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Appendix 5
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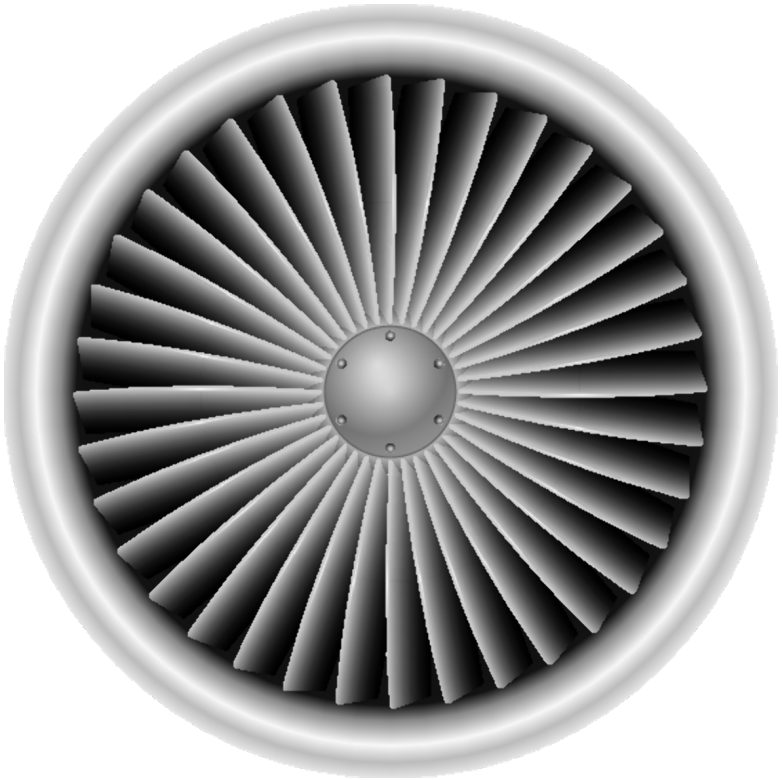

Niagara Region
Aerospace Sector Profile

March 2023

MAKING AN IMPACT THAT MATTERS since 1845

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Introduction

The global aerospace market was valued at US$712 billion in 2021[1], and when it comes to aerospace materials, the market reached US$36.4 billion in 2021 and is predicted to grow to US$67.2 billion by 2030.[2] The aerospace sector is an important sector for Ontario and Canada. In Ontario, the sector represents over $6 billion in annual sales, a direct GDP impact of $4.4 billion, and an annual expenditure of $500 million in research and development (R&D). Niagara region is home to a number of aerospace companies including Airbus Helicopters, Fleet Canada, Genaire Limited and a number of non-scheduled air transportation companies

[1] PWC, PwC's Global Aerospace and Defense: Annual Performance Look, 2022. Retrieved from <https://www.pwc.com/us/en/industries/industrial-products/library/aerospace-defense-review-and-forecast.html>

[2] Global News Wire. Retrieved from <https://www.globenewswire.com/news-release/2022/09/12/2514458/0/en/Aerospace-Materials-Market-Size-to-Surpass-Around-USD-67-42-BN-by-2030.html>

(sightseeing). Considering the importance of this sector and its projected global growth, interest in continuing to develop the sector has increased.

The Emerging Sector Profiles

Niagara Region Economic Development retained Deloitte LLP to produce sector profiles for five emerging sectors, including the marine sector, the health sector, film sector, and active economy/sport tourism, and electric vehicle battery industry. In the design of the project, the aerospace sector was added to the analysis. These sectors were initially identified in 'Niagara's 10 Year Economic Development Strategy 2022-2032'. This profile features the investment and growth potential of the aerospace sector. This aerospace sector profile was developed by defining the industries that are core to the sector as well as those that broadly support the aerospace sector and may provide opportunities for value chain development. These industries were characterized using business and employment data and include support and supply businesses. From this broad overview, international, national, and local trends were considered to identify high potential areas relevant to Niagara's economy. The research also includes the perspectives of local stakeholders, as well as a review of existing literature. The data were pulled together to show a picture of the sector's future potential. This profile does not include a benchmarking of the aerospace sector, and further research is needed to accurately identify employment directly linked to the aerospace sector.

The following data sources were used in the development of this sector profile: Lightcast (formerly EMSI Economic Modeling) 2022, Vicinity Jobs 2022, FDI Markets, Statistics Canada, and Canadian Business Counts[3] June 2022.

Investment Attraction Highlights

- Niagara region's aerospace industry is supported by a strong architectural and engineering services, aerospace parts manufacturing, support activities for air transportation, and composite component manufacturing. Emerging trends in aerospace have been in applying aerospace technology to drones and logistics

[3] The June 2022 Canadian Business Counts were used to determine the total number of registered businesses in the Niagara Region. Statistics Canada's Canadian Business Counts Data provides a record of business establishments by industry and size. This data is collected from the Canada Revenue Agency (CRA). The business data collected for Niagara Region included all local businesses that met at least one of the three following criteria: Have an employee workforce for which they submit payroll remittances to CRA, or have a minimum of $30,000 in annual sales revenue, or are incorporated under a federal or provincial act and have filed a federal corporate income tax form within the past three years.

subsectors. A major application, unmanned aerial and vehicle systems, have high potential to translate to a variety of mobility-related sectors.

- In Ontario, the aerospace sector generates annual R&D spending of $500 million, and exports over 75% of its finished products.

- Determinants for projects in the aerospace sector show the most important unique location requirement for foreign direct investment into North America is access to a skilled workforce (39% of projects).

- Increasing interest from both the Provincial and Federal Government to support the sector have funneled important public investments; $158 million since 2015 and an additional $250 million during the next three years. This investment will fund six projects within Ontario's aerospace sector and will support businesses and organization in the province's aerospace supply chain to increase manufacturing and productivity capabilities.

- Niagara Region has the potential to capitalize in aerospace trends when it comes to the manufacturing and development of drones, logistics technology, electric propulsion technology, radar systems, and electric vertical take-off and landing aircrafts (VTOLs) and radar systems.

- Synergies between the EV and battery manufacturing sector and the aerospace sector present potential connections in terms of a value proposition that can target both sectors (e.g., manufacturing of electrical components for both EVs and battery powered aerospace equipment including electric and hybrid powered planes, drones and other VTOLs).

The Aerospace Sector in Niagara Region

- **Sector related employment:** Employment in the aerospace sector and support industries in the Niagara region reached 6,460 jobs in 2022. A large proportion of jobs in the aerospace sector come from non-core industries (may support various industries but are important for aerospace).
- **Concentration of businesses:** Lightcast input-output model estimates that the core aerospace sector (see Figure 1) supply chain value in Niagara region reached $23 million in 2020. Important suppliers for the sector include petroleum and coal product manufacturing; machine shops, turned product, and screw, nut, and bolt manufacturing; and electrical equipment manufacturing.
- **Employment demand trends:** The overall aerospace sector will grow by 228 jobs by 2028: a 4% increase, compared to 2022; mostly driven by growth in the support industries to aerospace.

- **Business concentration:** A total of 803 businesses related to the aerospace sector were recorded in Niagara Region in June 2022. Most of these businesses were businesses with employees (421 businesses).
- **Core aerospace industries with the largest number of businesses:** include support activities for air transportation (20 businesses or 2% of businesses in the sector), non-scheduled air transportation (18/2%), and aerospace product and parts manufacturing (7/1%).
- **According to Statistics Canada International Accounts and Trade Division,** the Niagara region recorded a total of 5 exporting establishments in 2020 in the aircraft, spacecraft and parts thereof. These businesses exported an estimated $33.3 million in aerospace products. On the other hand, a total of 15 establishment recorded the import of aerospace products; these establishments imported more than $60.3 million in aerospace products.

Aerospace Sector Overview

Defining the Aerospace Sector

Aerospace in Canada is primarily defined by aerospace manufacturing and maintenance, repair, and overhaul (MRO). The aerospace industry in Canada contributed over $24 billion to GDP and over 200,000 jobs in 2021.[4] In 2021, aerospace manufacturing made up 68% of total Canadian aerospace industry employment, while MRO made up 32%.[5] The vast majority of manufacturing employment is located in Quebec (62% of total aerospace manufacturing employment), while Western Canada has the highest percentage of MRO employment (39% of total MRO employment).[6] Ontario's share of aerospace manufacturing and MRO employment is 22% and 34% respectively (both are second highest in their class in Canada).[7] Over 90% of the aerospace sector's revenues are export-oriented.[8]

Due to the COVID-19 pandemic in 2020, the global aerospace industry saw a major contraction of aerospace manufacturing and MRO operations. This was primarily due to

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[4] Innovation, Science and Economic Development Canada and Aerospace Industries Association of Canada, *State of Canada's Aerospace Industry Report Summer 2022,* July 2022.
[5] Ibid.
[6] Ibid.
[7] *State of Canada's Aerospace Industry Report Summer 2022,* July 2022.
[8] https://ised-isde.canada.ca/site/aerospace-defence/en/trade-and-exporting/aerospace-and-defence-canada

the sudden and sharp decline in commercial flights, which was down 90% in April 2020 and 75% in August 2020.[9] In Canada between 2019 and 2021, revenues of Canada's aerospace manufacturing firms decreased at a similar rate to the global market and are not expected to rebound to pre-pandemic levels until 2024.[10] The Aerospace Industries Association of Canada (AIAC) has called on the federal government to establish a national aerospace strategy to provide clarity on domestic production over the long-term and strengthen Canada's leadership in this sector.[11]

For this analysis, the codes shown below were used to collect employment and business counts and other numbers for the sector. These numbers were collected by Deloitte using Lightcast Economic Modeling[12]. In addition, and with the support of the Niagara Region's Project Team, the aerospace industry subsectors were further classified into core, and support/supply chain subsectors. In the figure below, core industry subsectors are highlighted in blue.

Figure 1 – Aerospace Sector NAICS

Industry	NAICS	Description
Manufacturing	3241	Petroleum and coal product manufacturing
	3313	Alumina and aluminum production and processing
	3314	Non-ferrous metal (except aluminum) production and processing
	3327	Machine shops, turned product, and screw, nut and bolt manufacturing
	3329	Other Fabricated Metal Product Manufacturing
	3345	Navigational, measuring, medical and control instruments manufacturing
	3353	Electrical equipment manufacturing
	3364	**Aerospace product and parts manufacturing**
Transportation and Warehousing	**4811**	**Scheduled air transportation**
	4812	**Non-scheduled air transportation**
	4881	**Support activities for air transportation**

[9] OECD, COVID-19 and the aviation industry: Impact and policy responses, October 2020.

[10] State of Canada's Aerospace Industry Report Summer 2022, July 2022.

[11] The Conference Board of Canada, Shaken by Turbulence, Aerospace Manufacturing Is Recovering, December 2021.

[12] Employment figures have not been independently verified by Deloitte.

Industry	NAICS	Description
	4884	Support activities for road transportation
	4885	Freight transportation arrangement
Finance and Insurance	5221	Depository credit intermediation
Professional, Scientific, and Technical Services	5413	Architectural, engineering, and related services

Sector Trends

During the last decade, the Federal Government, through FedDev Ontario, has invested over $158 million in aerospace projects across southern Ontario, creating over 900 jobs.[13]

The Niagara Region Advantage

- The region plays a critical role in the successful flow of goods, services and people between Canada and the United States. Over $100 billion worth of trade make its way through the region each year. Niagara is also Ontario's first designated Foreign Trade Zone (FTZ). The FTZ offers businesses the opportunity to work with a dedicated team of public and private sector experts to access information, programs and incentives that have been specifically developed to help companies initiate and improve their international trade efforts.[14]

- Niagara region is located 122 km west of Toronto, 565 km from Columbus (Ohio), 650 km from New York and Philadelphia, among other major U.S. markets. With half of North America's population located within a one-day drive, Niagara location offers easy access to both customers and suppliers.

Employment and Business Structure in Niagara Region

Overall, the employment in the aerospace sector and support industries in the Niagara region reached 6,460 jobs in 2022. Most of the jobs in the core industries were in

[13] Federal Economic Development Agency for Southern Ontario (FedDev Ontario). Retrieved from < https://www.canada.ca/en/economic-development-southern-ontario/news/2023/02/government-of-canada-supports-economic-growth-and-job-creation-in-ontarios-aerospace-sector.html>

[14] Niagara Economic Development. Retrieved from < https://niagaracanada.com/incentives-and-programs/niagara-foreign-trade-zone/>

aerospace product manufacturing (214 jobs or 3% of employment in the sector), non-scheduled air transportation (81 jobs or 1% employment in the sector), and support activities for air transportation (56 jobs or 1% of job in the sector).
A large proportion of jobs in the aerospace sector come from non-core industries (may support various industries but are important for aerospace), this includes freight transportation arrangement, and several manufacturing areas related to the aerospace product and parts manufacturing supply chain. The largest of these support sectors is depository credit intermediation; this sector is engaged in accepting deposits and lending funds (include banks and credit unions). This sector is relevant for the aerospace sector in general as it has become more common the investments from sovereign wealth funds, insurance companies, pension funds and certain private equity funds in investing in aircraft assets.[15]

Figure 2 – Employment Aerospace Sector and Supply Chain, Niagara Region, 2022

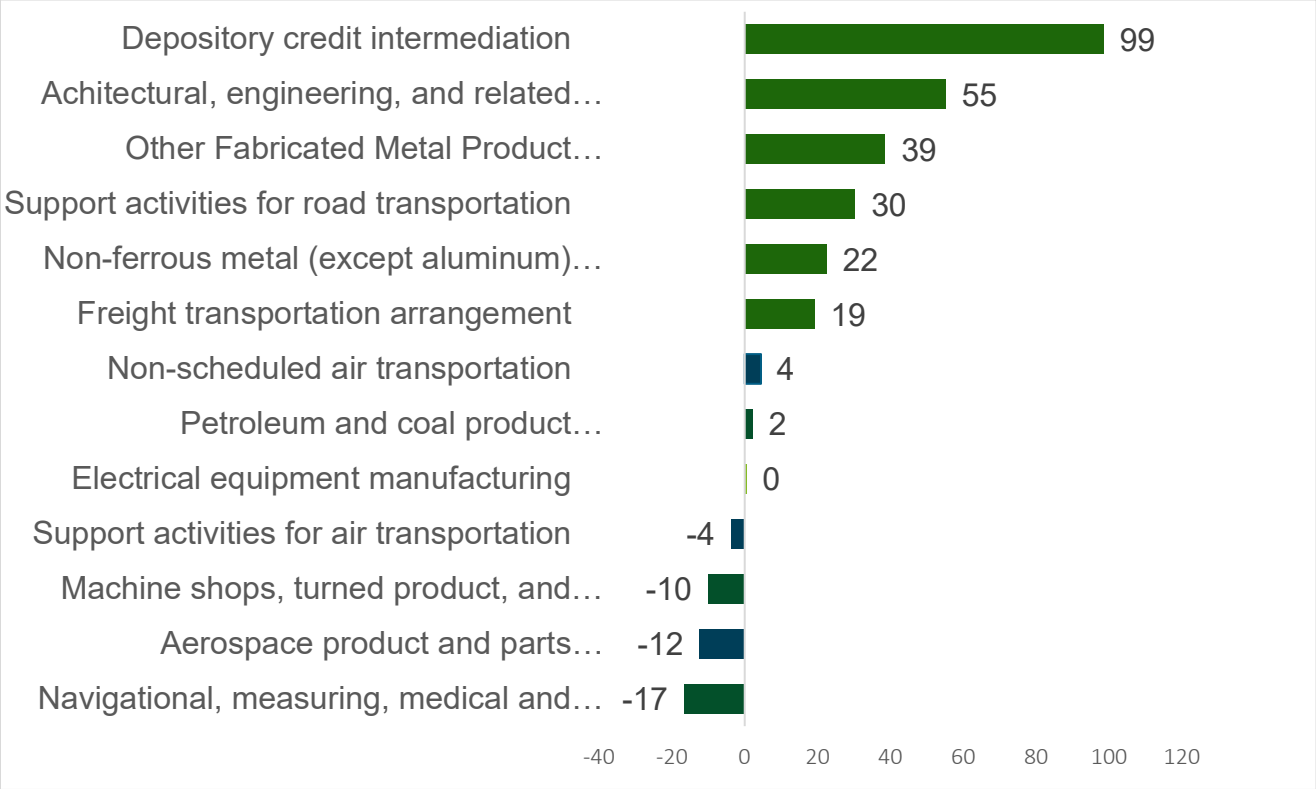
Description	Employment 2022	%
Total Aerospace	**6,460**	**100%**
Depository credit intermediation	2,145	33%
Architectural, engineering, and related services	1,760	27%
Freight transportation arrangement	703	11%
Machine shops, turned product, and screw, nut and bolt manufacturing	563	9%
Support activities for road transportation	276	4%
Other Fabricated Metal Product Manufacturing	241	4%
Non-ferrous metal (except aluminum) production and processing	217	3%
Aerospace product and parts manufacturing	**214**	**3%**
Navigational, measuring, medical and control instruments manufacturing	108	2%
Non-scheduled air transportation	**81**	**1%**
Electrical equipment manufacturing	58	1%
Support activities for air transportation	**56**	**1%**
Petroleum and coal product manufacturing	38	1%
Alumina and aluminum production and processing	0	0%
Scheduled air transportation	**<10**	**Insf. Data**

Source: Lightcast, 2022 - Datarun 2022.1 | Core industry subsectors are highlighted in blue

[15] PWC. Aviation Finance. 2013

The overall aerospace sector will grow by 228 jobs by 2028: a 4% increase, compared to 2022; mostly driven by growth in the support industries to aerospace (highlighted in green in the Figure below). Meanwhile, the core aerospace industries are expected to see declines in employment during the same period, aerospace product and part manufacturing will decrease by 17 jobs (15% decline), and support activities for transportation will decrease by 10 jobs (2% decline). Non-scheduled air transportation will experience a small growth of 4 jobs (6% growth).

Figure 3 – Employment Change, Aerospace Sector, Niagara Region, 2022-2028



Source: Lightcast, 2022- Datarun 2022.1 | Core industry subsectors are highlighted in blue

803 businesses related to the aerospace sector were recorded in Niagara Region in June 2022. Most of these businesses were businesses with employees (421 businesses).

Industry sectors (core aerospace industries) with the largest number of businesses include support activities for air transportation (20 businesses or 2% of businesses in the sector), non-scheduled air transportation (18/2%), and aerospace product and parts manufacturing (7/1%).

Figure 4 – Business Counts, Aerospace Sector, Niagara Region, June 2022

Description	With Employees	Without Employees	Total
Total Aerospace	**421**	**382**	**803**
Architectural, engineering, and related services	144	237	**381**
Depository credit intermediation	118	3	**121**
Support activities for road transportation	38	42	**80**
Freight transportation arrangement	41	24	**65**
Machine shops, turned product, and screw, nut and bolt manufacturing	39	21	**60**
Other Fabricated Metal Product Manufacturing	12	19	**31**
Support activities for air transportation	**6**	**14**	**20**
Non-scheduled air transportation	**2**	**16**	**18**
Navigational, measuring, medical and control instruments manufacturing	6	3	**9**
Aerospace product and parts manufacturing	**7**	**0**	**7**
Electrical equipment manufacturing	4	2	**6**
Petroleum and coal product manufacturing	3	1	**4**
Non-ferrous metal (except aluminum) production and processing	1	0	**1**
Alumina and aluminum production and processing	0	0	**0**
Scheduled air transportation	**0**	**0**	**0**

Source: Canadian Business Counts, June 2022 | Provided by Niagara Region | Core industry subsectors are highlighted in blue

Location Quotient

As part of the economic baseline analysis, a Location Quotient (LQ) Analysis was completed to determine the concentration of employment in the aerospace sector, in Niagara region and relative to the province. The location quotient reveals what makes a region unique, in this case in comparison with other communities in Ontario. The following chart shows common LQ Classifications to interpret the figures in Figure 5.

Overall, the aerospace sector shows a moderate concentration of businesses in the Niagara region relative to Ontario. The only core aerospace sector with a high concentration of businesses in the area is non-schedule air transportation; these are mostly sightseeing companies that provide plane tours in the region. Support sectors for the aerospace sector with a high concentration of businesses include machine shops, turned product, and screw, nut and bolt manufacturing, and depository credit intermediation.

Figure 5 – Business Concentrations (Location Quotients), Aerospace Sector, Niagara Region, June 2022

Description	LQs Total
Total Aerospace	**0.94**
Depository credit intermediation	1.45
Non-scheduled air transportation	1.38
Machine shops, turned product, and screw, nut and bolt manufacturing	1.27
Other Fabricated Metal Product Manufacturing	1.06
Freight transportation arrangement	1.05
Aerospace product and parts manufacturing	1.04
Electrical equipment manufacturing	1.02
Support activities for air transportation	0.92
Non-ferrous metal (except aluminium) production and processing	0.91
Architectural, engineering, and related services	0.87
Petroleum and coal product manufacturing	0.85
Navigational, measuring, medical and control instruments manufacturing	0.82
Support activities for road transportation	0.65

Source: Canadian Business Counts, June 2022 | Provided by Niagara Region | Core industry subsectors are highlighted in blue

Job Demand

Between January 1, 2020, to November 30, 2022, a total of 1,136 job postings in industries related to the aerospace sector were recorded in the Niagara Region. Most of

these job postings were in the depository credit intermediation (591 job postings), and freight transportation arrangement (192 job postings). Core aerospace industries such as aerospace products and parts manufacturing advertised 46 job postings between 2020 and 2022. Overall, most of the job postings were advertised in 2022.

Figure 6 – Job Demand (Job Postings) by Industry Sector (Aerospace Sector), Niagara Region, January 1, 2020, to November 30, 2022

NAICS	2020	2021	2022	Total Postings	%
Total Aerospace	**236**	**365**	**535**	**1,136**	**100%**
Depository Credit Intermediation	129	216	246	591	52.0%
Freight Transportation Arrangement	33	48	111	192	16.9%
Other Fabricated Metal Product Manufacturing	29	56	82	167	14.7%
Architectural, Engineering and Related Services	19	23	33	75	6.6%
Aerospace Product and Parts Manufacturing	**2**	**3**	**41**	**46**	**4.0%**
Machine Shops, Turned Product, and Screw, Nut and Bolt Manufacturing	11	9	7	27	2.4%
Electrical Equipment Manufacturing	10	5	2	17	1.5%
Non-Ferrous Metal (except Aluminum) Production and Processing	1	0	6	7	0.6%
Navigational, Measuring, Medical and Control Instruments Manufacturing	2	1	4	7	0.6%
Support Activities for Air Transportation	**0**	**4**	**0**	**4**	**0.4%**
Petroleum and Coal Products Manufacturing	0	0	3	3	0.3%

Source: Vicinity Jobs | Core industry subsectors are highlighted in blue

Sector Development

The aerospace sector in Canada is primarily defined by aerospace equipment manufacturing and maintenance, repair, and overhaul (MRO). The aerospace industry in Canada contributed over $24 billion and over 200,000 jobs in 2021. Most of the aerospace industry in Canada in clustered in Quebec (62% of total aerospace manufacturing employment), while Western Canada has the highest percentage of

MRO employment.[16] Ontario's share of aerospace manufacturing and MRO employment is 22% and 34% respectively (Both are second highest in their class in Canada).[17]

In the province of Ontario, this sector represents over $6 billion in annual sales, in addition to a direct GDP impact of $4.4 billion, and an indirect impact of over $6.4 billion.[18] The sector also generates annual R&D spending of $500 million, and exports over 75% of its finished products.[19] According to the Ontario Aerospace Council (OAC), Canada's aerospace manufacturing sector outpaces the total manufacturing sector in terms of research and development intensity, and 25% of this aerospace manufacturing R&D is done in Ontario. The province is also a leader in several areas including turboprop aircraft, business jets, turbine engines, landing gear systems, avionics, environmental systems and space robotics.[20]

Important developments in this sector in Niagara region include the potential investment by Airbus, as the company looks to increase the production of its A220 aircraft. This investment will create an additional 500 jobs in Canada, some of which will be at its Airbus Helicopters Canada site in Fort Erie.[21,22]

The Federal Government has also created the Aerospace Regional Recovery Initiative (ARRI); this is a national program that will provide $250 million over three years to help the Canadian aerospace sector emerge from the pandemic and continue to compete. The program will support businesses operating in the aerospace industry, and the organizations that support them through supply chains.[23]

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[16] PWC. Aviation Finance. 2013

[17] *State of Canada's Aerospace Industry Report Summer 2022,* July 2022.

[18] Ontario Aerospace Council. Retrieved from < https://theoac.ca/page/AerospaceQuickFacts>

[19] Invest Ontario. Retrieved from < https://www.investontario.ca/aerospace#by-the-numbers>

[20] Invest Ontario. Retrieved from < https://www.investontario.ca/aerospace#by-the-numbers>

[21] Niagara Falls Review. Retrieved from < https://www.niagarafallsreview.ca/business/2023/02/24/airbus-creating-500-new-jobs-in-canada-this-year-some-at-its-fort-erie-facility.html>

[22] This number has not been independently confirmed by Deloitte.

[23] Innovation, Science and Economic Development Canada (ISED). Retrieved from < https://ised-isde.canada.ca/site/ised/en/about-us/our-organization/canadas-regional-development-agencies/regional-relief-and-recovery-fund-rrrf/aerospace-regional-recovery-initiative>

Global Market Drivers

Niagara region's aerospace industry is supported by a strong architectural and engineering services, aerospace parts manufacturing segment and support activities for air transportation. Emerging trends in aerospace have centered around applying aerospace technology to the drones and logistics segments. A major application of this is unmanned aerial and vehicle systems as they have high pollination potential in a variety of mobility-related sectors.

The growth of the drone market can be attributed to the growth in the e-commerce industry, multichannel distribution channels, globalization of supply chain networks, emergence of autonomous mobile robots and rising need for same-day delivery in the logistics segment. Defense related drivers are also important to note here with increased interest in patrolling the Arctic and defense budgets in North America expected to increase over the next 5 years including due to the Ukrainian conflict.[24] With Ontario's (and Quebec's) defense industry more focused around aerospace, these trends would have the most impact on this industry in Ontario and relative to for example the marine sector.

Automated guided vehicle technology is becoming increasingly relevant as COVID-19 places increased pressure on hands-free factory operations. Drones also have applications in the agricultural industry due to increased demand for efficient farming practices, in addition to synergies with the marine industry specifically developing the drone rescue service segment. Furthermore, drones geared towards agriculture usage have been gaining popularity and can be used to gather comprehensive data about crop conditions more efficiently than ground-based inspections. In particular, tooled drones can be used to remotely apply fertilizers, pesticides, and water, allowing for higher efficiencies within process automation; this kind of development could have potential in Niagara region considering its benefits for the agricultural sector in Niagara. This type of development will also require new policy development that reflects and supports the use of UAVs/Drones for farming activities.

Investment Trends & Location Factors

A thriving drone company in Ontario includes SkyX which relocated most of its employees to Ontario in 2016 due to more supportive regulations and access to the labor pools in Ontario's universities. An example of a major project in the aerospace market and its supply chain in Ontario from 2018 to 2022 includes General Atomics Aeronautical Systems, a subsidiary of US-based General aircraft specialist Atomics, opened a new office near Confederation Park in Ottawa in May 2022. The project was worth $18.5 million and follows the Canadian government's recent announcement of a

[24] Global Data. Retrieved from <https://www.globaldata.com/store/report/canada-defense-market-analysis/>

request for proposal for the company's Remotely Piloted Aircraft System (RPAS) project. It will serve the domestic market. The project created 55 jobs.

A niche project in a growing eVTOL segment in Ontario is also notable; eVTOL aircraft operate on electric power. In May 2022, Horizon Aircraft partnered with Fleming College and Ontario Tech University to design and prototype ways of rendering aircraft more efficient and allow them to take on a higher load. Horizon noted their need for research partners that have an expertise in additive manufacturing, topology optimization and modelling. Examining motives and determinants for projects in the aerospace sector shows that the most important unique location requirement for foreign direct investment into North America is access to a skilled workforce, which represents 39% of projects. Data show that it has historically been important for aerospace investments to have proximity to markets or customers.

Figure 7 – Investment motives into the North American aerospace market

Motive	% of FDI	% of
Skilled workforce availability	44.2	43.7
Proximity to markets or customers	34.2	35.9
Government support	32.8	34.3
Industry cluster	17.1	18.7
Domestic market growth	14.2	14.0
Universities and research hubs	8.5	9.3
Suppliers and joint venture partners	7.1	7.8
Regulatory environment	7.1	7.8
Transport infrastructure	5.7	6.2
Quality of life	2.8	3.1
Natural resources	1.4	1.5
Technology and innovation	1.4	1.5

Source: fDimarkets

Outlook

Overall, the global aerospace market was valued at US$712 billion[25], and for aerospace materials this value reached US$36.4 billion in 2021 and is predicted to grow to

[25] PWC, PwC's Global Aerospace and Defense: Annual Performance Look, 2022. Retrieved from <https://www.pwc.com/us/en/industries/industrial-products/library/aerospace-defense-review-and-forecast.html>

US$67.2 billion by 2030 which represents a CAGR growth of 7% from 2022 to 2030.[26] In terms of the biggest aerospace export markets, the United States represents US$ 89.1 billion followed by France at US$31 billion in exports.[27] The European aerospace market overall experienced a decline from 2016 to 2020, but is poised for moderate growth, a CAGR of 2.4%, by 2027.[28]

Drones are expected to grow at a CAGR of 12% from 2020 to 2025 though the industry is in a nascent phase in terms of adoption in the commercial sector. However, grants in the United States have been made for industries like infrastructure, agriculture, transport, entertainment and security.[29] Parallel to trends in the drone segment, eVTOL aircraft are expected to grow by a CAGR of 15% by 2030 representing a global market value of US$30.8 billion.[30] eVTOL technology instrumentalizes electric power to take off, hover, and land vertically and has been driven by the need for the electrification of the aerospace industry as well as a growing transportation demand. The electric propulsion technology that the eVTOL market is catalyzing is expected to be a major innovator of the aerospace segment. In particular, it is predicted that the hydrogen electric segment that generates electricity from hydrogen and oxygen fuel cells that is vibration-free will witness strong growth. The Dorothy Rungeling Airport in Niagara region could serve a a potential hub for drone testing, research, and development. A challenge for this emerging sector is the regulatory and certification requirements needed for this technology to go to market.[31]

A niche that aligns with electrification trends in the electric vehicle market is electric propulsion systems which enable higher power and more efficient propulsion through enhanced aerodynamics. The global electric aircraft propulsion market is predicted to reach US$74.9 billion by 2035, which represents a CAGR of 18% from 2025 to 2035. The electric propulsion market has cross-pollination potential in the unmanned aerial

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[26] Global News Wire. Retrieved from <https://www.globenewswire.com/news-release/2022/09/12/2514458/0/en/Aerospace-Materials-Market-Size-to-Surpass-Around-USD-67-42-BN-by-2030.html>

[27] Statista. Retrieved from <https://www.statista.com/statistics/263290/aerospace-industry-revenue-breakdown/>

[28] Modor Intelligence. Retrieved from <https://www.mordorintelligence.com/industry-reports/europe-aerospace-and-defense-market>

[29] Modor Intelligence. Retrieved from <https://www.mordorintelligence.com/industry-reports/north-america-drones-market>

[30] Markets and Markets. Retrieved from <https://www.marketsandmarkets.com/Market-Reports/evtol-aircraft-market-28054110.html>

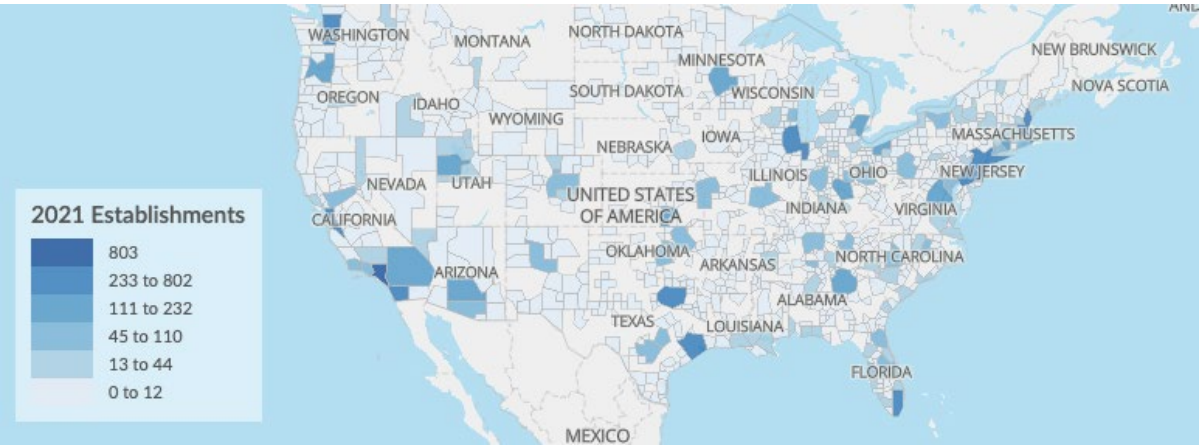
[31] Baker Mackenzie. Retrieved from <https://www.bakermckenzie.com/en/insight/publications/2022/01/regulation-certification-evtol-aircraft>

vehicle market and, given Niagara's strong marine industry, specifically developing the drone rescue service segment. Applying drone rescue as part of marine safety is a segment that is expected to reach US$547.6 million in 2023 and grow by 15% by 2033.[32] In terms of regional growth, the European drone market will grow by 34%, while the North American market will grow by 30%. Asia will experience moderate growth with China representing one of the larger markets.

Recruitment Zones

Examining prospective growth companies shows that of the companies projected to grow, 58% are based in the United States, 10% in the United Kingdom (Gazelle.ai). Overall, the US aircraft and parts manufacturing industry, as ranked by total value of shipments (US Census Bureau), is strongest in California, Texas, Connecticut, Kansas, and Arizona. Based on the number of establishments, the metropolitan areas of Los Angeles, New York, Boston, Seattle, Chicago, and Dallas are major centers.Outside of the United States, the Netherlands, France, and United Kingdom rank as key recruitment zones[33] based on foreign direct investment trends. In particular, Leiden (Netherlands), Paris, and London are key investment destinations. While Canada overall does not rank as an aerospace hub, Montreal is an important recruitment zone.

Figure 8 – Aerospace Hubs in the United States



Source: Lightcast

[32] Fact MR. Retrieved from <https://www.factmr.com/report/drones-rescue-service-market>

[33] Recruitment zones refer to areas where Niagara Region can focus marketing and promotion efforts to attract potential investors.

SWOT Analysis

The following is an overview of the strengths, weaknesses, opportunities, and threats that face the aerospace Sector in Niagara. This SWOT analysis utilizes the background research that was completed for the sector, as well as engagement from key stakeholders from the aerospace sector in Niagara region.

Niagara's aerospace industry is supported by a strong architectural and engineering services, aerospace parts manufacturing segment and support activities for air transportation. Emerging trends in aerospace have been in applying aerospace technology to drones and logistics segments. A major application includes aerial and vehicle systems have high pollination potential in a variety of mobility-related sectors.

Marketing messaging is recommended to align with the opportunities and strengths statements detailed below, which were drawn from stakeholder focus group sessions and uncovered through the research.

Key subsectors: drones, logistics technology, electric propulsion technology, eVTOLs

Sector SWOT	
Strengths	**Weaknesses**
• The aerospace sector is experiencing growth in the region. By 2028, The overall aerospace sector will grow by 228 jobs: a 4% increase, compared to 2022. • Niagara Dorothy Rungeling Airport is home to Accipiter's hangar which provides a safe space to fly drones for enthusiasts. • The region provides an end-to-end ecosystem for drones (safe location and a class G airspace) to develop technology locally.[34]	• The region has only moderate concentration of overall businesses in the aerospace sector compared to Ontario (LQ 0.94). • Niagara would have to compete for aerospace investment against nearby communities with a higher degree of specialization and a higher concentration of aerospace businesses. Among these are Toronto with four airports (Toronto-Pearson International Airport, Billy Bishop Toronto City Airport, Downsview

[34] Class G airspace is uncontrolled and is considered the basic operating environment for remotely piloted aircraft system (RPAS), assuming the conditions regarding

• Increasing interest from both the Provincial and Federal Government to support the sector, have funnelled important public investments; $158 million since 2015, and an additional $250 during the next three years to growth the sector. • Assets for the sector include post-secondary education institutions in the region. These can play an important role for a potential pipeline of workers for the sector, especially in areas such as software, hardware, and control systems.	Airport, Toronto Buttonville Municipal Airport), Hamilton with its international airport (fifth busiest airport in Ontario and third largest in cargo freight airport in Canada). Niagara region may also compete with other international locations including Niagara Falls and Buffalo in New York State. • Promotion of local aerospace businesses and education. • Lack of tailored training for the needs of the aerospace sector in the region. • Long procurement processes for federal aerospace contracts. • There are significant barriers to entry in the aerospace sector, including cost, money, and time and expertise to navigate stringent regulations and certifications.
Opportunities	**Threats**
• Growing opportunities in the drone industry – especially in key areas such as e-commerce and defence, agriculture, and the marine sector. • Opportunity subsectors for aerospace include inspection infrastructure, training and testing, small aircraft manufacturing operations, software development for navigational systems, robotics, and artificial intelligence signal processing. • Leverage Class G airport to facilitate attracting air/drone development centre in Niagara region.	• Determinants for projects in the aerospace sector shows that the most important unique location requirement for foreign direct investment into North America is access to a skilled workforce. Population trends in Niagara region position it as one of the most rapidly ageing areas in Canada. The decrease in working age population in the region could create important labour shortages. • The high degree of regulation for materials and processes for the aerospace industry, create barriers to

proximity to people, airports, and heliport are met. You don’t need to get permission from Nav Canada (Nav Drone) to operate in class G.

• Aerospace manufacturing sector outpaces the total manufacturing sector in terms of research and development intensity, and 25% of this aerospace manufacturing R&D is done in Ontario. The province is also a leader in several areas including turboprop aircraft, business jets, turbine engines, landing gear systems, avionics, environmental systems, and space robotics. • The electric propulsion market has cross-pollination potential in the unmanned aerial vehicle market and given Niagara's strong marine industry specifically developing the drone rescue service segment. • There is a local need for need for research partners that have an expertise in additive manufacturing, topology optimization, and modelling. • According to the Niagara Airport Feasibility Study and Business Case,[35] identified high potential opportunities for airport facilities in Niagara include general aviation commercial activities related to scheduled and charter air passenger services. • Niagara District Airport as a hub for commercial air traffic with runway expansion, and accommodation of Maintenance and Repair Organizations • Warehousing and storage facilities for aerospace manufacturing operations.	entry and will continue to create challenges for start-ups in the region. • Need for implementation of a unified vision for the Dorothy Rungeling Airport; the future development and operation of the airport is challenged by the current governance model, whereby all major decision must be agreed upon by elected officials of the three funding municipalities.[36]

[35] Niagara Airports Feasibility Study and Business Case (2020)

[36] Niagara Airports Feasibility Study and Business Case (2020)

Conclusion

Niagara region has airport infrastructure and associated manufacturing industries that can provide a foundation for further business investment. Employment in the aerospace sector is projected to grow, and there are potential connections to other emerging and established sectors such as drone involvement in the agriculture and marine sectors, and electric powered aircraft (eVTOL) connection with the exploration of EV battery opportunities.

The extent to which these potential connections can be leveraged relies on the interest and engagement of local businesses and prospective investors, as well as research commercialization. Stakeholders are seeking increased leadership in the Dorothy Rungeling Airport for drone testing, research and development, and the desire for increased air passenger traffic at the Niagara District Airport.

Key opportunities identified through the research include general aviation commercial activities, drone research and development, component manufacturing, and associated technolgy development, such as machine learning and autonomous navigation technologies.

To become a leader in aerospace, Niagara Region will need to care for and develop it’s airport facilities, build and maintain a strong skilled workforce, build awareness ad connections with emerging opportunities, navigating regulatory barriers, and build a business cluster to create momentum for increased investment in the sector.

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