

# Aviation and Aerospace Industries

## Labour Market Outlook

Canadian Council for Aviation & Aerospace

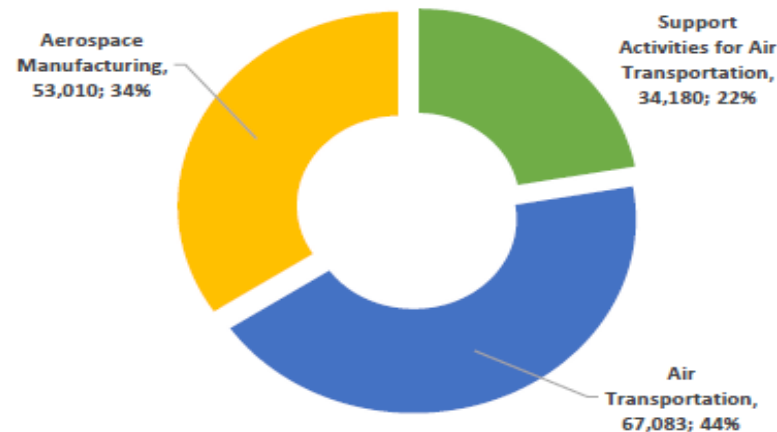


Funded in part by the Government of Canada's  
Sectoral Initiatives Program

# 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%

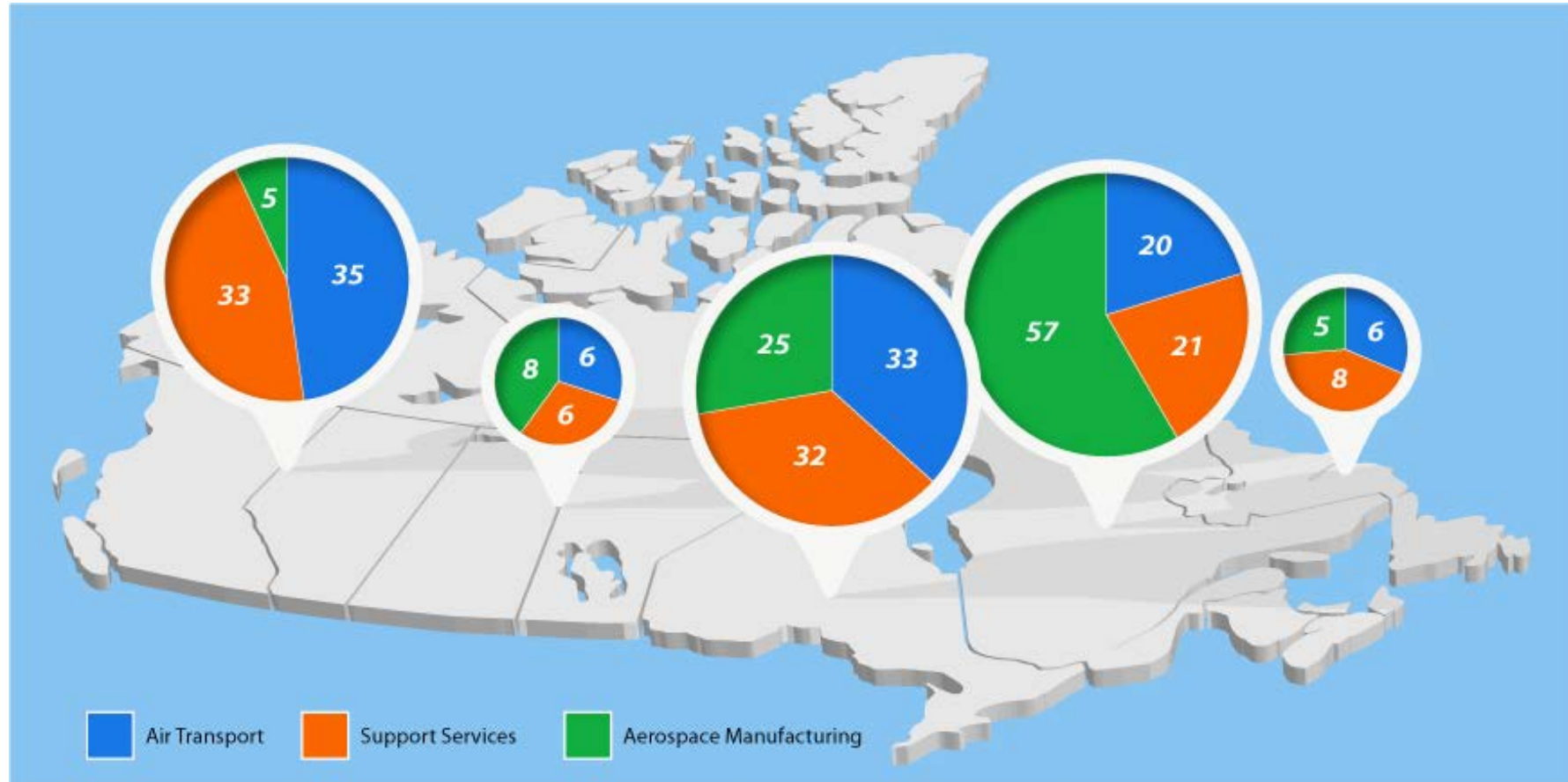
Aviation and Aerospace Employment Distribution, 2016



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

Industry	2011 Employment	2016 Employment	% Change Employment (2011 – 2016)
Air Transportation	63,300	67,083	6.0%
Support Activities for Air Transportation	32,465	34,180	5.3%
Aerospace Manufacturing	49,325	53,010	7.5%

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

# Educational Attainment

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.

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

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*

Gender	% Share in Aerospace Industry	% Share in Total Workforce
% Male	69.8%	48.8%
% Female	30.2%	51.2%

Source: Statistics Canada, National Household Survey, 2011

# Age Distribution

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.

Age distribution	% Share in the Aerospace Industry	% Share in Total Workforce
< 25 years old	6.5%	13.1%
Between 25 and 45 years old	47.9%	42.4%
> 45 years old	45.6%	44.4%
Total	100.0%	100.0%

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.

Immigration Status	% in the Aerospace Industry	% in the Total Workforce
Non-immigrants	72.9%	75.4%
Immigrants	25.9%	23.5%
Non-permanent residents	1.2%	1.2%
Total	100.0%	100.0%

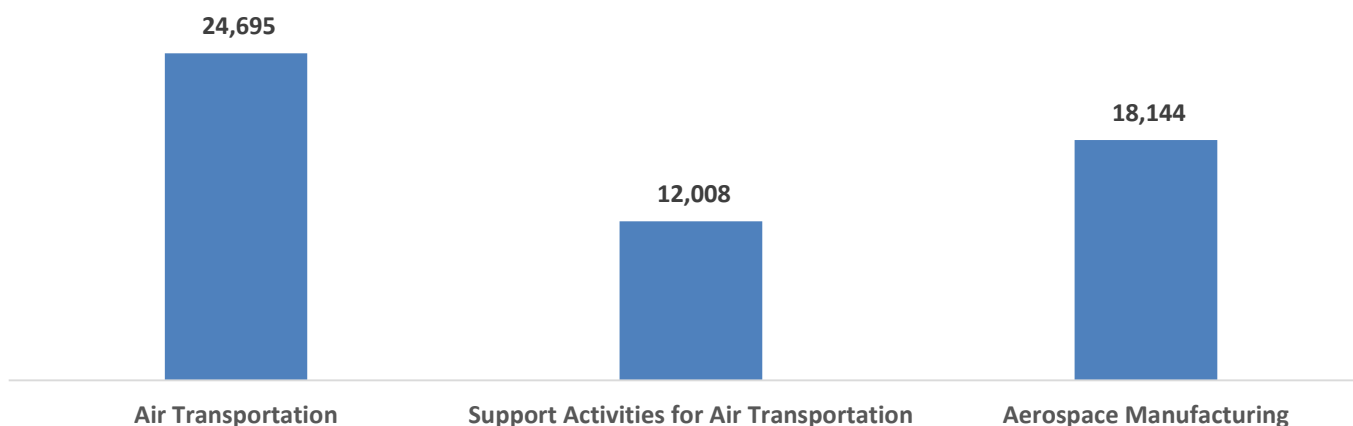
Source: Statistics Canada, National Household Survey, 2011



# 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.

Hiring Requirement by Industry, 2016-2025



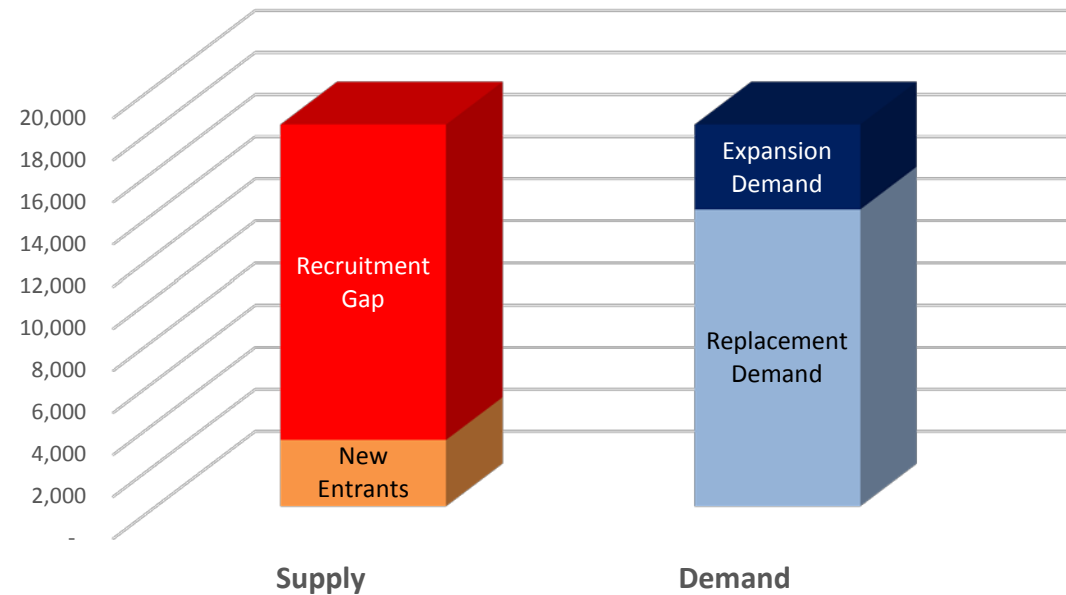
Industry	Total Hiring Requirement 2016 – 2025	Share of 2015 Employment
Air Transportation	24,695	37%
Support Activities for Air Transportation	12,008	35%
Aerospace Manufacturing	18,144	34%

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

# 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)

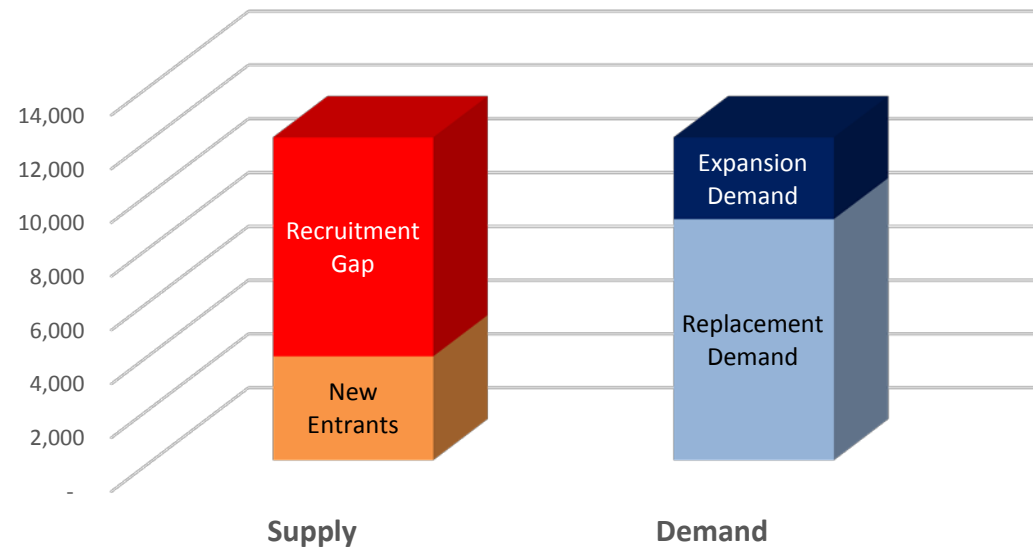


Note: New entrants are defined as the share of the population aged 15 to 30 in the labour force for each industry

# 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)**

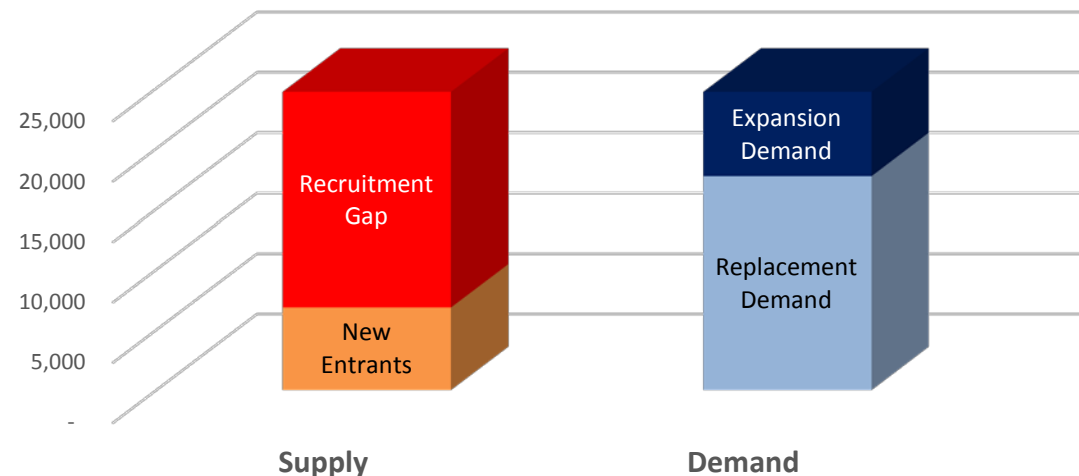


Note: New entrants are defined as the share of the population aged 15 to 30 in the labour force for each industry

# Components of Hiring Requirement, Air Transportation, 2016-2025

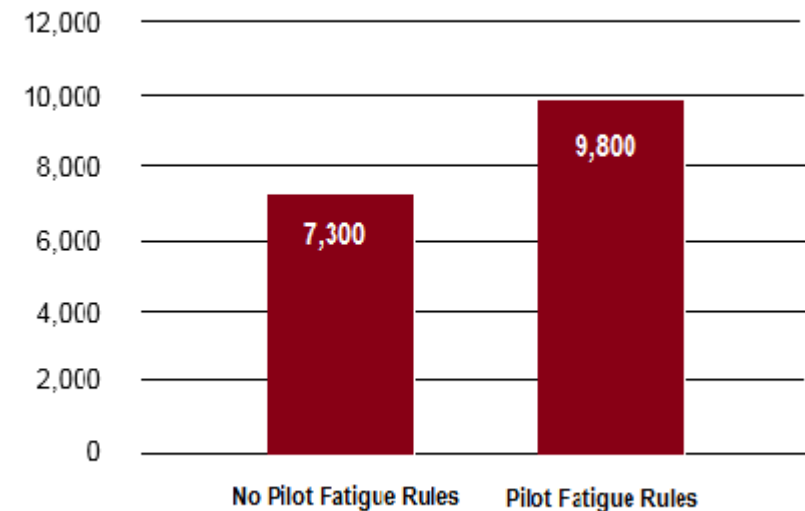
- 72% of total hiring requirement in Air Transportation industry is comprised of replacement demand
- 6,900 new entrants to the labour force make up less than 30% of the required workers by 2025
- 17,800 workers will be needed from other industries and jurisdictions (recruitment gap)

**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

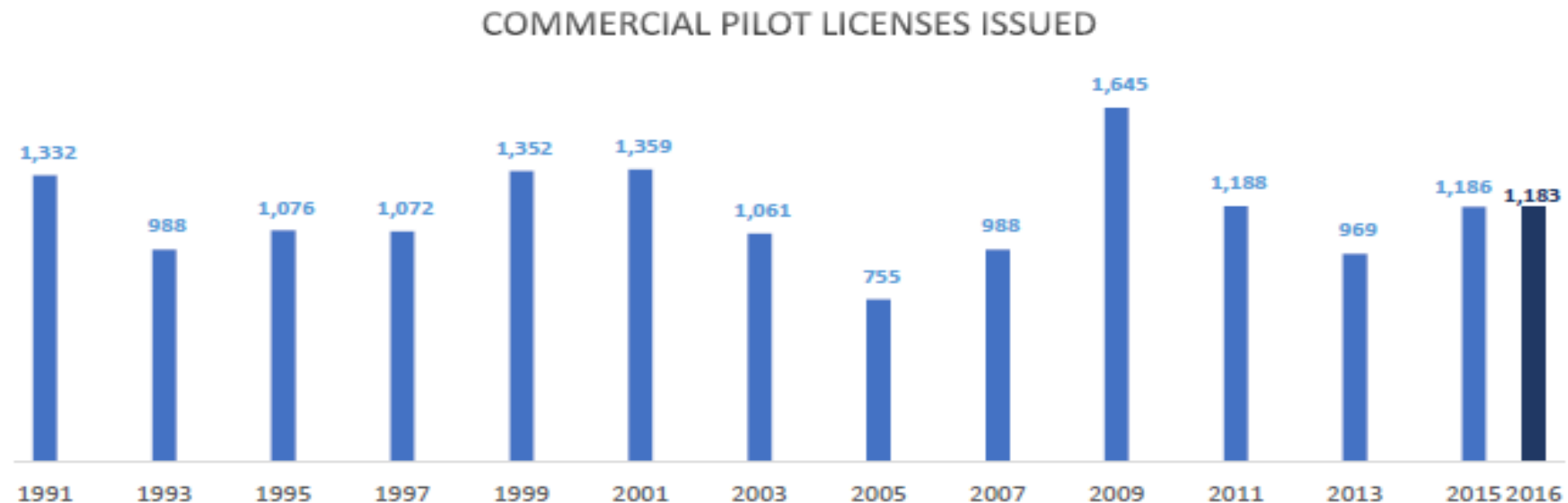
- More than 1,600 aerospace engineering students across all academic levels in 2015-16
- More than 300 graduates in the same year
- New enrolments have plateaued since peaking in 2007-08 – over the past seven academic years new enrolments have declined by an average of 2% annually
- Aerospace engineering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

	2015-16 Count
<b>Total Enrolments</b>	1,628
<b>New Enrolments</b>	484
<b>Graduations</b>	326



# 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



# 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

	First Survey	Second Survey
Growth in the next year	57%	54%
Growth in 5 years	83%	80%

# 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.”

First Survey	Second Survey
42%	33%

# Post-Secondary Providing Skills Needed

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

First Survey	Second Survey
62% yes	55% yes
38% no	38% somewhat, 7% no

# 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 be 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**