

Calgary in the new economy

An update to the Economic Strategy for Calgary

Calgary Economic Development's collaborative energy makes us a conduit, connector, catalyst and storyteller for the city of Calgary.

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Executive Summary

An unprecedented disruption in the global economy, from the rapid advancement of technology in all industries, is creating risks and opportunities for cities and is a driving force in this update to the long-term Economic Strategy for Calgary.

Times have changed and this update, titled *Calgary in the New Economy*, builds on our existing strengths and addresses current challenges. This strategy continually evolves to stay relevant and serve as a guide for The City of Calgary, Calgary Economic Development and the numerous stakeholders who contribute to economic growth and prosperity.

Calgary has a global reputation as an inclusive and entrepreneurial city connected through an incredible community spirit - these core values guided the development of this strategy.

In the decade since our first long-term economic strategy in 2008, Calgary has experienced the heights of an economic boom and the depths of an historic recession. We went from the lowest unemployment rate of any major city in Canada to the highest, and from virtually no office vacancies to over 25 per cent of downtown buildings empty.

The energy industry worldwide is evolving rapidly. It is creating opportunities for Calgary as a global centre of excellence for all things energy but the sector that has driven our economy for decades is unlikely to be the job creator it was or occupy the office space it once did.

Our economy is at a crossroads and there's no option but to adjust. We are committed to advancing our established sectors – energy, agribusiness, transportation and logistics – and embrace emerging areas of growth – creative industries, tourism, financial services and life sciences.

This strategy reflects the risks and opportunities from unprecedented innovation in digital, physical and virtual technologies impacting every sector of the economy. Our future will be driven by our adoption of technology, rounding out our talent pool and strengthening our innovation ecosystem.

Since September 2017, more than 1,800 Calgarians have been engaged in this update and provided vital insight. The perspective and direction from the CEO roundtable of business, community and academic leaders, who embody Calgary's can-do attitude, has been particularly valuable in this process.

The vision behind *Calgary in the new economy* is to be "the city of choice in Canada for the world's best entrepreneurs, as we embrace innovation and create solutions to meet the world's needs in food, health, energy and transportation."

The strategy focuses on the four key elements that drive economic growth. It also sets out our ambition for the city in each key area:

- **Talent:** Canada's destination for talent.
- **Innovation:** Canada's leading business-to-business innovation ecosystem.
- **Place:** Canada's most livable city.
- **Business environment:** Canada's most business-friendly city.

The strategy supports the idea that an entrepreneurial and innovative city generates enduring prosperity, and human capital is critical to our sustained growth. The update focuses on industry clusters to enhance the competitive advantages of our key sectors.

To successfully implement the strategy, it must be aligned with The City of Calgary's Resiliency Strategy, Council priorities, administration priorities, civic partners' strategies, business community initiatives and the goals of the Government of Alberta.

Almost 90 per cent of actions in the previous version of the strategy, titled *Building on our Energy*, were completed or there was significant progress from the civic partner responsible for implementation. This report details the stakeholders, resources, tactics, timelines and key performance indicators needed to successfully implement the updated strategy.

This strategy is intended to support economic competitiveness, embrace shared prosperity and build a strong community as well as providing a foundation for Calgary Economic Development to develop its four-year corporate strategy and annual business plans.

History

In 2008, Calgary adopted its first 10-year Economic Strategy *Think big. Act bold. Create great*. At the time, Calgary was at the peak of one of the longest and largest cycles of economic growth in our history. The strategy acknowledged the city's role as the economic driver for the country and set the sights on global greatness.

In 2012, Calgary embarked on an update to the strategy. Eighteen months of community engagement and strategic planning culminated with *Building on our Energy*, an Economic Strategy for Calgary that was adopted by City Council in October 2014.

The strategy was built on three main goals – purposeful diversification, shared prosperity and strong community – and was organized around the six areas of focus (or energies) below.

Figure 1 Framework for Building on our Energy



As the strategy was being finalized and approved in 2014, the price of oil began an historic plunge that was the impetus for a structural reform of the industry globally. The impact on Calgary, the home of the Canadian oil and gas industry, was significant.

The United States, always the leading customer for Alberta's petroleum exports, is now also our largest competitor. Meanwhile, our access to global markets is severely restricted and any attempt to expand the pipeline network is highly contentious and subject to, at a minimum, lengthy delays. The impact was evident in the decline of capital investment in Alberta's energy sector from \$81 billion in 2014 to \$44 billion in 2017.

After more than two decades of almost unimpeded and significant economic growth, Calgary's economy declined sharply in 2015 and 2016. It resulted in more than 40,000 jobs lost directly in the energy sector, unemployment above 10 per cent and over 25 per cent downtown office vacancy.

In these challenging times, Calgary has relied on its traditional strengths – entrepreneurship, innovation, and determination – to implement the economic strategy. Eighty-eight per cent of the 32 specific tactics have been commenced or completed and six of 14 (43 per cent) core indicators either remained steady or improved.

Why now?

It is accepted best practice to refresh economic strategies on a consistent basis. As the Economic Strategy for Calgary approaches its fifth year in operation, it is time for an update.

The strategy is a living document that continually evolves to ensure it serves as a practical blueprint to address the changing global economy and provide the foundation to support enduring growth and prosperity.

The structural change in Calgary's economy and unprecedented convergence of technological advances impacting all industrial sectors has added a sense of urgency to this update. We need a strategy to take advantage of the emerging opportunities. The timing also enables alignment with the four-year agenda setting process underway at The City of Calgary.

Much has changed since Calgary's first Economic Strategy was released in 2008, but one thing has not. The strategy is fundamentally about people and ensuring they can contribute to and benefit from the city's prosperity. The primary change in this update to the strategy is the greater focus on people and skills and how that will drive economic growth in this time of disruptive innovation.

The past few years have been a challenge. From historic flooding in 2013 to an unprecedented plunge in oil prices to the devastating forest fires in northern Alberta in 2015 that battered the entire provincial economy.

Calgary's gross domestic product declined by 3.2 per cent in 2015 and a further 3.7 per cent in 2016. The economy showed signs of recovery in 2017 and 2018, but unemployment of more than eight per cent is still double the rate of 2014 and the downtown office vacancy is more than 25 per cent.

The energy industry simply is not going to employ as many people or occupy as much office space as it once did. As part of its response, the City of Calgary has created the \$100-million Opportunity Calgary Investment Fund to support companies making transformative investments in key sectors that diversify the economy.

The combination of major challenges have made the economy the highest priority for Calgarians. During public engagement sessions for The City of Calgary's Resiliency Strategy – the economy was identified as the number one "stressor" for citizens.

Of all our challenges, the biggest risk is the advance in innovation and technology facing our industrial sectors. The capacity for companies, and entire industries, to adapt to disruptive change with artificial intelligence, blockchain, 3D printing, robotics, the internet of things and other advanced technology to be more efficient and productive, is critical to success.

The convergence of technologies will be equally disruptive to the labour force. Research conducted for this update estimates 25 per cent of jobs in Calgary are at "high risk" of being automated in the next 20 years. The skilling and reskilling of citizens to prepare them for the changing nature of work is a major driver of this update.

The advances across the physical, digital and virtual worlds also represent our greatest opportunity. We have the opportunity to apply innovation to our core sectors – energy, agriculture and transportation – to ensure we play a global role in these critical industries.

By embracing innovation and technology in our core industries and continuing to diversify into growth sectors like biomedical, Calgary can impact global hunger, health and well-being, energy security and environmental sustainability.

Alignment

The Economic Strategy for Calgary provides guidance to the community and all orders of government for long-term planning and collaboration. Throughout the process to update the strategy, Calgary Economic Development has worked closely with The City of Calgary. The updated strategy is related to and aligned with several initiatives of The City of Calgary. The strategy's success will also be important for The City's other strategies, partners and the broader community.

The degree of alignment with The City of Calgary and other civic partners is displayed below.

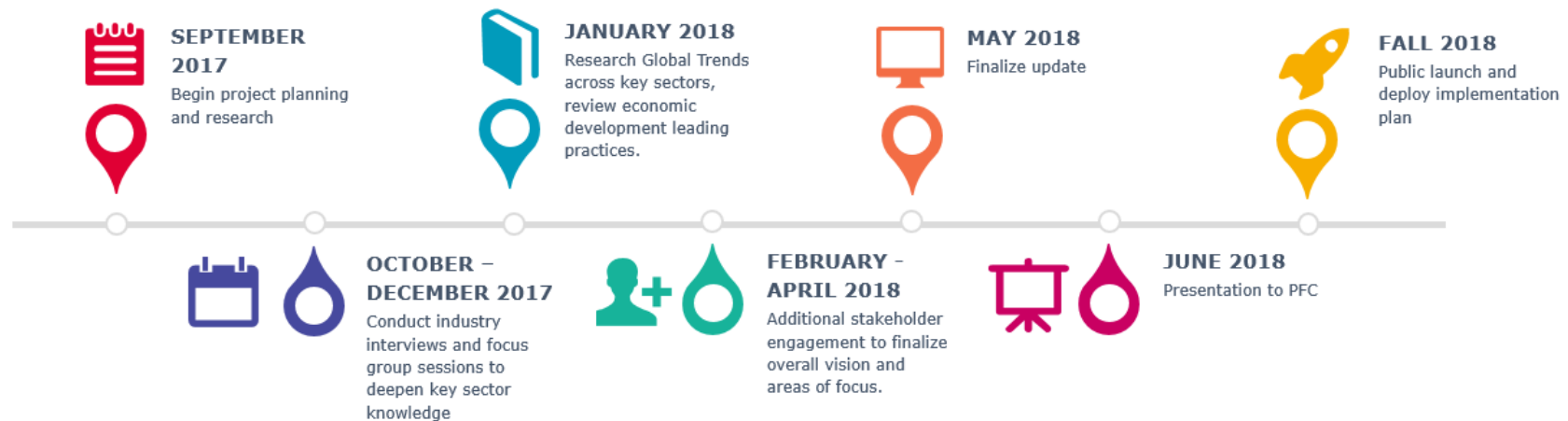
Figure 2 Alignment with City of Calgary



Approach

The process of updating the Economic Strategy for Calgary began in September 2017 with the goal of completing the work in June 2018.

Figure 3 Timeline for updating the Economic Strategy



Gaining insight

Calgary Economic Development engaged two leading global consulting firms, KPMG and Boston Consulting Group (BCG), to assist in the strategic planning process through research and analysis, stakeholder engagement, convening the CEO Roundtable and providing input and expertise into the formulation of the final strategy.

Figure 4 Process to update the Economic Strategy



Data review

Established and emerging sectors within the Calgary landscape were analyzed to understand trends and opportunities. This was coupled with a thorough cluster analysis to understand linkages and dependencies across sectors. The overall goal was to develop a landscape of Calgary's position that will inform strategic investment to propel Calgary's economic growth.

Competitive review

Calgary has the good fortune to be in one of the world's leading countries. As the update to the Economic Strategy is undertaken it is important to reflect on the advantages that come with the attributes, respect, and goodwill that Canada provides on the world stage including:

- Leading the G-7 countries in economic growth and foreign direct investment (2012 – 2016), and second in job growth since 2007 (OECD).
- Access to the North American market of 490 million people and \$21 trillion GDP.
- Easiest location in the G-20 countries to start a business (World Bank 2017) and third among 137 countries for entrepreneurship (Global Entrepreneurship and Development Institute 2017).
- Lowest overall business costs of the G-7 countries in the digital, R&D, manufacturing and corporate services sectors (KPMG Competitive Alternatives 2016).
- Banking system is ranked second in the world and soundest of the G-7 (World Bank).
- First among 55 countries in global reputation (The Reputation Institute 2017).
- Leading the G-20 in social progress (The Social Progress Imperative 2017), Global Peace Index, Democracy Index (Economist Intelligence Unit 2017) and overall prosperity (Legatum Prosperity Index).
- First among the G-7 countries in security and equal opportunity to individuals (IMD 2017) and Better Life Index (OECD).
- Most highly educated of OECD countries and leading the G-7 in reading, math and science (OECD).
- Leading the G-7 in per capita R&D investment in higher education.

While Canada has been leading the G-7 in economic growth, Alberta has disproportionately driven that growth. In the past 20 years Alberta accounted for 19 per cent of the country's economic growth while representing only 11 per cent of the national population. Within Alberta, Calgary has been leading the way having nearly doubled the size of the economy over the last 20 years. This has been primarily by population growth averaging 2.8 per cent annually. This has led Calgary, even after two years of decline in 2015 and 2016, to have per capita GDP considerably higher than the national average and that of peer cities at \$73,400 per capita.

In the same time period, Calgary's labour force participation has outpaced peer cities with the highest ratio of employed to non-working in the country at 1.25. However, labour force productivity growth in Calgary is lagging peer cities in averaging only 0.7 per cent per year with the national average being 1.3 per cent. This is the result of employment trending towards lower value add sectors including construction, retail and accommodation and food services.

In preparation of the update to the Economic Strategy, BCG conducted a competitive assessment of Calgary across five dimensions: innovation, human capital, quality of life, business environment and infrastructure and connectivity. Comparisons were conducted with communities of similar size and economic composition across North America. Overall Calgary ranked 10th of 23 peer cities. Calgary scored first and second respectively in human capital and business environment, but 19th in quality of life and connectivity and 22nd in innovation.

High rankings in human capital were achieved through the percentage of the population of working age, labour force participation rate, educational attainment and international student assessment scores. Lower rankings were noted for high school graduation rates, post-secondary students per capita and university rankings. High business environment rankings were achieved for equity financing, private equity financing, operation cash flow of businesses, number of top companies headquartered in the city and commercial lease costs. Calgary was in the middle of the peer group for industrial lease costs and diversity of industries.

While Calgary ranked high in quality of life measures including air quality, homicide rates and general practitioners per capita, the city ranked much lower in cost of housing, property crimes and acres of green space. Calgary ranked last in the measure of income inequality.

Innovation scores were low in research citations, patent applications and venture capital financing. Moderate scores were achieved for start-ups per capita, measured by idea generation and commercialization of ideas.

Best in class in innovation is San Francisco – leading peer cities in research citations, patent applications, start-ups per capita and venture capital financing.

Finally, Calgary ranked middle of the pack in infrastructure and connectivity including commute times, public transit usage and biking and walking commuters. In the category, Calgary ranked poorly with respect to global access and communications infrastructure.

Global trends

Global developments and trends impact Calgary's economy. Trends in business, consumer spending, foreign investment and trade, provide opportunities for key sectors of strength and emerging sectors in the Calgary region. These trends will impact our ability to attract investment and support high-growth local companies to scale up and expand into new markets.

- Declining commodity prices, reduced capital flow to emerging economies, financial market volatility and other factors contribute to economic uncertainty.
- Near-term economic growth is strong, however, financial vulnerabilities, inward-looking policies, and geopolitical tensions present downside risks in the medium term¹.

¹ International Monetary Fund's World Economic Outlook update January 2018

- Major trade liberalization initiatives such as Comprehensive Economic Trade Agreement (CETA) and the Trans Pacific Partnership (CPTPP) are positive developments. Canada represents approximately 2.5 per cent of world exports and imports, high relative to its size.
- Global foreign direct investment (FDI) flows are expected to modestly recover in over the next two years to close to \$1.9 trillion USD².
- Software and IT services, business services, industrial machinery and equipment, financial services, and communications are the top five sectors for investment, while real estate, oil and gas, and renewable energy are the top sectors for greenfield capital investment³.
- World trade volume is expected to grow at over 4.0 per cent annually in the next few years, led by Asia and North America⁴.
- Exports of IT services have expanded 18 per cent annually since 1995. IT services are followed by financial services, business services and communication services.
- Technology disruptions including the Internet of Things (IoT), robotics, artificial intelligence, and blockchain are transforming industry and business models while unlocking new market opportunities⁵.
- Technology impacts on the demand for talent, the supply of talent, and the need for companies to reimagine how they work, are top issues for most companies and jurisdictions⁶.

Cluster analysis

Clusters include interrelated firms and industries characterized by buyer-supplier relationship as well as a skilled workforce and institutions. Companies in clusters tend to draw a productive advantage in being

² United Nation's Conference on Trade and Development (UNCTAD), 2017 World Investment Report

³ FDI Intelligence

⁴ World Trade Organization (WTO)

⁵ The Changing Landscape of Disruptive Technologies (KPMG, 2017)

⁶ Twelve Forces That Will Radically Change How Organizations Work (BCG, 2017)

geographically near resources – and each other – to spark development of innovative products, build knowledge creation, and enhance cooperation and competition among firms.

The cluster of energy companies in an eight-block radius in downtown Calgary is an example of a long-established and highly integrated ecosystem.

It enhances positive externalities – such as knowledge spillovers, access to specialized inputs, potential for innovation, and sophisticated demand – and improves regional economic performance. Identifying industry clusters allows business recruitment, attraction and development efforts to focus on companies to complement existing businesses.

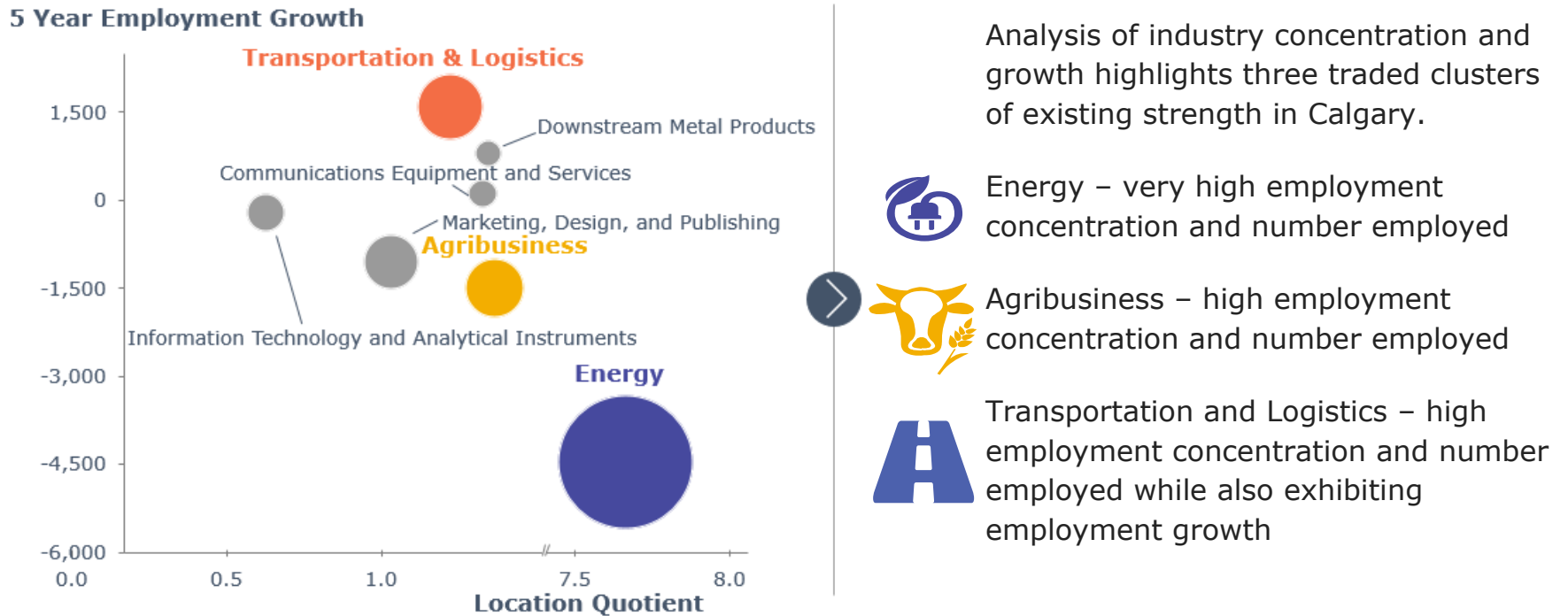
Industry cluster analysis in this strategy, focuses on economic activity in a region, highlights established and emerging industry clusters and regional assets, identifies trends, and articulates the needs and opportunities in the economy and workforce.

There are two kinds of clusters. Traded clusters trade products and services to other regions, nationally and internationally. Local clusters primarily serve the local market, their presence generally depends on the size of the region. Traded clusters bring wealth to the region while local clusters keep wealth in the region.

The focus for the update to the Economic Strategy is on traded clusters. A comparative analysis was conducted to identify trends and competitive advantages.





With numerous benefits associated with industry clusters, identifying Calgary's main growth and income generators in the new economic climate encourages sustained recovery. Calgary can enhance its brand through higher productivity, cost leadership, differentiation, and specific market focus from established and emerging industry clusters.

Figure 5 Established clusters



In addition to our existing strengths in traded clusters, there are a number of emerging industries that have potential to further diversify and grow Calgary's economy.

Figure 6 Emerging clusters

	Strengths	Growth Potential
 Tourism	<ul style="list-style-type: none"> • Proximity the Canadian Rockies • Newly increased int'l airport capacity • Experience hosting sport and major events 	<ul style="list-style-type: none"> • Increased conferences, sporting and major events • Increased visitation throughout the year
 Creative Industries	<ul style="list-style-type: none"> • Strong recent growth (<i>18% more firms vs 2010¹</i>) • Newly constructed film center • World-class natural filming locations 	<ul style="list-style-type: none"> • 6:1 return on Creative Industry investment⁶ • Large and growing industry in N. America (<i>\$620B GDP contribution, 5% 10-year CAGR⁴</i>)
 Life Sciences	<ul style="list-style-type: none"> • Groundbreaking research activity at UofC⁷ • Particular strength in Brain and Mental Health, Biomedical Engineering, & Infectious Diseases² 	<ul style="list-style-type: none"> • <u>Opp'ty</u> to commercialize advanced research • Rapidly growing industry globally (<i>\$8T+ health care spending, 5% CAGR⁵</i>)
 Financial Services	<ul style="list-style-type: none"> • Strong existing industry (<u>LQ: 1.21</u>) • Currently a global hub for Energy-related financial activity (<i>~17% of global deal value³</i>) 	<ul style="list-style-type: none"> • Calgary's 2nd most productive industry per capita • FS performance highly correlated with success in other industries

Additional information on each of Calgary's established and emerging clusters can be found in Appendix A.

Stakeholder engagement

During November and December 2017, KPMG conducted interviews with focus groups and individual leaders representing key sectors and stakeholders. Stakeholder engagement helps gather collective input from external and internal stakeholders, identify common themes/issues, conduct SWOT analysis (strengths, weaknesses, opportunities, threats), and identify potential areas for action.

Focus group attendees and interviewees ranged from founders of start-ups to directors of large, well-established companies. There was also representation from Calgary Economic Development, The City of Calgary, post-secondary institutions, industry associations, and incubator organizations.

BUSINESS STAKEHOLDER ENGAGEMENT

Calgary Economic Development Board of Directors

Advisory Committees:

- Agribusiness
- Renewable energy
- Energy
- Transportation and logistics
- Real Estate

Emerging sector focus groups:

- Cyber security
- Life Sciences/Health
- Autonomous systems

New entrants:

- Tangent Engineering
- Carbon Upcycling
- Katapult
- Viking Air
- Solium Capital



*More than 1,800
community and
business
stakeholders
were engaged
through the
course of this
project*

COMMUNITY ENGAGEMENT

Civic Partners:

- Tourism Calgary
- Calgary Arts Development
- Calgary Technologies Inc.
- Calgary TELUS Convention Centre

Community Partners:

- Momentum
- Vibrant Communities Calgary
- Economists
- Indigenous stakeholders

The City of Calgary:

- Resilience Team
- Planning and Development
- Urban Strategies
- Community Services
- Office of the Mayor

Entrepreneur support agencies:

- Alberta Women Entrepreneurs
- Futurpreneur
- Startup Calgary



Calgarians, many who were previously unaware of the Economic Strategy for Calgary, engaged through #loveYYC digital platform.

Post-secondary:

- University of Calgary
- Mount Royal University
- SAIT

CEO roundtable

In the fall of 2017, a CEO roundtable was struck to assist in synthesizing data and prioritize emerging themes. In total, the CEO roundtable met five times. The roundtable was built to include participants across sectors and included representative from Calgary's post-secondary institutions. The roundtable represented in below was chaired by Adam Waterous and facilitated by BCG.

Figure 7 CEO Roundtable

 A. Waterous CEO Roundtable Chair		 R. Middleton Partner & Managing Director	
 A. Reimer Associate	 D. Mowat CEO	 G. Manes CEO	 M. Crothers Pres. & Country Chair
 B. Espey CEO	 D. Ross President	 J. Boettcher CIO	 M. Heffernan CEO
 B. Sartor CEO	 E. Cannon President	 J. Davison Councilor	 P. Roberts President
 B. Zumwalt President	 G. Bass CEO	 J. Gray Chairman	 R. Peabody CEO
 B. De Lottinville Founder & CEO	 G. Brookman CEO	 K. Creel CEO	 T. Edwards COO
 D. Corbin Chief of Staff Office of the Mayor	 G. Saretsky Former CEO	 L. Mitchelmore President	 W. Chiu CEO

Calgary's strengths and challenges

At each meeting the roundtable was presented with a fact pack and discussion documents. Presented here are a summary of the strengths and challenges presented to the roundtable for discussion. These form the basis of the framework to the Economic Strategy update.

Strengths – Calgary has led economic growth in Canada for the past 20 years. This success has been no accident.

- Fifth most livable city in the world for a decade as rated by the Economist Intelligence Unit
- Young average age at 36.8 (national average 40.6)
- Third most diverse city in the country with visible minorities comprising 34 per cent of the population and the foreign-born population exceeding 25 per cent
- Attractive to migrants welcoming 172,000 international migrants in the past 10 years
- Safe city with available, affordable housing
- Active city with easy access to the Canadian Rockies
- Prosperous community with most millionaires per capita in Canada (access to capital)
- Globally connected through YYC Calgary Airport Authority
- World leaders in our core sectors – Energy, Agribusiness and Transportation and Logistics
- Excellent post-secondary institutes providing existing industries with talent
- Canada's highest percentage of engineers
- Leads the country in educational attainment
- Highest number of headquarters per capita in Canada – many located downtown
- Available spaces for people to meet and share ideas
- Business and regulatory environment facilitates business growth and expansion
- Professional services and access to capital purpose built for local industries

Recently, Calgary has been exposed to changes in society, business and technology revealing challenges that need to be addressed to grow and diversify our economy.

- Our downtown core faces nearly 30 per cent office vacancy rates and isn't perceived as a vibrant and livable area
- Historical reliance on a single industry sector
- Unemployment is at historically high levels and approximately one in ten Calgarians live in poverty
- Calgary has been recognized as a city with high wage inequity and the highest pay inequity for women of major cities in Canada
- We underperform in retaining and attracting post-secondary students
- We have the lowest percentage of software engineers
- No clear path to support labour force transition to new industries
- Innovation ecosystem is uncoordinated
- Weak connections between ideas, research, business, government and capital to start and scale companies
- We are a community that is 'first to be second' reluctant to be early adopters of new technology
- Our business and regulatory environment needs new ways of decision making and engaging
- Potentially losing our historical tax advantage
- Exponential change and convergence of technologies is disrupting our core industries
- Relatively expensive internet access
- Uncertain national and international trade environment

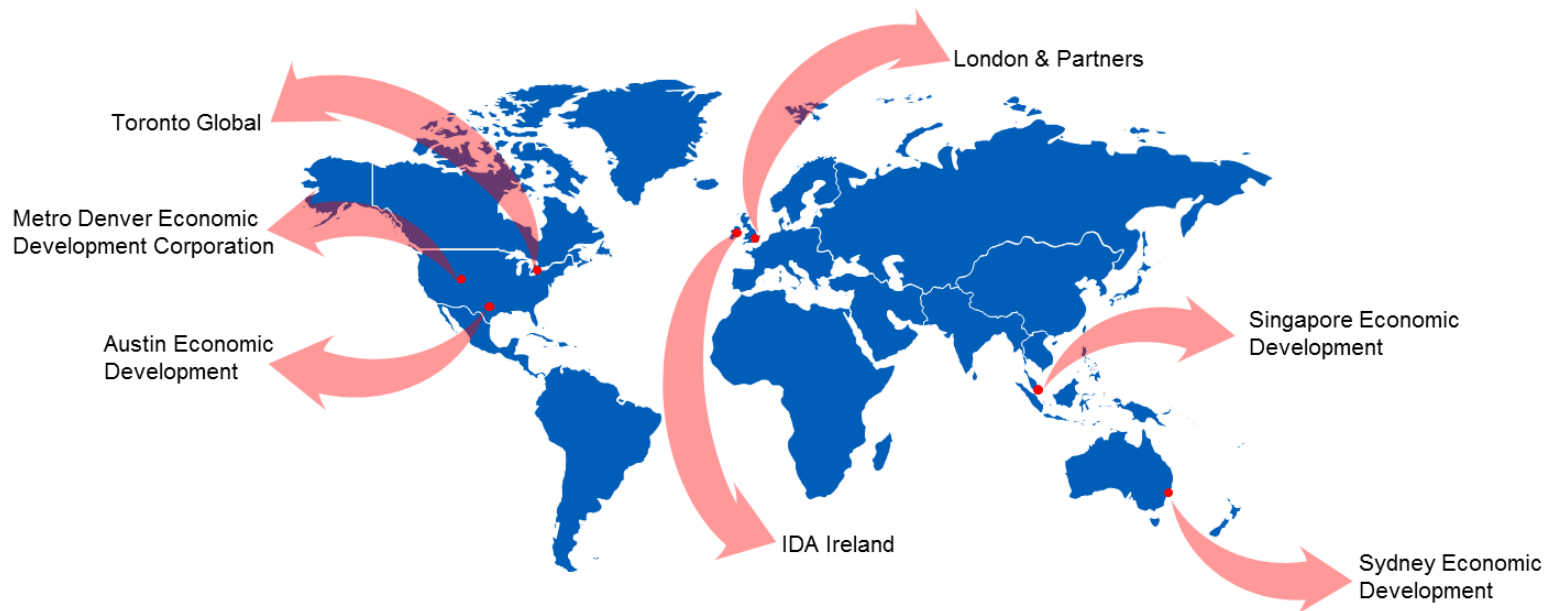
Jurisdictional review

Seven jurisdictions across the globe were reviewed for strategies and leading practices. Summary profiles on select leading practice jurisdictions in economic development combined research on leading practices and trends in economic development, subject matter expertise, and information on select regional economic development agencies in other jurisdictions.

While some of these very large cities/regions are not peer cities in size to Calgary, their learnings, strategies and leading practices are relevant to Calgary's global aspirations.

Cities and regions reviewed are shown below.

Figure 8 Comparator cities



From the review of successful jurisdictions and leading practices a number of themes emerged providing insight into the framework to the update to the Economic Strategy for Calgary. These themes, presented below, have been confirmed by the International Economic Development Council with its review of leading operational practices of high-performing economic development agencies (EDAs).

- There is a shift to more support to skilled workers and talent. **Workforce development** is shifting to **higher skills and training** as well as **recognizing demographic diversity** to meet the changing demands and needs of industry.
- Increased emphasis on **innovation**. Adapting to technological change across all industries to improve competitiveness and productivity is a common theme. All jurisdictions have put more focus in developing technology industries, and building digital capabilities and their technology ecosystem.
- **Place-building** and being a **dynamic, vibrant city** is an integral part of economic development efforts. This is mutually reinforcing for attracting and retaining talent and innovation. Investment in place includes encouraging investment in physical and social infrastructure to support connections within their jurisdiction and **connections to the rest of the world**.
- All leading practice jurisdictions market themselves as **“open for business”** with EDAs involved in advocacy efforts with their governments to continually ensure international **competitiveness** and a **business-friendly environment** to attract, retain and grow companies.
- There are focused efforts to both attract international investment, trade and jobs, and to facilitate the start-up, growth and scale-up of local entrepreneurial companies and small business.
- **Performance measures** are based on **results**, with most jurisdictions reporting on impacts on GDP, investment and jobs.
- **Alliances and partnerships** with industry, government, other organizations, advanced education and community are a key feature of economic development strategies. Leading jurisdictions not only create opportunities for economic development alliances and networks to flourish, they institutionalize them.

Updated strategy

The Economic Strategy for Calgary is an accumulation of a collaborative process, coming together with focus and purpose, to move Calgary forward in setting strategic direction to accelerate economic growth. The update to the Economic Strategy is designed to continue building on our strengths and addressing the challenges we face. The Economic Strategy is a living document, setting direction and priorities, and constantly evolving and adapting to change. Over its history, Calgary has a proven and well-earned reputation as a leading Canadian and global city for inclusion, entrepreneurship and community spirit. These core values ground our work and guide us as we implement the Economic Strategy.

Figure 9 Core Values

Inclusive

- We are a safe and diverse community
- We are a community that values your contribution
- We have a sense of shared ownership in decision making and implementing initiatives

Entrepreneurial

- We are risk takers
- We expand and grow to diversify our economy
- We co-create in adopting alternatives to changing circumstances
- We understand education is key to our success

Community Spirit

- We support each other to achieve our goals and solve problems
- We have a volunteer mindset
- We are resilient through creating our own future

Our core values serve as guiding principles in fulfilling the goals of the Economic Strategy. Through the implementation of the strategy we will build a community where people feel they belong. A community that provides opportunity to all Calgarians. A community that co-creates solutions for its collective future.

The purpose of the Economic Strategy reflects these core values: to align The City of Calgary, its civic partners, private sector, post-secondaries and other community stakeholders in achieving economic competitiveness, embracing shared prosperity and building a strong community.

The following sections outline vision, four areas of focus and strategies within each pillar. Key performance indicators will measure progress on the four areas of focus. Reporting will include additional progress measures for the strategies within the four areas of focus.

The many partnerships within Calgary are aligned with the focus and direction of the Economic Strategy and these organizations will collaborate on developing and executing specific actions for each strategy. Calgary has an amazing story, and our dynamic, vibrant people and place will continue to lead Canadian cities in achieving higher economic growth, attracting talent, innovating for the next generation, and contributing to solutions for world problems.

Vision

Calgary is the city of choice in Canada for the world's best entrepreneurs. We embrace innovation and create solutions to meet the world's needs in food, health, energy and transportation.

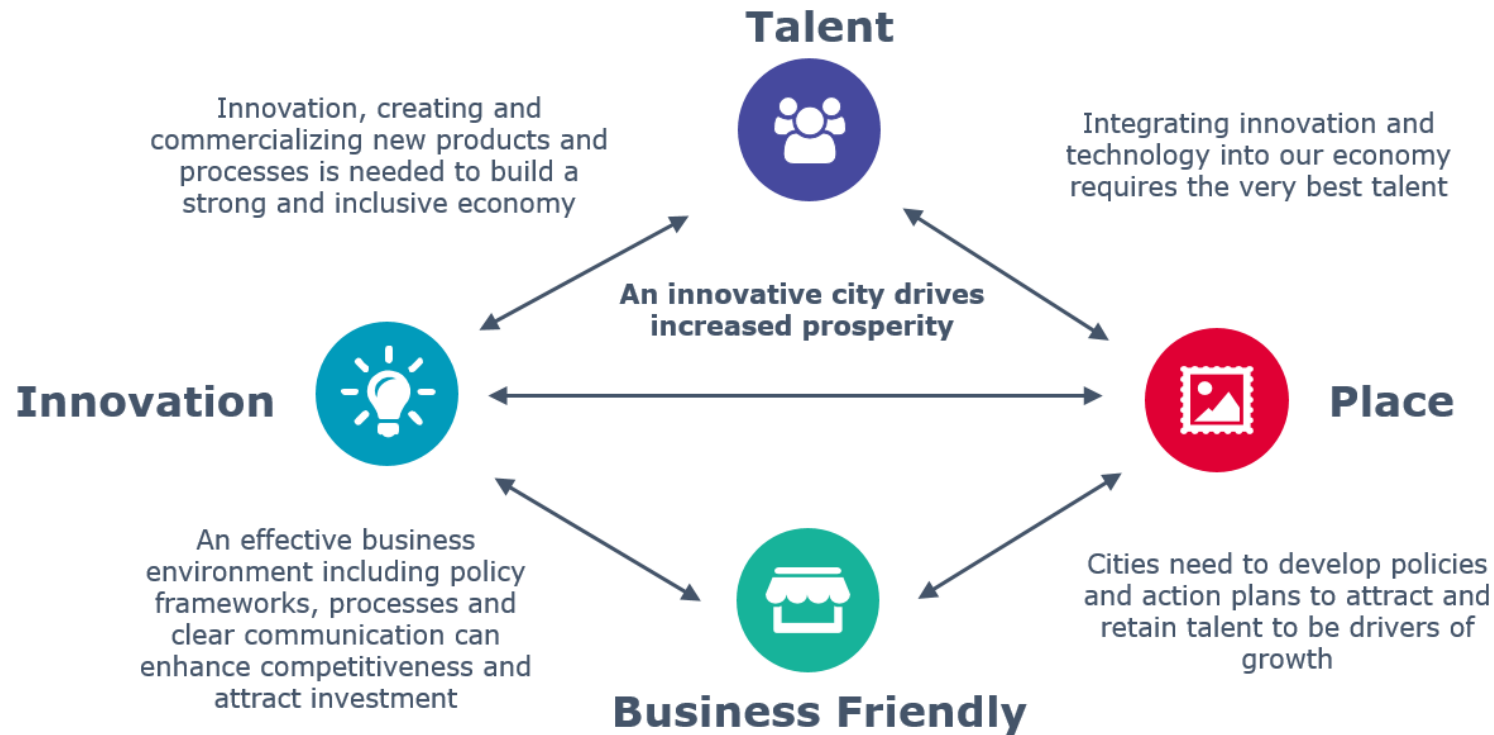
Framework

The Economic Strategy for Calgary is a strategy designed to achieve our long term vision for economic development. We will achieve this vision by targeting efforts towards four identified areas of focus: Talent, Innovation, Place and Business Environment. Each of these areas of focus needs to be addressed to support the development of established and emerging clusters.



The four areas of focus are deeply interconnected in creating the environment to foster economic development.

Figure 10 Interconnectivity of the focus areas



Throughout the process the team was encouraged to be focused, both in terms of scope and on those areas that enable economic development. As a result, the updated Economic Strategy shifts from six areas of focus (energies) to four (areas of focus) as seen below.

Figure 11 Narrowing areas of focus and reprioritizing

2014 strategy covered six areas of focus (“energies”)

Global	Leveraging energy expertise to bolster the economy and establish themselves as a global energy hub
Entrepreneurial	Supporting the development of alternate industries to reduce dependency on energy
Innovative	Fostering increased technology and innovation output, through better funding and support services
People	Reducing income inequality and improving employment opportunities for disadvantaged groups
Community	Investing in better infrastructure and facilities to create a vibrant, livable, accessible city
Collaborative	Building better partnerships between the Calgary's many private, NFP, and public organizations



2018 strategy has narrowed focus to four key topics

	Talent	Calgary is Canada's destination for talent
	Place	Calgary is Canada's most liveable city
	Innovation	Calgary is Canada's leading B2B innovation ecosystem
	Business environment	Calgary is Canada's most business friendly city

Talent

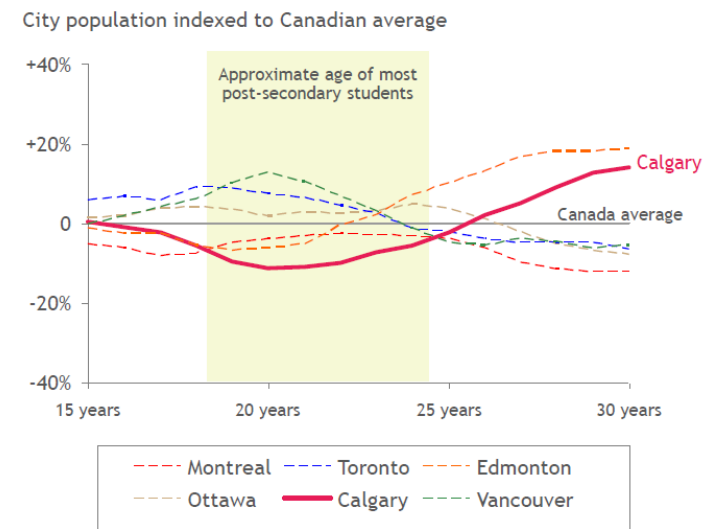
With the rapid advancement of physical, virtual and digital technologies disrupting all industries and the nature of work, having the skilled workers to support and grow technology-oriented companies is crucial to Calgary’s success. Research conducted by Boston Consulting Group indicates approximately half of our workforce is at risk to automation in the next 20 years. It is imperative our educational systems support people in gaining the skills needed for the jobs being created - and these skills are changing rapidly. Half of the most in-demand digital skills from 2013 did not appear in the top 10 list of in demand skills in 2017.

Conversely, half of the most in demand skills in 2017 weren't on the radar in 2013. This requires our educational programming from kindergarten to post secondary to be nimble and responsive to rapid changes.

Equally important that we include underrepresented populations in our efforts. Historically, fewer women participate in STEAM related educational programs and careers. High school completion rates are lower for First Nations and Aboriginal children. We have not been very successful at recognizing overseas experience or credentials and transitioning new Canadians into jobs that make use of their skills. Focusing on our diversity is an imperative as diversity brings innovation, different perspectives and creativity into our business practices. Studies have shown that engaging a gender and ethnically diverse workforce can boost business performance and overall economic growth. Just as our educational institutions and private sector delivery platforms need to be closely connected with industry, they also need to understand and respond to the diverse demographics of the community.

While Calgary currently has a highly-educated workforce, we lack a critical mass of skills for the jobs being created today. And our pipeline for future talent lags other jurisdictions:

- Calgary has the highest number of engineers per capita in Canada but the lowest share of software and computer engineers.
- Calgary's post secondary student-age population is declining relative to the Canadian average and lags other major cities.
- Calgary trails peer cities in post-secondary participation and participation in science, technology, engineering, arts and math (STEAM) programs is falling behind the Canadian average.



GOAL STATEMENT: CALGARY IS CANADA'S DESTINATION FOR TALENT



Create Canada's largest talent accelerator

- Expand work-integrated learning programs
- Collaborate with PSIs and other providers to design programs aligned with business workforce requirements
- Enhance program access to diverse communities
- Pilot / scale nimble short-term programs to reskill workers



Establish Calgary as a magnet for students

- Advocate for increased capacity within our PSIs
- Explore co-branded programs with global institutions
- Promote advantages of a globally diverse workforce
- Continue to prepare teachers to teach STEAM programs
- Secure funding for globally recognized professors



Emphasize creativity and innovation in K-U

- Grow work-integrated learning partnerships for STEAM careers
- Increase capacity to teach STEAM programs
- Enhance programs encouraging underrepresented participation in STEAM learning
- Develop after school programs with the talent accelerator



Address immediate needs through attraction efforts

- Build and execute talent attraction campaigns targeting senior technology leaders
- Attract companies that serve as magnets for talent

Marquee opportunity: Create Canada's largest talent accelerator

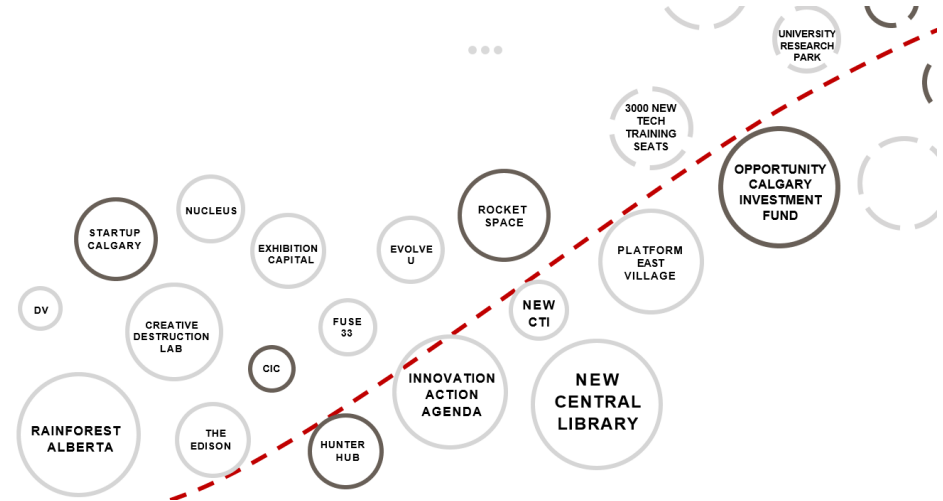
Calgary's talent accelerator brings key groups together to advance education in the city. The goal of the accelerator is to synchronize the supply of talent to the demand for talent. To be successful it is imperative collaboration take place to develop and deliver short-term, nimble programs to meet employer's needs. This will require a data-driven approach to understand talent gaps and receptor capacity of business to absorb graduates from programs.



Innovation

Calgary has made considerable progress in putting in place the building blocks of a networked innovation ecosystem. Calgary is home to established professional services and a community of potential investors to support the creation and growth of start-up companies. The City of Calgary's civic partners have been investing in the innovation ecosystem. Calgary Economic Development acquired and strengthened the offerings of Startup Calgary, while Calgary Technologies Inc. has enhanced programs available to help businesses scale. The broader community has also been making great strides in building the innovation ecosystem. In the last 18 months Calgary has launched:

- \$100 million Opportunity Calgary Investment Fund
- Clean Resource Innovation Network and Smart Agriculture superclusters
- Hunter Hub for Entrepreneurship
- Creative Destruction Labs, Zone Startups, District Ventures and Fuse33 Makerspace
- Rainforest Alberta innovation network and Nucleus as a focal point of activity with the intent to build Platform as a nexus for the innovation ecosystem
- Calgary Innovation Coalition



Challenges remain for Calgary to catch up and lead the country in innovation:

- We lag our peers in post-secondary participation and participation in science, technology, engineering and math programs

- Our universities conduct excellent research, yet we lack connections between research institutions, industry and entrepreneurs to commercialize research
- We are falling behind other cities in generating start-ups
- Venture capital funding is well short of other cities and too focused in the oil and gas sector

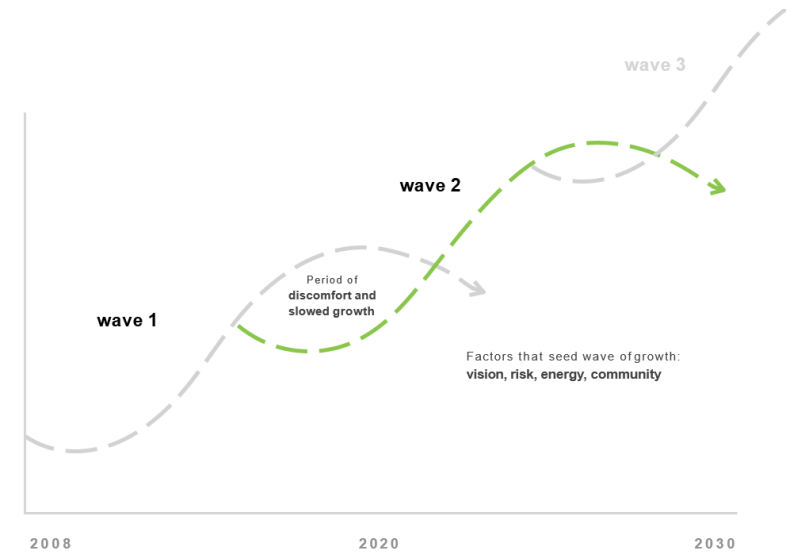
To address our challenges, we need to develop and build a networked ecosystem for innovation. An ecosystem filled with people, organizations and capital that move and connect within the ecosystem. An ecosystem with a culture of trust, leadership, role models, policy, activities and resources to start and grow companies.

In Calgary, we already have one of the best examples of a networked ecosystem in our oil and gas industry and associated value chain. This network of nodes and connections has long punched well above its weight class, generating enormous wealth for Calgary, Alberta and Canada over the last four decades.



Innovation, and economic development, isn't a linear process. As one wave of activity or industry growth peaks, there is period of discomfort as the community or organization seeks the next wave of growth. Each wave of change carries the seeds for the next, accelerating change and growth over time. Calgary has already begun the work of building the nodes in the ecosystem. As we continue to develop nodes, we need to strengthen the connections between the nodes. We need to invest in projects that increase the velocity and scale of the next wave of activity.

For this we need Canada's leading business-to-business (B2B) innovation ecosystem. An ecosystem that rapidly accelerate ideas. An ecosystem that decentralizes and connects activities in order to make the entire system more resilient. An ecosystem that inspires Calgarians to invest and become champions for the next wave of activity.



GOAL STATEMENT: CALGARY IS CANADA'S LEADING B2B INNOVATION ECOSYSTEM



Create the Calgary Innovation Corridor

- Create more enterprise connections for start-up & scale-up companies
- Build on existing assets to connect and expand innovation places and spaces in the Downtown Core
- Find creative ways to provide access to workspaces



Build funding to support generation growth

- Pursue new funding models for startups and scaleups including creation of Canada's largest community-built fund to support companies as they grow
- Educate investors in the innovation space
- Facilitate the entrance of global capital to local market



Develop relationships within the innovation ecosystem

- Curate and cultivate relationships between academia, enterprise, service agencies and investors
- Embrace innovation in large enterprise
- Align and expand programming of innovation accelerators
- Enhance access to mentors and senior advisors



Accelerate growth through attraction, advocacy and trade

- Attract investment and companies to fill gaps in our innovation ecosystem
- Advocate for government VC investment and tax credits
- Build connections & reach of Calgary's tech companies

Marquee opportunity: Create the Calgary Innovation Corridor

The Calgary Innovation Corridor will address key challenges facing the community and serve to build connections between ideas and financial capital. As the centre of the Calgary Innovation Corridor, Calgary's downtown will be a place that cultivates networks and enhances collisions between start-ups, large business, potential customers, academia and capital. It will build on existing and planned assets including Bow Valley College, Nucleus, Edison, Central Library, Platform, and a cluster of professional services, corporate headquarters and existing start-ups. The downtown will anchor nodes of activity extending from Fuse33 Makerspace and International Avenue, SAIT and ARIS, The University of Calgary and Mount Royal University, all connected by mass rapid transit. Cortex in St. Louis is an excellent example of clusters of activity and collaboration between stakeholders to create a robust innovation community.



Place

ImagineCALGARY, the 100-year vision for Calgary speaks to Calgary being “A great place to make a living, a great place to make a life.” From this we can infer there is a desire for Calgary to offer a premier living environment; safe communities; a global centre for business; a centre for arts, culture and recreation; and a city that welcomes people. A city that offers these elements and communicates its sense of place will attract talent, foster innovation and lead in economic growth.

Calgary has numerous strengths of place expressed by the fact the city has been ranked fifth most liveable city in the world by the Economist Intelligence Unit for a decade. Years of robust population growth and international migration has resulting in Calgary being the third most diverse city in the country. Alberta ranks among top places in Canada for charitable contributions, volunteering and participating in community events. While we are likely best known for our proximity to Banff National Park, more recently several architectural projects, including the Peace Bridge, Bow tower, TELUS Sky and the new Central Library, have drawn international attention.



While Calgary has many strengths, there are challenges to be faced in creating a place that attracts attention, people and businesses from across Canada and around the globe. Existing strategies already lay the foundation for developing a sense of place for visitors and residents alike. Calgary's Destination Strategy | *Ultimate Hosts. Ultimate Host City* tells us we need to attract, develop and enhance events and

experiences, as well as build out infrastructure to host events, giving visitors a reason to choose Calgary. Calgary's Cultural Plan and Arts Development Strategy both speak to the need for Calgarians to have opportunity to appreciate and connect artistically and culturally with our diverse community and the need to promote arts and culture as part of what defines us as a city.

When seeking places to live, different demographics seek different amenities and lifestyles. This requires the development of dynamic and diverse neighbourhoods throughout the city. With younger workers seeking urban environments, almost 60 per cent of downtown workers living within 10 kilometres of the downtown core, and the number of walking and bicycle commuters on the rise, particular attention should be paid to the downtown core. While the Centre City plan launched in 2007 states a vision for the Centre City as a liveable, caring and thriving place, perceptions remain that it is not liveable or vibrant.

Finally, the city needs to offer housing that is affordable to all incomes. While Calgary has the highest median income in Canada, it also has one the highest income gaps in Canada. Approximately 1 in 10 in Calgary live in poverty. Access to affordable housing can be a challenge for those on lower incomes.

GOAL STATEMENT: CALGARY IS CANADA'S MOST LIVEABLE CITY



Accelerate urbanization and connectivity in the core

- Target investment to build on existing & planned assets
- Investigate funding models for catalytic development
- Create a multi-agency committee to implement the vision for our downtown core
- Enhance connectivity between the Core, Rivers and Entertainment District, and the Beltline



Expand & enhance tourism, culture, recreation assets

- Attract, enhance and promote premier experiences and events showcasing Calgary as the Ultimate Host City
- Pursue enhanced transportation corridor linking YYC, downtown and Banff
- Support *Cultural Plan for Calgary* and *Living a Creative Life*
- Continue to build on livability assets reflecting our diversity throughout city



Intentionally support diversity and inclusion

- Increase economic participation for the underrepresented and underemployed
- Promote *Enough for All* – Calgary's poverty reduction strategy
- Continually provide diverse housing options that people can afford

Marquee opportunity: Accelerate urbanization and connectivity in the core

In 2007 Calgary revealed the Centre City plan laying out the vision for the Centre City as a liveable, caring and thriving place. Since this time, considerable work has been undertaken improving downtown neighbourhoods and connecting those neighbourhoods to those directly adjacent to the core (Beltline, Ramsay/Inglewood, Bridgeland and Sunnyside). Complementing the vision for the Centre City, Calgary Municipal Land Corporation launched the Rivers District Master Plan in 2017. These two documents form the basis for a coordinated effort to accelerate urbanization and connectivity in the core.

Neighbourhoods are the building blocks of great cities and the neighbourhoods of Victoria Park and Connaught (Beltline), East Village, Chinatown, Eau Claire, Downtown Core and Downtown West are the anchor neighbourhoods of a premier urban environment that welcomes residents and visitors through thriving arts and culture, tourism and recreation activities. These neighbourhoods are host to the new Central Library, Platform and Edison, and are the nexus of the Calgary's LRT infrastructure. There is incredible opportunity to investigate and implement creative/partnership funding models for catalytic developments to kick-start growth and enhance connectivity between these anchor neighbourhoods and adjacent neighbourhoods.



Business friendly

While access to talent, a culture of innovation and offering a great quality of life are important to being a business-friendly jurisdiction, so are the initiatives of a place to support business growth and maintain strong lines of communication with the business community. Strong progress has been made in these areas by City of Calgary including:

- Focusing capital infrastructure investment to enhance economic prosperity
- Implementing a Goods Movement Strategy
- \$90 million in tax relief for businesses
- \$500 million reduction in operating expenditures
- Business group with express purpose to address key issues and creating Customer Coordinator, Small Business position
- Opened new city permit portal
- \$100 million Opportunity Calgary Investment Fund
- Downtown Enterprise Zone



Businesses surveyed want all orders of government to have a more business-friendly perspective. The efforts to be business friendly are ongoing as there are always opportunities for continued improvement. Calgary should continue to remove and reduce barriers to business growth, enhance communications with

the business community and drive to maintain cost competitiveness. This is essential, not only in attracting companies to Calgary, but in retaining and fostering the growth and capital expenditures of our existing businesses.

GOAL STATEMENT: CALGARY IS CANADA'S MOST BUSINESS FRIENDLY CITY



Deploy initiatives to facilitate business development

- Launch an *Open for Business* campaign
- Enhance communication with the business community
- Initiate one-window approach for business and expand the role of Customer Coordinator, Small Business
- Ensure business continuity through disasters and infrastructure projects
- Maintain a supply of industrial land to meet objectives in attracting new business and supporting business growth
- Develop and deploy a public KPI scorecard
- Advocate for provincial and federal governments to improve tax position versus United States



Develop Calgary as a Living Lab

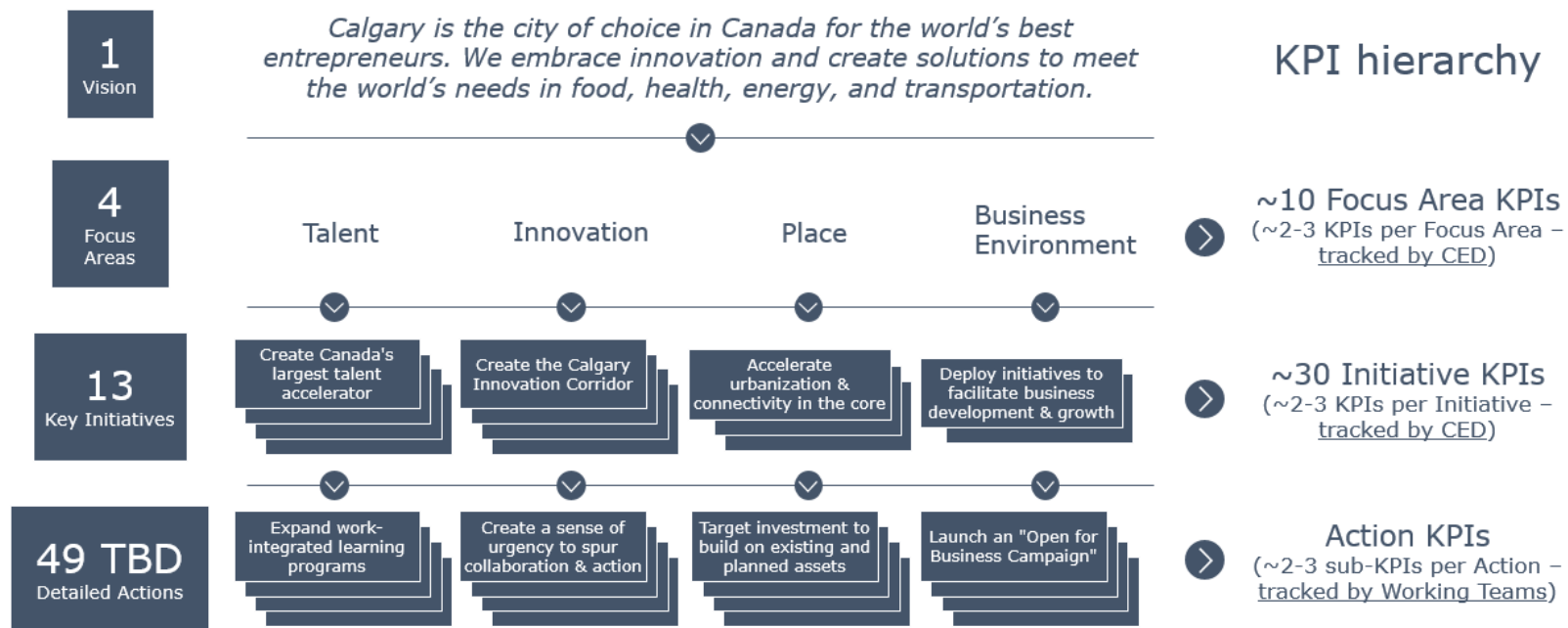
- Share & license City of Calgary data on large scale
- Open City infrastructure to create wireless (5G ready) zones with industry partners
- Extend dark fibre footprint to business/industrial parks and transit oriented development sites
- Explore new ways for adoption of technology & innovation to provide solutions to City challenges

Performance indicators

Hierarchy of indicators

The previous Economic Strategy for Calgary reported on core indicators that were meant to answer “how are Calgarians better off?”. In this update, the core indicators will be replaced with indicators reflecting progress on each of the four areas of focus. These indicators are presented in the following section. In addition, performance indicators will be developed reflecting progress towards the key initiatives. Detailed actions will be reported on through activity reporting and storytelling. The hierarchy of performance indicators are shown in Figure 13.

Figure 12 Hierarchy of indicators



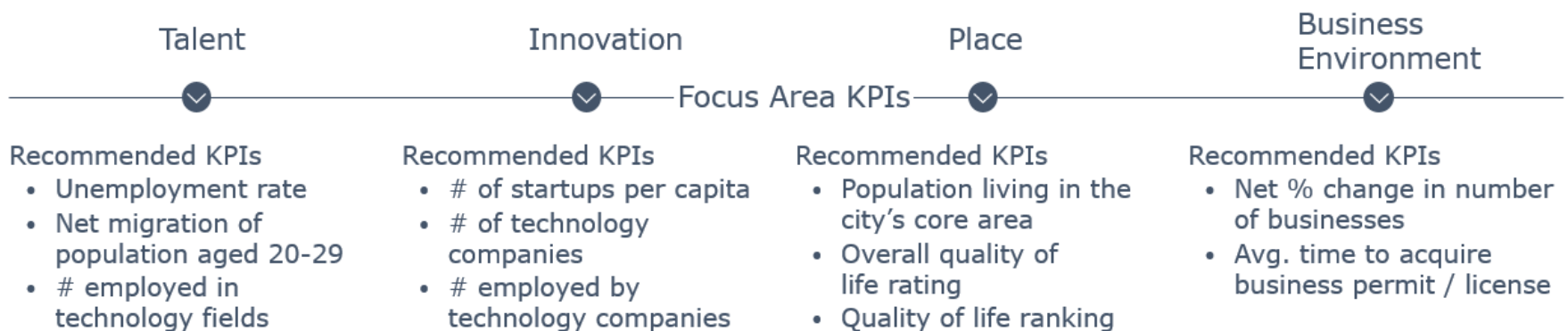
Focus area indicators

Through the course of designing the Economic Strategy it was clear that each area of focus be defensible. As such performance indicators created for the areas of focus meet three criteria:

1. Progress toward the goal
2. Data available on an annual reporting basis
3. Comparable data is available from other jurisdictions in Canada

Figure 14 summarizes the indicators for each area of focus.

Figure 13 Areas of focus performance indicators



Implementation

With four areas of focus and 13 key initiatives, there is much to be done in achieving the vision of the Economic Strategy. Over the course of the next four months an implementation plan for the Economic Strategy will be developed. In advance of this work, consideration has been given to the timeline to implement as seen in figure 15.

Figure 14 Timeline to execute



As the implementation plan is developed, this proposed timeline for implementation will be accompanied by immediate, intermediate and long-term milestones for each of the key initiatives.

With this in mind, implementation of the Economic Strategy has already begun with beginning conversations in reformulating the Leadership and Implementation Team, building working groups for each area of focus and gathering additional stakeholders to support each of the key initiatives. There will be a focus on broadening stakeholder engagement, establishing an implementation plan and realizing quick wins to show progress to the community. Activities for the next 12 months are shown in Figure 17.

Figure 15 First 12 months

	Next 3 months	3 to 12 months	Beyond 12 months
PFC/City Council approval and support	<ul style="list-style-type: none"> • Present strategy for City approval (June 5 PFC meeting) 	<ul style="list-style-type: none"> • Develop implementation plan and restructure Leadership Team (November) 	<ul style="list-style-type: none"> • Have City and key leaders consistently message strategic priorities
Broadening our engagement	<ul style="list-style-type: none"> • Introduce strategy to new stakeholders (eg, City, other organizations) • Stand-up sub-committees 	<ul style="list-style-type: none"> • Have key leaders advocate broadly for strategy during public release 	<ul style="list-style-type: none"> • Stakeholders continue to champion initiatives, driving broader support and engagement
Implementation of initiatives	<ul style="list-style-type: none"> • Push to implement quick wins (eg, PSI seats, bus-env't commitment) • Stand-up leadership for near-term initiatives (eg, talent accelerator) 	<ul style="list-style-type: none"> • Establish implementation plan and resourcing to ensure success of near-term initiatives 	<ul style="list-style-type: none"> • Continue driving broader strategy • Engage key leaders for regular strategic updates and decisions

Summary of key initiatives

Talent	Innovation	Strategic goal	Place	Business Environment
Canada's destination for talent	Canada's leading B2B innovation ecosystem	Canada's most livable city	Canada's most business-friendly city	
Key initiatives				
Create Canada's largest talent accelerator	Create the Calgary Innovation Corridor	Accelerate urbanization and connectivity in the core	Deploy initiatives to facilitate business development and growth	
Establish Calgary as a magnet for students	Build funding to support generational growth	Expand and enhance tourism, culture, and recreation assets	Develop Calgary as a Living Lab	
Emphasize creativity and innovation in K-U	Develop relationships within the innovation ecosystem	Intentionally support diversity and inclusion		
Address immediate needs through attraction efforts	Accelerate growth through attraction, advocacy and trade			

Appendix A: Established and emerging Clusters

ENERGY

The energy sector's roots in Calgary go back more than a century and it has been the driving force in the city's economy for decades. Canada is one of the top producers of crude oil and natural gas in the world and every major energy company in the country is headquartered in Calgary. There is a highly integrated ecosystem linking talent, capital and policy that makes Calgary a global centre of excellence in all things energy.

The cluster centred in eight-block radius downtown includes companies involved in all aspects of energy production and transportation, entrepreneurs, highly skilled workers, well-developed supply chains and applied research. Our expertise in this global-scale industry extends from petroleum to solar, wind and other renewables as well as innovation in clean tech.

Even with challenging economic fundamentals and a historic structural recession in recent years, oil and gas companies still invest more in Canada each year – \$45 billion in capital spending in 2017 – than any other industrial sector.

In 2016, the oil and gas sector accounted for \$36.5 billion in GDP and 57,000 jobs in Calgary.

Renewable energy and clean tech are fast-growing elements to the sector as Calgary represents nearly half of Alberta's \$2.7 billion clean tech market in energy. We are leaders in addressing environmental issues through stringent regulation and investments in advanced technologies, such as carbon capture and storage. Calgary companies also operate about 25 per cent of Canada's installed renewable energy capacity.

Among the most promising opportunities for the sector are leveraging the convergence of technological advances such as industrial internet of things (IIOT), machine learning, big data, blockchain, robotics and sensor fusion to reduce costs and improve performance.

Trends influencing the energy industry include:

- Energy demand is growing globally; driven by developing and non-OECD countries.
- As the global energy supply map changes, Canadian oil and gas is essentially landlocked due to a lack of tidewater access for exports and our biggest customer, the United States, is now also our biggest competitor.
- The push for greater efficiency and lower carbon emissions globally is pushing energy companies to adopt new technologies to produce more with less.
- Economic viability of renewable energy is improving, in combination with public policy, results in increasing capital investment.

AGRIBUSINESS

Agribusiness is another historic economic sector in Calgary and part of the fabric of the community with roots dating to the 18th century.

Today, the industry has expanded to crop and livestock production, meat processing, food and beverage manufacturing, support services and equipment manufacturing as well as growth areas such as precision agriculture and functional foods. Value-added activities in the sector include sales and marketing, agri-finance, and research and development.

Agriculture is now the largest part of the manufacturing industry in Alberta and generates 50,000 direct jobs and \$14.6 billion in sales. The agribusiness in Alberta forecast to need to fill over 23,000 potential jobs by 2025. Alberta has an established advantage in producing plant-based protein and pulse crops.

Alberta's top agrifood exports in 2017 were processed meats, wheat, and oilseeds. The leading export market was the United States, which, at \$4 billion, was greater than the rest of the top five combined – China, Japan, Mexico and South Korea.

Calgary's is a centre of agribusiness in Canada and is home to a cluster of leading firms, a multi-modal transportation network, and post-secondary institutions including the University of Calgary, SAIT and nearby Olds College working with industry to drive innovation.

In 2018, the Calgary-Olds Smart Agri-Food Corridor was established to further develop an ecosystem to support innovation and incubate entrepreneurial companies with access to a world-class agriculture environment supporting the development and scaling of new technologies throughout the production chain.

Trends influencing the agribusiness industry include:

- Global population is forecast to reach 9.8 billion by 2050 and will drive agriculture demand; most growth will come from China and India.
- Increases in crop production will come from yield efficiency improvements, not land usage.
- Conscious consumerism is driving a demand for food quality, safety, transparency, and supply chain management.
- Sector consolidation will see companies vertically integrate to capitalize on branding, and research and development.

TRANSPORTATION AND LOGISTICS

Calgary has been a transportation and logistics centre since the intercontinental railroad arrived in the 1870s and today it is the leading inland port in Western Canada. There's a well-established ecosystem for moving cargo and people, warehousing and storage of goods as well as support activities for modes of transportation.

Three quarters of all air cargo in Alberta moves through YYC Calgary Airport and can reach anywhere in the world within 48 hours. Calgary is at the intersection of major east-west and north-south highways, providing access to 16 million consumers by road in a one-day drive. Both of Canada's Class I railroads operate high-velocity intermodal facilities that provide 48-hour transit to West Coast ports.

The Transportation and Logistics sector in Calgary was estimated to generate \$5.6 billion in GDP and employ approximately 55,000 people in 2017.

Calgary's location in the centre of western Canada results in lower landed costs over other cities across the west. Calgary is the second busiest airport for air cargo flights. In addition, Calgary is home to large shipment hubs for leading courier companies and trucking firms and home to distribution centres for a number of leading consumer goods companies.

Calgary is emerging as a global hub for development of technologies for autonomous mobile systems that are expected to drive future growth in the sector. A cluster of UAV, geospatial data and analysis, navigation and global positioning companies are located in Calgary and focused in improving efficiency in major industrial sectors; energy, agribusiness and construction.

Trends influencing the transportation and logistics industry include:

- Cross border e-commerce is increasing resulting in higher demand and requirement for distribution and fulfillment centres
- Multi-channel supply chain is emerging as companies expect reliable and faster deliveries
- Automation is giving rise to the use of Internet of Things (IoT), robotics, and modularization in warehouse management
- Autonomous vehicles are approaching mainstream application which will disrupt the labour force in transportation sector and other sectors.

LIFE SCIENCES

The life sciences industry is an emerging sector in Calgary and it is focused on industries related to public health and well-being. The high-growth sector includes biotechnology, healthcare services, clinical trials, pharmaceuticals, animal health, medical imaging and medical devices, nutraceuticals, genomics and medical research.

The sector typically has a higher degree of research and development, and public sector investment than most sectors.

Life sciences accounted for seven per cent or 56,000 jobs in Calgary in 2017 – primarily in healthcare services. The private sector cluster generated an estimated \$1 billion in revenue in 2015. Calgary is home to dozens of life science companies and has strong research infrastructure at the University of Calgary and Foothills Hospital with particular strengths in infectious disease, brain and mental health, animal health, clinical trials and biomedical engineering.

Trends influencing the life sciences industry include:

- Life sciences are experiencing high rates of annual growth with pharmaceuticals growing at 4.4 per cent annually
- Technology is disrupting the delivery of health care and pharmacy services
- Research and development will remain as an integrated component of the life sciences industry

FINANCIAL SERVICES

Calgary is one of four largest financial centres in Canada with the cluster of financial services firms here leaders in investment banking, managing foreign direct investment, private equity management, wealth management, and retail and corporate banking.

Most of the world's major investment and commercial banks have a presence in the city. Calgary firms handled 9.5 per cent of energy-related finance deals across the world from 2012 to 2016 and about 17 per cent of their total value.

The financial services sector accounted for approximately \$19 billion or 10 per cent of Calgary's GDP and employed approximately 42,000 people in 2016. The sector includes retail and investment banking, accounting, insurance but with the emergence of financial services technologies (fintech) and the adaptations of technology such as blockchain to finance, the sector has grown to include software companies

Growth in financial services has been a catalyst for emerging fintech firms, cybersecurity and other tech firms with products and services for the financial sector.

Trends influencing the financial services industry include:

- Increasing regulation and compliance regime globally
- Cybersecurity and customer protection issues of identity protection are increasing
- Financial companies are focusing on digital strategies and utilizing new technology platforms and applications to serve and stay in touch with customers
- Automation is improving productivity and changing the nature of the workforce
- Financial services are becoming increasingly technology companies

CREATIVE INDUSTRIES

Creative Industries is based on the ability to convert ideas and knowledge into commercial products and services. It encompasses the firms and organizations that contribute to Calgary's arts and culture including film, television, video and sound production; broadcasting; visual and performing arts; advertising and marketing; publishing and printing; digital media; and design services.

Film and TV production are a notable strength for Calgary as our talented crews have won more Emmy, Golden Globe and Academy awards than any jurisdiction in Canada over the past 15 years. Significant assets in the community for creative industries and culture include the Glenbow Museum and National Music Centre. The Calgary Film Centre has modern sound stages and can accommodate the any size of production.

Creative Industries contribute \$3.1 billion to Calgary's GDP in 2016 and generated an estimated 50,000 jobs. The film and television sector generated an estimated 10,000 jobs and \$178 million in production in 2017. Calgary is also home to a cluster companies in the fast growing sectors of elearning and digital advertising.

Calgary's low operating cost and growing talent base has the city in a position to be a leader in digital media. The sector is supported by educational programming at the Alberta College of Art and Design, SAIT, Mount Royal University and the University of Calgary.

Trends influencing the creative industries include:

- Digital subscription based platforms are assuming market share from cable providers and are increasing their investments in digital productions
- Advertising is the fastest growing segment of digital media followed by digital education
- During economic downturns, film and television digital subscriptions continue to rise
- Virtual and augmented reality technology is disrupting how creative content is generated and consumed
- Emerging economies share of creative industries production and consumption is increasing

TOURISM

Tourism is a cluster that cuts across several industries including: accommodation, food and beverage, retail, transportation, sport and recreation, and arts and culture. This places the tourism cluster in the somewhat unique position of both contributing to quality of places as well as being an industry cluster in its own right.

Tourism spending from vacationers and business travellers pulls new money into the economy. Tourism spending by local residents hosting friends and family and 'staycations' keeps money circulating in the local economy generating ongoing benefits. In 2016, tourism spending in the Calgary Region was estimated to be \$1.6 billion and the sector generated 15,000 jobs.

Calgary's Destination Strategy – Ultimate Hosts: Ultimate Host City emphasizes the role of marketers, advocates, hosts and activators to drive tourism growth.

Calgary is the gateway to Banff National Park one hour west of the city. Other tourism sites and events include the Calgary Stampede, Spruce Meadows, Calgary Folk Festival, Glenbow Museum, Calgary Zoo and Heritage Park.

Trends influencing the tourism industry include:

- Led by China, emerging economies share of global tourism is expected to increase from 45 per cent today to 57 per cent by 2030
- International overnight tourists increased by 7 per cent in 2017 while tourism expenditures increased by 6.3 per cent in Canada in 2017, more than double the rate of growth for the broader economy
- Increasing demand for experienced-based tourism including wilderness adventures, ecotourism and wellness retreats
- Technology is disrupting how travel is planned and experienced decreasing the role of intermediaries