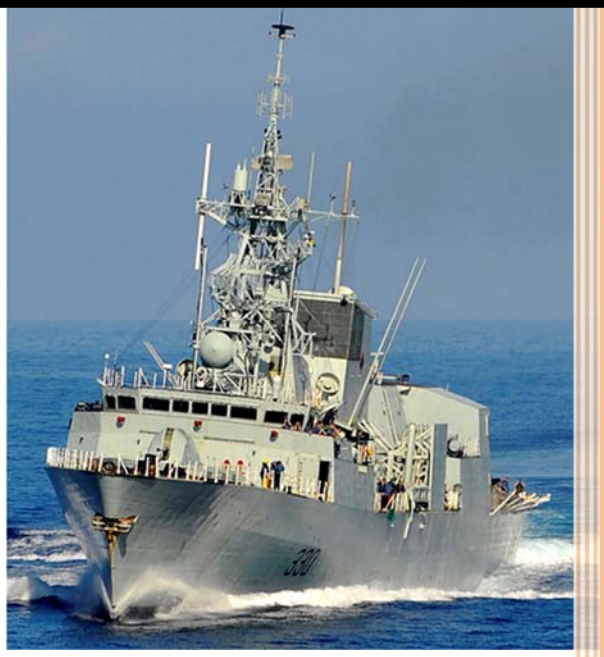
2020

Economic Impact Study – Atlantic Canada Aerospace & Defence Industry



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DISCLAIMER

This Economic Impact Study has been prepared on a best-effort basis and reflects the conditions prevailing and information available at the time, April 2020.

The projections, recommendations, and conclusions contained in this report are, to some degree, based on opinions and assumptions that are subject to variation depending upon evolving events. Therefore, we cannot represent them as results that will necessarily be achieved but only as those that could be attained provided the opinions and assumptions relied upon remain valid.

SAINT MARY'S UNIVERSITY ENTREPRENEURSHIP CENTRE

APRIL 2020

Executive Summary

The Atlantic Canada Aerospace and Defence Association (ACADA) is a collaborative SME-focused not-for-profit industry association that represents approximately 170 members in the Atlantic provinces and is the industry's voice for information dissemination, advocacy and strategic coordination of the industry sectors represented. It is an amalgamation of four previous associations that existed in each of the Atlantic provinces and was officially created in December 2016.

Tasked with an overall goal of growing the industry in Atlantic Canada, and to fully deliver on the organization's mandate, a thorough understanding of the economic role the Aerospace & Defence sector plays in the Atlantic Canada region is required. While aggregated information about specific industry sectors is compiled by Innovation, Science and Economic Development Canada, including Aerospace and other sectors represented by ACADA, there is no regional assessment of the impact the sectors aggregately represent, nor is the information broken down at the provincial level. This information is deemed to be vital to assist the development of appropriate industry policy to enable the sectors strategic development which is one reason ACADA has sponsored this economic impact assessment project.

The Aerospace and Defence (A&D) industry is comprised of companies involved in the production of spacecrafts, commercial / military / private aircraft and manufacturers of military equipment. Unfortunately, there is no one industry category that is classified as aerospace or defence within the industry codes that are tracked by government data collection agencies. As such, the companies that make up the A&D industry are classified individually depending on the specific products or services provided.

To determine the economic impact generated within Atlantic Canada, additional analysis was required to breakdown available aggregate regional data provided by Innovation, Science and Economic Development Canada to understand the specific economic impacts at the provincial level. Ultimately, the regional and provincial level economic impact assessments were derived from determining the employee distribution of Aerospace and Defence industry participants and estimating the share each province represented of the region's total. The employment data collection and analysis consisted of four successive stages:

- identification of companies participating in the Aerospace & Defence industry
- determining employment figures for each of the identified companies
- assessing the proportion of employees in the identified companies that are directly engaged in the Aerospace & Defence industry

- calculate the pro rata share of GDP and employee levels for each of the Atlantic Provinces

The direct economic impact for each province was determined by its relative share of the total identified employees represented by each province. Indirect and induced effects were then calculated using the industry multiplier identified in the national reports to determine the total economic impact of the Aerospace & Defence Industry for each of the Atlantic Canadian provinces.

When combined, the Aerospace and Defence industries contribute $1.18 billion in direct contribution to the region's GDP. Expanding the industries impact, through economic multiplier effects to include indirect and induced impacts, the overall economic impact on regional GDP is $2.42 billion

In terms of employment, the A&D industries combined accounted for direct employment of approximately 9,600 people and over 22,500 in total as shown in the summary table below.

Impact on Canadian GDP ($ millions)																				
	Atlantic Canada				Newfoundland &				Prince Edward Island				New Brunswick				Nova Scotia			
	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total
Aerospace	**760**	**468**	**319**	**1,547**	**108**	**66**	**45**	**219**	**126**	**78**	**53**	**257**	**27**	**17**	**12**	**56**	**499**	**307**	**209**	**1,016**
A&D	**135**	**83**	**67**	**285**	**19**	**12**	**10**	**40**	**22**	**14**	**11**	**47**	**5**	**3**	**2**	**10**	**88**	**54**	**44**	**187**
Defence	**285**	**162**	**143**	**589**	**14**	**8**	**7**	**28**	**1**	**1**	**0**	**2**	**27**	**15**	**13**	**55**	**244**	**138**	**122**	**504**
Total	**1,180**	**713**	**529**	**2,422**	**141**	**86**	**62**	**288**	**149**	**92**	**65**	**306**	***59***	***35***	***27***	***121***	**831**	**500**	**375**	**1,707**

Impact on Canadian Employment (Jobs x 1000)																				
	Atlantic Canada				Newfoundland &				Prince Edward Island				New Brunswick				Nova Scotia			
	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total
Aerospace	**5.8**	**4.9**	**3.4**	**14.2**	**0.8**	**0.7**	**0.5**	**2.0**	**1.0**	**0.8**	**0.6**	**2.4**	**0.2**	**0.2**	**0.1**	**0.5**	**3.8**	**3.2**	**2.2**	**9.3**
A&D	**1.2**	**0.8**	**0.7**	**2.7**	**0.2**	**0.1**	**0.1**	**0.4**	**0.2**	**0.1**	**0.1**	**0.4**	**0.0**	**0.0**	**0.0**	**0.1**	**0.8**	**0.5**	**0.4**	**1.8**
Defence	**2.6**	**1.7**	**1.4**	**5.7**	**0.1**	**0.1**	**0.1**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.2**	**0.1**	**0.5**	**2.2**	**1.5**	**1.2**	**4.9**
Total	**9.6**	**7.5**	**5.5**	**22.5**	**1.1**	**0.9**	**0.6**	**2.7**	**1.2**	**1.0**	**0.7**	**2.8**	**0.5**	**0.4**	**0.3**	**1.1**	**6.8**	**5.2**	**3.9**	**15.9**

From a tax revenue generation perspective, the cumulative economic affects of the Atlantic Canada A&D industry generated $849 million in tax contribution nationally. The combined provincial level tax revenue for Atlantic Canada is estimated to be $662.6 million as shown below.

Provincial Tax Revenue - Aerospace & Defence Industry (2018) ($ millions)					
Economic Impact Type	NL	PEI	NB	NS	Atl Cda
Direct	31.3	44.2	15.4	232.0	322.9
Indirect	19.1	27.2	9.1	139.5	195.0
Induced	13.7	19.1	7.1	104.7	144.7
Total	64.2	90.5	31.7	476.2	662.6

Table of Contents

Background

The Atlantic Canada Aerospace and Defence Association (ACADA) is a collaborative SME-focused not for profit industry association that represents approximately 170 members in the Atlantic provinces with the overall goal of growing the industry in the region. It is an amalgamation of the four previous associations that existed in each of the Atlantic provinces and was officially created in December 2016.

ACADA members deliver products and services to the global marketplace in land, marine, and air/space domains for both commercial and defence applications.

ACADA represents the interests of the aerospace, defence, marine and security industries in Atlantic Canada and was formed in response to the desire and need to work collectively with a "strength in numbers" approach to promote and advance the Aerospace & Defence sector development on behalf of the Atlantic region. ACADA is the industry's voice for information dissemination, advocacy and strategic coordination of the industry sectors represented.

To fully deliver on the organization's mandate, a thorough understanding of the economic role the Aerospace & Defence sector plays in the Atlantic Canada region is required. While aggregated information about specific industry sectors is compiled by Innovation, Science and Economic Development Canada, including Aerospace and other sectors represented by ACADA, there is no regional assessment of the impact the sectors aggregately represent, nor is the information broken down to the provincial level.

Purpose of the Project

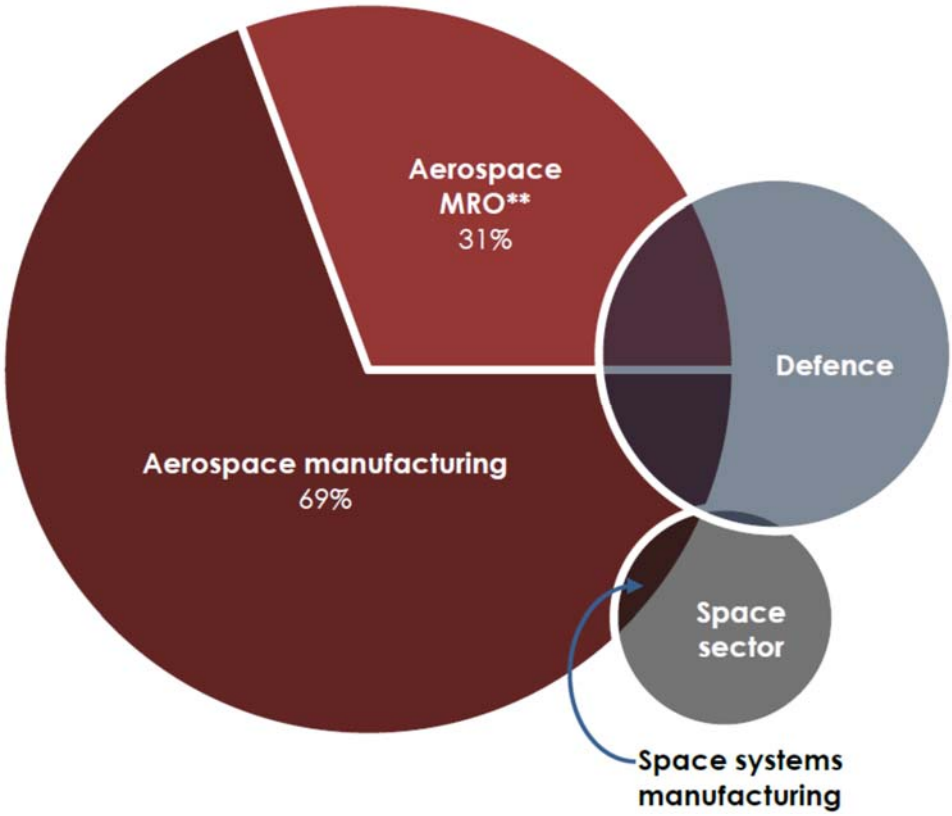
The purpose of the project is to understand the economic impact provided by the Aerospace and Defence Industry in Atlantic Canada and each of the constituent provinces.

This information will enable ACADA to clearly articulate, to stakeholder groups, the economic impact the industry has in the region. In addition, the resulting findings will be available to assist in developing appropriate industry policy to enable the sectors strategic development.

Structure of the Industry

The Aerospace and Defence (A&D) industry is comprised of companies involved in the production of spacecrafts, commercial / military / private aircraft and manufacturers of military equipment. The companies involved in the A&D industry may service only one of the two components or both segments. There is considerable overlap between the two and with the associated Space industry as shown in Figure 1.

Figure 1: The Canadian Aerospace Industry Ecosystem[1]



The Aerospace Industry is further segmented by differentiating between manufacturing and maintenance, repair, and overhaul (MRO).

There is no one industry category that is classified as aerospace or defence within the NAICS[2] codes. As such, the companies that make up the A&D industry are classified individually depending on the specific

[1] State of Canada's Aerospace Industry 2019 Report; Innovation, Science, and Economic Development Canada
[2] North American Industry Classification Codes

products or services provided. For example, a few of the subsectors that form part of the Aerospace industry are: 3364 Aerospace product & parts manufacturing, 3336 Engine, turbine and power transmission equipment manufacturing, 3342 Communications equipment manufacturing, 541510 - Computer Systems Design and Related Services, 334410 - Semiconductor and Other Electronic Component Manufacturing, and 541990 - All Other Professional, Scientific and Technical Services. The same type of broad range categories makes up the Defence industry component including 3366 Shipbuilding & Repairing, 3369 Armoured and Specialized Military Vehicles, 333310 - Commercial and Service Industry Machinery Manufacturing and 332999 - All Other Miscellaneous Fabricated Metal Product Manufacturing. A more complete breakdown of the business categories used by the Canadian Federal Government to identify participants in the A&D industry is provided in Appendix A.

Aerospace and Defence Industry Size and Impact

One challenge in quantifying the size of the A&D industry is that not all companies comprising an identified subsector participates in the Aerospace or Defence industry or may only be involved in one of them. Innovation, Science and Economic Development Canada is the Canadian government department that aggregates information about the A&D industry and it relies on the Statistics Canada Canadian Defence, Aerospace and Marine Industries Survey, which is conducted irregularly, to develop its profile of each of the industry segments.

The most recent survey, conducted in 2018, indicated that the Aerospace industry economic impact generated revenue of $31 billion, employed 213,000 people and contributed over $25 billion to the national GDP[3][4]. The direct impact represented $13.1 billion in GDP and 89,463 jobs. Likewise, the Defence industry had direct revenues of $10.1 billion and was responsible for 26,968 jobs[5].

Innovation, Science and Economic Development Canada does not break the national survey data down to the provincial level and only provides estimates with regards to the percentage of employees represented in each region. The Aerospace industry breakdown by employment is provided in Figure 2.

To determine the economic impact generated at the Atlantic Canada and individual provincial level additional analysis was required.

[3] State of Canada's Aerospace Industry 2019 Report, Op. cit.
[4] Gross Domestic Product – an indicator of the total value-added contribution to the economy
[5] State of Canada's Defence Industry 2018 report, Innovation, Science, and Economic Development Canada

Figure 2: Employment Distribution Aerospace Industry[6]

Provincial Level Economic Impact Determination

The regional and provincial level economic impact assessments were derived by prorating the number of employees engaged in the A&D industry in each province against the estimated total share of employment provided by the Innovation, Science, and Economic Development Canada most recent state of the aerospace and defence industry reports. The employment data collection and analysis consisted of four successive stages:

- identification of companies participating in the Aerospace & Defence industry
- determining employment figures for each of the identified companies
- assessing the proportion of employees in the identified companies that are directly engaged in the Aerospace & Defence industry
- calculate the pro rata share of GDP and employee levels for each of the Atlantic Provinces

Company Identification and Employment in A&D Industry

The main sources of information to identify industry participants were the ACADA membership directory and online search engines. The number of employees at each company was determined from a recent ACADA survey of its membership, company websites, press articles, annual reports and online business

[6] State of Canada's Aerospace Industry 2019 Report, Op. cit.

directories. Once the number of employees for a given A&D participant company was identified, an assessment was made as to how many of their total workforce provided goods & services to the A&D industry. For example, companies designated as part of the NAICS industry code 3364 - Aerospace product and parts manufacturing all employees were considered as part of the Aerospace & Defence industry. For NAICS industry code 33271 - Machine shops, where the companies provide goods & services to multiple industry segments such as marine, forestry, general manufacturing, oil & gas, etc. only a portion of the employees would be counted as part of the Aerospace & Defence industry depending on a determination of the relative size that the Aerospace & Defence industry represents of their total revenue.

Using the employment share for the Atlantic Region for each of the segments of the Aerospace & Defence Industries, as indicated in the State of Canada's Aerospace Industry 2019 report, yields the total number of direct employees of 6,439[7]. The market research process identified aerospace related employment of 4,595 or 71.4% of the industries' report. The corresponding Defence Industry employment assessment identified 2,978 employees versus 3,191 or 93.3%[8]. There is significant overlay between the two segments which means there is double counting of some employees in the national data. After adjusting for the overlap, the total employment for both segments combined from the national survey was 7,573 against an identified 9,005 or 84.1%. Figure 3 shows the employment findings by province and by membership status in the ACADA.

Figure 3: Atlantic Canada Aerospace & Defence Industry Summary Employment Findings

Summary Employment Findings								
	Aerospace (2018)				Defence (2016)			
	ACADA Members	Other Participants	Total	% Total	ACADA Members	Other Participants	Total	% Total
Prince Edward Island	645	117	762	16.6%	10	-	10	0.3%
Newfoundland	421	230	651	14.2%	98	45	143	4.8%
New Brunswick	156	10	166	3.6%	269	10	279	9.4%
Nova Scotia	2,894	122	3,016	65.6%	803	1,743	2,546	85.5%
Total	**4,116**	**479**	**4,595**	100.0%	**1,180**	**1,798**	**2,978**	100.0%

Economic Impact Assessment

The direct economic impact for each province was determined by its relative share of the total identified employees represented by each province. The final total employee count per province was determined by

[7] Using The State of Canada's Aerospace Industry 2019 Report employment distribution as shown in Figure 2.
[8] The Atlantic Canada region accounts for 14% of national employees in the Defence industry

the same assessment. Additionally, provincial economic impact and employee counts were compared to previous provincial assessments undertaken by the individual provincial Aerospace & Defence Industry Associations prior to the forming of ACADA and found to be close.

Indirect and Induced[9] effects were then calculated with the general multiplier used in the national report to determine the total economic impact of the Aerospace & Defence Industry for each of the Atlantic Canadian provinces.

The relative importance of the Aerospace & Defence Industry in each province was also assessed by comparing the industry's identified economic impact with those of the largest industry segments at the three-digit NAICS code level which represents an industry subsector such as 336 - Transportation equipment manufacturing.

Atlantic Canada Aerospace and Defence Industry

The Atlantic Canada Aerospace and Defence industry is made up of more than 200 companies, most of which are small or medium sized businesses. A breakdown by company size by province for the most relevant industry subsector NAICS codes in provided in Appendix B.

The combined industries contribute over $1.18 billion in direct contribution to the region's GDP as shown in Figure 4.

Figure 4: Canada and Atlantic Canada A&D Industry GDP (2018)[10]

Impact on Canadian GDP ($ millions)								
	Canada				Atlantic Canada			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Mfg	8,409	3,741	2,878	15,028	385.5	171.5	131.94	688.9
Aerospace MRO	3,717	2,943	1,852	8,512	374.9	296.8	186.83	858.5
Aerospace Net (2018)	**12,126**	**6,683**	**4,731**	**23,540**	**760.4**	**468.3**	**318.8**	**1,547.4**
A&D	**963**	**546**	**482**	**1,990**	**134.8**	**83.0**	**67.4**	**285.3**
Defence (2016)	**2,037**	**1,154**	**1,019**	**4,210**	**285.2**	**161.60**	**142.59**	**589.4**
Total	***15,126***	***8,383***	***6,231***	***29,740***	***1,180.4***	***712.9***	***528.8***	***2,422.0***

[9] Direct impacts are the results of expenditures by industry participants, indirect impact are the expenditures of suppliers to the industry that would not have occurred if not for the industry, induced impact is the economic activity resulting from industry employee spending their wages on purchases at the household level.

[10] The defense industry indirect and induced effects are based on the State of Canada's Defense Industry Report 2018, Innovation, Science, and Economic Development Canada.

When factoring in the multiplier effects to determine the indirect and induced the overall economic impact effects of the combined industry sectors the resulting GDP contribution is $2.42 billion. The evolution over time is shown in Figure 5. Notice that the combined industry has declined over the four-year period between 2014 and 2018, however the 2018 estimates are 8.6% higher than in 2011.

In terms of employment impact, the A&D industries combined accounted for direct employment of approximately 9,600 people and over 22,500 in total an shown in Figure 6. The GDP / employment breakdown for each industry before the A&D overlap assessment is provided in Appendix C.

Figure 5: Canada and Atlantic Canada GDP Impacts (Selected Years)[11][12]

Canada (Direct Impact)	2011	2014	2016	2018
Aerospace Net	10,821	12,440	11,889	12,126
A&D Overlap	1,102	1,227	1,003	963
Defence Net	1,653	1,840	2,112	2,037
National Total	13,576	15,507	15,004	15,126
Atlantic Canada				
Direct Impact	1,070	1,516	1,283	1,249
Indirect Impact	743	1,142	908	755
Induced Impact	417	671	656	558
Total Economic Impact	**2,230**	**3,329**	**2,847**	**2,562**

Figure 6: Canada and Atlantic Canada A&D Industry Employment Impact (2018)

Impact on Canadian Employment (Jobs)								
	Canada				Atlantic Canada			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Mfg	51,213	36,813	31,416	119,442	2,561	1,841	1,571	5,972
Aerospace MRO	29,583	28,142	16,847	74,571	3,254	3,096	1,853	8,203
Aerospace Net (2018)	**80,796**	**64,955**	**48,262**	**194,013**	**5,815**	**4,936**	**3,424**	**14,175**
A&D	**8,667**	**5,778**	**4,751**	**19,196**	**1,213**	**809**	**665**	**2,687**
Defence (2016)	**18,333**	**12,222**	**10,049**	**40,604**	**2,567**	**1,711**	**1,407**	**5,685**
Total	***107,796***	***82,955***	***63,062***	***253,813***	***9,595***	***7,456***	***5,496***	***22,547***

In 2018, the Canadian tax to GDP ratio was 32.8%. The individual components breakdowns are shown in Figure 7[13].

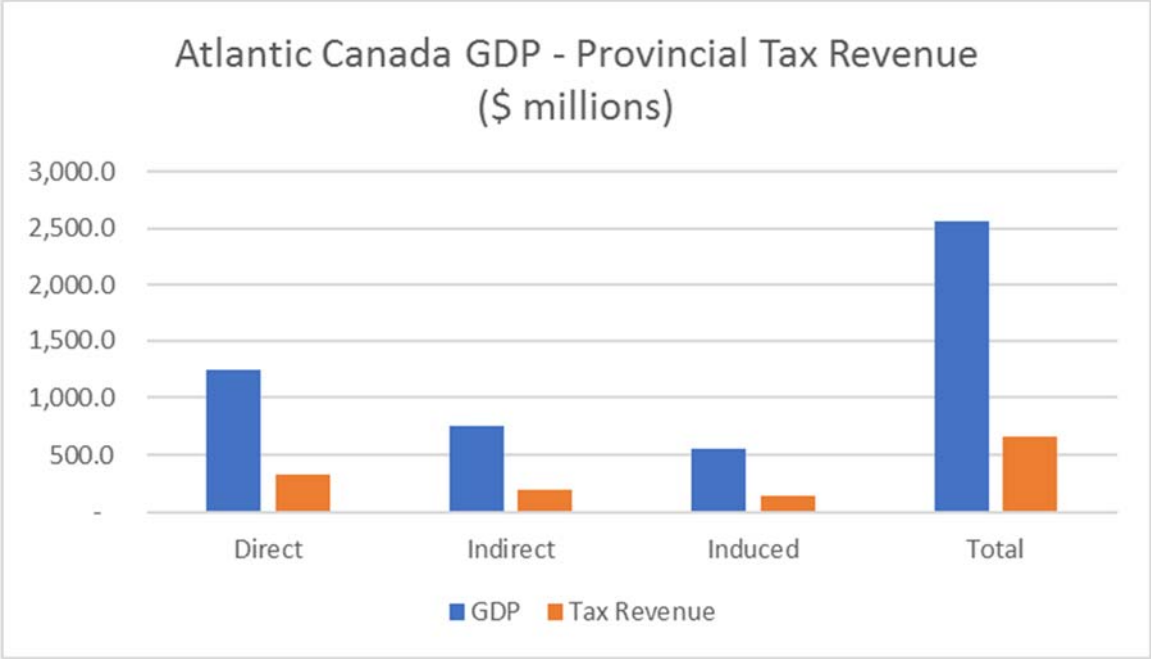
[11] The years shown are the only years in which Defense industry data was published
[12] Compiled from State of Canada's Defense Industry and State of Canada's Aerospace Industry reports
[13] Revenue Statistics 2019 Canada, www.oecd.org/tax/revenue-statistics-canada.pdf

Figure 7: Tax Structure – Canada (2018)

Total Tax Revenue - Aerospace & Defence Industry (2018) ($ millions)			
Tax Category	% of Total Tax Collected	Canada	Atlantic Canada
Taxes on personal income, profits and gains	36%	3,511.7	302.6
Taxes on corporate income, profits and gains	11%	1,073.0	92.4
Social security contributions	14%	1,365.7	117.7
Payroll taxes	2%	195.1	16.8
Taxes on property	12%	1,170.6	100.9
Value Added taxes / goods and services tax	14%	1,365.7	117.7
Taxes on goods and services (excl. VAT/GST)	10%	975.5	84.0
Unaccounted for	1%	97.5	8.4
Total	**100%**	**9,754.7**	**840.4**

Applying these ratios to the country and the Atlantic Canada Region yield total taxes collected from the cumulative economic affects of the A&D industry at $9.75 billion nationally and of which $840.4 million was from the Atlantic Canada region in 2018. The total revenue derived by the Atlantic Canadian provinces from the Aerospace and Defence sector was $662.6 million as shown in Figure 8.

Figure 8: Atlantic Canada GDP Summary and Associated Provincial Tax Revenue



Aerospace & Defence Industry – Provincial Breakdowns

The provincial level economic impacts were derived from employment distribution as summarized in Figure 3. In addition to identifying the direct, indirect and induced economic impact effects on GDP and employment by province, the Aerospace & Defence Cluster group's direct economic impact is shown in comparison to the largest 10 non-governmental/health care/education industry sectors, by direct economic impact, at the three-digit NAICS industry subsectors level. The provincial tax revenues associated with each level of impact generated was also determined. These assessments are presented in Figures 9 through Figure 24.

Newfoundland & Labrador

Figure 9: A&D Industry Economic Impacts on GDP and Employment – Newfoundland & Labrador

Impact on Canadian GDP ($ millions)								
	Atlantic Canada				Newfoundland & Labrador			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**829.3**	**510.7**	**347.7**	**1,687.7**	**107.7**	**66.3**	**45.2**	**219.2**
A&D	**134.8**	**83.0**	**67.4**	**285.3**	**19.1**	**11.8**	**9.6**	**40.4**
Defence	**285.2**	**161.6**	**142.6**	**589.4**	**13.7**	**7.8**	**6.8**	**28.3**
Total	**1,249.3**	**755.4**	**557.7**	**2,562.3**	***140.5***	***85.9***	***61.6***	***287.9***

Impact on Canadian Employment (Jobs)								
	Atlantic Canada				Newfoundland & Labrador			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**5,815**	**4,936**	**3,424**	**14,175**	**824**	**699**	**485**	**2,008**
A&D	**1,213**	**809**	**665**	**2,687**	**172**	**115**	**94**	**381**
Defence	**2,567**	**1,711**	**1,407**	**5,685**	**123**	**82**	**68**	**273**
Total	**9,595**	**7,456**	**5,496**	**22,547**	***1,119***	***896***	***647***	***2,662***

Figure 10: A&D Industry Tax Revenue Contribution - Newfoundland & Labrador[14]

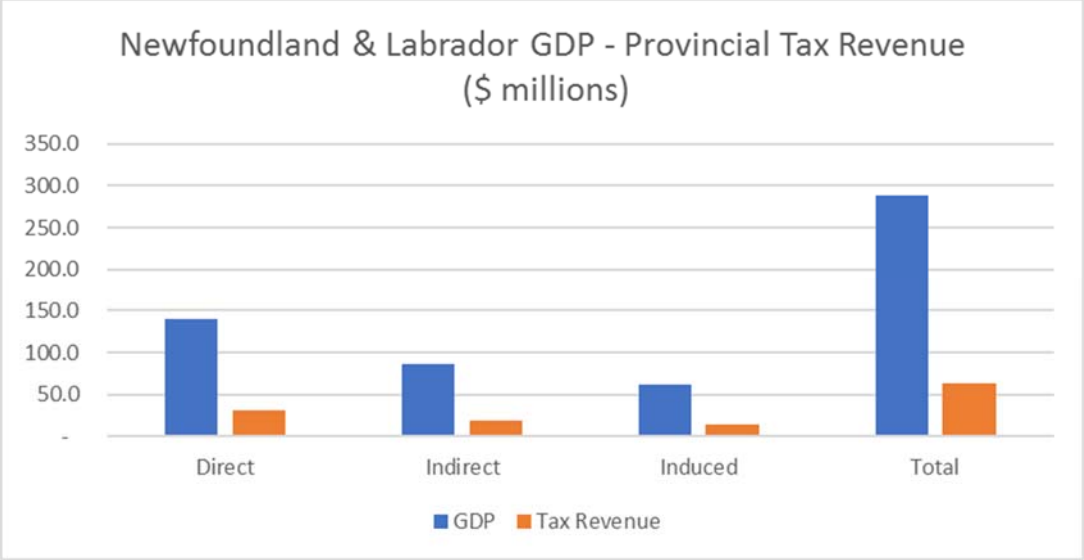
Newfoundland & Labrador		
Tax Revenue - Aerospace & Defence Industry (2018) ($ millions)		
Economic Impact Type	GDP Contribution	Tax Revenue
Direct	140.5	31.3
Indirect	85.9	19.1
Induced	61.6	13.7
Total	**287.9**	**64.2**

[14] NL Provincial Tax – GDP ratio (2018) – 22.3%, RBC Economic Reports - Canadian Federal and Provincial Fiscal Tables, http://www.rbc.com/economics/economic-reports/pdf/canadian-fiscal/prov_fiscal.pdf

Figure 11: Direct GDP by Selected Industry Groups – Newfoundland & Labrador[15]

Industry and NAICS code	GDP (current) $ millions	
	2016	2018
Oil and gas extraction [211]	3,355.8	3,725.3
Real estate [531]	2,799.6	2,875.0
Engineering construction [23C]	3,022.5	2,025.2
Mining and quarrying (except oil and gas) [212]	1,560.9	1,249.5
Professional, scientific and technical services [541]	972.6	1,004.1
Utilities [221]	584.9	624.9
Depository credit intermediation and monetary authorities [522]	590.1	608.8
Telecommunications [517]	576.7	592.3
Food manufacturing [311]	468.1	468.3
Residential building construction [23A]	523.7	457.8
Aerospace & Defence Cluster	**182.9**	**140.5**

Figure 12: Newfoundland & Labrador GDP Summary and Associated Provincial Tax Revenue



[15] Derived from CANSIM Table 379-0030 - Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories, Statistics Canada,

Prince Edward Island

Figure 13: A&D Industry Economic Impacts on GDP and Employment – Prince Edward Island

Impact on Canadian GDP ($ millions)								
	Atlantic Canada				Prince Edward Island			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**829.3**	**510.7**	**347.7**	**1,830.7**	**126.1**	**77.7**	**52.9**	**256.6**
A&D	**134.8**	**83.0**	**67.4**	**285.3**	**22.4**	**13.8**	**11.2**	**47.3**
Defence	**285.2**	**161.6**	**142.6**	**589.4**	**1.0**	**0.5**	**0.5**	**2.0**
Total	***1,249.3***	***755.4***	***557.7***	***2,562.3***	***149.4***	***92.0***	***64.5***	***305.9***

Impact on Canadian Employment (Jobs)								
	Atlantic Canada				Prince Edward Island			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**5,815**	**4,936**	**3,424**	**14,175**	**964**	**819**	**568**	**2,351**
A&D	**1,213**	**809**	**665**	**2,687**	**201**	**134**	**110**	**446**
Defence	**2,567**	**1,711**	**1,407**	**5,685**	**9**	**6**	**5**	**19**
Total	**9,595**	**7,456**	**5,496**	**22,547**	***1,174***	***958***	***683***	***2,815***

Figure 14: A&D Industry Tax Revenue Contribution - Prince Edward Island[16]

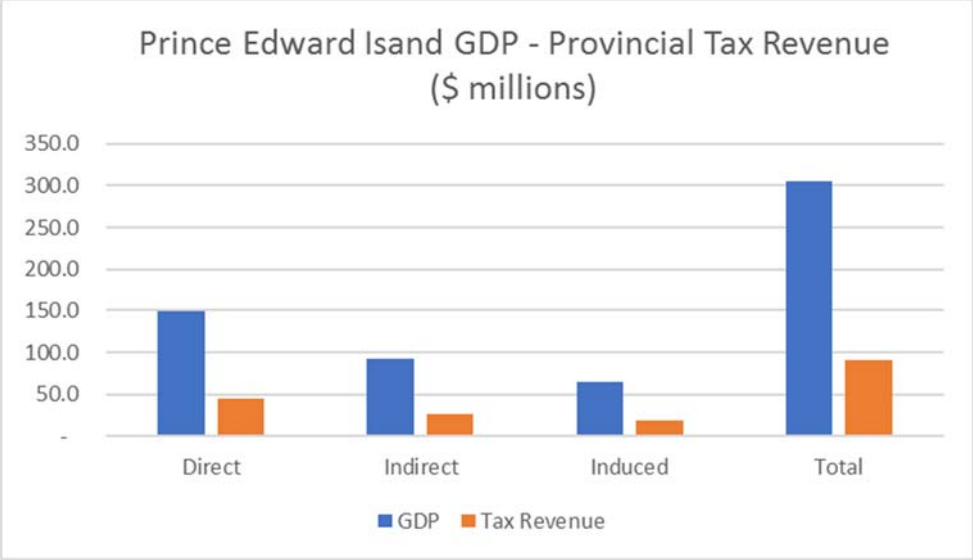
Prince Edward Island		
Tax Revenue - Aerospace & Defence Industry (2018) ($ millions)		
Economic Impact Type	GDP Contribution	Tax Revenue
Direct	149.4	44.2
Indirect	92.0	27.2
Induced	64.5	19.1
Total	**305.9**	**90.5**

[16] PEI Provincial Tax – GDP ratio (2018) – 29.6%, RBC Economic Reports - Canadian Federal and Provincial Fiscal Tables, Op. cit.

Figure 15: Direct GDP by Selected Industry Groups – Prince Edward Island [17]

Industry and NAICS code	GDP (current) $ millions	
	2016	2018
Real estate [531]	731.9	772.0
Food manufacturing [311]	303.9	315.1
Credit intermediation and related activities [522]	188.8	201.7
Professional, scientific and technical services [541]	178.3	185.8
Residential building construction [23A]	125.5	175.8
Crop production [111]	171.8	166.2
Fishing, hunting and trapping [114]	138.0	161.8
Telecommunications [517]	145.2	154.1
Aerospace & Defence Cluster	**114.2**	**149.4**
Food services and drinking places [722]	117.9	128.1
Chemical manufacturing [325]	109.0	118.0

Figure 16: Prince Edward Island - GDP Summary and Associated Provincial Tax Revenue



[17] Derived from CANSIM Table 379-0030, Op. cit.

New Brunswick

Figure 17: A&D Industry Economic Impacts on GDP and Employment – New Brunswick

Impact on Canadian GDP ($ millions)								
	Atlantic Canada				New Brunswick			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**829.3**	**510.7**	**347.7**	**1,687.7**	**27.5**	**16.9**	**11.5**	**55.9**
A&D	**134.8**	**83.0**	**67.4**	**285.3**	**4.9**	**3.0**	**2.4**	**10.3**
Defence	**285.2**	**161.6**	**142.6**	**589.4**	**26.7**	**15.1**	**13.4**	**55.2**
Total	**1,249.3**	**755.4**	**557.7**	**2,562.3**	***59.1***	***35.1***	***27.3***	***121.4***

Impact on Canadian Employment (Jobs)								
	Atlantic Canada				New Brunswick			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**5,815**	**4,936**	**3,424**	**14,175**	**210**	**178**	**124**	**512**
A&D	**1,213**	**809**	**665**	**2,687**	**44**	**29**	**24**	**97**
Defence	**2,567**	**1,711**	**1,407**	**5,685**	**240**	**160**	**132**	**533**
Total	**9,595**	**7,456**	**5,496**	**22,547**	***494***	***368***	***280***	***1,142***

Figure 18: A&D Industry Tax Revenue Contribution - New Brunswick[18]

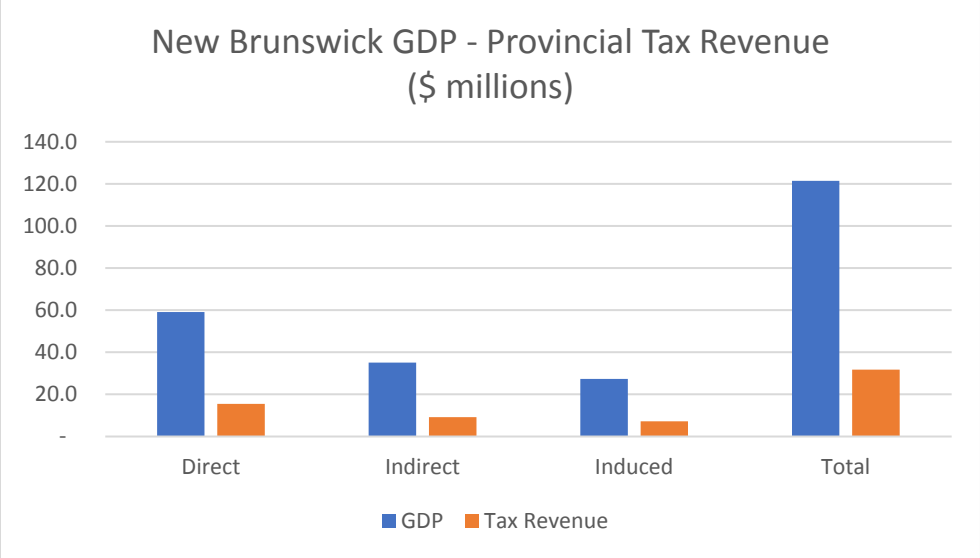
New Brunswick		
Tax Revenue - Aerospace & Defence Industry (2018) ($ millions)		
Economic Impact Type	GDP Contribution	Tax Revenue
Direct	59.1	15.4
Indirect	35.1	9.1
Induced	27.3	7.1
Total	**121.4**	**31.7**

[18] NB Provincial Tax – GDP ratio (2018) – 26.1%, RBC Economic Reports - Canadian Federal and Provincial Fiscal Tables, Op. cit.

Figure 19: Direct GDP by Selected Industry Groups – New Brunswick[19]

Industry and NAICS code	GDP (current) $ millions	
	2014	2016
Real estate [531]	3,771.1	3,939.2
Administrative and support services [561]	1,190.0	1,173.0
Professional, scientific and technical services [541]	1,050.9	1,109.5
Credit intermediation and related activities [522]	994.4	1,029.4
Utilities [221]	951.6	978.2
Truck transportation [484]	746.8	816.3
Food manufacturing [311]	790.5	736.2
Telecommunications [517]	678.9	714.7
Engineering and other construction activities [23X]	622.5	679.4
Residential building construction [23A]	626.8	664.0
Aerospace & Defence Custer	**71.3**	**59.1**

Figure 20: New Brunswick - GDP Summary and Associated Provincial Tax Revenue



[19] Derived from CANSIM Table 379-0030, Op. cit.

Nova Scotia

Figure 21: A&D Industry Economic Impacts on GDP and Employment – Nova Scotia

Impact on Canadian GDP ($ millions)								
	Atlantic Canada				Nova Scotia			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**829.3**	**510.7**	**347.7**	**1,687.7**	**499.1**	**307.3**	**209.2**	**1,015.6**
A&D	**134.8**	**83.0**	**67.4**	**285.3**	**88.5**	**54.5**	**44.2**	**187.2**
Defence	**285.2**	**161.6**	**142.6**	**589.4**	**243.8**	**138.2**	**121.9**	**503.9**
Total	**1,249.3**	**755.4**	**557.7**	**2,562.3**	***831.4***	***500.0***	***375.4***	***1,706.8***

Impact on Canadian Employment (Jobs)								
	Atlantic Canada				Nova Scotia			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Net	**5,815**	**4,936**	**3,424**	**14,175**	**3,817**	**3,240**	**2,247**	**9,304**
A&D	**1,213**	**809**	**665**	**2,687**	**796**	**531**	**437**	**1,764**
Defence	**2,567**	**1,711**	**1,407**	**5,685**	**2,194**	**1,463**	**1,203**	**4,860**
Total	**9,595**	**7,456**	**5,496**	**22,547**	***6,807***	***5,234***	***3,887***	***15,928***

Figure 22: A&D Industry Tax Revenue Contribution - Nova Scotia[20]

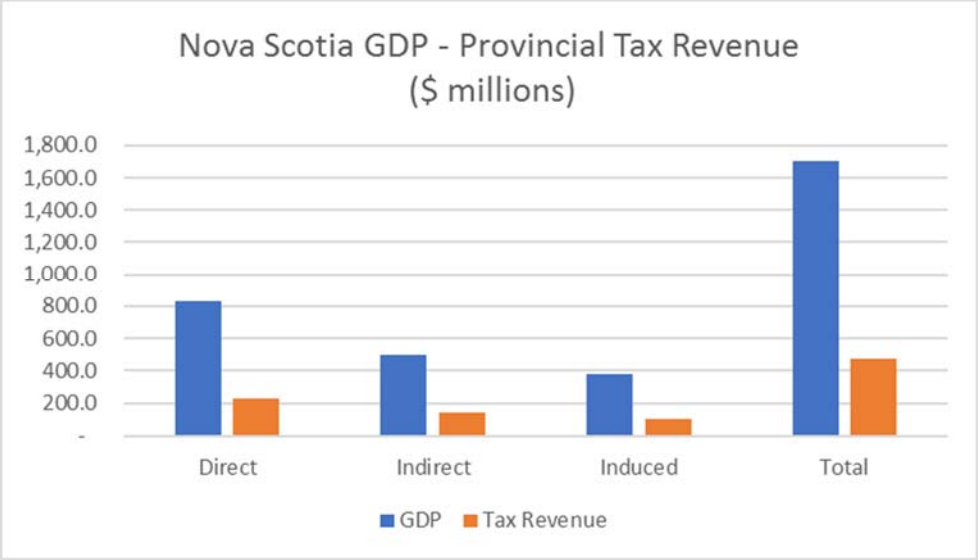
Nova Scotia		
Tax Revenue - Aerospace & Defence Industry (2018) ($ millions)		
Economic Impact Type	GDP Contribution	Tax Revenue
Direct	831.4	232.0
Indirect	500.0	139.5
Induced	375.4	104.7
Total	**1,706.8**	**476.2**

[20] NS Provincial Tax – GDP ratio (2018) – 27.9%, RBC Economic Reports - Canadian Federal and Provincial Fiscal Tables, Op. cit.

Figure 23: Direct GDP by Selected Industry Groups – Nova Scotia[21]

Industry and NAICS code	GDP (current) $ millions	
	2016	2018
Real estate [531]	5,812.7	6,014.6
Professional, scientific and technical services [541]	1,639.0	1,681.8
Credit intermediation and related activities [522]	1,313.8	1,309.2
Telecommunications [517]	979.7	1,031.0
Utilities [221]	847.2	883.9
Aerospace & Defence Cluster	**914.2**	**831.4**
Residential building construction [23A]	750.0	818.0
Food services and drinking places [722]	731.0	739.8
Fishing, hunting and trapping [114]	752.5	737.5
Administrative and support services [561]	699.7	725.9

Figure 24: Nova Scotia - GDP Summary and Associated Provincial Tax Revenue



[21] Derived from CANSIM Table 379-0030, Op. cit.

Other Economic Metrics

In addition to the economic impact assessment of the regional aerospace & defence sector, additional metrics and data sets are of importance to ACADA for policy initiatives. Of specific interest is the sector's R&D expenditures, employment growth and wage growth in the key industry sub-sectors, and student enrollment in the STEM[22] programs.

R&D Expenditures

The total national expenditures of the aerospace & defence sector for the time frame assessed were reported to be $1.863 billion. Adjusting for the overlay within the two industries, the net expenditures were $1.735 billion or approximately 11.5% on direct GDP. Assuming the expenditures are evenly dispersed throughout the country based on economic activity, estimated R&D expenditures attributed the Atlantic Canada region would be $135 million. The national, regional and provincial subtotals are provided in Figure 25.

Figure 25: Aerospace & Defence Industry R&D Expenditures

Aerospace & Defence Industry R&D Expenditures (2018) ($ millions)						
	Canada	Atlantic Canada	NF	PE	NB	NS
GDP	15,126.0	1,180.4	140.5	149.4	59.1	831.4
R&D	1,734.9	135.4	16.1	17.1	6.8	95.4

Industry Employment Trends

Total employment in the A&D Industry sectors in Atlantic Canada has been slowly declining from 23,413 in 2014 to 22,547 in 2018 representing a 3.4% decline over the four years as shown in Figure 26. The specific provincial breakdown for 2016 to 2018 is provided in Figure 27.

[22] STEM programs – Science, Technology, Engineering and Mathematics

Figure 26: Aerospace & Defence Sector Total Employment 2014-2018

Impact on Atlantic Canadian Employment			
	2014	2016	2018
Direct	9,913	9,676	9,595
Indirect	8,058	7,743	7,456
Induced	5,442	5,307	5,496
Total	**23,413**	**22,726**	**22,547**

Figure 27: Provincial Breakdown A&D Employment Levels 2016-2018

Impact on Regional A&D Employment (Jobs x 1000)																
Year	Newfoundland & Labrador				Prince Edward Island				New Brunswick				Nova Scotia			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
2016	1.38	1.10	0.76	3.24	0.83	0.70	0.46	1.99	0.56	0.42	0.30	1.28	6.91	5.51	3.79	16.21
2018	1.12	0.90	0.65	2.66	1.17	0.96	0.68	2.82	0.49	0.37	0.28	1.14	6.81	5.23	3.89	15.93
% Change	-19%	-19%	-14%	-18%	42%	37%	48%	42%	-12%	-13%	-7%	-11%	-2%	-5%	3%	-2%

Industry Wage Growth

The associated national industry sub-sector weekly wages for the period 2014 to 2018 are provided in Figure 28. The sub-sector data sourced matches, as close as possible, to the NAICS sector summarized in Appendix A. Where the specific sub-sector category information was not available or reported by Statistics Canada, the closest NAICS level data was used. Highest wage growth is seen in the federal government public administration sector which exhibited a 30.7% increase over the five-year time frame. Ship and boat building saw a 20.1% wage growth. Other sectors with at least a 10% increase included machinery manufacturing, chemical products manufacturing, and support activities for air transportation.

Figure 28: Select Industry Sub-Sector Average Weekly Wages (2014-2018)

Average Weekly Wages - Select Industry Sub-Sectors (2014-2018)						
All Employees (Excluding Overtime)						
Industry Sub-Sector	Canada					
	2014	2015	2016	2017	2018	% Change
Aerospace Product and Parts Manufacturing [3364]	1,316.68	1,323.01	1,314.15	1,340.65	1,434.75	9.0%
Machinery manufacturing [333]	1,093.88	1,128.00	1,153.19	1,167.00	1,267.42	15.9%
Motor vehicle parts manufacturing [3363]	1,011.76	1,063.46	1,075.88	1,079.03	1,024.97	1.3%
Other chemical product manufacturing [3259]	1,268.15	1,326.71	1,188.39	1,201.15	1,452.40	14.5%
Support activities for air transportation [4881]	1,152.87	1,183.08	1,172.92	1,220.83	1,282.45	11.2%
Ship and boat building [3366]	952.20	1,039.09	1,008.42	1,059.16	1,143.26	20.1%
Motor vehicle manufacturing [3361]	1,250.88	1,209.14	1,261.56	1,221.16	1,355.43	8.4%
Transportation equipment manufacturing [336]	1,141.51	1,161.37	1,166.75	1,165.66	1,182.62	3.6%
Federal government public administration [911]	1,169.37	1,435.43	1,429.29	1,476.71	1,528.00	30.7%
Other chemical product manufacturing [3259]	1,268.15	1,326.71	1,188.39	1,201.15	1,383.02	9.1%
Semiconductor and other electronic component manufacturing [3344]	1,058.73	1,046.66	1,068.06	1,063.49	1,149.78	8.6%
Navigational, measuring, medical and control instruments manufacturing [3345]	1,312.29	1,322.50	1,282.01	1,278.32	1,345.84	2.6%

In Atlantic Canada, overall wages also grew over the five-year time frame from 2014 through 2018, however during the period 2016-2018 average weekly wages declined. The provincial level data is provided in Appendix D.

Post Secondary Enrollment in STEM

The A&D industry is highly reliant on special skills and detailed knowledge in engineering, technology, and sciences in order to deliver appropriate products and solutions to its customer base. A robust feeder system is required to continue to support the industry which is represented by post secondary enrollment in the appropriate STEM subjects. While specific program detail, such as aerospace engineering enrollment, is not readily available aggregated data for the broader categories are. Figure 29 summarized the college and university enrollment level for Atlantic Canada as broken down by level of study. Total enrollments across all programs has risen slightly from 2013-2018 with college enrollment trending down and higher degree programs trending upwards. The largest gains were in the category of mathematics, computer and information sciences. The provincial level breakdowns can be found in Appendix E.

Figure 29: Post Secondary STEM Enrollment Atlantic Canada (2013-2018)[23]

Atlantic Canada	2013/2014			2014/2015			2015/2016			2016/2017			2017/2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Architecture, engineering and related technologies															
College	6,528	1,146	7,704	6,606	1,311	7,953	6,555	1,200	7,809	6,288	1,122	7,482	5,607	924	6,591
Bachelor's or equivalent	4,491	1,221	5,721	4,755	1,323	6,081	4,938	1,419	6,360	4,890	1,527	6,306	4,860	1,551	6,420
Master's or equivalent	885	240	1,119	855	270	1,122	843	285	1,125	942	294	1,236	918	282	1,200
Doctoral or equivalent	285	87	372	324	93	420	354	93	447	393	87	477	357	78	435
Mathematics, computer and information sciences															
College	975	324	1,305	984	594	1,326	966	288	1,257	1,053	270	1,338	1,095	282	1,383
Bachelor's or equivalent	1,218	828	1,698	1,440	393	1,827	1,572	417	1,992	1,707	435	2,553	1,842	522	2,364
Master's or equivalent	294	159	453	297	174	465	297	174	471	300	156	453	351	192	537
Doctoral or equivalent	114	45	153	132	51	183	129	51	180	126	60	183	126	66	195
Physical and life sciences and technologies															
College	75	93	168	78	96	177	84	75	162	69	87	153	60	78	141
Bachelor's or equivalent	3,897	5,211	9,114	4,041	5,565	9,612	3,978	5,607	9,591	3,840	5,742	9,594	3,729	5,685	9,426
Master's or equivalent	435	435	870	411	456	861	417	483	900	438	477	912	435	441	876
Doctoral or equivalent	291	201	486	297	219	513	288	210	498	297	207	507	285	219	504
Total	19,488	9,990	29,163	20,220	10,545	30,540	20,421	10,302	30,792	20,343	10,464	31,194	19,665	10,320	30,072

[23] Note: Total enrollments are correct – gender summations may not add up due to several "gender unknown" assessments

Summary

The Aerospace and Defence Industry as a unified sector is a significant contributor to the economics of Atlantic Canada and each individual province, in terms of GDP, employment and tax revenue generation. Collectively the industry group accounts for $2.56 billion in GDP with total attributable employment of over 22,500. Tax revenue generated for all levels of government in 2018 was estimated to be $840.4 million with the individual provincial portion being $662.6 million. Figures 30, 31 and 32 summarizes the economic impact of the A&D industry at the provincial level.

Figure 30: Summary A&D Industry Impact on the Regional / Provincial GDP

Impact on Canadian GDP ($ millions)																				
	Atlantic Canada				Newfoundland &				Prince Edward Island				New Brunswick				Nova Scotia			
	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total
Aerospace	**760**	**468**	**319**	**1,547**	**108**	**66**	**45**	**219**	**126**	**78**	**53**	**257**	**27**	**17**	**12**	**56**	**499**	**307**	**209**	**1,016**
A&D	**135**	**83**	**67**	**285**	**19**	**12**	**10**	**40**	**22**	**14**	**11**	**47**	**5**	**3**	**2**	**10**	**88**	**54**	**44**	**187**
Defence	**285**	**162**	**143**	**589**	**14**	**8**	**7**	**28**	**1**	**1**	**0**	**2**	**27**	**15**	**13**	**55**	**244**	**138**	**122**	**504**
Total	**1,180**	**713**	**529**	**2,422**	**141**	**86**	**62**	**288**	**149**	**92**	**65**	**306**	***59***	***35***	***27***	***121***	**831**	**500**	**375**	**1,707**

Figure 31: Summary A&D Industry Impact on the Regional / Provincial Employment

Impact on Canadian Employment (Jobs x 1000)																				
	Atlantic Canada				Newfoundland &				Prince Edward Island				New Brunswick				Nova Scotia			
	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total	Dir	In	Ind	Total
Aerospace	**5.8**	**4.9**	**3.4**	**14.2**	**0.8**	**0.7**	**0.5**	**2.0**	**1.0**	**0.8**	**0.6**	**2.4**	**0.2**	**0.2**	**0.1**	**0.5**	**3.8**	**3.2**	**2.2**	**9.3**
A&D	**1.2**	**0.8**	**0.7**	**2.7**	**0.2**	**0.1**	**0.1**	**0.4**	**0.2**	**0.1**	**0.1**	**0.4**	**0.0**	**0.0**	**0.0**	**0.1**	**0.8**	**0.5**	**0.4**	**1.8**
Defence	**2.6**	**1.7**	**1.4**	**5.7**	**0.1**	**0.1**	**0.1**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.2**	**0.1**	**0.5**	**2.2**	**1.5**	**1.2**	**4.9**
Total	**9.6**	**7.5**	**5.5**	**22.5**	**1.1**	**0.9**	**0.6**	**2.7**	**1.2**	**1.0**	**0.7**	**2.8**	**0.5**	**0.4**	**0.3**	**1.1**	**6.8**	**5.2**	**3.9**	**15.9**

Figure 32: Summary A&D Industry Impact on the Regional / Provincial Tax Revenue

Provincial Tax Revenue - Aerospace & Defence Industry (2018) ($ millions)					
Economic Impact Type	NL	PEI	NB	NS	Atl Cda
Direct	31.3	44.2	15.4	232.0	322.9
Indirect	19.1	27.2	9.1	139.5	195.0
Induced	13.7	19.1	7.1	104.7	144.7
Total	64.2	90.5	31.7	476.2	662.6

APPENDICES

APPENDIX A: Aerospace and Defence Industry Defined

APPENDIX A: Aerospace and Defence Industry Defined[24]

Aerospace enterprises are those which reported a value of greater than zero from sales of any of the following:

Civil Aerospace Categories

- Aircraft and Related Propulsion Systems, Structures and Components
- Unmanned Aerial Systems/Vehicles (UAS/V)
- Landing Gear Systems and Components
- Avionics Airborne Electronics and Simulation Equipment Systems and Components
- Maintenance, Repair and Overhaul Services
- Commercial Systems Deployed in Space, Space Launch Vehicles, Land-based Systems for the Operation, Command and Control of Space Launch Vehicles or Systems Deployed in Space; and Related Components
- Government Non-Military Systems Deployed in Space, Space Launch Vehicles, Land-based Systems for the Operation, Command and Control of Space Launch Vehicles or Systems Deployed in Space; and Related Components
- Other Civil Aerospace

Aerospace Defence Categories

- Military Systems Deployed in Space, Space Launch Vehicles, Land-based Systems for the Operation, Command and Control of Space Launch Vehicles or Systems Deployed in Space and Related Components
- Primarily Airborne Electro-Optical, Radar, Sonar and Other Sensor/Information Collection Systems; Fire Control, Warning and Countermeasures Systems and Related Components
- Primarily Airborne Communications and Navigation Systems; and Other Information Systems (Including Processing and Dissemination), Software, Electronics and Components
- Aircraft Fabrication, Structures and Components
- Military Aircraft Maintenance, Repair and Overhaul Services
- Unmanned Aerial Systems/Vehicles (UAS/V) and Components
- Simulation Systems for Aircraft

[24] Canadian Defence, Aerospace and Marine Industries Survey, 2016, Op. cit.

Defence enterprises are those which reported a value of greater than zero from sales of any of the following:

- Ammunition, Missiles, Rockets and Related Components
- Firearms and Other Weapons
- Military Systems Deployed in Space, Space Launch Vehicles, Land-based Systems for the Operation, Command and Control of Space Launch Vehicles or Systems Deployed in Space and Related Components
- Primarily Airborne Electro-Optical, Radar, Sonar and Other Sensor/Information Collection Systems; Fire Control, Warning and Countermeasures Systems and Related Components
- Primarily Land-Based or Man-Portable Electro-Optical, Radar, Sonar and Other Sensor/Information Collection Systems; Fire Control, Warning and Countermeasures Systems and Related Components
- Primarily Airborne Communications and Navigation Systems; and Other Information Systems (Including Processing and Dissemination), Software, Electronics and Components
- Primarily Land-Based, Man-Portable or Non-Platform Specific Communications and Navigation Systems; and Other Information Systems (Including Processing and Dissemination), Software, Electronics and Components
- Naval Ship-Borne Systems Mission Systems and Components
- Naval Ships' Structural Elements, Platform Systems, Parts and Components (Excludes: Ship-Borne Naval Mission Systems)
- New Naval Vessels Constructed by Shipyards, and Naval Conversions
- Naval Ship Maintenance, Repair and Overhaul
- Combat Vehicles and Components
- Combat Vehicles Maintenance, Repair and Overhaul
- Aircraft Fabrication, Structures and Components
- Military Aircraft Maintenance, Repair and Overhaul Services
- Unmanned Aerial Systems/Vehicles (UAS/V) and Components
- Simulation Systems for Aircraft
- Simulation Systems for Naval Vessels
- Simulation Systems for Land Vehicles or Other Applications
- Military Training Services — Live, Virtual and Constructive
- Military Personal Protective Equipment, Load Carriage Systems and Operational Clothing
- Other Defence

APPENDIX B: Company Size Breakdown

APPENDIX B: Company Size Breakdown (2019)[25]

Aerospace Industry

Aerospace Product and Parts Manufacturing - 3364						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	8	3	0	4	3	1
New Brunswick	0	2	0	0	0	0
Newfoundland and Labrador	2	2	1	1	0	0
Prince Edward Island	3	0	1	1	1	0

Engine, Turbine and Power Transmission Equipment Manufacturing - 3336						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	1	2	1	0	0	0
New Brunswick	0	0	0	0	0	0
Newfoundland and Labrador	0	0	0	0	0	0
Prince Edward Island	1	2	1	0	0	0

Motor Vehicle Electrical and Electronic Equipment Manufacturing - 33632						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	0	0	0	0	0	0
New Brunswick	0	0	0	0	0	0
Newfoundland and Labrador	2	0	1	1	0	0
Prince Edward Island	0	1	0	0	0	0

Communications Equipment Manufacturing - 3342						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	5	4	2	2	1	0
New Brunswick	1	0	0	1	0	0
Newfoundland and Labrador	0	0	0	0	0	0
Prince Edward Island	0	0	0	0	0	0

[25] Compiled from Canadian Industry Statistics; Innovation, Science and Economic Development Canada online database, https://www.ic.gc.ca/app/scr/app/cis/search-recherche, accessed March 2020

Other Chemical Product Manufacturing - 3259						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	mediu m (100-499)	large (500+)
Nova Scotia	6	3	2	4	0	0
New Brunswick	3	4	2	1	0	0
Newfoundland and Labrador	3	1	0	3	0	0
Prince Edward Island	0	2	0	0	0	0

Support Activities for Air Transportation - 4881						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	mediu m (100-499)	large (500+)
Nova Scotia	16	23	5	10	1	0
New Brunswick	18	15	4	13	1	0
Newfoundland and Labrador	24	15	7	14	3	0
Prince Edward Island	6	2	1	5	0	0

Defence / Security Industry

Ship and Boat Building - 3366						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	mediu m (100-499)	large (500+)
Nova Scotia	65	31	20	41	3	1
New Brunswick	13	4	4	9	0	0
Newfoundland and Labrador	13	8	2	10	1	0
Prince Edward Island	12	4	6	6	0	0

Aerospace Product and Parts Manufacturing - 3364						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	mediu m (100-499)	large (500+)
Nova Scotia	8	3	0	4	3	1
New Brunswick	0	2	0	0	0	0
Newfoundland and Labrador	2	2	1	1	0	0
Prince Edward Island	3	0	1	1	1	0

Automobile and Light-Duty Motor Vehicle Manufacturing - 33611						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	0	0	0	0	0	0
New Brunswick	0	2	0	0	0	0
Newfoundland and Labrador	0	0	0	0	0	0
Prince Edward Island	0	0	0	0	0	0

Other Transportation Equipment Manufacturing - 33699						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	0	2	0	0	0	0
New Brunswick	3	3	1	1	1	0
Newfoundland and Labrador	1	0	1	0	0	0
Prince Edward Island	0	0	0	0	0	0

Defence Services - 9111

	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	3	0	3	0	0	0
New Brunswick	1	0	1	0	0	1
Newfoundland and Labrador	1	0	1	0	0	1
Prince Edward Island	1	0	1	0	0	0

Explosives Manufacturing - 32592						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	1	0	0	1	0	0
New Brunswick	1	0	0	1	0	0
Newfoundland and Labrador	3	0	0	3	0	0
Prince Edward Island	0	0	0	0	0	0

Semiconductor and Other Electronic Component Manufacturing - 33441						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	1	2	0	1	0	0
New Brunswick	1	1	0	0	1	0
Newfoundland and Labrador	0	0	0	0	0	0
Prince Edward Island	0	0	0	0	0	0

Navigational, Measuring, Medical and Control Instruments Manufacturing - 3345						
	Employers	non-employer or indeterminate	micro (1-4)	small (5-99)	medium (100-499)	large (500+)
Nova Scotia	14	3	3	9	2	0
New Brunswick	7	1	3	3	1	0
Newfoundland and Labrador	7	1	3	4	0	0
Prince Edward Island	1	1	0	1	0	0

APPENDIX C: Aerospace and Defence Industry Aggregated Data

APPENDIX C: Aerospace and Defence Industry Aggregated Data

Impact on Canadian GDP ($ millions)								
	Canada				Atlantic Canada			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Mfg	9,077	4,046	3,171	16,294	453.9	202.3	158.55	814.7
Aerospace MRO	4,012	3,183	2,041	9,236	441.3	350.1	224.51	1,016.0
Aerospace Total (2018)	**13,089**	**7,229**	**5,212**	**25,530**	**895.2**	**552.4**	**383.1**	**1,830.7**
Defence (2016)	**3,000**	**1,700**	**1,500**	**6,200**	**420.0**	**238.0**	**210.0**	**868.0**
Total	***16,089***	***8,929***	***6,712***	***31,730***	***1,315.2***	***790.4***	***593.1***	***2,698.7***

Impact on Canadian Employment (Jobs)								
	Canada				Atlantic Canada			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Aerospace Mfg	56,707	40,088	34,508	131,303	2,835	2,004	1,725	6,565
Aerospace MRO	32,756	30,645	18,505	81,906	3,603	3,371	2,036	9,010
Aerospace Total (2018)	**89,463**	**70,733**	**53,013**	**213,209**	**6,439**	**5,375**	**3,761**	**15,575**
Defence (2016)	**27,000**	**18,000**	**14,800**	**59,800**	**3,780**	**2,520**	**2,072**	**8,372**
Total	***116,463***	***88,733***	***67,813***	***273,009***	***10,219***	***7,895***	***5,833***	***23,947***

Note: There is overlap between the two industry sectors representing 32.1% of the Defence sector's total[26].

[26] State of Canada's Defence Industry 20183 Report; Innovation, Science, and Economic Development Canada, p.18

APPENDIX D: A&D Sub-Sector Average Weekly Wages (2014-18)

APPENDIX D A&D Sub-Sector Average Weekly Wages (2014-18)

Average Weekly Wages - Select Industry Sub-Sectors (2014-2018)						
All Employees (Excluding Overtime)						
Industry Sub-Sector	Newfoundland & Labrador					
	2014	2015	2016	2017	2018	% Change
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Support activities for transportation [4881]	1,366.31	-	1,349.29	-	1,489.86	9.0%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Federal government public administration [911]	1,339.48	1,341.69	1,298.78	1,336.50	1,369.77	2.3%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%
Manufacturing [31-33]	994.95	997.87	1,067.95	1,011.06	1,013.77	1.9%

Average Weekly Wages - Select Industry Sub-Sectors (2014-2018)						
All Employees (Excluding Overtime)						
Industry Sub-Sector	Prince Edward Island					
	2014	2015	2016	2017	2018	% Change
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Transportation and warehousing [48-49]	837.28	865.06	861.53	-	886.38	5.9%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Federal government public administration [911]	1,285.95	1282.49	1283.53	1321.05	1354.21	5.3%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%
Manufacturing [31-33]	769.14	841.95	921.56	878.15	900.93	17.1%

Average Weekly Wages - Select Industry Sub-Sectors (2014-2018)						
All Employees (Excluding Overtime)						
Industry Sub-Sector	New Brunswick					
	2014	2015	2016	2017	2018	% Change
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Support activities for transportation [488]	1,070.35	981.39	1,068.56	1,066.54	1,111.37	3.8%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Federal government public administration [911]	1,339.04	1,327.84	1,316.12	1,349.92	1,392.88	4.0%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%
Manufacturing [31-33]	867.60	880.44	949.66	933.72	914.71	5.4%

Average Weekly Wages - Select Industry Sub-Sectors (2014-2018)						
All Employees (Excluding Overtime)						
Industry Sub-Sector	Nova Scotia					
	2014	2015	2016	2017	2018	% Change
Transportation equipment manufacturing [336]	1,046.32	1,084.36	1,092.26	1,124.17	1,105.40	5.6%
Manufacturing [31-33]	899.80	911.81	916.18	906.44	918.92	2.1%
Transportation equipment manufacturing [336]	1,046.32	1,084.36	1,092.26	1,124.17	1,105.40	5.6%
Manufacturing [31-33]	899.80	911.81	916.18	906.44	918.92	2.1%
Support activities for transportation [488]	984.21	975.96	967.61	984.06	994.04	1.0%
Ship and boat building [3366]	964.02	1,018.44	1,001.67	1,071.36	1,010.46	4.8%
Transportation equipment manufacturing [336]	1,046.32	1,084.36	1,092.26	1,124.17	1,105.40	5.6%
Transportation equipment manufacturing [336]	1,046.32	1,084.36	1,092.26	1,124.17	1,105.40	5.6%
Federal government public administration [911]	1,369.77	1,373.74	1,353.72	1,398.56	1,453.67	6.1%
Manufacturing [31-33]	899.80	911.81	916.18	906.44	918.92	2.1%
Manufacturing [31-33]	899.80	911.81	916.18	906.44	918.92	2.1%
Manufacturing [31-33]	899.80	911.81	916.18	906.44	918.92	2.1%

APPENDIX E: Post Secondary STEM Enrollment (2013-18)

APPENDIX E: Post Secondary STEM Enrollment (2013-18)[27]

Newfoundland and Labrador	2013/2014			2014/2015			2015/2016			2016/2017			2017/2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Architecture, engineering and related technologies															
College	2,037	528	2,568	2,133	657	2,793	2,181	549	2,730	1,995	483	2,478	1,764	369	2,133
Bachelor's or equivalent	1,038	354	1,395	1,095	393	1,491	1,110	411	1,524	1,122	429	1,551	1,107	408	1,521
Master's or equivalent	318	96	411	345	105	447	396	99	492	423	99	525	393	105	498
Doctoral or equivalent	117	27	144	141	36	180	168	39	207	195	42	237	195	30	225
Mathematics, computer and information sciences															
College	165	51	216	156	63	222	135	57	192	165	39	204	162	45	204
Bachelor's or equivalent	162	69	231	162	72	231	159	69	228	210	78	291	213	81	294
Master's or equivalent	75	30	105	78	30	108	72	33	105	72	30	99	60	33	90
Doctoral or equivalent	30	6	33	36	6	42	42	9	48	39	12	51	42	18	60
Physical and life sciences and technologies															
College	39	36	75	33	27	66	39	24	63	33	18	51	33	12	45
Bachelor's or equivalent	858	804	1,662	1,074	1,170	2,247	1,149	1,341	2,496	1,074	1,359	2,445	1,098	1,413	2,520
Master's or equivalent	174	171	345	159	177	336	168	174	345	180	186	366	165	186	351
Doctoral or equivalent	99	75	171	99	75	174	99	78	177	102	72	177	102	78	180
Total	5,112	2,247	7,356	5,511	2,811	8,337	5,718	2,883	8,607	5,610	2,847	8,475	5,334	2,778	8,121

Prince Edward Island	2013/2014			2014/2015			2015/2016			2016/2017			2017/2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Architecture, engineering and related technologies															
College	327	39	366	438	57	495	429	54	486	399	39	441	411	39	453
Bachelor's or equivalent	78	15	96	96	15	111	123	21	144	156	30	183	174	45	222
Master's or equivalent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Doctoral or equivalent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mathematics, computer and information sciences															
College	75	12	87	99	15	114	108	18	126	102	15	120	108	15	120
Bachelor's or equivalent	99	15	117	102	21	123	102	27	132	114	18	543	135	21	156
Master's or equivalent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Doctoral or equivalent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Physical and life sciences and technologies															
College	3	15	18	9	21	27	9	15	27	6	21	24	9	18	27
Bachelor's or equivalent	270	399	672	252	402	654	213	378	591	177	366	543	171	384	555
Master's or equivalent	9	12	21	15	12	24	18	18	36	18	21	36	15	15	30
Doctoral or equivalent	3	0	3	3	3	6	6	3	9	6	3	6	3	3	6
Total	864	507	1,380	1,014	546	1,554	1,008	534	1,551	978	513	1,896	1,026	540	1,569

[27] Summarized from: Statistics Canada - Postsecondary enrolments, by registration status, institution type, status of student in Canada and gender, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3710001801
Note: Total enrollments are correct – gender summations may not add up due to several “gender unknown” assessments

New Brunswick	2013/2014			2014/2015			2015/2016			2016/2017			2017/2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Architecture, engineering and related technologies															
College	1791	174	1,977	1743	195	1,950	1557	168	1,743	1542	189	1,755	1524	171	1,698
Bachelor's or equivalent	1491	318	1,809	1509	339	1,848	1512	348	1,860	1371	363	1,629	1260	345	1,605
Master's or equivalent	132	33	165	123	27	150	123	33	156	126	36	162	132	36	168
Doctoral or equivalent	81	30	111	78	24	102	72	18	93	78	18	93	63	12	75
Mathematics, computer and information sciences															
College	408	129	540	393	114	510	354	87	438	381	84	465	384	75	459
Bachelor's or equivalent	423	78	504	450	99	546	507	108	615	486	96	582	492	108	600
Master's or equivalent	81	24	105	84	30	111	84	30	111	72	15	87	63	21	84
Doctoral or equivalent	42	15	57	48	12	60	42	12	54	36	15	51	30	15	48
Physical and life sciences and technologies															
College	33	42	75	36	48	84	36	36	72	30	48	78	18	48	69
Bachelor's or equivalent	777	1023	1,800	723	939	1,662	684	969	1,653	678	951	1,629	612	939	1,554
Master's or equivalent	81	66	147	78	78	153	81	87	168	96	75	171	96	75	171
Doctoral or equivalent	45	36	81	51	39	87	51	39	90	48	45	93	54	45	96
Total	5,385	1,968	7,371	5,316	1,944	7,263	5,103	1,935	7,053	4,944	1,935	6,795	4,728	1,890	6,627

Nova Scotia	2013/2014			2014/2015			2015/2016			2016/2017			2017/2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Architecture, engineering and related technologies															
College	2373	405	2,793	2292	402	2,715	2388	429	2,850	2352	411	2,808	1908	345	2,307
Bachelor's or equivalent	1884	534	2,421	2055	576	2,631	2193	639	2,832	2241	705	2,943	2319	753	3,072
Master's or equivalent	435	111	543	387	138	525	324	153	477	393	159	549	393	141	534
Doctoral or equivalent	87	30	117	105	33	138	114	36	147	120	27	147	99	36	135
Mathematics, computer and information sciences															
College	327	132	462	336	402	480	369	126	501	405	132	549	441	147	600
Bachelor's or equivalent	534	666	846	726	201	927	804	213	1,017	897	243	1,137	1002	312	1,314
Master's or equivalent	138	105	243	135	114	246	141	111	255	156	111	267	228	138	363
Doctoral or equivalent	42	24	63	48	33	81	45	30	78	51	33	81	54	33	87
Physical and life sciences and technologies															
College	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bachelor's or equivalent	1992	2985	4,980	1992	3054	5,049	1932	2919	4,851	1911	3066	4,977	1848	2949	4,797
Master's or equivalent	171	186	357	159	189	348	150	204	351	144	195	339	159	165	324
Doctoral or equivalent	144	90	231	144	102	246	132	90	222	141	87	231	126	93	222
Total	8,127	5,268	13,056	8,379	5,244	13,386	8,592	4,950	13,581	8,811	5,169	14,028	8,577	5,112	13,755