

January 2021

# TRANSPORTATION & LOGISTICS VALUE PROPOSITION

A study commissioned by:  
Calgary Economic Development

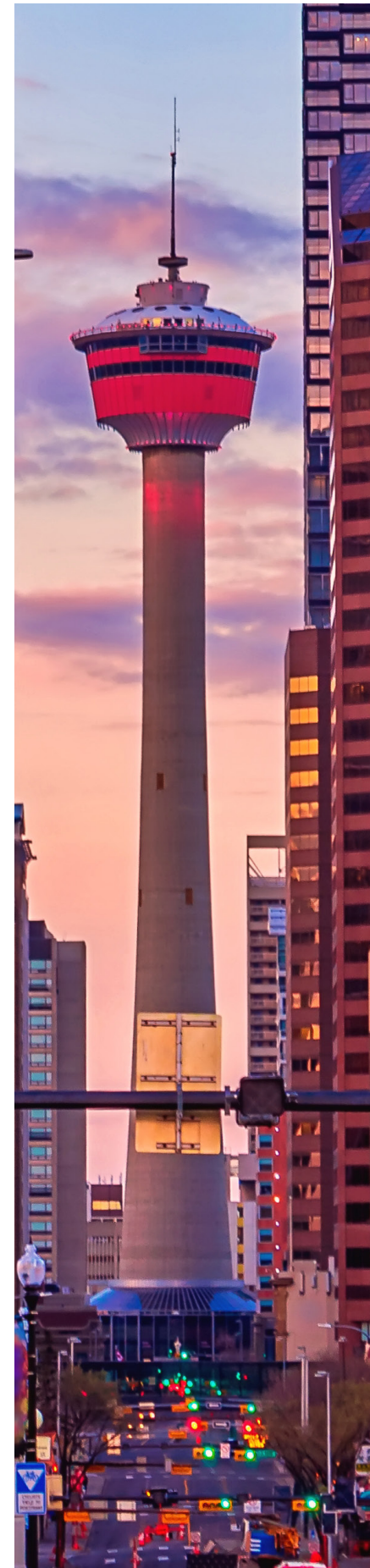
Authored by:  
Conway Advisory



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# EXECUTIVE SUMMARY

## Context

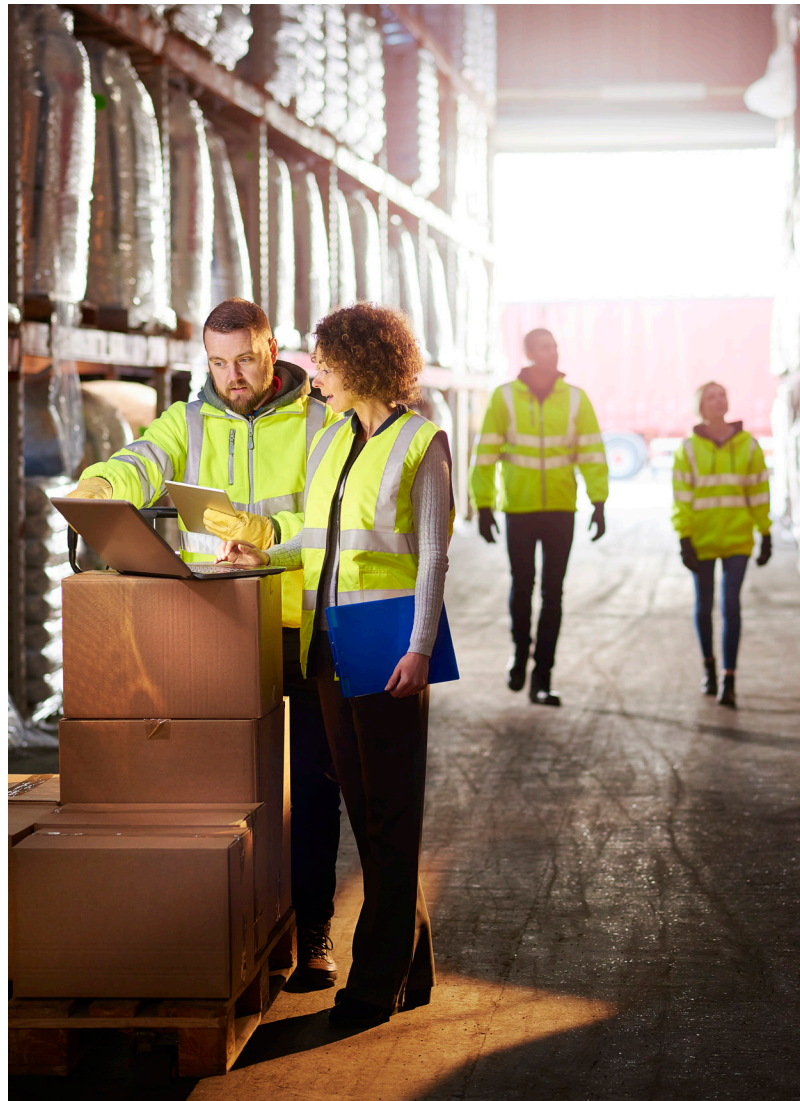
To bolster its efforts in attracting, retaining, and growing the significance of the transportation and logistics sector, Calgary Economic Development began a process in 2020 to refine the City's specific value proposition for the sector and its sub-sectors – both for current activities and how they may develop over time. Conway was retained as a third party consultant to conduct a study and develop the following series of analyses, findings, and suggested next steps, including:

- Examine the value propositions for the City of Calgary for transportation and logistics;
- Identify key current and developing sectors that are either reliant on or adjacent to the transportation and logistics sector and for which Calgary is an attractive location for growth;
- Develop a list of specific and sector-relevant advantages of the City of Calgary for these sectors, as well as statements to support those advantages; and
- Lay out a set of actions to enhance the value and competitiveness of the sector and to support future marketing efforts for the City of Calgary in this space.

## Approach

In order to develop the value propositions and action plan, Conway performed objective, quantitative analysis and qualitative stakeholder engagement with companies already operating in the City of Calgary in the transportation, logistics, and associated sectors. Specifically, Conway conducted the following tasks:

- A review of previous community and economic development initiatives and plans, logistics and freight plans, and relevant internal/external marketing and promotional materials;
- Interviews with freight operators, railroads, integrated logistics (3PLs), trucking operators, air carriers, and other companies involved in the transportation and logistics and associated clusters in Calgary;
- Interviews with local public and non-profit agencies with responsibility for or interest in transportation and investment attraction;



- Location quotient and shift share analyses to understand the City's and region's current economic networks and changes over time;
- Competitive benchmarking analysis examining Calgary against similar peer cities from the perspective of a company conducting a location search would (i.e., reverse site selection methodology);
- Opportunity match profiling to examine the best-match industry types as well as the factors influencing these industries over the near term;
- Value proposition development for these targets and for the City more generally; and,
- An action plan to begin executing on the findings and recommendations of this report.

<sup>1</sup> Federal Communications Commission. (Jan 15, 2021) First Phase of Record-Breaking 5G Spectrum Auction Concludes. <https://www.fcc.gov/document/first-phase-record-breaking-5g-spectrum-auction-concludes>

<sup>2</sup> Canadian Radio-Television and Telecommunications Commission. (2020). Communications Monitoring Report. Retrieved from <https://crtc.gc.ca/pubs/cm/2020-en.pdf>

## Key Findings

The analyses conducted enabled Conway and Calgary Economic Development to identify foundational, growth, and innovation sectors for transportation, logistics, and related areas. Conway developed a series of unique characteristics applicable for the City of Calgary across the entire transportation and logistics sector.

**Excellence in Logistics** – The City of Calgary has a strong history in specialized and global logistics. This means that we have the talent, mix of providers and servicers, diversified transportation and logistics infrastructure to meet almost any need, including global air access, continent spanning railroad, and long and short distance trucking.

**Commitment to Our Ideas** – The City of Calgary has a strong history of supporting the initiatives that it puts forward. Examples include transportation and logistics planning and infrastructure, Calgary Living Labs programs, the Opportunity Calgary Investment Fund, and investments at YYC Calgary International Airport.

**Strong Support System and Talent Pipeline** – Through the unique programs and certifications funded and provided by the University of Calgary, Southern Alberta Institute of Technology (SAIT), and Mount Royal University, Calgary has educational institutions that support all aspects of transportation and logistics as well as other sector partners like maintenance, automation, and information technology (IT).

**Talented and Entrepreneurial Talent Pool** – Our people are skilled, motivated, and have built a legacy of economic success and innovation. Our community, workforce, and companies have a unique ‘can do’ attitude born out of the unique requirements of our history and our legacy industries.

**Innovative and Sector-Leading Activities** – Companies like [Attabotics Inc.](#), [Hexagon’s Autonomy & Positioning division \(Hexagon|Novatel Inc.\)](#), [AltaML Inc.](#), and [AERIUM Analytics](#) have made Calgary their home, and they are at the heart of innovation in logistics technology, autonomous systems, machine learning, and other technologies driving the state of the art in smart materials movement.

**Ability to Execute** – We have available industrial land at and adjacent to key transportation nodes, allowing for effective and efficient development.

Conway also examined foreign direct investment (FDI) trends and sector analysis to determine, for specific sub-sectors:

- Is the sector growing?
- Are there recent greenfield examples of new FDI investment?
- Is there a sufficient pool of companies to make focus on the sector reasonable?
- Is the target group definable enough so that it may be approached as a coherent construct?

As a result of the above, Conway – in collaboration with Calgary Economic Development – identified and prioritized the following sub-sectors as likely targets of opportunity for expansion in, and attraction to, the City of Calgary:

The following sub-sectors could be considered first priority for target opportunities:

- Food manufacturing and logistics
- Regional distribution and logistics
- Third-party integrated logistics providers (3PL)
- Truck services
- Air cargo

The following sub-sectors could be considered second priority for target opportunities:

- Aircraft maintenance
- Aerospace manufacturing – drones
- Information technology (IT) – artificial intelligence (AI) and network modeling
- Autonomous vehicles, particularly materials movement

The following sub-sectors could be considered nascent, but opportunistic sub-sectors for target opportunities:

- Value added logistics (i.e., assembly and customization in free trade arrangement)
- Aerospace manufacturing – small/medium aircraft
- Logistics consulting and management

Finally, Conway developed a series of value propositions for Calgary that correspond to each sub-sector. The value propositions are detailed in the body of the report.

# Recommendations

Simply identifying the value propositions and opportunities in transportation and logistics will not be enough alone to realise the potential afforded to the City of Calgary. Instead, Calgary Economic Development and its partners in the public and private sectors will need to work collaboratively to support and promote the sector.

This report contains a full list of recommended actions for each of the three major cluster areas: Logistics, Technology, and Aerospace. However, there is a series of general actions that can serve as recommendations to grow, expand, and enhance the City's transportation and logistics sector. It should be noted the items in list of action items are not necessarily the responsibility (or within the purview) of any one agency or authority. Instead, implementing these actions will require the collaboration of stakeholders across the public, private, and institutional realms.

## RECOMMENDATION 1 Stakeholder Identification and Engagement

Bring together interested parties as identified in the specific clusters for Logistics, Technology, and Aerospace.

### Why this is important:

This is a necessary first step in creating an ongoing, self-catalyzing process of local engagement, ambassadorship, and capacity enhancement.

## RECOMMENDATION 2 Land

- Assemble a catalogue of developable land and available buildings that may accommodate the activities identified in the clusters above. To the extent possible, identify landowners and/or listing brokers and also examine "shovel-readiness" of these parcels.
- Specifically identify, or reserve, land near key transportation access modes, such as at the airport, rail yards, and along the designated freight corridors.

### Why this is important:

Location decisions are made on a constellation of factors, most of them with greater overall importance than real estate. However, real estate is a necessary factor in the implementation of that location decision. The City of Calgary will need to show prospective investors there is suitable real estate that will allow them to execute on their plans.

## RECOMMENDATION 3 Workforce Development

- Conduct periodic evaluations of labour needs and supplies.
- Collaborate with local training entities and institutions of higher learning to create new or enhanced training and learning programs. In particular, continue to build upon the programs and the competitive advantage already provided at SAIT and Mount Royal University.

### Why this is important:

Workforce and talent are primary location drivers across a wide range of industry types. Innovative industry thrives on and is drawn to pools of talent and the institutions that build them.

## RECOMMENDATION 4 Marketing

- Create a strategy for further developing and then transmitting the value propositions above in a marketing campaign that will be attractive to decision makers in the identified clusters. Specific channels may include direct mail, LinkedIn marketing, direct outreach, online, or other forms.
- As budgets and current travel restrictions permit, consider taking part in and sponsoring specific portions of organizations and conferences for Logistics, Technology, and Aerospace.

### Why this is important:

Corporate decision makers and the consultants that advise them need to be educated on the opportunity that the Calgary region provides.

## RECOMMENDATION 5 Regional Collaboration

- The current competition among the regional municipalities in the Calgary area undermines the City's – and Region's – ability to compete effectively for investment on the global stage. Efforts should continue to be made to find means and mechanisms for shared investment and shared reward in attracting transportation and logistics investment.

### Why this is important:

Collaborating regionally will enable better economies of scale, an enhanced ability to serve a broader array of investors, and an ability to each find benefit in each project. A failure to do so will not only mean a lack of efficiency but may also create a negative impression of conflict to potential investors.



# GLOSSARY OF TERMS & ACRONYMS

**3PL**..... Third-Party Logistics provider (sometimes interchangeable referred to as “Integrated Logistics Provider”). Provides outsourced operations of warehousing, transportation, and other related services.

**AI**..... Artificial intelligence. The development of computer systems able to perform tasks normally requiring human intelligence.

**BCO** ..... Beneficial cargo owner. The party that ultimately owns the product being shipped.

**CAGR** ..... Compound annual growth rate. The mean annual growth rate of an investment over a specified period longer than one year.

**CETA**..... Comprehensive Economic and Trade Agreement between Canada and the European Union.

**CIFFA** ..... Canadian International Freight Forwarders Association.

**CIFST** ..... Canadian Institute of Food Science and Technology.

**CMA** ..... Census metropolitan area.

**CSCB** ..... Canadian Society of Customs Brokers.

**CSCMP** ..... Council of Supply Chain Management Professionals.

**FDI** ..... Foreign direct investment. New greenfield operations established in a jurisdiction from companies originating outside of the jurisdiction.

**FTZ** ..... Foreign trade zone. A geographical area, in (or adjacent to) a point of entry where commercial merchandise receives the same Customs treatment as if it were still outside of the country.

**IANA**..... Intermodal Association of North America.

**ISM** ..... Institute for Supply Management.

**LTL** ..... Less-Than-Truckload. Shipping service for relatively small loads or quantities of freight.

**MHEDA** ..... Material Handling Equipment Distributors Association.

**MRO** ..... Maintenance, repair, and overhaul of aircraft.

**NAFTZ** ..... National Association of Foreign Trade Zones.

**NAICS** ..... North American Industry Classification System.

**PPE** ..... Personal protective equipment. Masks, gloves, and other similar equipment used to reduce the risk of the spread of disease.

**SAIT** ..... Southern Alberta Institute of Technology.

## Introduction

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# CALGARY TRANSPORTATION & LOGISTICS SECTOR OVERVIEW

## Transportation & Logistics Ecosystem

To better understand the importance and dynamics of the transportation and logistics sector, it is important to both define it and describe the different companies, entities, and agencies participating in the sector.

While the terms “transportation” and “logistics” are occasionally used interchangeably when talking about the movement of freight and cargo, they have distinct meanings. Strictly, transportation is the movement of goods, and logistics is the management of the inward and outward transportation of goods from the manufacturer to the end user. Put another way, logistics encompasses all activities related to freight and cargo between the point of origination and destination – including processing, storage, and sorting, among others. Transportation is limited to the movement of goods between points.

Given this, the transportation ecosystem includes the following transportation entities such as:

- Airlines, both cargo and passenger airlines carrying belly freight
- Trucking companies
- Railroads
- Third-party logistics (3PL) providers
- Freight forwarders
- Beneficial cargo owners (BCO) - The party that ultimately owns the product being shipped.
- Public Agencies:
  - Transportation agencies for road, rail, and air transportation (e.g., Transport Canada, Alberta Ministry of Transportation)
  - Regulatory agencies at the provincial and federal level
  - Educational and training institutions
  - Real estate developers:
    - Warehouse and industrial space
    - Airports
- Service Providers:
  - Consultants
  - Technology companies

Each of these entities and organizations operate in distinct but overlapping communities of activity. Some companies, agencies, and institutions play more than one role. For example, YYC Calgary International Airport is an important player in both air cargo movement and is also a real estate development entity.

## Known Opportunities & Constraints

Many of the companies and organizations above were engaged in interviews to provide a better understanding of the current Calgary transportation and logistics ecosystem. The results of the interviews provided a useful overview of the current dynamics in the sector and enabled Conway to distill several key insights into Calgary’s transportation and logistics sector. The key insights are grouped into themes such as logistics as an advantage, innovation, connections to Calgary, workforce development and attraction, real estate development, and regional factors.

### Logistics as a Canadian and Calgary advantage:

- Canada has advantages in global trade, such as being part of the Comprehensive Economic and Trade Agreement and the TransPacific partnership.
- The Calgary region has one of the deepest talent bases for engineering, has an excellent quality of life, good recruitability, a very good overall tax regime, and a favorable operating cost structure.
- The City is of a moderate size that allows for a very personal connection to the providers, ensuring better service. This size advantage also allows newcomers to immerse themselves in the area ecosystem easier than compared to larger markets.
- The region’s legacy of oil and gas development also means heavy transportation infrastructure and linkages exist here beyond what might normally be expected of a community of this size.
- From a national supply chain perspective, most of the freight coming from the West Coast needs to be staged through Calgary to move on to the Eastern parts of Canada, resulting in a natural advantage for value added activity.



### **Calgary as a home for innovation:**

- The Calgary community is resilient and committed to surviving and thriving. Interviewees noted the entrepreneurial spirit of the region as a whole and of the workforce specifically.
- Local companies like Attabotics and Hexagon are driving innovation in robotics, sensors, and related fields that help make transportation, logistics, and warehousing more efficient.
- There is a nascent local cluster forming in logistics technology, resulting in new opportunities for more companies to either start or come into the region. There are specific opportunities for companies in electronics, satellites, data, AI, and similar fields.
- The COVID-19 pandemic has accelerated development of the ecommerce supply chain, resulting in new opportunities for local logistics (new distribution patterns, increased speed of operations, increased automation).
- Similarly, the medical and pharmaceutical supply chain has changed dramatically – shippers now have dedicated lines for medical and pharmaceutical products, and these are given priority status within the system. These supply chains are increasingly being viewed and planned as essential services.

### **Calgary's strong transportation connections:**

- Calgary is a strong market for rail access, particularly for the [Canadian Pacific Railway Company \(CP\)](#). While the [Canadian National Railway \(CN\)](#) also has operations in the area, Calgary is the prime connection point for CP cargos coming from the West Coast and the Port of Vancouver to Eastern Canadian locations.
- Pre-COVID-19, there were significant and growing connections from Calgary into international markets, including flights into London and throughout Asia. While these have been scaled back during COVID-19, additional enhancements at Calgary - including Canada's first COVID-19 rapid testing pilot program - have emphasized the importance of the Calgary airport to the National Transportation Strategy, further demonstrating its adaptability.

### **A talented workforce, with excellent institutions for education and training:**

- Broadly, the regional labour situation is seen as favorable, with good access to most necessary skills.
- The oil and gas industry's traditional boom and bust cycle has created periods of labour shortage and surplus for all other sectors. Likewise, the high wages paid in the oil and gas sector have occasionally created unrealistic expectations for earnings in other fields.
- SAIT offers a technical maintenance program for aircraft. The Springbank campus of Mount Royal University currently offers a two-year pilot training program, and there are early discussions about developing an aviation management program at the same University.
- Local companies offer training to lead to Canadian Society of Customs Brokers (CSSB) and Canadian International Freight Forwarders Association (CIFFA) certification.
- Companies also noted they have had mixed success in recruiting to Calgary. In many cases, the region's quality of life, access to recreation, and general image are positive. However, in other cases, the region's specific quality of life is as not widely known or appreciated.

### **Opportunities and constraints for real estate development:**

- While the City is identifying specific logistics growth corridors, interviewees suggested it would be worthwhile to establish logistics parks in one or more areas of the city. This would include setting parcels of 50 to 300 acres for designated rail served industrial uses, or areas adjacent to the airport.
- Some interviewees noted that the city has seen a trend of some industrial land being converted to commercial rather than industrial use. While mixed-use can bring some advantages, analysis should be performed to ensure there is not inherent conflict in the types of uses envisioned.

### **A need for greater regional collaboration:**

- Rocky View County and Airdrie are working to attract transportation and logistics activity. These communities currently compete for economic development based on potential needs of individual companies and the community's ability to meet these needs. Freight and logistics are priority sectors given the notable strengths of the region.
- The Calgary Metropolitan Region Board was established to help coordinate activities amongst the regional municipalities.



## PEER & REGIONAL ASSESSMENT

Calgary value propositions for transportation and logistics (and associated activities) can best be understood by examining the dynamics already in play within the regional market and by comparing the city (and region) against likely competitive locations. From this it is possible to identify industries and activities that are a good match for Calgary – as well as the messages that will appeal to the business and location needs of those targets.

The first aspect – examining existing dynamics and how sectors have changed over time – is determined through location quotient (LQ) and shift share analyses. A complementary reverse site selection analysis provides an analysis of the competitive context from the perspective of a company looking to expand or relocate. The two of these analyses along with a review of FDI and sector trends allows for a prioritization of opportunities for sector development and attraction.

## Dynamics within the Market

LQ and shift share analyses were performed to look at the current areas of economic activity and how these were changing over time.

A location quotient (LQ) is a simple indication of industry cluster concentration within a certain area relative to a larger base. It demonstrates the economic base of an area as it compares to the national (or in some cases provincial) average. The location quotient is calculated by dividing the share of employment of an industry sector in a local or regional area (in this case, the Calgary CMA) against the national average. A LQ that is greater than 1 indicates that the area has an above average amount of employment in that sector, and it therefore can be considered an economic base. If less than one, the share of employment falls below the national average indicating that the sector is not an economic engine of the area in question. These concentrations were compared with comparator Canadian cities to determine areas of strength.

Changes in employment growth were also examined to determine which were due to general industrial factors and what appeared to a more local dynamic. In the table below, N/A denotes data suppression by Statistics Canada.

The results of the LQ analysis (full results in Appendix A) demonstrate Calgary has clear advantages in critical mass for logistics activity. The Calgary Census Metropolitan Area (CMA) has a larger concentration of employment in transportation and logistics as a whole (NAICS 48 and 49) than Edmonton (LQ of 1.2 compared to 0.99). Regarding its sub-sector specializations, Calgary has a clear competitive advantage over Edmonton and Winnipeg in air transportation with an LQ of 2.83 (though Winnipeg has a larger employment cluster in rail and truck transportation). In fact, Calgary has a higher concentration of employment in rail and pipeline transportation than Edmonton.

NAICS	Calgary	Edmonton	Regina	Saskatoon	Winnipeg
481 Air Transportation	2.83	0.49	N/A	N/A	1.19
482 Rail Transportation	2.02	1.43	N/A	2.00	3.15
483 Water Transportation	N/A	N/A	N/A	N/A	N/A
484 Truck Transportation	0.78	0.87	0.93	0.73	1.37
485 Transit & Ground Passenger Transportation	0.97	1.16	0.54	0.85	0.86
486 Pipeline Transportation	No	6.55	N/A	N/A	N/A
487 Scenic & Sightseeing Transportation	N/A	N/A	N/A	N/A	N/A
488 Support Activities Transportation	0.88	0.83	N/A	N/A	0.82
491 Postal Service	0.76	1.08	N/A	1.52	0.86
492 Couriers & Messengers	1.22	1.02	0.90	1.42	2.40
493 Warehousing & Storage	1.03	N/A	N/A	N/A	0.97

Source: Statistics Canada, 2019; Conway Calculations



A shift share analysis distinguishes the factors which drive changes in employment through various considerations. The three primary considerations used in this study were:

- **Share Change:** This change reflects the impact that changes in the broader national or provincial-level economy have on local employment in each sector.
- **Mix Change:** This change reflects the impact that changes in a specific industry have on local employment in each sector.
- **Shift Change:** This change reflects the impact that local factors have had on increases or decreases in local employment. It isolates local factors by removing share change and mix change effects. This is the factor that resembles the local area's competitive advantages and disadvantages in each sector.

The shift-share analysis results (full results in Appendix A) show Calgary added almost double the number of jobs in transportation and logistics when compared to Winnipeg over the same period (9,100 jobs compared to 5,700 jobs). Meanwhile, other prairie locations such as Edmonton, Regina, and Saskatoon all experienced a net decrease in jobs in this industry. The 9,100-job increase in transportation and logistics employment represents a growth of 19% between 2016 and 2019.

Only time will tell if Calgary expands its competitive edge during and following COVID-19. Speculation at present is COVID-19 merely accelerated existing trends (such as the decline in retail and increase in office flexibility) thus affecting corporate real estate strategy. Some trends may offset one another. For instance, COVID-19 could increase the adoption of warehouse automation, but it is also increasing demand for warehouse space due to shifting consumer preferences (e-commerce and direct-to-consumer distribution centres). This could help reverse the job losses in the warehousing and storage sector. The pandemic is also negatively impacting the air transportation sector, but Calgary is likely to be better situated to recover compared to Edmonton, Winnipeg, and others given its specialization in this sector and its well-connected international hub airport, especially as YYC Calgary International Airport continues to prioritize cargo transportation.



## Competitive Analysis

A reverse site selection analysis was also performed to more directly compare Calgary against similar peer cities to showcase performance using tools commonly used in corporate location projects. The reverse site selection compared Calgary to municipalities including Winnipeg, Edmonton, Denver, Houston, Kansas City, Louisville, and Minneapolis. Each is an appropriate comparative peer due to the focus on logistics. However, each peer also presents a diversified economy leveraging logistics and transportation as a springboard into other forms of economic growth.

The reverse site selection methodology uses tools commonly used in location decision making and examines data across a variety of categories, including:

- Transportation and Market Access
- Industry and Occupation-Specific Employment
- Occupation-Specific Salaries
- Labour Availability
- Population & Demographics
- Real Estate
- Tax Regime
- Education
- Household Statistics
- Weather
- Crime

The reverse site selection analysis (full results in Appendix A) demonstrates Calgary ranks fourth among its competitor cities, leading Edmonton, Winnipeg, Denver, and Minneapolis in transportation and logistics competitiveness overall. However, Houston, Louisville, and Kansas City rank above Calgary in the model. Houston ranks first as its market size overshadows other locations: The population within a 4-hour drivetime is over 22 million people. Furthermore, Houston has the added benefit of having the only true seaport among the competitive peers. It is also a major air transportation hub, serving over 45.2 million passengers at George Bush Intercontinental Airport (IAH) in 2019<sup>1</sup> and capacity to handle up to 454,000 tons of cargo.<sup>2</sup>

Kansas City and Louisville also serve large markets within their radius. This is accentuated by their world-class infrastructure. Kansas City has access to five Class 1 railroads (BNSF Railway Company, CP, Kansas City Southern Railway, Norfolk Southern Railway, and Union Pacific Railroad) and is ranked as the second largest transportation center in the U.S.<sup>3</sup> While Calgary has access to two Class 1 railroads (CP and CN; the only two operating in Canada), both have full continental reach. Louisville has become a leader in air cargo transportation, facilitating roughly 2.8 million tonnes in 2019<sup>4</sup> compared to roughly 88,869 tonnes in Calgary in 2019.<sup>5</sup>

Calgary, however, has its own strengths. Among its Canadian competitors, it has several key advantages:

- It is larger than Edmonton and Winnipeg. Although the size of the Canadian population reachable within 4 hours is comparable to that of Edmonton (around 4 million), each additional hour radius benefits Calgary as it is closer to United States (U.S.) markets.
  - Calgary is closer than Edmonton to high-demographic growth U.S. markets such as Boise, Idaho, Salt Lake City, Utah and Denver, Colorado (Rocky Mountain locations).
- It has three intermodal terminals compared to two in both Edmonton and Winnipeg.
- It has a clear advantage over Edmonton and Winnipeg in air transportation both in terms of passenger and cargo volumes:
  - 17.2 million passengers in Calgary compared to 7.9 million in Edmonton and 4.3 million in Winnipeg in 2019<sup>6</sup>
  - 88,869 tonnes of air cargo in Calgary compared to 26,920 tonnes in Edmonton and 58,158 tonnes in Winnipeg as of 2019.<sup>7</sup>

- Its percentage of employment in transportation and logistics is greater than Edmonton and Winnipeg (5.73%, compared to 4.76% and 5.69% respectively) (see Appendix A for reverse site selection data sources).
- Calgary's educational attainment is higher than that of Edmonton, Winnipeg, and Houston (see Appendix A for reverse site selection data sources).
- Calgary has a more extensive Light Rail Transportation (LRT) system than Edmonton or Winnipeg; with 118.1km of CTrain track in 2019.<sup>8</sup>
- Calgary leads its Canadian peers in a number of quality-of-life factors:
  - Calgary has lower property and violent crime rates than Edmonton and Winnipeg.<sup>9</sup>
  - Calgary's housing unit growth is on-par with that of Edmonton, far exceeding all other peers in 2020 (see Appendix A for reverse site selection data sources).
  - Calgary has the highest percentage of owner-occupied housing units (72.7%) among peers in 2020 (see Appendix A for reverse site selection data sources).

This means that from a location perspective, Calgary stands to compete well as a “first among the rest” investment destination in the transportation and logistics industry.



<sup>1</sup> [https://fly2houston.com/sites/default/files/2020-11/iah\\_fact\\_sheet\\_rev\\_071420%20copy\\_0.pdf](https://fly2houston.com/sites/default/files/2020-11/iah_fact_sheet_rev_071420%20copy_0.pdf)  
<sup>2</sup> *Ibid*  
<sup>3</sup> <https://www.modot.org/freight-railroads>  
<sup>4</sup> <https://www.flylouisville.com/wp-content/uploads/2021/01/Aviation-Stats-2020-12.pdf>  
<sup>5</sup> <https://www150.Statistics Canada.gc.ca/t1/tbl1/en/tv.action?pid=2310025401>

<sup>6</sup> <https://www150.Statistics Canada.gc.ca/t1/tbl1/en/tv.action?pid=2310025301>  
<sup>7</sup> <https://www150.Statistics Canada.gc.ca/t1/tbl1/en/tv.action?pid=2310025401>  
<sup>8</sup> <https://www.calgarytransit.com/about-us/facts-and-figures/statistics>  
<sup>9</sup> <https://www150.Statistics Canada.gc.ca/n1/pub/85-002-x/2020001/article/00010/tbl/tbl12-eng.htm>

## Detailed Opportunities

Through examining the data available in Conway Analytics – a database of FDI deals from around the globe – Conway identified, revised, and prioritized a list of industry sub-sectors based the characteristics below:

- Is the sub-sector growing?
- Are there recent greenfield examples of new FDI investment?
- Is there a sufficient pool of companies to make focus on the sub-sector reasonable?
- Is the target group definable enough so that it may be approached as a coherent construct?

The table below is derived from an evaluation both of data available from the tool as well as Conway's knowledge and interpretation of transportation and logistics trends.

Screened sub-sectors	Growing sub-sector?	Greenfield FDI examples?	Sufficient pool of firms?	Definable target group?	Region a good fit?
Food & beverage logistics	✓	✓	✓	✓	✓
Regional distribution & logistics	✓	✓	✓	➤	✓
Integrated logistics (3PL)	✓	✓	➤	✓	✓
Truck services	✓	➤	✓	✓	✓
Air cargo	➤	✓	✓	✓	✓
Aircraft maintenance	✓	➤	✗	✓	➤
Aerospace manufacturing - drones	➤	✓	➤	➤	➤
Information technology - AI & network modeling	✓	➤	➤	➤	➤
Autonomous vehicles	✓	➤	➤	➤	➤
Value added logistics (assembly & customization in free trade arrangement)	➤	➤	➤	➤	
Aerospace manufacturing - small/medium aircraft	✗	➤	➤	✓	
Logistics consulting & management	➤	✗	✗	➤	



## Detailed Opportunities

Conway collected data on the specifics of the sub-sector to allow Calgary Economic Development to better understand the unique nature, drivers, and outlook for each. Knowing the dynamics and outlook of each sub-sector will allow Calgary Economic Development to better understand each sub-sector's needs and informs the value propositions that Calgary may provide. This information also helps Calgary Economic Development better prioritize its efforts based on the likelihood that a company may have a location need in the foreseeable future. The individual descriptions and outlooks for the sub-sectors above are as follows:

Food & Beverage Logistics	
Specific Description	<ul style="list-style-type: none"> <li>Includes all logistics activities in the manufacture, packaging, and final movement of food and beverages.</li> <li>May include either food components or prepared foods.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>Before COVID-19, the food manufacturing market was forecast to grow steadily by growing demand from increasing global family disposable incomes coupled with strengthening buyer power.<sup>10</sup></li> <li>Since COVID-19, the industry has seen specific growth in areas such as pre-made meals, eat at home options, and frozen foods.<sup>11</sup></li> <li>The market is expected to recover and grow at a compound annual growth rate (CAGR) of 7% from 2021 and reach \$7.53 trillion in 2023.<sup>12</sup></li> <li>Food and beverage manufacturing generated \$15.8 billion in sales in 2019, 20.8% of the provinces total manufactured goods.<sup>13</sup></li> <li>Food manufacturing sales grew 5.9% in Alberta between 2019 and 2020, while other types of manufacturing such as machinery, fabricated metal products, and petroleum and coal products witnessed significant decline.<sup>14</sup></li> <li>Note that the numbers above do not yet include ancillary activities such as the manufacture and movement of personal protective equipment (PPE) or other similar activities.</li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>Proximity to key points of agricultural production.</li> <li>Position within the food value chain.</li> <li>Educational or training institutions that can support development of specific skills bases.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>Production, processing, formulating, packaging, and logistics for food and beverages.</li> </ul>
City of Calgary Competitive Advantages & Assets	<ul style="list-style-type: none"> <li>Existing agricultural industry can supply primary inputs and shorten supply chains.</li> <li>High density of trucking talent.</li> <li>Affordable energy (electric and gas).</li> <li>CN and CP Class I railways provide transportation routes to markets east and west (towards a port), and south (U.S.).</li> <li>Available intermodal facilities.</li> <li>Location on Queen Elizabeth II and the Trans-Canada Highways.</li> <li>Airport with perishables and cold storage capabilities.</li> <li>Abundant industrial lands.</li> <li>SAIT program in <a href="#">food and beverage leadership</a> and <a href="#">School of Advanced Manufacturing and Automation</a>.</li> <li>University of Calgary's <a href="#">Simpson Centre for Agricultural and Food Innovation and Public Education</a> in the School of Public Policy.</li> </ul>

<sup>10</sup> <https://www.businesswire.com/news/home/20200220005671/en/2020-Global-Food-Manufacturing-Market-Size-Share-Outlook-Growth-Opportunities-Forecast-ResearchAndMarkets.com#:~:text=The%20food%20manufacturing%20market%20is,growth%20between%2020%20and%202026>

<sup>11</sup> <https://www.fticonsulting.com/~media/Files/us-files/insights/articles/2020/apr/covid-19-impacts-us-food-industry.pdf>  
<sup>12</sup> <https://www.globenewswire.com/news-release/2020/10/20/2110853/0/en/Global-Food-and-Beverages-Market-Forecast-to-Grow-to-6111-1-Billion-in-2020-at-a-CAGR-of-2-9-from-2019.html#:~:text=The%20global%20food%20and%20beverages%20market%20is,expected%20to%20grow,CAGR%20of%202.9%25>

<sup>13</sup> <https://open.alberta.ca/dataset/79f01912-5e5c-469e-8cf4-97cf6901cea/resource/99a6af21-3620-4138-ae5c-2cfe1c48f19/download/af-agriculture-statistics-factsheet-2019.pdf>

<sup>14</sup> <https://economicdashboard.alberta.ca/ManufacturingShipments#type>. This data is January – December 2020 compared to January – December 2019, for food manufacturing sales

## Food & Beverage Logistics

City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>• Competitor locations in the U.S. have larger consumer populations within their radius.</li> <li>• Seasonality introduces specific challenges for managing storage, logistics, and workforce.</li> <li>• Region has lower density of food processing labourers.</li> <li>• Industry competition with wages of oil and gas.</li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Proximity to key points of agricultural production.</li> <li>• Position within the food value chain.</li> <li>• Educational or training institutions that can support development of specific skills bases.</li> </ul>

## Regional Distributions & Logistics

Specific Description	<ul style="list-style-type: none"> <li>• Warehouses and distribution centers (and their supporting activities) to service Western Canada.</li> <li>• Specific focus on distribution centers, which specialize more on value added services like product mixing, order fulfillment, cross docking, packaging in addition to general product storage.</li> <li>• Distribution centers are explicitly more customer oriented (whether B2B or B2C) and require siting, design, and operation that take this into account.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>• Supply chains were globally impacted by COVID-19, quarantines, border closings, and stay at home orders.</li> <li>• However, the industry has seen both growth and adaptation as a result of increased direct to consumer purchasing – a trend that is expected to stay in place and expand after COVID-19.<sup>15</sup></li> <li>• Additionally, the rise of e-commerce is changing the industry, driving more logistics operations to serve consumers directly rather than at a retail point of sale.</li> <li>• Distribution to retail centers is likely to change and adapt to the reduced need for in-person shopping over time.</li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Ability to interface with global supply chains and then provide for sorting, transportation, and distribution throughout the region.</li> <li>• Ability to accommodate both inbound and outbound logistics (for both deliveries to the region and backhaul to point of origin).</li> <li>• Available workforce to staff key positions in materials management, warehouse staff, sorting, logistics planning, truck drivers, and management.</li> <li>• Ability to construct logistics facilities of a variety of sizes directly adjacent to multiple transportation and logistics nodes.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>• Large and medium size warehouse and distribution for retail with footprint in Western Canada.</li> <li>• Direct to customer shipping for large items (both B2C and B2B).</li> <li>• eCommerce – While not a unique opportunity for Calgary, how the City of Calgary responds to and nurtures the eCommerce sector is an opportunity to showcase innovation in automation and related areas.</li> </ul>

<sup>15</sup> [https://www.logisticsmgmt.com/article/outlook\\_for\\_warehousing\\_market\\_remains\\_positive](https://www.logisticsmgmt.com/article/outlook_for_warehousing_market_remains_positive)



## Regional Distributions & Logistics

<p>City of Calgary Competitive Advantages</p>	<ul style="list-style-type: none"> <li>• Excellent multimodal (air/ground, containerized rail/road, etc.) connections to North American and global markets.</li> <li>• Strong transportation and logistics sector labour market.</li> <li>• Established transportation and logistics clusters has resulted in regional critical mass.</li> <li>• Low-cost jurisdiction for electricity.</li> <li>• Competitive tax environment.</li> <li>• Abundant industrial lands directly adjacent to key transportation nodes.</li> <li>• High density of trucking talent.</li> <li>• CN and CP Class I railways provide transportation routes to markets east and west (towards a port), and south (U.S.).</li> <li>• Available intermodal facilities.</li> <li>• Robust highway network.</li> <li>• Local innovation in materials movement automation.</li> </ul>
<p>City of Calgary Opportunities for Improvement</p>	<ul style="list-style-type: none"> <li>• Competition with other regional options.</li> <li>• Higher real estate taxes as compared to suburban locations.</li> <li>• Industry competition with wages of oil and gas.</li> </ul>

## Integrated Logistics and Third-Party Logistics (3PL) Providers

<p>Specific Description</p>	<ul style="list-style-type: none"> <li>• 3PLs provide outsourced distribution, warehouse, and fulfillment services.</li> <li>• Services may also include procurement, customization, packaging, and assembly.</li> </ul>
<p>Current Industry Outlook</p>	<ul style="list-style-type: none"> <li>• Overall growth in 3PL has been accelerating with global trade, with a forecast CAGR of over 7% from 2020-2027. Much of this is driven by increased trade into and out of Asia.<sup>16</sup></li> <li>• The increased reliance on ecommerce caused by the COVID-19 pandemic is – if anything – accelerating this trend and creating an increased need for providers and services.<sup>17</sup></li> </ul>
<p>Key Requirements or Value Chain</p>	<ul style="list-style-type: none"> <li>• Ability to interface with global supply chains and then provide for sorting, transportation, and distribution throughout the region.</li> <li>• Ability to accommodate both inbound and outbound logistics (for both deliveries to the region and backhaul).</li> <li>• Available workforce to staff key positions in materials management, warehouse staff, sorting, logistics planning, truck drivers, and management.</li> <li>• Ability to construct logistics facilities of a variety of sizes directly adjacent to multiple transportation and logistics nodes.</li> </ul>
<p>Specific Role/Opportunity for City of Calgary</p>	<ul style="list-style-type: none"> <li>• Expansion of additional global 3PL providers into Calgary, providing an additional or consolidated Western Canadian nexus.</li> </ul>

<sup>16</sup> [https://www.alliedmarketresearch.com/3PL-market#:~:text=Third%2Dparty%20Logistics%20\(3PL\)%20Market%20Statistics%20%2D%202027,1%25%20from%202020%20to%202027](https://www.alliedmarketresearch.com/3PL-market#:~:text=Third%2Dparty%20Logistics%20(3PL)%20Market%20Statistics%20%2D%202027,1%25%20from%202020%20to%202027)

<sup>17</sup> <https://www.businesswire.com/news/home/20200814005359/en/Third-Party-Logistics-3PL-Market-and-COVID-19-Impact-2020-2027---Includes-Profiles-of-SinoTrans-DB-Group-Deutsche-Post-Geodis-UPS-and-Other-Key-Players---ResearchAndMarkets.com>

## Integrated Logistics and Third-Party Logistics (3PL) Providers

<p>City of Calgary Competitive Advantages and Assets</p>	<ul style="list-style-type: none"> <li>• Ability to utilize FTZ treatment if needed.</li> <li>• Excellent multimodal connections to North American and global markets.</li> <li>• Strong transportation and logistics sector labour market.</li> <li>• Established transportation and logistics clusters results in regional critical mass.</li> <li>• Competitive tax environment.</li> <li>• Abundant industrial lands directly adjacent to key transportation nodes.</li> <li>• High density of trucking talent.</li> <li>• CN and CP Class I railways provide transportation routes to markets east and west (towards a port), and south (U.S.).</li> <li>• Available intermodal facilities.</li> <li>• Robust highway network.</li> </ul>
<p>City of Calgary Opportunities for Improvement</p>	<ul style="list-style-type: none"> <li>• Perception of the regional logistics environment being energy sector dominated.</li> <li>• Competition from larger, more established clusters in Vancouver and Toronto.</li> </ul>

## Truck Services

<p>Specific Description</p>	<ul style="list-style-type: none"> <li>• Fleet management and support services for trucking companies already operating in the Calgary market.</li> <li>• Due to the current level of logistics activity in the region, there is a need for washing, servicing, and other services to ensure the continued smooth operation of regional fleets.</li> <li>• Other activities include fleet maintenance, chassis storage, and fleet management services.</li> </ul>
<p>Current Industry Outlook</p>	<ul style="list-style-type: none"> <li>• While long-haul logistics had been increasing before the COVID-19 crisis, the current pandemic and expected resulting economic downturn may cause a temporary slowdown in the need for support services.<sup>18</sup></li> <li>• However, the need for more specialized trucking for food, refrigerated supplied, pharmaceuticals, and other needs, may cause a shifting need for the kinds of supporting services required.<sup>19</sup> Those transportation nodes with specific capabilities may be able to spur development of a cluster.</li> </ul>
<p>Key Requirements or Value Chain</p>	<ul style="list-style-type: none"> <li>• Existing truck movement into, from, and through the region.</li> <li>• Adjacency and direct connections to the national highway system.</li> </ul>
<p>Specific Role/Opportunity for City of Calgary</p>	<ul style="list-style-type: none"> <li>• Truck management.</li> <li>• Cleaning.</li> <li>• Servicing and maintenance.</li> <li>• Training.</li> <li>• Chassis storage.</li> <li>• Equipment customization.</li> </ul>

<sup>18</sup> <https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00067-eng.htm>  
<sup>19</sup> <https://www.globenewswire.com/news-release/2020/04/14/2015414/0/en/The-Refrigerated-Trucking-Industry-in-the-United-States-and-Canada-Forecast-to-2025-Growing-Organic-Food-Market-Rising-Need-for-Pharmaceutical-Shipping-Increasing-Multi-Temperature.html>

Truck Services	
City of Calgary Competitive Advantages and Assets	<ul style="list-style-type: none"> <li>• Strong transportation and logistics sector labour market.</li> <li>• Established transportation and logistics sectors create regional critical mass.</li> <li>• Abundant industrial lands directly adjacent to key transportation nodes.</li> <li>• High density of trucking talent.</li> <li>• Robust highway network, including connections to the Canamex corridor (a series of improvements to freeways and other transportation infrastructure linking Canada to Mexico through the U.S.).</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>• Regional competition with lower costs of land (and therefore lower cost to establish operations).</li> </ul>

Air Cargo	
Specific Description	<ul style="list-style-type: none"> <li>• Any cargo carried in or being prepared to be carried in an aircraft. Particularly useful for high value and high demand cargoes.</li> <li>• Includes air freight, air mail, air express, and special cargoes.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>• Air carriers have consolidated their routes as passenger air cargo volume has declined as a result of the COVID-19 pandemic.</li> <li>• The resulting loss of belly space in passenger aircraft has reduced the overall capacity of many traditional cargo carriers but has increased demand for dedicated cargo.</li> <li>• Air cargo volumes will recover and grow by over 4% per year, and approximately half of that will be carried by freighters.<sup>20</sup></li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Service by both cargo freight carriers and access to belly cargo from passenger routes.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>• Enhanced/increased air cargo processing and service.</li> <li>• Ground support services for air cargo processing.</li> </ul>
City of Calgary Competitive Advantages and Assets	<ul style="list-style-type: none"> <li>• Dedicated enhancements to YYC Calgary International Airport cargo processing infrastructure including the development of separate ramps and servicing for freight aircraft.</li> <li>• YYC Calgary International Airport Global Logistics Park with 330 acres of land for trade development.<sup>21</sup></li> <li>• During the COVID-19 pandemic, YYC Calgary International Airport was one of only four Canadian airports currently operating international flights<sup>22</sup>, highlighting its national importance.</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>• Competition with Toronto and Vancouver.</li> </ul>

<sup>20</sup> <https://www.aviationbusinessnews.com/cargo/boeing-forecast-highlights-even-more-critical-need-for-dedicated-freighters-in-next-20-years/>

<sup>21</sup> <https://www.yyc.com/en-us/calgaryairportauthority/businessatyyc/aircargo/yycgloballogisticspark.aspx>

<sup>22</sup> <https://www.yyc.com/News/tabid/91/articleType/ArticleView/articleId/387/YYC-working-with-airlines-agencies-to-bring-Canadians-home--YYC-collabore-avec-les-transporteurs-et-les-agences-pour-rapatrier-les-Canadiens.aspx>

Aircraft Maintenance	
Specific Description	<ul style="list-style-type: none"> <li>• Maintenance, repair and overhaul (MRO) of aircraft and parts.</li> <li>• Ferrying aircraft between departure gates and taxiways.</li> <li>• Inspection and testing of aircraft.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>• Overall, expected to experience declining demand in 2020 due to a sharp decline in domestic and international air travel as a result of the COVID-19 (coronavirus) pandemic.</li> <li>• This may be offset to a degree by an increase in freight flying.</li> <li>• MRO activity grew 25% between 2012 and 2017, while Canadian aerospace manufacturing declined over the same period.<sup>23</sup> This suggests an increasing need for services in the near future as well.</li> <li>• While Western Canada (including Alberta) accounts for only 15% of aerospace manufacturing, it dominates the MRO segment – accounting for 43% of employment in Canada.<sup>24</sup> This is a niche for Alberta.<sup>5</sup></li> <li>• Alberta accounts for 22% of Canada’s registered business aviation aircraft.<sup>25</sup></li> <li>• Overall downward pressure on oil process may paradoxically mean that older (less efficient) aircraft will be kept in fleets longer, suggesting greater need for maintenance and testing.<sup>26</sup></li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Available space at major airport.</li> <li>• Existing talent base.</li> <li>• A common connection point or reasonably close to major flight lanes.</li> <li>• Regional technical programs that can continue to provide new talent into the field.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>• Location for new or expanded aircraft maintenance and/or customization facilities run by the airlines, cargo carriers, or be independent operators.</li> <li>• Possibility to expand and/or enhance maintenance training programs at Calgary post-secondary institutions.</li> </ul>
City of Calgary Competitive Advantages & Assets	<ul style="list-style-type: none"> <li>• Strong existing talent base.</li> <li>• SAIT offers the only <a href="#">aircraft maintenance engineers technology program</a> in Alberta.</li> <li>• Current existing available ramp accessible space at YYC Calgary International Airport.</li> <li>• Mount Royal University offers a concentration in <a href="#">supply chain management</a> as part of its Bachelor of Business Administration (BBA). Good proximity in and adjacent to primary flight lanes across Canada.</li> <li>• Proximity to primary air lanes both running north/south (Alberta) and east/west across Canada.</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>• Research did not uncover specific weaknesses related to Calgary’s capabilities.</li> </ul>

<sup>23</sup> <https://aiac.ca/wp-content/uploads/2018/06/State-of-Canadas-Aerospace-Industry-2018-Report.pdf>

<sup>24</sup> <https://aiac.ca/wp-content/uploads/2018/06/State-of-Canadas-Aerospace-Industry-2018-Report.pdf>

<sup>25</sup> <https://westalberta.ca/industry-profiles/aviation-and-logistics/>; Alberta is home to 420 of Canada’s 1,900 registered business aviation aircraft. Business aviation is a major contributor to Alberta’s economy

<sup>26</sup> <https://www.ibisworld.com/united-states/market-research-reports/aircraft-maintenance-repair-overhaul-industry/#~:text=Industry%20Definition,and%20aircraft%20and%20parts%20overhaul.>

## Information Technology – AI and Network Modeling

Specific Description	<ul style="list-style-type: none"> <li>Information analysis, sensors, simulation, and other technologies that are used to model, optimize, and manage supply chains.</li> <li>Artificial Intelligence (AI) refers to advanced computing using technology that processes large amounts of data and can recognize patterns that allows to adjust and optimize processes (machine learning) and even make autonomous decisions.</li> <li>AI technology is being applied across all different industries qualifying it as a horizontal (cross-industry) sector.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>Relatively limited marketplace.</li> <li>Computer simulation as a field is on the increase. The global simulation software market size was valued at USD 7.19 billion in 2018 and is expected to grow at a compound annual growth rate (CAGR) of 16.98% from 2019 to 2025.<sup>27</sup></li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>Access to high-skilled talent.</li> <li>Strong talent base and talent retention.</li> <li>Post-secondary institutions.</li> <li>R&amp;D facilities.</li> <li>International connectivity.</li> <li>Sufficient funding at the University-level.</li> <li>Access to capital.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>New or start up location for network modeling or similar technology companies.</li> </ul>
City of Calgary Competitive Advantages & Assets	<ul style="list-style-type: none"> <li>Vertical industry bases where AI can be applied, including but extending beyond logistics and materials movement.</li> <li>Mount Royal University offers a concentration in <a href="#">supply chain management</a> as part of its Bachelor of Business Administration (BBA). University of Calgary specializations in <a href="#">geospatial science and engineering</a>, as well as intelligent and autonomous systems research. Presence of companies like Hexagon Novatel and AltaML help build the reputation of the Calgary location.</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>Relatively low current concentrations of employment in information and cultural industries.</li> <li>Current experience of local employers in attracting talent to relocate from coastal tech centres.</li> </ul>

## Autonomous Vehicles (Materials Movement)

Specific Description	<ul style="list-style-type: none"> <li>Also referred to as self-driving cars or trucks.</li> <li>Vehicle that is capable of sensing its environment and moving safely with little or no human input.</li> <li>Also includes vehicles that operate within buildings (e.g. self-operating material handling equipment).</li> </ul>
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<sup>27</sup> <https://www.grandviewresearch.com/industry-analysis/simulation-software-market>

## Autonomous Vehicles (Materials Movement)

Current Industry Outlook	<ul style="list-style-type: none"> <li>• The Global Automated Material Handling (AMH) market was valued at USD 55.9 billion in 2020 and is expected to reach USD 1121.9 billion by 2026, registering a compound annual growth rate (CAGR) of 12.7%, during the period of 2021-2026.<sup>28</sup></li> <li>• Through the Census of Fatal Occupational Injuries, the U.S. Bureau of Labor Statistics established that workplace injuries have decreased by 25% in 10 years, due to the advent of various technologies in the workplace, including the developing use of autonomous vehicles in hazardous environments.<sup>29</sup></li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Access to high-skilled talent.</li> <li>• Strong talent base and talent retention.</li> <li>• Post-secondary institutions.</li> <li>• R&amp;D facilities.</li> <li>• International connectivity.</li> <li>• Sufficient funding at the University-level.</li> <li>• Access to capital.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>• Development and manufacture of autonomous vehicles for materials movement within warehouses and distribution centres.</li> </ul>
City of Calgary Competitive Advantages & Assets	<ul style="list-style-type: none"> <li>• Existing, developing ecosystem for inside-the-box materials handling, tracking, and movement.</li> <li>• Beginning awareness of brands and companies like Hexagon Novatel and Attabotics.</li> <li>• Mount Royal University offers a concentration in <a href="#">supply chain management</a> as part of its Bachelor of Business Administration (BBA).</li> <li>• <a href="#">Calgary Living Labs</a> provide possibilities for support in testing pilot vehicles and/or other applications.</li> <li>• University of Calgary specializations in <a href="#">geospatial science and engineering</a>, as well as intelligent and autonomous systems research.</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>• Nascent cluster. Full ecosystem not yet in place.</li> <li>• Difficulties in attracting tech talent from coastal locations.</li> </ul>

## Value Added Logistics (Assembly and Customization in Free Trade Arrangement)

Specific Description	<ul style="list-style-type: none"> <li>• Specific use of Canada's Foreign Trade Zone (FTZ) capabilities to attract value added (manufacturing and assembly) logistics to the City, near key transportation nodes.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>• Canada has a flexible FTZ program that eliminate tariffs on all manufacturing inputs. Canada's initiative applies across the entire country, making Canada one large FTZ for firms importing manufacturing inputs.</li> <li>• While FTZ use in the U.S. has been on the increase, Canada currently lacks a comprehensive approach to marketing the nation's capabilities in this area.</li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Existing logistics and manufacturing base.</li> <li>• Strong connections to international value chains, especially in areas with high value add during the process.</li> <li>• Proximity/access to high demand export markets.</li> </ul>

<sup>28</sup> <https://www.mordorintelligence.com/industry-reports/global-automated-material-handling-market-industry>

<sup>29</sup> [https://www.researchandmarkets.com/reports/4774995/automated-material-handling-amh-market?utm\\_source=dynamic&utm\\_medium=BW&utm\\_code=sd5vmz&utm\\_campaign=1360699+-Automated+Material+Handling+Market+Expected+to+Grow+with+a+CAGR+of+11.30%25+During+the+Forecast+Period%2c+2020-2025&utm\\_exec=anwr281bwd](https://www.researchandmarkets.com/reports/4774995/automated-material-handling-amh-market?utm_source=dynamic&utm_medium=BW&utm_code=sd5vmz&utm_campaign=1360699+-Automated+Material+Handling+Market+Expected+to+Grow+with+a+CAGR+of+11.30%25+During+the+Forecast+Period%2c+2020-2025&utm_exec=anwr281bwd)

## Value Added Logistics (Assembly and Customization in Free Trade Arrangement)

Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>Act as a location for value added manufacturing products. Components to be shipped in from international locations. Assembly/processing to take place within FTZ jurisdiction, and then finished products to be shipped out internationally.</li> </ul>
City of Calgary Competitive Advantages and Assets	<ul style="list-style-type: none"> <li>The Calgary Region FTZ is established and marketed as covering the Calgary region as a whole.<sup>30</sup></li> <li>While any location in Canada can technically function as an FTZ, the Calgary region is one of locations specifically marketed by the Canadian government for this function.</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>Lack of supporting institutions for and around the Canadian FTZ program.</li> <li>Lack of general marketing and therefore international awareness of the Canadian FTZ program.</li> </ul>

## Logistics Consulting and Management

Specific Description	<ul style="list-style-type: none"> <li>Management and supply chain consulting in the field of transportation and logistics.</li> <li>Help clients manage supplier relations, distribution channels and marketing strategies. Plays an important role in facilitating growth among manufacturing, retail, wholesale, utility, and agricultural industries.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>After being rocked by the COVID-19 (coronavirus) pandemic, the Supply Chain Management Services industry is expected to quickly recover and return to growth over the five years.<sup>31</sup></li> <li>Private investment is expected to quickly recover (within 5 years) as consumer spending and confidence bounce back from the pandemic.</li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>Workforce and institutions with experience and knowledge in specific aspects of the supply chain industry.</li> <li>Ability to network and interact with key industry stakeholders.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>Home for either branches or headquarters for logistics consulting firms. While multiple major consultancy firms (e.g., Deloitte, BCG, McKinsey, etc.) are already present in Calgary, it is unclear how many of them have invested specifically in logistics consulting.</li> </ul>
City of Calgary Competitive Advantages & Assets	<ul style="list-style-type: none"> <li>Existing knowledge base built up through decades of experience with air, rail, trucking.</li> <li>Strong presence of professional and technical workforce that may be called upon to support the cluster.</li> <li>Specialized knowledge of heavy logistics such as developed through serving the oil and gas industry.</li> <li>Mount Royal University offers a concentration in <a href="#">supply chain management</a> as part of its Bachelor of Business Administration (BBA).</li> <li>The University of Calgary specializes in <a href="#">geospatial science and engineering</a>.</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>Not currently known as a consulting hub outside of the energy field.</li> <li>Possibility of recruiting challenges (see information technology section above).</li> </ul>

<sup>30</sup> <https://www.calgarylogisticscouncil.org/projects/calgary-region-inland-port/>

<sup>31</sup> Supply Chain Management Services Industry in the US - Market Research Report. Retrieved at: <https://www.ibisworld.com/united-states/market-research-reports/supply-chain-management-services-industry/>

## Aircraft Manufacturing – Drones

Specific Description	<ul style="list-style-type: none"> <li>• Manufacturing of fixed or rotary wing aircraft that are piloted remotely.</li> <li>• Market is broad including military, government, industrial, commercial, and recreational users.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>• Fast growing market possibly enhanced by manufacturing supply chain concerns in China due to COVID-19.</li> <li>• Unmanned aerial vehicle (UAV) market is expected to grow at a CAGR of 14.1% from 2020 to 2027 to reach \$21.8 billion by 2027.<sup>32</sup></li> </ul>
Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Access to strong IT and manufacturing talent.</li> <li>• Existing talent base in autonomous or remote vehicles.</li> <li>• Access to precision manufacturing capabilities.</li> <li>• Access to areas for testing remotely piloted aircraft.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>• Research and development for drones and remotely piloted aircraft.</li> <li>• Manufacturing for drones and remotely piloted aircraft.</li> </ul>
City of Calgary Competitive Advantages & Assets	<ul style="list-style-type: none"> <li>• Nascent and growing for aircraft customization and construction.</li> <li>• <a href="#">Viking Air Ltd.</a> is already present in the market and building airplanes for export.</li> <li>• Huge support base for oil and gas flying and ferrying etc.</li> <li>• Presence of companies like Hexagon Novatel also provides for specific expertise in areas like sensor development and application.</li> <li>• SAIT is the only post-secondary in Alberta offering hands-on training in aerospace and UAV.</li> <li>• University of Calgary specializations in geospatial science and engineering, as well as integration with autonomous systems and vehicles.</li> <li>• <a href="#">Calgary Living Labs</a> support drone development, such as in the case of AERIUM Analytics (along with National Aeronautics and Space Administration (NASA) and Lockheed Martin Canada CDL Systems).<sup>33</sup></li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>• Research indicated that there is little brand awareness of Calgary as a center of aircraft manufacturing at present (this liability may be easily mitigated through marketing).</li> </ul>

## Aerospace Manufacturing – Small/Medium Aircraft

Specific Description	<ul style="list-style-type: none"> <li>• Manufacturing of aircraft components or of complete airframes, particularly of general aviation or of corporate aircraft.</li> </ul>
Current Industry Outlook	<ul style="list-style-type: none"> <li>• Demand for new aircraft and helicopters likely to be on decline due to pandemic. Instead, consumers in downstream markets are expected to increase maintenance and repair activity, fueling demand growth for these industry products.<sup>34</sup></li> <li>• While Canada is currently a leader in small and mid-size aircraft manufacturing, the industry is experiencing significant volatility and the nation's traditional centers of manufacturing excellence may be at risk.</li> </ul>

<sup>32</sup> <https://www.globenewswire.com/news-release/2020/06/11/2046938/0/en/Unmanned-Aerial-Vehicle-UAV-Market-Worth-21-8-billion-by-2027-Pre-and-Post-COVID-19-Market-Analysis-Report-by-Meticulous-Research.html>

<sup>33</sup> <https://www.livetechlovelife.com/stories/aerium-analytics-flying-a-new-course>

<sup>34</sup> <https://www.ibisworld.com/canada/market-research-reports/aircraft-engine-parts-manufacturing-industry/>





### Aerospace Manufacturing – Small/Medium Aircraft

Key Requirements or Value Chain	<ul style="list-style-type: none"> <li>• Access to supply chain.</li> <li>• Skilled workforce.</li> <li>• Affordable cost of energy.</li> <li>• Availability of land.</li> </ul>
Specific Role/Opportunity for City of Calgary	<ul style="list-style-type: none"> <li>• Given the volatility of the moment, we recommend that while Calgary possesses many of the key value chain components, the City should look at this as a target of opportunity rather than a foundational attraction target.</li> </ul>
City of Calgary Competitive Advantages and Assets	<ul style="list-style-type: none"> <li>• Nascent and growing for aircraft customization and construction.</li> <li>• Viking - building airplanes for export.</li> <li>• SAIT is the only post-secondary in Alberta offering hands-on training in aerospace and UAV.</li> <li>• Huge support base for oil and gas flying and ferrying etc.</li> </ul>
City of Calgary Opportunities for Improvement	<ul style="list-style-type: none"> <li>• No brand awareness of Calgary as a center of aircraft manufacturing beyond those immediately involved.</li> </ul>

## Value Propositions

Value propositions are critical to attracting companies and organizations to a jurisdiction as they demonstrate the unique characteristics of a jurisdiction from three perspectives: sector trends and growth outlook, regional strengths and assets, and specific project drivers. Value propositions alleviate the value chain gap and present the investment opportunity to target markets.

Conway developed specific value propositions for each of the identified cluster areas (i.e., Logistics, Technology, and Aerospace). However, below are also a series of unique selling points that apply for the City of Calgary across the entire transportation and logistics sector.

**Excellence in Logistics** – The City of Calgary has a strong history in specialized and global logistics. This means that we have the talent, mix of providers and servicers, diversified transportation and logistics infrastructure to meet almost any need, including global air access, continent spanning railroad, and long and short distance trucking.

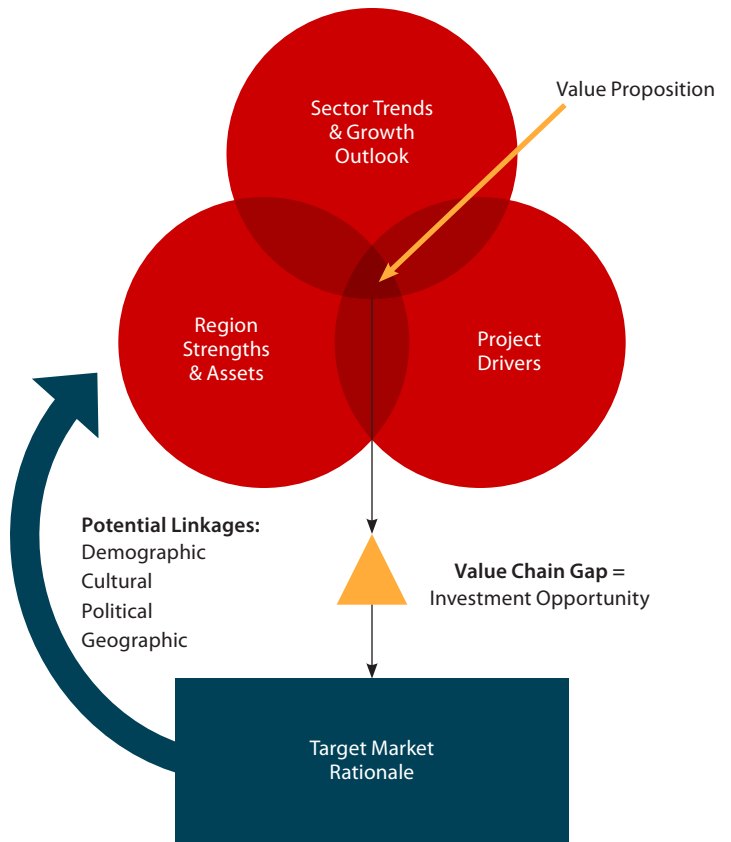
**Commitment to Our Ideas** – The City of Calgary has a strong history of supporting the initiatives that it puts forward. Examples include transportation and logistics planning and infrastructure, [Calgary Living Labs](#) programs, the [Opportunity Calgary Investment Fund](#), and investments at YYC Calgary International Airport.

**Strong Support System and Talent Pipeline** – Through the unique programs and certifications funded and provided by the University of Calgary, SAIT, and Mount Royal University, Calgary has educational institutions that support all functions of transportation and logistics as well as other cluster partners like maintenance, automation, and IT.

**Talented and Entrepreneurial Talent Pool** – Our people are skilled, motivated, and have built a legacy of economic success and innovation. Our community, our workforce, and our companies have a unique can-do attitude born out of the unique requirements of our history and our legacy industries.

**Innovative and Sector-Leading Activities** – Companies like Attabotics, Hexagon|Novatel, AltaML, and AERIUM Analytics have made Calgary their home, and they are at the heart of innovation in logistics technology, autonomous systems, machine learning, and other technologies that are driving the state of the art in smart materials movement.

**Ability to Execute** – We have available industrial land at and adjacent to key transportation nodes, allowing for effective, efficient development.



There are also more specific value propositions to appeal to the target sectors identified earlier. These can be arranged in three major clusters areas – each with similarities in value proposition, audience, and action steps for enhancing Calgary’s market position. The three major cluster areas are:

### Logistics

- Regional distribution and logistics
- Food and beverage logistics
- Integrated third-party logistics (3PL)
- Truck services
- Air cargo
- Value added logistics (assembly and customization in free trade arrangement)
- Logistics consulting and management

### Technology

- IT – AI and network modeling
- Autonomous vehicles

### Aerospace

- Aircraft maintenance
- Aerospace manufacturing – drones
- Aerospace manufacturing – small/medium aircraft

# VALUE PROPOSITION BY CLUSTER

## Logistics

- Alberta offers less than 24-hour delivery service to all Western Canada and the U.S. Pacific Northwest, thus reaching a market of more than 50 million consumers.<sup>35</sup>
- Alberta's strategic location in the epicenter of Western Canada provides it with a market of 11 million people within one trucking day. It has emerged as the Western North American warehouse and distribution hub for both Canada and the Pacific Northwest region of the U.S..<sup>36</sup>
- Our regional and international connections – and comparatively lower cost – provide excellent alternatives to locations on the coast.
- We have over 120,000 truck trips taking place daily within the City of Calgary, and truck movement around, to, and from the City of Calgary has increased over 55% in the past 15 years.<sup>37</sup>
- With one of Canada's busiest and best-connected airports, major highways north-south (Queen Elizabeth II) and east-west (TransCanada), two of North America's Class I railways, and efficient access to ocean ports, Calgary is a gateway to millions of customers locally and internationally.
- Over the past several years, YYC Calgary International Airport has made specific improvements to dedicated areas and support services for freight aircraft, enhancing the efficiency of freight operations in our City.
- We already handle 4,305 cargo landings a year (2019).<sup>38</sup> We have the knowledge of how to take care of you and your freight.
- The Calgary Region FTZ covers all of Calgary.<sup>39</sup> The Canadian FTZ program is significantly more flexible and user-friendly than the American counterpart, making it a more straightforward and effective program for manufacturers and value added producers looking to serve the global market.
- Calgary and Alberta have growing activity in advanced manufacturing, life sciences, agrifoods, and ecommerce – all providing new opportunities and needs for third-party logistics operators.
- Our region's specialized knowledge across the world of logistics – from heavy equipment to ecommerce – means that we have the talent to work through tricky logistics problems.
- Mount Royal University has specific training and continuing education programs in supply management to provide key talent.
- SAIT and the University of Calgary provide specific programs for food and agricultural research and manufacturing support.

## Technology

- Companies like Attabotics, AltaML, and Hexagon|Novatel have made Calgary their home because of Calgary's expertise in logistics, sensing, automation, and are using these to develop the next generation of materials movement.
- The University of Calgary has a long history of geospatial and engineering excellence and is applying this to developing new autonomous systems.
- Suncor and Microsoft Canada have a multi-year alliance to upgrade data centres and increase analytics capabilities.<sup>40</sup>
- Federal Strategic Innovation fund may be leveraged to assist investments in innovation, as was the case with Attabotics Inc.<sup>41</sup>
- Our region's specialized knowledge across the world of logistics – from heavy equipment to ecommerce – means that we have the talent to work through challenging logistics problems.



<sup>35</sup> CPSC (2017), Transportation & Supply Chain Competitiveness Study, Prepared for Calgary Economic Development

<sup>36</sup> CPSC (2017), Transportation & Supply Chain Competitiveness Study, Prepared for Calgary Economic Development

<sup>37</sup> The City of Calgary (2018), The Calgary Goods Movement Strategy, Retrieved from: <https://www.calgary.ca/transportation/tp/strategy/goods-movement-strategy.html>

<sup>38</sup> <https://www.yyc.com/en-us/media/factsfigures/factsheet.aspx>

<sup>39</sup> <https://www.calgarylogisticscouncil.org/projects/calgary-region-inland-port/>

<sup>40</sup> <https://www.globenewswire.com/news-release/2019/11/12/1945172/0/en/Suncor-accelerates-digital-transformation-journey-through-strategic-alliance-with-Microsoft.html>

<sup>41</sup> <https://betakit.com/calgary-based-attabotics-to-receive-34-million-from-federal-government/>



## Aerospace

- Whether aerospace manufacturing, testing, or maintenance, we have the expertise and the partners needed to make your business thrive.
- SAIT is the only post-secondary in Alberta offering hands-on training in aerospace and UAV, meaning that we can provide the technical talent you need to keep your aircraft flying.
- Mount Royal University offers hands-on training in aviation and supply chain management.
- We have a nascent and growing cluster for aircraft customization and construction as evidenced by Viking Air Ltd., who is building airplanes in Calgary for export.
- While Western Canada (including Alberta) accounts for only 15% of aerospace manufacturing, it dominates the MRO segment – accounting for 43% of employment in Canada.<sup>42</sup> This is a niche for Alberta.
- Alberta accounts for 22% of Canada's registered business aviation aircraft.<sup>43</sup>
- Calgary International Airport already has over 4,300 cargo landings and handles over 18 million passengers annually (2019, pre-pandemic)<sup>44</sup>, meaning that we are in the center of the action of aircraft movement.
- Our considerable international connections allow for better integration into your aircraft operations, allowing for a more efficient MRO environment.
- Our cost environment is lower than our peers in the U.S..
- We have facilities available directly adjacent to our apron, allowing you to bring your aircraft (or to service aircraft) easily.

<sup>42</sup> <https://aiac.ca/wp-content/uploads/2018/06/State-of-Canadas-Aerospace-Industry-2018-Report.pdf>

<sup>43</sup> <https://investalberta.ca/industry-profiles/aviation-and-logistics/>

<sup>44</sup> <https://www.wycc.com/en-us/media/factsfigures/factsheet.aspx>

# ACTION PLAN AND RECOMMENDATIONS

Simply identifying the value propositions and opportunities in transportation and logistics will not be enough alone to realise the potential afforded to the City of Calgary. Instead, Calgary Economic Development and its partners in the public and private sectors will need to work collaboratively to support and promote the cluster.

This report contains a full list of recommended actions for each of the three cluster areas: Logistics, Technology, and Aerospace. recommendations to grow, expand, and enhance the City's transportation and logistics sector. It should be noted the items in list of action items are not necessarily the responsibility (or within the purview) of any one agency or authority. Instead, implementing these actions will require the collaboration of stakeholders across the public, private, and institutional realms.

## General Recommendations

### RECOMMENDATION 1: Stakeholder Identification and Engagement

- Bring together interested parties as identified in the specific clusters for Logistics, Technology, and Aerospace.

Why this is important: This is a necessary first step in creating an ongoing, self-catalyzing process of local engagement, ambassadorship, and capacity enhancement.

### RECOMMENDATION 2: Land

- Assemble a catalogue of developable land and available buildings that may accommodate the activities identified in the clusters above. To the extent possible, identify landowners and/or listing brokers and also examine "shovel-readiness" of these parcels.
- Specifically identify, or reserve, land near key transportation access modes, such as at the airport, rail yards, and along the designated freight corridors.

Why this is important: Location decisions are made on a constellation of factors, most of them with greater overall importance than real estate. However, real estate is a necessary factor in the implementation of that location decision. The City of Calgary will need to show prospective investors there is suitable real estate that will allow them to execute on their plans.

### RECOMMENDATION 3: Workforce Development

- Conduct periodic evaluations of labour needs and supplies.
- Collaborate with local training entities and institutions of higher learning to create new or enhanced training and learning programs.
- Continue to build upon the programs and the competitive advantage already provided at SAIT and Mount Royal University.

Why this is important: Workforce and talent are primary location drivers across a wide range of industry types. Innovative industry thrives on and is drawn to pools of talent and the institutions that build them.

### RECOMMENDATION 4: Marketing

- Create a strategy for further developing and transmitting Calgary's value propositions to decision makers in the identified clusters. Specific channels may include direct mail, LinkedIn marketing, direct outreach, online, or other forms.
- Consider taking part in and sponsoring specific portions of organizations and conferences serving the Logistics, Technology, and Aerospace clusters.

Why this is important: Corporate decision makers and the consultants that advise them need to be educated on the opportunity that a Calgary region provides.

### RECOMMENDATION 5: Regional Collaboration

- The current competition among the regional municipalities in the Calgary area undermines the City's – and Region's – ability to compete effectively for investment on the global stage. Efforts should continue to be made to find means and mechanisms for shared investment and shared reward in attracting transportation and logistics investment.

Why this is important: Collaborating regionally will enable better economies of scale, an enhanced ability to serve a broader array of investors, and an ability to each find benefit in each project. A failure to do so will not only mean a lack of efficiency but may also create a negative impression of conflict to potential investors.

# CLUSTER-SPECIFIC RECOMMENDATIONS

## Logistics

- Develop census of current logistics related companies, including the following groups:
  - Food distribution companies
  - 3PLs
  - Trucking companies
  - Warehouse and logistics operators
  - Railroads
  - Freight forwarders
  - Air cargo providers
- Identify key stakeholders/ambassadors within this group.
- Work with stakeholders/ambassadors to:
  - Identify gaps in value chain or opportunities to enhance competitiveness.
  - Identify key types of companies whose presence would be mutually beneficial.
  - Hone message of value proposition.
  - Identify further addressable shortcomings in infrastructure and policy.
  - Identify support services that may be required in market.
- Create database of developable land and available buildings to support new investment attraction.
- Participate in the following organizations to develop networks, grow market awareness, and identify potential targets:
  - Canadian Institute of Food Science and Technology (<https://www.cifst.ca/>)
  - SIAL Canada (<https://sialcanada.com/>)
  - Council of Supply Chain Management Professionals ([www.cscmp.org](http://www.cscmp.org))
  - Institute for Supply Management (<https://www.ismworld.org/>)
  - Cargo Logistics Canada (<https://www.cargologisticscanada.com/>)
  - Intermodal Association of North America - IANA ([www.intermodal.org](http://www.intermodal.org))
- Consider attendance at NAFTAZ (<https://www.naftz.org/>) sessions or annual conference to ascertain potential for networking or further intelligence gathering.

## Technology

- Work with Attabotics and Hexagon|Novatel to identify other players in the region (possibly throughout Alberta) who participate in sensor, AI, and autonomous vehicle development or applications.
- Identify key stakeholders/ambassadors within this group.
- Actively engage University of Calgary and Mount Royal University in the talent attraction, development and retention role.
- Work with stakeholders/ambassadors to:
  - Hone message of value proposition
  - Identify opportunities to recruit talent to the Calgary region, enhance the region's profile for quality of life for tech workers
  - Identify further addressable shortcoming in infrastructure, policy, or other
- Consider participation in/at:
  - Council of Supply Chain Management Professionals ([www.cscmp.org](http://www.cscmp.org))
  - Cargo Logistics Canada ([www.cargologisticscanada.com](http://www.cargologisticscanada.com))
  - Material Handling Equipment Distributors Association (<https://www.mheda.org/>)
  - Autonomous Vehicle Technology Expo (<https://www.autonomousvehicletechnologyexpo.com/michigan/en/>)

## Aerospace

- Identify key stakeholders/ambassadors within the cluster through conversations with WestJet, Air Canada, and the cargo airlines.
- Work with stakeholders/ambassadors to:
  - Further identify specific current and projected needs
  - Hone message of value proposition
  - Identify further addressable shortcoming in infrastructure, policy, or other
- Develop initial marketing materials outlining the success stories of Viking Air Ltd. and of current drone manufacturers/operators.
- Consider attendance at the following sector events:
  - AirVenture (<https://www.eaa.org/en/airventure>).
  - Farnborough Air Show (<https://www.farnboroughairshow.com/>)
  - Paris Air Show (<https://www.siae.fr/en/>)



# APPENDIX A: QUANTITATIVE ANALYSIS RESULTS

## Results from Location Quotient analysis

The table below demonstrates Calgary's location quotient across all sectors of the economy compared to comparator Canadian cities Edmonton, Regina, Saskatoon, and Winnipeg.

Industry	Calgary	Edmonton	Regina	Saskatoon	Winnipeg
Agriculture	0.30	0.36	0.56	0.85	0.45
Forestry, Fishing, Mining, Quarrying, Oil and Gas	3.45	1.79	0.60	1.43	0.13
Utilities	1.45	1.73	2.69	0.38	1.45
Construction	1.08	1.49	1.02	1.11	0.93
Manufacturing	0.59	0.71	0.57	0.67	1.07
Wholesale & Retail Trade	0.90	1.06	1.01	1.03	0.92
Transportation & Logistics	1.20	0.99	0.68	0.82	1.25
Information, Cultural and Recreation	0.94	0.71	1.19	1.07	0.96
Professional, Scientific and Technical Services	1.43	0.85	0.73	0.88	0.66

Source: Statistics Canada 2019 and Conway Calculations

The table below demonstrates Calgary's location quotient in 2016 and 2019, and the difference between the two years, compared to the national average. Importantly, this table analyses only NAICS 48 and 49 at the three digit level.

NAICS	2016			2019			LQ Trend	
	Canada	Calgary	LQ	Canada	Calgary	LQ	Change	Trend
481 Air Transportation	0.38%	0.88%	2.34	0.43%	1.23%	2.83	0.49	Growing
482 Rail Transportation	0.19%	0.25%	1.32	0.22%	0.45%	2.02	0.70	Growing
483 Water Transportation	0.07%	N/A	N/A	0.07%	N/A	N/A	N/A	N/A
484 Truck Transportation	1.65%	1.24%	0.76	1.75%	1.35%	0.78	0.02	Steady
485 Transit and Ground Passenger Transportation	0.97%	0.81%	0.83	1.05%	1.02%	0.97	0.14	Growing
486 Pipeline Transportation	0.06%	0.62%	9.62	0.08%	0.71%	9.22	-0.39	Declining
487 Scenic & Sightseeing Transportation	0.01%	N/A	N/A	0.02%	N/A	N/A	N/A	N/A
488 Support Activities for Transportation	0.67%	0.75%	1.11	0.72%	0.63%	0.88	-0.23	Declining
491 Postal Service	0.36%	0.30%	0.83	0.36%	0.28%	0.76	-0.08	Declining
492 Couriers and Messengers	0.35%	0.31%	0.89	0.47%	0.57%	1.22	0.34	Growing
493 Warehousing and Storage	0.30%	0.78%	2.62	0.28%	0.29%	1.03	-1.59	Declining

Source: Statistics Canada and Conway Calculations



## Results from Shift Share analysis

The table below demonstrates the shift share analysis of Calgary employment between 2016 and 2019.

Industry	Share Change	Mix Change	Shift Change	Total Change
Agriculture	113	(125)	1,912	<b>1,900</b>
Forestry, Fishing, Mining, Quarrying, Oil and Gas	2,866	(1,940)	(1,526)	<b>(600)</b>
Utilities	475	(353)	278	<b>400</b>
Construction	4,237	190	(10,427)	<b>6,000</b>
Manufacturing	2,207	(1,283)	4,576	<b>5,500</b>
Wholesale & Retail Trade	6,363	(2,246)	(5,618)	<b>(1,500)</b>
Transportation & Logistics	2,580	4,295	2,326	<b>9,200</b>
Information, Cultural and Recreation	1,824	(2,187)	(37)	<b>(400)</b>
Finance and Insurance, Real Estate and Leasing	2,396	811	(3,007)	<b>200</b>
Professional, Scientific and Technical Services	5,278	6,090	(7,568)	<b>3,800</b>
Business, Building, and Other Support Services	1,554	(1,182)	5,928	<b>6,300</b>
Educational Services	2,769	1,287	1,344	<b>5,400</b>
Health Care and Social Assistance	4,717	902	12,981	<b>18,600</b>
Accommodation and Food Services	2,704	(2,580)	9,676	<b>9,800</b>
Other Services (except Public Administration)	2,051	33	2,116	<b>4,200</b>
Public Administration	1,220	864	9,116	<b>11,200</b>
<b>Total employed, all industries</b>	<b>43,355</b>	<b>2,575</b>	<b>22,070</b>	<b>68,000</b>

Source: Statistics Canada and Conway Calculations

The table below demonstrates Calgary's shift share analysis results compared to Canadian municipalities across all NAICS codes.

Industry	Calgary	Edmonton	Regina	Saskatoon	Winnipeg
Agriculture	1,900	(400)	400	200	500
Forestry, fishing, mining, quarrying, oil and gas	(600)	1,800	(200)	(1,500)	(200)
Utilities	400	3,800	300	(500)	(1,900)
Construction	(6,000)	(1,700)	(1,000)	(2,500)	2,400
Manufacturing	5,500	9,400	1,000	1,900	1,700
Wholesale & Retail Trade	(1,500)	13,000	(1,000)	600	(1,800)
Transportation & Logistics	9,200	(5,700)	(100)	(400)	5,700
Information, Cultural and Recreation	(400)	(1,000)	(800)	2,200	(900)
Finance and Insurance, Real Estate and Leasing	200	900	-	1,200	2,200
Professional, Scientific and Technical Services	3,800	1,000	(900)	1,600	1,900
Business, Building, and Other Support Services	6,300	(2,100)	1,500	1,000	3,300
Educational Services	5,400	3,300	1,300	1,900	1,200
Health Care and Social Assistance	18,600	12,700	(1,000)	3,000	1,500
Accommodation and Food Services	9,800	1,100	1,500	900	700
Other Services (except Public Administration)	4,200	(6,800)	900	2,500	(300)
Public Administration	11,200	1,300	1,100	(200)	3,700
<b>Total Employment Change</b>	<b>68,000</b>	<b>30,600</b>	<b>3,000</b>	<b>11,900</b>	<b>19,700</b>

Source: Statistics Canada and Conway Calculations

## Results from Reverse Site Selection analysis

The table below compares Calgary to peer cities across North America across key criteria in site selection decisions. Comparator cities include Edmonton, Winnipeg, Denver, Houston, Kansas City, Louisville, and Minneapolis.

Weight	Categories	Calgary	Edmonton	Winnipeg	Denver	Houston	Kansas City	Louisville	Minneapolis
25.00%	Transportation & Market Access	6	8	7	5	1	3	2	4
14.00%	Industry & Occupation-Specific Employment	3	6	7	8	1	4	2	5
14.00%	Occupation-Specific Salaries	5	2	1	8	4	5	3	7
12.00%	Labour Availability	4	5	8	2	1	7	6	3
10.00%	Population & Demographics	5	4	6	2	1	7	8	9
8.00%	Real Estate	6	3	8	7	1	2	3	3
7.00%	Tax Regime	4	4	8	2	3	6	1	6
5.00%	Education	3	1	2	7	8	5	4	6
2.00%	Household Statistics	1	2	5	6	3	7	8	4
2.00%	Weather	7	8	5	4	1	1	3	5
1.00%	Crime	5	7	8	1	4	6	1	3
<b>100%</b>	<b>Overall Rank</b>	<b>4</b>	<b>5</b>	<b>8</b>	<b>7</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>6</b>

## Reverse Site Selection Analysis Raw Data and Sources

The table below provides all data and sources used to complete the reverse site selection analysis.

	Calgary	Edmonton	Winnipeg	Denver	Houston	Kansas City	Louisville	Minneapolis	Geography	Source
<b>Demographics</b>										
2020 Total Population (Esri)	1,569,944	1,502,363	859,128	2,988,896	7,233,951	2,191,128	1,283,286	3,678,099	MSA/CMA	Esri Business Analyst Online (BAO), purchased by Conway Advisory
2020 Median Age (Esri)	37.3	36.6	38	37.3	34.7	38	40.1	37.7	MSA/CMA	Esri BAO, purchased by Conway Advisory
2025 Total Population (Esri)	1,731,131	1,665,047	923,780	3,221,972	7,931,830	2,283,728	1,325,690	3,863,078	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020-2025 Population: Annual Growth Rate (Esri)	1.97%	2.08%	1.46%	1.51%	1.86%	0.83%	0.65%	0.99%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2016 Population 25+: No Diploma (%)	8.10%	9.70%	10.10%	9.2%	16.7%	7.9%	10.5%	8.5%	MSA/CMA	Data.census.gov
2016 Population 25+: High School Diploma (%)	22.30%	24.80%	26.70%	20.5%	23.7%	25.9%	29.2%	22.0%	MSA/CMA	Data.census.gov
2016 Population 25+: Post-Secondary Below Bachelor's (%)	31.20%	36.70%	31.70%	27.8%	27.7%	29.4%	32.0%	29.6%	MSA/CMA	Data.census.gov
2016 Population 25+: Bachelor's Degree (%)	26.60%	20.00%	22.50%	26.9%	20.4%	23.5%	17.1%	24.9%	MSA/CMA	Data.census.gov
2016 Population 25+: Post Graduate (%)	11.60%	8.90%	9.10%	15.6%	11.6%	13.2%	11.2%	14.9%	MSA/CMA	Data.census.gov
2020 Industry: Agriculture/Mining (Esri) (%)	6.89%	4.07%	1.49%	1.2%	3.2%	0.8%	0.7%	0.7%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Industry: Construction (Esri) (%)	9.23%	11.63%	6.82%	8.6%	10.6%	7.3%	6.3%	5.8%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Industry: Manufacturing (Esri) (%)	5.09%	6.03%	8.72%	6.4%	9.9%	9.9%	14.3%	13.8%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Industry: Wholesale Trade (Esri) (%)	3.67%	4.10%	3.61%	2.7%	3.2%	3.0%	2.8%	2.9%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Industry: Retail Trade (Esri) (%)	10.96%	11.04%	10.81%	9.8%	9.5%	9.4%	9.4%	9.3%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Industry: Transportation & Logistics (Esri)	5.73%	4.76%	5.69%	4.7%	5.8%	5.5%	7.2%	4.1%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Unemployment Rate	9.2%	6.80%	7.20%	2.7%	3.8%	3.3%	3.8%	3.0%	MSA/CMA	BLS & Statistics Canada
2020 Owner Occupied Housing Units (Esri) (%)	72.7%	69.57%	67.25%	58.7%	55.8%	59.3%	62.1%	66.6%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Renter Occupied Housing Units (Esri) (%)	27.3%	30.24%	32.71%	36.1%	35.8%	32.0%	29.8%	28.1%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2025 Owner Occupied Housing Units (Esri) (%)	72.6%	69.82%	67.47%	58.9%	56.1%	59.0%	61.8%	66.7%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2025 Renter Occupied Housing Units (Esri) (%)	27.4%	29.99%	32.49%	36.4%	35.8%	32.4%	30.2%	28.2%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Per Capita Income (Esri)	\$49,877	\$44,696	\$38,798	\$50,777	\$43,082	\$46,784	\$43,482	\$53,859	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020-2025 Per Capita Income: Annual Growth Rate (Esri)	2.6%	3.2%	2.7%	2.0%	2.3%	2.0%	1.9%	2.1%	MSA/CMA	Esri BAO, purchased by Conway Advisory
2025 Per Capita Income (Esri)	\$56,588	\$ 52,261	\$44,264	\$56,161	\$48,376	\$51,594	\$47,692	\$59,666	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020 Housing Units (Esri)	565,543	547,874	326,742	1,238,723	2,731,079	946,149	559,153	1,502,885	MSA/CMA	Esri BAO, purchased by Conway Advisory
2025 Housing Units	621,304	603,120	348,888	1,328,148	2,979,919	985,840	577,175	1,574,172	MSA/CMA	Esri BAO, purchased by Conway Advisory
2020-2025 Housing Unit Growth (%) (Esri)	9.0%	9.2%	6.3%	6.7%	8.4%	4.0%	3.1%	4.5%	MSA/CMA	Esri BAO, purchased by Conway Advisory

	Calgary	Edmonton	Winnipeg	Denver	Houston	Kansas City	Louisville	Minneapolis	Geography	Source
<b>Unemployment Rates</b>										
2015	6.4%	6.0%	6.0%	3.7%	4.6%	4.8%	4.6%	3.4%	MSA/CMA	BLS & Statistics Canada
2019	7.1%	7.3%	5.3%	2.7%	3.8%	3.3%	3.8%	3.0%	MSA/CMA	BLS & Statistics Canada
2015-2019 unemployment rate change	0.7%	1.3%	-0.7%	-1.0%	-0.8%	-1.5%	-0.8%	-0.4%	MSA/CMA	Conway Advisory Calculations
<b>Labour Force</b>										
2015	871,400	809,200	451,700	1,505,494	3,258,377	1,113,332	633,657	1,931,302	MSA/CMA	BLS & Statistics Canada
2019	938,100	854,500	469,600	1,677,324	3,428,878	1,129,162	675,635	2,030,730	MSA/CMA	BLS & Statistics Canada
2015-2019 labor force change	7.65%	5.60%	3.96%	11.41%	5.23%	1.42%	6.62%	5.15%	MSA/CMA	Conway Advisory Calculations
<b>Weather</b>										
(Minimum Living Hourly Wage - 1 Adult)	\$18.15	\$16.51	\$14.54	\$18.54	\$15.86	\$15.11	\$14.81	\$16.37	Province/MSA	MIT Living Wage & Living Wage Canada
Annual Precip mm	412.6	476.9	504	406.4	1219.2	939.8	1168.4	812	MSA/CMA	Cities Ranked and Rated, Google Search
Annual Snowfall cm	126.7	123.5	114.8	152.4	0	50.8	22.86	115.1	MSA/CMA	Cities Ranked and Rated, Google Search
Days Precipitation	113.6	125.8	123.5	88	107	102	115	112	MSA/CMA	Cities Ranked and Rated, Google Search
<b>Transportation &amp; Logistics</b>										
Average Commute Time (Driving Car)	24.1	24.2	22.6	26	28.4	22.4	22.4	24.4	MSA/CMA	Statistics Canada & Governing.com
Km Light Rail in 2019	118.1	24.3	0	76	36.9	3.5	0	37	MSA/CMA	Transportation Websites
Km to Mjr Airport	15.6	28.9	8	51.3	17.5	33.3	11.3	19.3	MSA/CMA	Google Maps
Time to Mjr Airport	17	29	15	37	18	23	10	14	MSA/CMA	Google Maps
Annual Air Passenger Volume (2018)	15,565,055	7,449,265	4,146,275	64,494,613	55,327,328	11,850,825	3,866,057	38,046,085	N/A	Airport websites
Annual Air Cargo Volume in tonnes (2018)	85,907.00	27,113.00	61,550.20	29,778	494,058	102,752	2,623,019	239,546	N/A	Airport websites
Seaport/Riverport (Y/N)	N	N	N	N	Y	Y	Y	Y	MSA/CMA	Google Maps
Class 1 Railroads	2	2	2	2	3	5	2	4	MSA/CMA	Loadmatch.com
Intermodal Rail Terminals	3	2	2	4	3	4	3	2	MSA/CMA	Loadmatch.com
Interstate Highways	2	2	2	3	3	4	3	2	MSA/CMA	Google Maps
<b>Crime Rates</b>										
2019 crime severity index (Canada) and 2019 Violent Crime Rate per 100,000 (U.S.)	1,059	1,232	1,403	736	1,046	1,596	556	815	City	Statistics Canada & Neighbourhood Scout
2019 Property Crime Rate per 100,000	4,514	5,706	6,505	3,731	4,125	4,352	3,682	4,140	City	Statistics Canada & Neighborhood Scout
<b>Labour Force Cost (Median Hourly Wage)</b>										
Managers in transportation/Transportation, storage, and district Managers	\$43.27	\$41.83	\$36.54	\$69.95	\$67.20	\$60.70	\$55.51	\$63.13	MSA/ CMA	BLS & Canada Job Bank
Heavy Truck Drivers	\$25.00	\$27.78	\$20.00	\$32.34	\$27.99	\$29.80	\$30.16	\$31.86	MSA/ CMA	BLS & Canada Job Bank
Material Handlers	\$21.00	\$20.00	\$18.40	\$21.31	\$17.37	\$19.32	\$18.32	\$22.04	MSA/ CMA	BLS & Canada Job Bank

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<b>Labour Force Numbers by Position</b>										
Managers in transportation/Transportation, storage, and district Managers	2,100	1,340	850	890	3,650	1,010	810	1,920	MSA/CMA	BLS & Canada Job Bank
Heavy Truck Drivers	12,710	14,440	6,580	14,450	41,960	15,730	9,810	19,020	MSA/CMA	BLS & Canada Job Bank
Material Handlers	7,670	7,860	3,470	19,660	50,050	21,330	26,590	31,700	MSA/CMA	BLS & Canada Job Bank
<b>Occupation Employment as Share of Labour Force</b>										
Managers in transportation/Transportation, storage, and district Managers	0.22%	0.16%	0.18%	0.05%	0.11%	0.09%	0.12%	0.09%	MSA/CMA	Conway Calculations
Heavy Truck Drivers	1.35%	1.69%	1.40%	0.86%	1.22%	1.39%	1.45%	0.94%	MSA/CMA	Conway Calculations
Material Handlers	0.82%	0.92%	0.74%	1.17%	1.46%	1.89%	3.94%	1.56%	MSA/CMA	Conway Calculations
<b>Tax</b>										
Federal Corporate Income Tax - Highest Bracket	15.00%	15.00%	15.00%	21.00%	21.00%	21.00%	21.00%	21.00%	National	Google Search
State/Provincial Corporate Income Tax -Highest Bracket (starting P55, second column)	8.00%	8.00%	12.00%	4.63%	0.75%	6.25%	5.00%	9.80%	State/Province	Government of Alberta & Tax Foundation
Employment/Unemployment Insurance Rates	2.27%	2.27%	2.27%	8.15%	6.46%	9.75%	9.25%	9.10%	National (CA)/State(USA)	Statistics Canada & Tax Foundation
Sales Tax (Federal, State/Provincial, and Local combined)	5.00%	5.00%	13.00%	7.52%	8.17%	8.38%	6.00%	7.43%	All Levels	Statistics Canada & Tax Foundation
Median Property Tax	1.77%	2.08%	2.44%	0.70%	2.26%	1.62%	0.93%	1.31%	MSA/CA	Altus Group & Smart Asset
<b>Access to Markets</b>										
Average Commute Time (Driving Car)	24.1	24.2	22.6	26	28.4	22.4	22.4	24.4	MSA/CMA	Statistics Canada & Governing.com
Km Light Rail in 2019	118.1	24.3	0	76	36.9	3.5	0	37	MSA/CMA	Transportation Websites
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Intermodal Rail Terminals	3	2	2	4	3	4	3	2	MSA/CMA	Loadmatch.com
Interstate Highways	2	2	2	3	3	4	3	2	MSA/CMA	Google Maps
<b>Real Estate Availability Q3 2020</b>										
Inventory Industrial Buildings (sf)	153,200,531	183,213,332	79,062,357	222,126,223	456,929,895	234,271,079	189,690,123	185,897,005	MSA/CMA	JLL
Vacancy Rate	7.00%	6.70%	4.80%	6.10%	9.20%	4.50%	4.50%	5.90%	MSA/CMA	JLL
Weighted Average Net Rent	\$10.03	\$9.52	\$9.26	\$10.21	\$0.62	\$6.32	\$5.04	\$7.14	MSA/CMA	JLL