Columbia's Mixed Innovation Performance.")

British Columbia's Mixed Innovation Performance

To boost its productivity levels, Greater Vancouver could look for ways to improve its innovation performance. The Conference Board of Canada defines innovation as a process through which economic or social value is extracted from knowledge—through the creating, diffusing, and transforming of ideas—to produce new or improved products, services, processes, strategies, or capabilities.

Recent Conference Board research shows that B.C.'s innovation performance is mixed. British Columbia ranks highly on entrepreneurial ambition—the proportion of the population aged 18–64 who report

early-stage entrepreneurial activity, including attempts to establish, or own and manage, a new business. With 17 per cent of respondents reporting early-stage entrepreneurial activity, B.C. is the second-highest-ranking Canadian province in terms of entrepreneurial ambition (only Alberta surpasses it). B.C. also earns relatively high marks for its enterprise entry rate—a measure of the number of new businesses as a per cent of the number of active (i.e., entrant + incumbent) businesses in a given year.

On the other hand, B.C. lags on ICT investment (investment in software, IT equipment, and communications equipment) and on R&D spending by government and higher education, with public R&D spending in B.C. accounting for only 0.62 per cent of GDP, well below the 1.62 per cent spent in top-performer Nova Scotia. B.C.'s worst performance comes in business enterprise R&D (BERD). BERD as a share of GDP is only 0.7 per cent in B.C., well below the 1.91 per cent spent by firms in the United States. Although R&D is not a direct measure of innovation performance—because such investments can be poorly selected and results are not guaranteed—the development of new or improved products, processes, and services frequently requires R&D efforts. Moreover, research shows that R&D is associated with productivity and GDP growth. A multi-country study by the OECD found that a "sustained increase of 0.1 percentage points in a nation's BERD to GDP ratio would eventually translate to a 1.2 per cent higher GDP per capita, other things being equal."[viii] Thus, BERD provides a useful, albeit partial and imperfect, proxy for business innovation performance

[viii] Expert Panel on Business Innovation, *Innovation and Business Strategy: Why Canada Falls Short*, 50.

Challenge 5: Room to Improve on Educational Attainment Rates

To boost its labour productivity levels, Greater Vancouver could put greater emphasis on advanced educational attainment, as a fully employed, highly educated, and highly skilled workforce will invariably generate higher incomes. Greater Vancouver boasts many post-secondary institutions that draw students from outside the province and the country. Post-secondary institutions also funnel graduating students into the private sector, as many who study in Vancouver choose to work in the region or elsewhere in B.C. after completing their degrees. Given that employment prospects have become increasingly tied to possessing more education, thanks to the rise of the knowledge economy, regions with high-quality post-secondary educational institutions have an advantage over those without them. However, despite its many post-secondary institutions, Greater Vancouver earns only a "C" grade in terms of its population 25 or over with a bachelor's degree or higher. The region may also be disadvantaged on this benchmark by its greyer population—since educational attainments rates have generally increased over time, older generations generally have lower educational attainment—but more work needs to be done to isolate this factor.

Greater Vancouver would do well to lift the skills and education of its Aboriginal citizens. In 2011, the region was home to 52,375 people of Aboriginal identity. Although they only account for a little over 2 per cent of the total population, they are one of Vancouver's fastest-growing cohorts. Indeed, Vancouver's Aboriginal population increased by 30 per cent between 2006 and 2011, compared with 8.3 per cent growth for the non-Aboriginal population.

But for Greater Vancouver to tap into the full potential of its Aboriginal population, educational attainment rates—a key driver of labour market participation—would need to improve. In 2011, nearly one in five Aboriginal people between the ages of 25 and 64 in Greater Vancouver had less than a high school education, compared with less than one in ten non-Aboriginal people. The gap in university attainment was particularly wide—only 14 per cent of Aboriginal people had at least a bachelor's degree in 2011, compared with 34.5 per cent of non-Aboriginal people. Given this wide gap, it is not surprising that the Aboriginal population suffers from above-average unemployment rates and below-average incomes. Improving the Aboriginal population's educational attainment rates would not only improve their economic well-being but have the added benefit of lifting the region's employment rates and the region's economic potential.

Challenge 6: High Marginal Tax Rates on Capital for Businesses

Fundamental to productivity growth and competitiveness is a system of fiscal and tax incentives that promotes efficiency and fosters the entrepreneurship that will result in a growing and innovative economy. Unfortunately, Greater Vancouver's performance is mixed on tax competitiveness. True, it earns an "A" on the total tax index, which is a measure of the total corporate taxes paid expressed as a percentage of total taxes paid by corporations in the United States. Greater Vancouver's success on this measure is in great part thanks to Canada having much lower statutory labour costs (payroll-based taxes) than the United States.

But British Columbia ranks as the second least competitive tax jurisdiction for capital investment in Canada.[46] This is Greater Vancouver's sixth challenge to its competitiveness. At 27.5 per cent, its marginal effective tax rate on capital investment for businesses is over 3 percentage points higher than that of eight of the ten Canadian provinces. (See Table 17.) Only Manitoba performs slightly worse, while Saskatchewan also ranks near the bottom.

Table 17
Marginal Effective Tax Rate on Capital Investment for Businesses, 2014

Province	Marginal effective tax rate
New Brunswick	4.8
Newfoundland	10.7
Prince Edward Island	11.4
Nova Scotia	13.4
Quebec	15.9
Alberta	17.0
Ontario	18.2
Saskatchewan	24.3
British Columbia	**27.5**
Manitoba	27.9
Canada	19.0

Source: D. Chen and J.M. Mintz, *The 2014 Global Tax Competitiveness Report: A Proposed Business Tax Reform Agenda*.

There is a simple explanation for British Columbia's, Manitoba's, and Saskatchewan's status as outliers in tax competitiveness. They are the only three Canadian provinces that still levy an unharmonized retail sales tax, while most of the remaining provinces have moved to a value-added consumption tax system by harmonizing their sales tax with the federal GST. (Alberta has no sales tax.) The problem with retail sales taxes—or cascading sales taxes—is that they are levied on many products that are used as inputs in the production of other goods, resulting in higher effective tax rates on the final goods. This stands in stark contrast to value-added taxes, which are levied on the sale of final goods. Firms receive a tax refund for the taxes paid by their suppliers—avoiding taxing intermediate goods used as business inputs. In effect, an unharmonized retail sales tax results in a significant tax on capital investments.

Challenge 7: Attracting Head Offices

Head office activity is an important measure in evaluating a region's attractiveness to businesses. In particular, attracting head offices provides well-paying jobs and can stimulate local business investment. Data from Statistics Canada (see Table 18) reveal that Greater Vancouver had 242 head offices in 2013, ranking far behind Toronto and Montréal, and only slightly ahead of Calgary—perhaps disappointing given that Calgary has one million fewer residents. Put another way, Greater Vancouver had 99 head

[46] Chen and Mintz, *The 2014 Global Tax Competitiveness Report: A Proposed Business Tax Reform Agenda*, 6.

offices per 1 million people, while Calgary had 159 and Toronto had 118. Results for employment per head office offer even more sobering news. With an average of only 61.32 employees per head office, Greater Vancouver ranks far behind Toronto, Montréal, and Calgary—all three have over 100 employees per head office on average. Calgary led way in 2013, but its average head office employment has likely dropped since then as a result of the dramatic decline in oil prices.

But given that Greater Vancouver is already home to almost all of the head offices of large B.C.-based corporations—including mining, forestry, and energy companies whose business assets are located in other parts of the province—any additional head offices would have to come from Greater Vancouver attracting those of out-of-province (or out-of-country) companies. An important step in this direction was taken in early 2015 with the creation of HQ Vancouver—an investment partnership between the Government of Canada, the province of British Columbia, and the Business Council of British Columbia aimed at luring Asian businesses into relocating their head offices to Vancouver. HQ Vancouver has had early success in attracting headquarters to relocate, including Aikang Capital Inc. and Sony Pictures Imageworks.

Table 18
Number of Head Offices and Head Office Employment, 2013

	Number of head offices	Head office employment	Average number of employees per head office	Head offices per capita
Toronto	702	73,919	105.30	118
Montréal	392	41,171	105.03	98
Calgary	216	31,922	147.79	159
Vancouver	**242**	**14,840**	**61.32**	**99**

Source: Statistics Canada.

9.3 Regional Approach Needed to Address Challenges

Addressing these challenges will be extremely difficult, given their complexity and the local government fragmentation within Greater Vancouver.

Regions are the new unit of economic organization, and the business community must play a key role in their development. Cities and municipalities are becoming increasingly important players in our economy. However, it isn't necessarily the municipality that has created this new economic focus—it is the region. Only regional thinking can tackle the social and economic challenges facing Greater Vancouver and ensure our global competitiveness.

Moreover, many of these challenges are interconnected, so they would need to be addressed simultaneously. They also tend to be regional in scope and could not be successfully addressed without the partnership of Metro Vancouver, the province, First Nations and the federal government.

A key cause of these challenges is division between regional stakeholders. Therefore, a prerequisite for successfully addressing these challenges would be greater regional co-ordination among the municipalities that make up Greater Vancouver. For example, poor transit infrastructure and low productivity levels are not problems that are specific to a single municipality— they affect the entire Greater Vancouver region. Having many governments in a single metropolitan area naturally creates competition for limited resources.

If municipalities compete without strategic cooperation, economic growth is limited and slow. However, if cities choose to work together to leverage their unique economic traits across a region, their growth can be compounded, resulting in a robust regional economy. Studies have shown that economic growth in urban centres and surrounding suburbs are positively correlated. Local governments in metropolitan areas need to work together to maximize benefits in our region. When local governments have to protect themselves from each other, the whole region suffers. When trust and cooperation thrive internally, the region pulls together and grows stronger as a result. In places where regional economic development has been extraordinarily successful, cooperation has been led by the private sector.

Greater Vancouver is just beginning to scratch the surface of what it means to work as a region. While a regional district system that brings together local governments has been in place since the 1960s, there is still limited co-operation that takes place outside of long-established service agreements. The municipalities in the Greater Vancouver region still act individually when lobbying provincial and federal governments and then compete internally for development instead of leveraging the successes of their neighbours. The municipalities should act as a unified external voice and work together internally. Two recent examples of successful cooperation include the 2010 Winter and Olympics and the unprecedented agreement among the region's mayors in 2015 on the Mayors' Council Plan on regional transportation investments. While these milestones add momentum to regional co-operation in Greater Vancouver, there is still much work to be done to maximize our regional economy. There are hopeful signs in recent efforts by the regional mayors to pursue this work.

When a coordinated approach to economic development planning is undertaken, the odds of success are increased. The formation of a regional economic development agency may be a good first step to facilitate regional cooperation. Such an agency would bring together key stakeholders from across the region and from across all spectrums of Greater Vancouver's economy—government, private sector, and academia—and facilitate dialogue among them. Such an agency would help the region take a coordinated approach to economic development planning, increasing the odds of success. It could focus its attention on areas such as regional land planning and trade-enabling land protection.

Greater co-operation allows the region to present a united face to the rest of the world. Instead of competing for foreign investment dollars, jointly pursuing investment attraction opportunities together would not only increase the chances of success, but it would also greatly reduce duplication of effort and resources. Not only would regional cooperation increase the chances that these issues will be resolved, it would also allow the Greater Vancouver metro region to better leverage its competitive strengths. Organizations like the Greater Vancouver Economic Partnership, the Greater Vancouver Economic Council, and Metro Vancouver Commerce are all notable examples of efforts to better align

the region economically. Unfortunately, these efforts did not bear much fruit as all of these agencies were disbanded within two to three years of their creation, mostly due to a lack of buy-in from stakeholders.

Leadership should not have to be solely the responsibility of government to facilitate regional collaboration. Future success will require a long-term commitment from a broad spectrum of regional stakeholders—senior levels of government, private sector, and academia—to better coordinate economic development. Stakeholders from across all spectrums of Greater Vancouver's economy have a role to play in leading cooperative efforts.

10. Conclusion

Chapter Summary

- This report provides a comprehensive overview of Greater Vancouver's performance relative to 19 international metropolises on key economic and social indicators.
- The overall results of the scorecard offer mixed news for Greater Vancouver—the region places in 9th place in a ranking of 20 global metro regions.
- Even though Greater Vancouver's economic prospects are solid, challenges remain that, if not addressed, could act as headwinds to growth.

This report provides a comprehensive overview of Greater Vancouver's performance in relation to 19 international metropolises on key economic and social indicators. We benchmarked the features that make these cities attractive to businesses and skilled workers, thereby revealing Greater Vancouver's relative competitive strengths and weaknesses.

The overall results of the scorecard offer mixed news for Greater Vancouver—the region places in 9th place in a ranking of 20 global metro regions. Nevertheless, poor performances on certain indicators should serve as a warning against being complacent. The region still faces significant challenges to remain competitive in the race for knowledgeable and mobile talent and to maintain its economic vitality. The race to attract highly skilled talent is increasingly important as the baby-boom generation begins to exit the workforce.

These conclusions are achieved by ranking of indicators in two categories, Economy and Social, and comparing Greater Vancouver's data with that of 19 other international regional municipalities. Greater Vancouver ranks 9th overall, although it trails overall leader Singapore by a significant margin and Canadian counterpart Calgary by lesser scores. It does come ahead of Toronto, Montréal, and Halifax.

Greater Vancouver ranks 7th in the Social category, earning a "B" grade because of its clean air, its low homicide rate, and its relatively large foreign-born population. The metro region could have scored higher were it not for its low portion of 25–34 year olds and its very poor housing affordability. The two seem linked, since younger people find relocating to Greater Vancouver financially daunting. The metro region is working to improve mediocre scores in its average travel time to work and proportion of commuters who use public transportation by spending $1.4 billion to extend the SkyTrain service. But last year's failed referendum on a congestion improvement tax to fund a transportation and transit plan highlights the need for better regional transit coordination among area municipalities.

Greater Vancouver ranks in 9th place and earns a "B" grade in the Economy category. Areas that hold it back in this category include relatively weak venture capital investment (although it leads all Canadian cities), low levels of labour productivity, and high marginal tax rates on capital for businesses. Greater Vancouver also needs to boost its attractiveness to foreign visitors and international associations, where its rank is merely average. In particular, however, the evolution of the city's productivity bears scrutiny, as this is an important underpinning of future prosperity. It could look to highly ranked non-petroleum cities like San Francisco, Sydney, and Seattle for direction. Still, we think the metro region has some good economic cards to play. Its five-year average growth rates for real GDP per capita and after-tax

income were fairly solid by North American standards. Moreover, Greater Vancouver boasts affordable office rents and healthy activity at its port and airport, reinforcing the view that the transportation sector is a major component of the region's economy and should remain a key priority area for policymakers.

The proposed Trans-Pacific Partnership among 12 Pacific Rim countries could brighten Greater Vancouver's long-term economic outlook. The deal addresses various trade impediments, labour and environmental laws, and investor-state dispute settlement. Assuming legislative approval by the deal's signatories, local benefits would include foreign tariff elimination on key British Columbia exports, including steel and iron, fish and seafood, agriculture and agri-food, and wood and forestry products. The deal would also facilitate temporary foreign entry for Canadian business people, smooth the way for many service suppliers, and set clear rules for Canadian investors.

This report's cluster analysis confirms that the transportation sector is one of five key traded clusters in Greater Vancouver. Here the future is relatively bright, mainly thanks to the area's role in facilitating Canada's increasing trade exposure to the dynamic Pacific Rim. While many Asian economies are slowing, the region should remain an important global economic driver. However, taking full advantage of this opportunity requires a supply of vacant land suitable for trade and goods movement, and Greater Vancouver may have as little as a 10-year supply. Other local clusters revealed by the analysis are tourism, information and culture, high-tech, and finance and insurance.

Despite some of the challenges and concerns raised by the scorecard results, local economic growth has exceeded 3 per cent in four of the last five years, putting Greater Vancouver among Canada's best-performing metro economies since 2010. Fortunately, the positive momentum is expected to continue over the next few years.

But even though the region's economic prospects are solid, challenges remain that, if not addressed, could act as headwinds to growth. The regional scope of these challenges demands coordinated action from all municipalities that make up Greater Vancouver. Failure to address some of the challenges raised by the benchmarking results, such as deteriorating housing affordability, low labour productivity levels, and inadequate investment in infrastructure, could have serious repercussions. They could prevent the region from fully cashing in on the benefits of being a transportation gateway. They could also deter talented people and business investment—both crucial ingredients for success in an increasingly globalized and competitive world.

Appendix 1: Greater Vancouver's Largest Companies

According to the Financial Post 500, 91 of Canada's 800 largest corporate head offices are headquartered in Greater Vancouver. Among these 91 firms, one-third of them operate in the natural resources sector. This highlights the significance of natural resources to B.C.'s and Greater Vancouver's economies. More specifically, 17 are metal and mining companies, 10 are gold mining companies, and 8 are paper and forestry product companies. Seven of the 91 companies operate in specialty retailing, while another seven operate in the transportation or courier industry. An example of a locally based specialty retailer is lululemon athletica, while an example of a transportation or courier company is CHC Group Ltd. The remaining Greater Vancouver-based companies operate in a variety of different industries.

Table A1

Top 800 Companies: 91 Headquartered in Greater Vancouver, Ranked by Revenue

Rank by revenue	Company	Industry code
38	TELUS Corp.	Telecommunication
57	Teck Resources Ltd.	Metal and mining
59	The Jim Pattison Group	Conglomerate
71	Finning International Inc.	Wholesalers/distributors
85	British Columbia Hydro and Power Authority	Gas/electrical utilities, pipelines
92	Insurance Corp. of British Columbia	Property and casualty insurance
100	Best Buy Canada Ltd.	Specialty retailing
107	Westcoast Energy Inc.	Gas/electrical utilities, pipelines
112	West Fraser Timber Co. Ltd.	Paper and forest products
118	First Quantum Minerals Ltd.	Metal and mining
119	Goldcorp Inc.	Gold mining
127	Methanex Corp.	Chemicals and fertilizers
135	Canfor Corp.	Paper and forest products
141	The Ledcor Group of Companies	Engineering and construction
156	HSBC Bank Canada	Banks
157	Workers' Compensation Board of British Columbia	Services (general)
159	Lions Gate Entertainment Corp.	Entertainment
160	British Columbia Liquor Distribution Branch	Specialty retailing
195	MacDonald, Dettwiler and Associates Ltd.	High-tech manufacturing
206	lululemon athletica inc.	Specialty retailing
218	CHC Group Ltd.	Transportation/couriers
222	Turquoise Hill Resources Ltd.	Metal and mining
238	Univar Canada Ltd.	Wholesalers/distributors
242	GLENTEL Inc.	Specialty retailing
251	MFC Industrial Ltd.	Finance
256	Interfor Corp.	Paper and forest products
269	The Futura Corp.	Finance

278	Mercer International Inc.	Paper and forest products
286	Premium Brands Holdings Corp.	Food manufacturing and processing
298	Taiga Building Products Ltd.	Wholesalers/distributors
303	Eldorado Gold Corp.	Gold mining
304	KGHM International Ltd.	Metal and mining
311	Catalyst Paper Corp.	Paper and forest products
326	Western Forest Products Inc.	Paper and forest products
358	Canaccord Genuity Group Inc.	Finance
367	Marubeni Canada Ltd.	Wholesalers/distributors
369	Pan American Silver Corp.	Metal and mining
372	New Gold Inc.	Gold mining
377	CanWel Building Materials Group Ltd.	Wholesalers/distributors
381	The Oppenheimer Group	Food distributors
383	Vancouver City Savings Credit Union	Credit unions
386	Capstone Mining Corp.	Metal and mining
396	Silver Wheaton Corp.	Metal and mining
419	Endeavour Mining Corp.	Gold mining
423	Sierra Wireless, Inc.	High-tech manufacturing
433	Nevsun Resources Ltd.	Metal and mining
441	South Coast British Columbia Transportation Authority	Transportation/couriers
451	Ritchie Bros. Auctioneers Incorporated	Services (general)
455	B2Gold Corp.	Gold mining
475	Coast Capital Savings Credit Union	Credit unions
487	Vancouver Airport Authority	Transportation/couriers
491	Seaspan ULC	Transportation/couriers
494	Hardwoods Distribution Inc.	Wholesalers/distributors
501	Great Canadian Gaming Corp.	Entertainment
503	OpenRoad Auto Group Ltd.	Specialty retailing
530	WesternOne Inc.	Engineering and construction
532	Taseko Mines Ltd.	Metal and mining
535	Migao Corp.	Chemicals and fertilizers
546	Conifex Timber Inc.	Paper and forest products
550	Raymond James Ltd.	Finance
559	Silver Standard Resources Inc.	Metal and mining
564	Mountain Equipment Co-operative	Specialty retailing
573	Central 1 Credit Union	Credit unions
577	Westshore Terminals Investment Corp.	Transportation/couriers
581	China Gold International Resources Corp. Ltd.	Gold mining
592	First Majestic Silver Corp.	Metal and mining
593	Rio Alto Mining Ltd.	Gold mining
605	VersaCold International Corp.	Transportation/couriers
612	Fortress Paper Ltd.	Paper and forest products
620	Avigilon Corp.	High-tech manufacturing

627	Copper Mountain Mining Corp.	Metal and mining
629	Lucara Diamond Corp.	Metal and mining
632	Whistler Blackcomb Holdings Inc.	Services (general)
640	Glacier Media Inc.	Publishing
659	First West Credit Union	Credit unions
675	Endeavour Silver Corp.	Metal and mining
676	Fred Deeley Imports Ltd.	Specialty retailing
683	Peoples Trust Co.	Trust company
684	Vancouver Fraser Port Authority	Transportation/couriers
704	Fortuna Silver Mines Inc.	Metal and mining
705	Sierra Metals Inc.	Metal and mining
714	Tree Island Steel Ltd.	Steel
716	Hecla Quebec Inc.	Gold mining
727	Timmins Gold Corp.	Gold mining
743	Village Farms International, Inc.	Agricultural products
752	Westport Innovations Inc.	General manufacturing
756	Pure Industrial Real Estate Trust	Real estate
767	Amica Mature Lifestyles Inc.	Real estate
784	Imperial Metals Corp.	Metal and mining
793	Klondex Mines Ltd.	Gold mining
798	Klohn Crippen Berger Ltd.	Engineering and construction

Total number of firms	**91**

Source: The Financial Post 500, 2015.

Appendix 2: Benchmarking Methodology

The overreaching goal of the scorecard is to provide a comprehensive overview of the Greater Vancouver metro area's performance in relation to 19 international metropolises on key economic and social indicators. We benchmark the features that make these cities attractive to businesses and skilled workers, thereby revealing Greater Vancouver's relative competitive strengths and weaknesses. Therefore, this report should help the Greater Vancouver Board of Trade identify priority areas for policy advocacy.

To gauge Greater Vancouver's performance, The Conference Board of Canada used its standard methodology for benchmarking. The Conference Board of Canada has been a Canadian leader in benchmarking analysis since it began producing its flagship *Performance and Potential* reports in 1996. Renamed *How Canada Performs* in 2007, this multi-year research program identifies relative strengths and weaknesses in the socio-economic performance of Canada and its provinces and territories. Following in the footsteps of *How Canada Performs*, the Centre for Municipal Studies began producing metro-level benchmarking reports in 2007.

Metropolitan Area Selection Process

The first step involved selecting which metropolitan areas to include in the benchmark analysis. The selection of cities was done in consultation with the Greater Vancouver Board of Trade, and evolved over a period of months to enable a test run for data availability. In the end, 20 metropolitan areas, including Greater Vancouver, were chosen. All of the selected metropolitan areas meet one or more of the following criteria:

- The metropolitan area is a gateway metro region and contains a major seaport within its boundaries (Hong Kong, Sydney, Seoul, Shanghai, Singapore, Rotterdam, San Francisco, Los Angeles, Miami, Houston, Halifax).
- The metro region is one of Greater Vancouver's Canadian competitors (Calgary, Montréal, Toronto, Halifax).
- The metro region is one of Greater Vancouver's Pacific Northwest competitors (Seattle and Portland).
- The metro region is comparatively sized to Greater Vancouver (Manchester, Portland, Copenhagen).
- The metro region is in a rapidly emerging economy (Shanghai).
- The metropolitan area is a popular tourist destination (Hong Kong, Miami, Barcelona, Los Angeles, and Singapore).

Indicator Selection Process

The second step involved selecting which indicators to include in the analysis. Like the comparator regions, the indicators were selected in consultation with the Greater Vancouver Board of Trade.

The search for indicators began with a commitment to find measures that influence Greater Vancouver's attractiveness to both individuals and businesses. The indicators that were selected provide valuable information about the performance or status of a metropolitan area within a particular category, either

as a direct output (e.g., disposable income) or a proxy measure (e.g., proportion of the workforce employed in cultural occupations as a proxy for access to culture) and were tested by the Conference Board for availability and reliability. A total of 32 indicators were chosen for the two categories: Economy and Social.

Unfortunately, it was impossible to collect data on all 32 indicators for every metropolitan area, mainly because of data incomparability. However, all 32 indicators were available for the Vancouver region. All data sources were rigorously screened to ensure that each indicator for the international cities had the same definition as its Canadian counterpart. In other words, we wanted to avoid an "apples to oranges" comparison. All international data were converted to U.S. dollars using OECD purchasing power parity exchange rate estimates for the given year.

Benchmarking studies use annual historical data as a means of comparison. Given that this study was launched in the summer of 2015, data beyond the year 2014 were unavailable for any of the indicators. This does not imply, however, that the results of this study are compromised. A benchmarking analysis, by definition, is a relative comparison. Therefore, it is reasonable to assume that if 2015 full-year data were included in this study, the overall rankings would remain fairly stable.

Ranking Method

This study uses a report card–style ranking of A–B–C–D to assess the performance of metropolitan areas for each indicator. We assigned a grade level using the following method: for each indicator, we calculated the difference between the top and bottom performer and divided this figure by four. A metropolitan area received a scorecard ranking of "A" on a given indicator if its score was in the top quartile, a "B" if its score was in the second quartile, a "C" if its score was in the third quartile, and a "D if its score was in the bottom quartile. A metropolitan area was assigned an "n.a." if data were unavailable for that indicator.

For example, on the labour attractiveness indicator "cultural occupations," the top performer (Copenhagen) had 7.9 per cent of its workforce employed in cultural occupations in 2013, while the bottom performer (Shanghai) had only 0.7 per cent. Applying the method for scoring yields the following ranges for each grade:

"A": 6.1–7.0 per cent

"B": 4.3–6.0 per cent

"C": 2.5–4.2 per cent

"D": 0.7–2.4 per cent

(Note: In this example, a high score indicates a high level of performance. For indicators where a low score signifies a high level of performance—such as on housing affordability—the ranking levels are reversed, i.e., the highest result receives the lower grade.)

Each indicator was also carefully screened for outliers. In a handful of cases, one metro region scored so well that it left nearly every other metro area garnering a “C” or “D” grade. Conversely, some scores were so poor that they left nearly every other metro area with an “A” or “B” grade.

How did we tackle this issue? When an outlier resulted in a skewed distribution of grades, we removed that metro region when calculating the grades. In other words, obvious outliers were eliminated from the grading calculation using the following method: 1) the outlier was attributed a letter grade (an “A” or a “D” depending on whether it negatively or positively skewed the grades); 2) the top and bottom performers were identified among the remaining metro regions, and the grading method described above was applied.

For example, on the indicator “number of participants in international association meetings,” Barcelona was identified as an outlier and was assigned an “A” grade. In 2014, it hosted 127,469 participants in international association meetings, more than twice the number of second-place Copenhagen. Among the remaining 18 metro regions, the top performer was now considered to be Copenhagen, which had 57,551 participants in 2014, while the bottom performer was Houston, which had only 1,826. Applying the method for grading, the ranges for A–B–C–D are:

“A”: 43,621–57,551 participants

“B”: 29,690–43,620 participants

“C”: 15,758–29,689 participants

“D”: 1,826–15,757 participants

Failure to identify Barcelona as an outlier would have resulted in Barcelona earning the lone “A” grade and all other metro regions scoring a “C” or “D” grade on this indicator. No metro region would have received a “B.”

It must be emphasized that two cities getting an “A” grade do not necessarily perform equally according to this methodology. In the example above, a metro region with 57,000 participants would get an “A” grade in the same way that a metro region with 43,700 participants would. However, when we establish a ranking of cities, the metro region with 57,000 participants would place higher than the one with 43,700, even if they both get an “A” grade. Thus, in the tables, when looking at cities with the same letter grade, the one with the higher score is listed first. It must also be emphasized that the rankings for each indicator are relative. A metro region receives an “A” grade because it outperforms all other cities in our sample, not because it is necessarily a global leader.

Category Rankings and Overall Score

The overall category rankings are based on a composite index (an average of the normalized scores for each indicator in the specific category). In other words, the top-ranking metropolitan area for a given indicator will receive a 1, while the bottom-ranking metropolitan area will receive a zero.

Normalization Formula
Normalized value = (indicator value – minimum value) ÷ (maximum value – minimum value)

To use the example above, a score of 1 would be attributed to Barcelona given that it leads all other metro regions with 127,469 participants. With Barcelona being an outlier, a score of 1 would also be assigned to second-ranked Copenhagen, which hosted 57,551 participants in 2014. Meanwhile, a zero would be attributed to Houston given that it ranks last with 1,826 participants.

Using the formula, Barcelona's score of 1 = (57,551 – 1,826) ÷ (57,551 – 1,826), Houston's score of 0 = (1,826 – 1,826) ÷ (57,551 – 1,826), and a metropolitan area with 20,401 participants, for example, would get a score of 0.33 = (20,401 – 1,826) ÷ (57,551 – 1,826).

To calculate a category ranking, the metropolitan areas were then ranked according to their composite index scores. No attempt was made to give explicit differential weights to indicators according to importance: we are implicitly giving equal weight to each indicator. We assigned a grade level to the overall category performance using the following method: we calculated the difference between the category composite index of the top and bottom performer and divided this figure by four. A metropolitan area received a scorecard rating of "A" for the category if its score was in the top quartile, a "B" if its score was in the second quartile, a "C" if its score was in the third quartile, and a "D if its score was in the bottom quartile.

An overall ranking was established by taking a weighted average of the Economy and Social category scores. We did not assign an explicit differential weight to each category. Thus, each category was assigned a weight of 0.5.

Finally, it is important to note that although we generate an overall score that ranks each metro area based on the scores from the Economy and Social categories, we do not create an overall composite letter grade. The two categories cover entirely different sets of indicators, so assigning an overall grade would falsely assume that the two categories can be aggregated.

Appendix 3: Cluster Analysis Methodology

This section details the methodology and the results of the cluster analysis. An industry cluster is a group of firms and institutions that are located near one another and that draw productive advantage from their mutual proximity and connections. A cluster analysis involves two main steps: 1) computing location quotients and 2) conducting a shift-share analysis. A particular type of cluster—a traded cluster—is what interests us here. Traded clusters are groups of related industries that service markets beyond the region in which they are located. Traded clusters are key drivers of regional economic growth.

Location Quotients

Location quotients (LQs) are simply industries' output shares in a given region (Vancouver) divided by the industries' corresponding shares in the nation (Canada). LQs provide information about the structure of the economy by identifying areas of specialty and concentration.

Industries with an LQ greater than 1 have a higher concentration in Greater Vancouver than in Canada as a whole. These sectors are referred to as "basic sectors," and it is assumed that part of their output is exported outside the region. In contrast, sectors with a LQ less than 1 have a lower concentration in Greater Vancouver than in the country as a whole. They are defined as "non-basic sectors," and part of their local demand is assumed to be met by imports. In this scorecard, we use employment by industry data to compute LQs. LQs can also be computed using real GDP by industry data, but they are fairly aggregated, with only 16 industries available. Instead, using the more detailed employment data, which includes information on 59 subsectors, yields a richer result. In particular, it may lead to the emergence of other possible clusters that are hidden within one of the aggregated sectors.

Shift-Share Analysis

The second step toward a cluster analysis is to conduct a shift-share analysis, which enables us to decompose real GDP growth (or employment) in Greater Vancouver over a particular period into three components:

1. national growth effect (NGE)
2. industrial mix effect (IME)
3. competitive share effect (CSE)

The NGE is the amount of change that would occur if all industries in Greater Vancouver grew at the rate of the overall Canadian economy. The IME is the amount of change that would occur if all industries in the region grew at their individual national rates minus the NGE. In other words, the IME accounts for the effect of a region's industrial composition. For example, a region with a high concentration of high-growth industries will have an overall positive IME, while a region with a low concentration of high-growth industries will have an overall negative IME. Finally, the CSE is the difference between the actual change in output in each industry and the IME. An overall positive CSE implies that the region's economic performance has been superior to that of the country as a whole. Table A2 presents the CSEs and LQs for all 59 industry subsectors.

Table A2
Identification of Potential Clusters Based on Sectoral Employment Data, 2009–14

Industry	Location quotient	Competitive share effect
Agriculture	0.30	-3.9
Forestry and logging with support activities	0.18	-0.1
Fishing, hunting, and trapping	0.00	0.0
Mining and oil and gas extraction	0.31	3.8
Utilities	0.87	3.5
Construction	1.06	-0.2
Manufacturing		
Food, beverage, and tobacco product manufacturing	0.88	0.6
Textile mills and textile product mills	0.76	1.0
Clothing apparel	1.40	-0.1
Wood product manufacturing	0.74	1.6
Paper manufacturing	0.54	1.8
Printing and related support activities	0.98	1.2
Petroleum and coal products manufacturing	0.00	0.0
Chemical manufacturing	0.79	0.9
Plastics and rubber products manufacturing	0.45	-0.8
Non-metallic mineral product manufacturing	0.68	-1.5
Primary metal manufacturing	0.00	-1.7
Fabricated metal product manufacturing	0.74	0.9
Machinery manufacturing	0.66	-1.1
Computer and electronic product manufacturing	1.31	0.7
Electrical equipment, appliance, and component manufacturing	0.94	0.2
Transportation equipment manufacturing	0.33	1.2
Furniture and related product manufacturing	1.01	2.6

Miscellaneous manufacturing	1.12	1.0
Wholesale trade	1.23	9.8
Retail trade	0.96	6.0
Transportation		
Air transportation	1.99	-0.7
Truck transportation	0.93	6.1
Transit and sightseeing transportation	1.41	1.3
Postal and courier services	1.34	2.6
Other transportation and storage	1.48	1.2
Finance	1.10	-2.4
Insurance carriers, related activities and funds & other financial vehicles	1.16	-2.4
Real estate	1.45	-1.6
Rental and leasing services	1.22	0.9
Legal services	1.57	1.6
Architectural, engineering, and design services	1.28	-2.1
Computer system design services	1.33	-0.2
Management, scientific, and technical services	1.32	-2.2
Other professional services	1.12	-6.2
Employment and business services	0.81	3.5
Other management and administrative services	1.11	-3.8
Primary and secondary education	0.93	5.9
Other educational services	1.32	-3.7
Ambulatory health care services	1.04	5.3
Hospitals	0.85	-8.1
Nursing and residential care facilities	0.81	3.4
Social assistance	0.73	-8.1
Information and cultural industries	1.35	0.2
Arts, entertainment, and recreation	1.18	-0.8
Accommodation services	1.14	0.7

Food services and drinking places	1.13	-3.9
Repair and maintenance	0.80	1.6
Personal and laundry services	1.07	-1.5
Religious, grant-making, civic, and professional and similar organizations	0.93	-0.7
Private households	1.31	-0.8
Federal government public administration (including defence services)	0.75	-1.1
Provincial and territorial public administration	0.55	0.6
Local, municipal, and regional public administration	1.02	-0.8

Sources: The Conference Board of Canada; Statistics Canada.

Greater Vancouver's Traded Clusters

Combining the LQ results with those of the CSE provides a framework for cluster identification and analysis in Greater Vancouver. To be considered a traded cluster, an industry must meet the following four criteria:

1. It has an LQ greater than 1 (has a higher concentration in Greater Vancouver than in the country as a whole).
2. It has a CSE above 0 (has grown at a faster pace than their national averages).
3. It has been expanding and not contracting.
4. It exports a good portion of its production; i.e., it does not grow largely in response to local demand.

Sectors that satisfy the first two of these criteria are candidates for traded clusters, sometimes referred to as "growing base industries." Our analysis found that 16 out of 59 industries had both an LQ greater than 1 and a positive CSE. In other words, we found 16 candidates, which are listed in Table A3.

Table A3

Identification of Potential Clusters Based on Sectoral Employment Data, 2009–14

Industry	Location quotient	Competitive share effect
Clothing apparel production	1.40	0.59
Computer and electronic product manufacturing	1.31	4.31
Air transportation	1.99	1.43
Transit and sightseeing transportation	1.41	2.39
Postal and courier services	1.34	4.12
Other transportation and storage	1.48	2.46
Finance	1.10	3.17
Insurance carriers and related activities	1.16	1.46
Real estate	1.45	0.54
Rental and leasing services	1.22	1.55
Legal services	1.57	2.67
Computer system design services	1.33	1.51
Information and cultural industries	1.35	0.71
Accommodation services	1.14	4.00
Personal and laundry services	1.07	2.69
Private households	1.31	0.36

Sources: The Conference Board of Canada; Statistics Canada.

From this list, we excluded those sectors that are largely serving the domestic market. Specifically, we excluded real estate, rental and leasing services, legal services, personal and laundry services, and private households. That left us with 11 industries as potential traded clusters: clothing apparel production, computer and electronic product manufacturing, air transportation, transit and sightseeing

transportation, postal and courier services, other transportation and storage, finance, insurance carriers and related activities, computer system design services, information and cultural industries, and accommodation services.

We also eliminated clothing apparel production as a traded cluster because employment has actually fallen steadily over the past 10 years. Indeed, this sector recorded the single biggest decline among all manufacturing subsectors from 2005 to 2014, lowering its share of total manufacturing employment from 8.6 per cent in 2004 to 3.5 per cent in 2014. However, its CSE was still positive because the national decline in clothing apparel employment between 2010 and 2014 was even more pronounced.

Despite its exclusion as a traded cluster, it is important to highlight the fact that the clothing apparel industry has managed to carve out a niche in Greater Vancouver, particularly in athletic and performance apparel. Indeed, a number of large clothing companies that do business internationally are headquartered in Vancouver, including lululemon athletica, Mountain Equipment Co-op, and Arc'teryx Equipment. Smaller local companies like Dream and Motherland, as well as designers such as Nicole Bridger, also make use of Vancouver's manufacturing facilities. Although much of the manufacturing has been moved offshore, the Vancouver-based clothing companies still add to the economy through head office employment, design, and other higher-value jobs.

The 10 remaining industries can be further grouped into five broad traded clusters:

1) transportation (air transportation, postal and courier services, other transportation and storage)
2) tourism (transit and sightseeing transportation and accommodation services);
3) information and cultural industries
4) high-tech (computer and electronic product manufacturing and computer system design services)
5) finance and insurance

Appendix 4: Detailed Employment Data

Table A4

Employment Creation by Sector in Greater Vancouver (000s)

Industry	25 years	10 years	5 years
Total	478.0	174.0	90.1
Primary and utilities	2.8	3.7	4.7
Agriculture	1.3	-4.5	-0.7
Forestry and logging with support activities	-2.0	-0.5	0.6
Fishing, hunting, and trapping	-2.3	0.0	0.0
Mining and oil and gas extraction	2.1	5.0	2.7
Utilities	3.7	3.7	2.0
Construction	48.6	31.6	4.8
Manufacturing	3.5	-18.8	4.4
Food, beverage, and tobacco product manufacturing	5.5	-0.8	0.8
Textile mills & textile product mills	-1.0	0.7	1.2
Clothing manufacturing & leather & allied product manuf.	-0.9	-6.1	-0.2
Wood product manufacturing	-5.5	-1.2	-0.1
Paper manufacturing	-1.2	1.3	-0.5
Printing and related support activities	-1.9	-1.3	-0.8
Petroleum and coal products manufacturing	-1.0	0.0	0.0
Chemical manufacturing	3.6	0.2	1.8
Plastics and rubber products manufacturing	0.2	-2.9	-1.9
Non-metallic mineral product manufacturing	1.1	-2.8	-1.5
Primary metal manufacturing	-4.3	-2.3	-1.5
Fabricated metal product manufacturing	1.6	-0.4	0.3
Machinery manufacturing	2.0	-1.5	1.6
Computer and electronic product manufacturing	1.7	-1.8	3.7
Electrical equipment, appliance, and component manufacturing	0.6	-0.6	2.0
Transportation equipment manufacturing	-0.4	-0.2	-0.4
Furniture and related product manufacturing	0.3	0.7	-1.1
Miscellaneous manufacturing	3.0	0.1	0.9
Wholesale trade	18.0	12.8	-1.5
Retail trade	36.2	18.4	7.3
Transportation and warehousing	30.3	18.7	16.9
Air transportation	-2.0	-0.5	0.6
Truck transportation	8.2	7.0	3.7
Transit and sightseeing transportation	17.8	6.8	4.4
Postal and courier services	2.7	1.8	3.8
Other transportation and storage	3.5	3.6	4.4
Finance, insurance, and real estate	25.7	7.4	8.3
Finance	8.5	4.4	5.1
Insurance carriers & related activities	8.4	-0.2	1.5
Real estate	9.8	3.9	1.0
Rental & leasing services	-0.9	-0.7	0.7
Professional, scientific, and technical services	62.0	22.7	13.3

Legal services	6.8	3.6	3.3
Architectural, engineering, and design services	11.6	6.9	0.9
Computer system design services	25.2	7.9	7.1
Management, scientific, and technical services	11.9	4.7	1.0
Other professional services	6.5	-0.5	1.1
Administration support and waste management	35.0	9.5	-3.2
Employment and business services	6.6	3.1	1.6
Other management and administrative services	28.4	6.4	-4.8
Education	50.1	19.1	9.3
Primary and secondary	24.9	11.2	8.3
Other educational services	25.2	8.0	1.0
Health care	67.2	25.1	7.1
Ambulatory health care services	19.8	13.2	2.4
Hospitals	18.5	6.9	0.3
Nursing and residential care facilities	12.7	6.8	4.1
Social assistance	16.1	-1.8	0.3
Information and cultural industries	8.5	-1.8	-1.0
Arts, entertainment, and recreation	19.3	3.0	-0.9
Accommodation and food	38.8	13.8	12.4
Accommodation services	4.1	1.8	3.7
Food services and drinking places	34.7	12.0	8.7
Other services	16.2	5.5	5.1
Repair and maintenance	3.6	2.8	2.2
Personal and laundry services	9.0	1.9	2.7
Religious, grant-making, civic, and similar organizations	2.6	1.2	0.3
Private households	1.0	-0.4	-0.1
Public administration	13.6	3.7	3.2
Federal government public administration	5.1	-1.2	-2.2
Provincial public administration	2.7	1.8	4.0
Municipal public administration	5.8	3.1	1.4

Source: Statistics Canada.

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