Aviation and Aerospace Industries

Labour Market Outlook

Canadian Council for Aviation & Aerospace
Aviation and Aerospace Employment

• Aviation and Aerospace employed an estimated 154,000 workers across Canada in 2016
• Air Transportation accounted for 44% of employment, followed by Aerospace Manufacturing providing 34% of employment, and Support Activities with 22%

Source: Statistics Canada; Prism Economics and Analysis estimates and forecast, 2017; CCAA Aviation & Aerospace LMI Outlook report, 2017
Regional Distribution of Employment

Distribution of Employment in Aviation and Aerospace in Canada

Source: Statistics Canada; Prism Economics and Analysis estimates and forecast, 2017; CCAA Aviation & Aerospace LMI Outlook report, 2017
## Aviation and Aerospace Employment

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Air Transportation</td>
<td>63,300</td>
<td>67,083</td>
<td>6.0%</td>
</tr>
<tr>
<td>Support Activities for Air</td>
<td>32,465</td>
<td>34,180</td>
<td>5.3%</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerospace Manufacturing</td>
<td>49,325</td>
<td>53,010</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Source: Statistics Canada; Prism Economics and Analysis estimates and forecast, 2017; CCAA Aviation & Aerospace LMI Outlook report, 2017
Employees with post-secondary education make up the majority of the industry’s workforce with 72.3%. This share is only 54.3% in the Canadian workforce.

These numbers indicate that the workforce of the industry is more educated than the Canadian workforce.

<table>
<thead>
<tr>
<th>Educational Attainment</th>
<th>% Share in the Aerospace Industry</th>
<th>% Share in Total Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than High School Education</td>
<td>5.2%</td>
<td>20.1%</td>
</tr>
<tr>
<td>High School Education</td>
<td>22.6%</td>
<td>25.6%</td>
</tr>
<tr>
<td>Post-secondary Education</td>
<td>72.3%</td>
<td>54.3%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, National Household Survey, 2011
Gender Distribution

69.8% of the industry’s workforce is composed of male workers

*This ratio is 48.8% for the total workforce*

<table>
<thead>
<tr>
<th>Gender</th>
<th>% Share in Aerospace Industry</th>
<th>% Share in Total Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Male</td>
<td>69.8%</td>
<td>48.8%</td>
</tr>
<tr>
<td>% Female</td>
<td>30.2%</td>
<td>51.2%</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, National Household Survey, 2011
Employees over the age of 45 make up a slightly higher percentage of the industry’s workforce compared to the national workforce. 

45.6% in the Aviation and Aerospace industry vs. 44.4% in the total workforce.

These numbers indicate that the workforce of the industry is slightly older than the Canadian workforce.

<table>
<thead>
<tr>
<th>Age distribution</th>
<th>% Share in the Aerospace Industry</th>
<th>% Share in Total Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 25 years old</td>
<td>6.5%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Between 25 and 45 years old</td>
<td>47.9%</td>
<td>42.4%</td>
</tr>
<tr>
<td>&gt; 45 years old</td>
<td>45.6%</td>
<td>44.4%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, National Household Survey, 2011
Immigration Status

These numbers indicate that the workforce of the industry is composed of about the same share of immigrants as the overall Canadian workforce.

<table>
<thead>
<tr>
<th>Immigration Status</th>
<th>% in the Aerospace Industry</th>
<th>% in the Total Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-immigrants</td>
<td>72.9%</td>
<td>75.4%</td>
</tr>
<tr>
<td>Immigrants</td>
<td>25.9%</td>
<td>23.5%</td>
</tr>
<tr>
<td>Non-permanent residents</td>
<td>1.2%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, National Household Survey, 2011
Hiring Requirement by Industry, Canada, 2016-2025

Aviation and Aerospace industries need to attract a total of 55,000 workers from 2016 to 2025 across the three sub-sectors.

Components of Hiring Requirement, Aerospace Manufacturing, 2016-2025

- 78% of total hiring requirement in Aerospace Manufacturing is comprised of replacement demand
- 3,200 new entrants make up only 17% of the required additional workers until 2025
- 15,000 workers will be needed from other industries and jurisdictions (recruitment gap)

Change in Aerospace Manufacturing Workforce 2016-2025 Hiring Requirement (18,144)

Note: New entrants are defined as the share of the population aged 15 to 30 in the labour force for each industry

Components of Hiring Requirement, Support Activities for Air Transportation, 2016-2025

- 75% of total hiring requirement in Support Activities for Air Transportation industry is comprised of replacement demand
- 3,900 new entrants to the labour force make up 32% of the required workers by 2025
- 8,200 workers will be needed from other industries and jurisdictions (recruitment gap)

Change in Support Activities for Air Transportation Workforce

2016-2025 Hiring Requirement (12,008)

Note: New entrants are defined as the share of the population aged 15 to 30 in the labour force for each industry

Components of Hiring Requirement, Air Transportation, 2016-2025

- 72% of total hiring requirement in Air Transportation industry is comprised of replacement demand
- 6,900 new entrants to the labour force make up less than 30% of the required workers by 2025
- 17,800 workers will be needed from other industries and jurisdictions (recruitment gap)

Change in Air Transportation Workforce
2016-2025 Hiring Requirement (24,695)

Effect of Pilot Fatigue Rules on Hiring Requirement, 2016-2025

• Proposed federal regulations would cut the number of consecutive hours pilots are allowed to fly, increase the duration of mandatory rest time between flights, and reduce the total number of hours pilots can fly annually

• Enforcement would increase projected pilot hiring requirement over the next decade from 7,300 to 9,800, a 26% increase

Aviation and Aerospace Graduates
Aviation and Aerospace, College Graduates by Program, Canada

• Colleges with Aviation and Aerospace specific programs graduate approximately 1500 students per year

• Aviation employs an estimated 77%* of Aviation and Aerospace new entrants; approximately 1155 per year
Aerospace Engineering, University Enrolments and Graduations, Canada

- More than 1,600 aerospace engineering students across all academic levels in 2015-16
- More than 300 graduates in the same year
- New enrolments have plateaued since peaking in 2007-08 – over the past seven academic years new enrolments have declined by an average of 2% annually
- Aerospace engineering graduates have totaled nearly 4,100 since 1995-96
- Female students make up 16% of total enrolment

<table>
<thead>
<tr>
<th></th>
<th>2015-16 Count</th>
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<tbody>
<tr>
<td>Total Enrolments</td>
<td>1,628</td>
</tr>
<tr>
<td>New Enrolments</td>
<td>484</td>
</tr>
<tr>
<td>Graduations</td>
<td>326</td>
</tr>
</tbody>
</table>
Flight Training Statistics, Canada

- The number of commercial pilot licenses issued per year peaked in 2009, reaching 1,645.
- In 2016, less than 1,200 commercial pilot licenses were issued; a drop of 28% from the 2009 peak.
- A declining trend in flight training units since early 2000s temporarily reversed in 2012 but has plateaued since then.

![Diagram showing commercial pilot licenses issued from 1991 to 2016]
Survey Results

First Survey of Employers
• May 2016
• 153 respondents, mainly manufacturing and helicopter companies,
• Represented approximately 52,000 workers

Second Survey of Employers
• November 2017
• 132 respondents, 48% Air Transport sector
• Represented approximately 38,933 workers
Anticipated Growth

<table>
<thead>
<tr>
<th></th>
<th>First Survey</th>
<th>Second Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth in the next year</td>
<td>57%</td>
<td>54%</td>
</tr>
<tr>
<td>Growth in 5 years</td>
<td>83%</td>
<td>80%</td>
</tr>
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</table>
Recruitment Challenges

How accurately does the following statement describe your company’s recruitment experience:

“Over the last year, we have experienced immediate and persistent challenges recruiting skilled and qualified workers to the extent that vacant positions go unfilled.”

<table>
<thead>
<tr>
<th>First Survey</th>
<th>Second Survey</th>
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<tbody>
<tr>
<td>42%</td>
<td>33%</td>
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</table>
Post-Secondary Providing Skills Needed

Are post-secondary education and training institutions providing the skills that your company needs

<table>
<thead>
<tr>
<th>First Survey</th>
<th>Second Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>62% yes</td>
<td>55% yes</td>
</tr>
<tr>
<td>38% no</td>
<td>38% somewhat, 7% no</td>
</tr>
</tbody>
</table>
Findings

• Looming retirements, replacement rate higher than growth rate
• Companies need to have a balance of new and experienced workers to maintain workforce and be fully productive
• Knowledge transfer methods, both formal and informal, are required
• Difficult finding workers with enough experience and required skill set
• Business models have changed - workers need to have more diverse skills
• Soft skills and business skills are lacking
• Specifically critical thinking, ability to make decisions, troubleshooting, eligible for security clearance
• Some occupational shortages are not large employment numbers but critical work, such as NDT level 3.
Findings

• Workforce is increasingly becoming more digital (big data, electronic work orders and online manuals)
• Training does not keep up with the rate of emerging skills required for new equipment and technologies (3D printing, CNC, additive manufacturing, robotics)
• Educators do not have access to newest technologies and priority equipment
• Required training not available in all regions
  (aerospace engineers, composites, painters, structures)
• Some training not available at all – stores, technical writing
• Lack of practical training for Engineers
• Lack of WIL for technicians and mechanics
Findings

• Manufacturers need to incorporate lean processes to remain competitive
• When companies need to increase or upskill workforce for a new contract it puts pressure on the HR departments
• Industry is not tapping into underrepresented workforce such as females in STEM or indigenous persons
• Generation differences
Labour and Skill Shortages
Skilled Trades, Technicians, Mechanics, Production

- AMEs with enough experience
- Avionics (airplanes are becoming an “ipad”)
- Structures
- “Good” welders with aerospace skill set
- Machinists
- Composites experience
- NDT, Level 3
- Electricians
- Painters
- CNC/CMM Programmers
- Carpenters
- Landing Gear Assembly
Labour and Skill Shortages
Pilots, Flight Operations

- Pilots with sufficient flight hours
- Specialties - Long lining skills, Float planes, Mountain flight qualifications
- Air Worthiness Inspectors
- Customer services skills
- Business acumen
- Conflict resolution skills
- Leadership
Labour and Skill Shortages
Management / IT

- IT – programmers, software designers
- Manufacturing, Supply Chain, Facilities Operations, Project, quality, Engineering, Maintenance Manager
- Lacking in Industry knowledge – technical experience (parts), standards, regulations, best practices, trends
- Lacking in lean knowledge, operations experience, quality assurance and control,
- Negotiation skills, coaching, people skills
Labour and Skill Shortages

Engineers

• Specialities: Aerospace, Industrial and Manufacturing, Mechanical, Process Control
• Lacking in: Metallurgy, aerospace costing, test lab experience, special processes, structural analysis, hydraulics, CAD software, chemical engineering experience, lean experience, ability to go into the field
• Teamwork, open to feedback, leadership, communication, problem solving
LMI Coordination Across Regions
Sub-Committee
May 2017 Meeting

• Richard Billard, President/CEO, Atlantic Canada Aerospace and Defence

• Marlene Conway Diels, Project Manager, Ontario Aerospace Council (OAC)

• Mike Mueller, Vice President, AIAC Pacific

• Nathalie Paré, Executive Director, CAMAQ (representing CAMAQ and AeroMontreal)

• Bill Werny, Chair, Alberta Aviation Council (by telephone)

• Wendell Wiebe, Chief Executive Officer, Manitoba Aerospace
Committee Work

• Major aviation and aerospace clusters are represented by the members of the sub-committee.

• Each has different methods of collecting data, as well as very different data collection sets. (NAICs)

• Some clusters have very developed labour market information systems and some are in the beginning stages. Survey administration ranges from in-house to outsourcing to larger consulting firms.

• During the meeting each member shared their methodology and success levels.
Committee Work

Uses of LMI data / Scope

- To understand the regional and national labour market
- Provide data to association members for HR planning
- Provide data to educators for program planning
- To understand skill gaps and develop necessary training
- To understand which occupations have current or projected shortages
- To understand how new technology is effecting the labour market and required skills
- To understand the changing requirements of the workforce
- Obtain government support
Committee Work

Most important data to collect

- Developed a list of core questions – that will allow comparison of “apples to apples” across Canada
- Each region will collect core data, as well as data that is important to their association / region
Committee Work

Possible sharing of data / Privacy of data

• Will require permission from survey participants to share data for national report
• Regional associations will only share aggregated results – will extract the “common core” set of questions for a national report
• There will be data gaps from areas and sub-sectors not represented by a participating regional association
Committee Work

Items to consider:

• CCAA’s role would be to analyze data and to fill in gaps for unrepresented regions / sub-sectors
• Collection cycle: can it still be accurate if regions collect in different cycles?
• Decide how frequent surveys need to done once baseline is established.
• Storage of data
Draft of Core Critical Questions

Questions will focus on

• Which occupations do you anticipate hiring for?
• How many workers does your organization plan to hire due to growth?
• How many workers does your organization plan to hire due to replacement?
• Which jobs are the hardest to fill? Current vacancies?
• What is the average age of your workforce?
• If employees who are approaching retirement are concentrated in particular occupations, what are those occupations?
• Which, if any, new technologies are you implementing?
• What training would you like to see available for your employees?
• Try to scope the changing nature of work.
Thank You