



Canadian Council for **Aviation & Aerospace**

For a skilled workforce

The Canadian Association of Motive
Power Educators (CAMPE)

*May 3, 2012
Sydney, Nova Scotia*

Robert Donald, Executive Director

The Skills Development Model for Aviation and Aerospace

- What is the CCAA?
- Skills Development
- Training
- Demographics / Skills Shortages
- Projects

CCAA is a “not-for-profit” organization which is dedicated to ensuring the Canadian Aviation and Aerospace industry has enough workers with the right skills to meet industry needs.

A Sector Council is not a trade association – it is an industry resource

Our origin

- Canadian Aviation Maintenance Council
- Skills Development
- Occupational Standards, Certification, Curricula, Accreditation, etc.

Today

- Broader than “Aviation Maintenance”
- Demographics / Critical Skills Shortage
- Over 200 corporate partners

New name: *Canadian Council for Aviation & Aerospace*

CCAA Board of Directors



National Defence



Aerospace Industries Association of Canada



Air Transportation Association of Canada



Canadian Business Aviation Association



Helicopter Association of Canada



International Association of Machinists & Aerospace Workers



Canadian Auto Workers

Canadian Federation of AME Association



Association of Canadian Community Colleges



National Training Association

Our Origin

In 1998, the Canadian aviation maintenance industry was facing a critical shortage of skilled personnel and a lack of standards for most occupations in the sector.

A comprehensive human-resource study was commissioned. The study, undertaken by Price Waterhouse between 1998 and 1991, was the first one ever conducted on the industry. The study recommended action in four areas:

- Defining occupational standards for the industry.
- Establishing training programs and core curricula for post-secondary training organizations.
- Recruiting new workers for the industry.
- Developing mechanisms for industry-wide resource planning.

The Canadian Aviation Maintenance Council (CAMC) was formed in the fall of 1991 to address these matters.

- 27 National Occupational Standards (NOs) developed by the industry to reflect the needs.
- A national program to certify competency of the workforce in these occupations.
- National curricula to reflect the NOSs and ensure colleges are delivering programs which reflect industry needs.
- A program to accredit such colleges.
- A national strategy was implemented to attract new workers to the industry (e.g. youth).
- A national Labour Market Information System was developed.

CCAA Skills Development

Road Map

1. National **Occupational Standards** with supporting logbooks
2. **Curricula** for post-secondary training organizations and for high-schools
3. **Accreditation** of training organization programs
4. **Certification** in 27 occupations
5. **Training**

1. Occupational Standards

- Industry identifies occupations which would benefit from standards.
- Industry subject matter experts identify the experience, knowledge and skills required be considered competent in various occupations and perform the occupation “professionally”.

1. Occupational Standards

- Aircraft Gas Turbine Engine Repair and Overhaul Technician*
- Aircraft Interior Technician*
- Aircraft Propeller Systems Technician*
- Aircraft Structures Technician
- Aircraft Maintenance Technician
- Aviation Machinist*
- Aviation Mechanical Component Technician*
- Aviation Non Destructive Inspection Technician*
- Aviation Painter*
- Aviation Welding Technician*
- Avionics Maintenance Technician
- Aircraft Mechanical Assembler
- Aircraft Structures Assembler
- Composite Fabricator
- Electrical / Electronic Assembler
- Aerospace Materials Specialist*
- Aircraft Reciprocating Engine Technician*
- Aircraft Refueller
- Aircraft Simulator Technician
- Aviation Ground Services Attendant
- Aviation Maintenance Inspector
- Aviation Maintenance Manager
- Aviation Special Processes Technician*
- Electrical / Electronics / Instrument Component Technician*
- Professional Pilot
- Quality Assurance Manager
- Quality Systems Auditor

* Standards recognized by Transport Canada Ref: Airworthiness Notice C009 for personnel working in an Approved Maintenance Organization (AMO).

11 Curricula have been developed based on the CCAA Occupational Standards (red).



1. Occupational Standards

- Can be combined to align with specific jobs at each employer.
- Provide a complete process for confirming / assessing competency of new or existing workforce.
- Identify competency gaps for that “job” at that particular employer.
- Provides employers with a national standard for staff training programs.

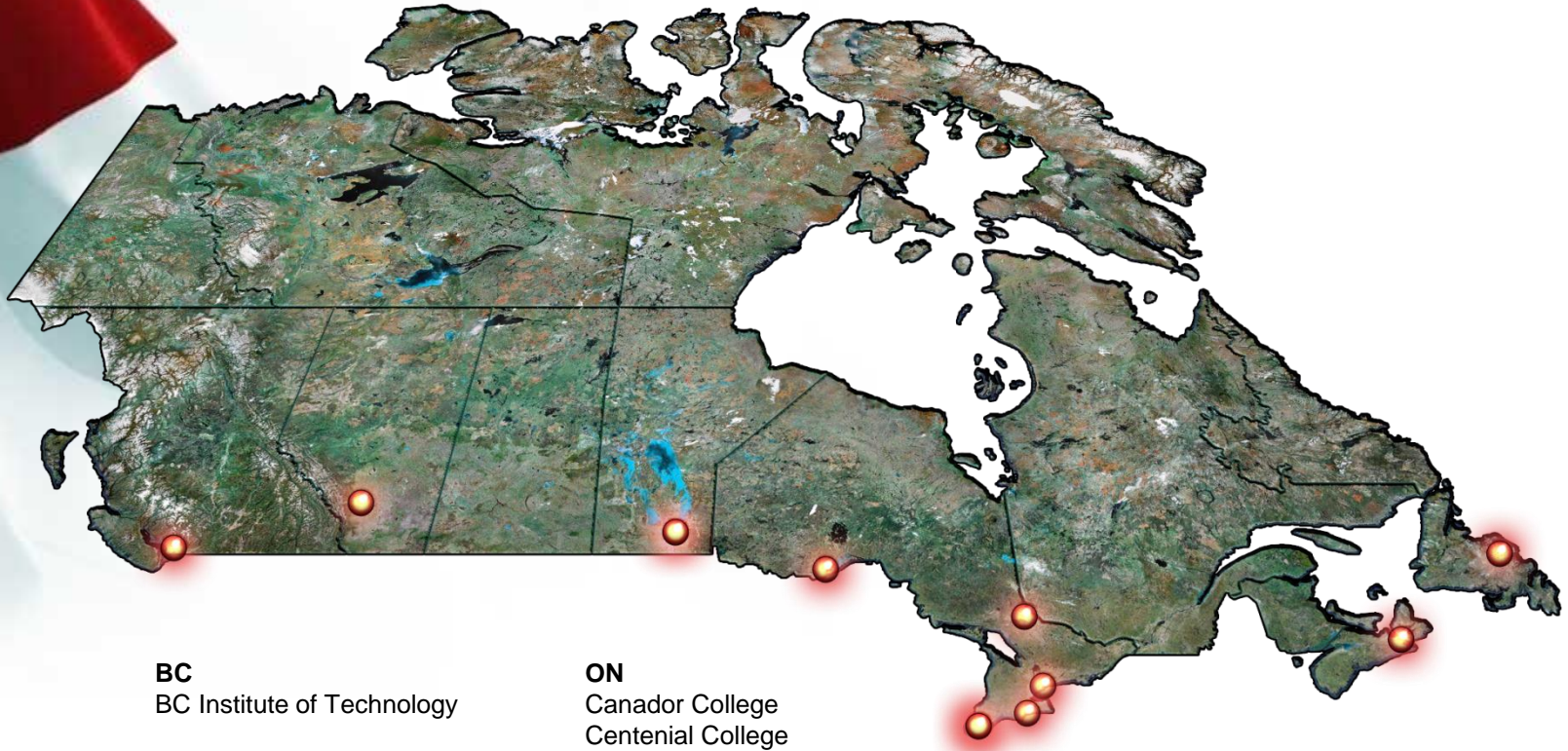
2. National Curricula

11 Curricula have been developed based on the CCAA Occupational Standards.

- Aircraft Gas Turbine Engine Repair and Overhaul Technician*
- Aircraft Interior Technician*
- Aircraft Propeller Systems Technician*
- Aircraft Structures Technician
- Aircraft Maintenance Technician
- Aviation Machinist*
- Aviation Mechanical Component Technician*
- Aviation Non Destructive Inspection Technician*
- Aviation Painter*
- Aviation Welding Technician*
- Avionics Maintenance Technician

3. CCAA Accredited Training Institutes

22 Post-Secondary Programs in 11 Institutions



BC
BC Institute of Technology

AB
SAIT Polytechnic

MB
Red River / Stevenson
StandardAero

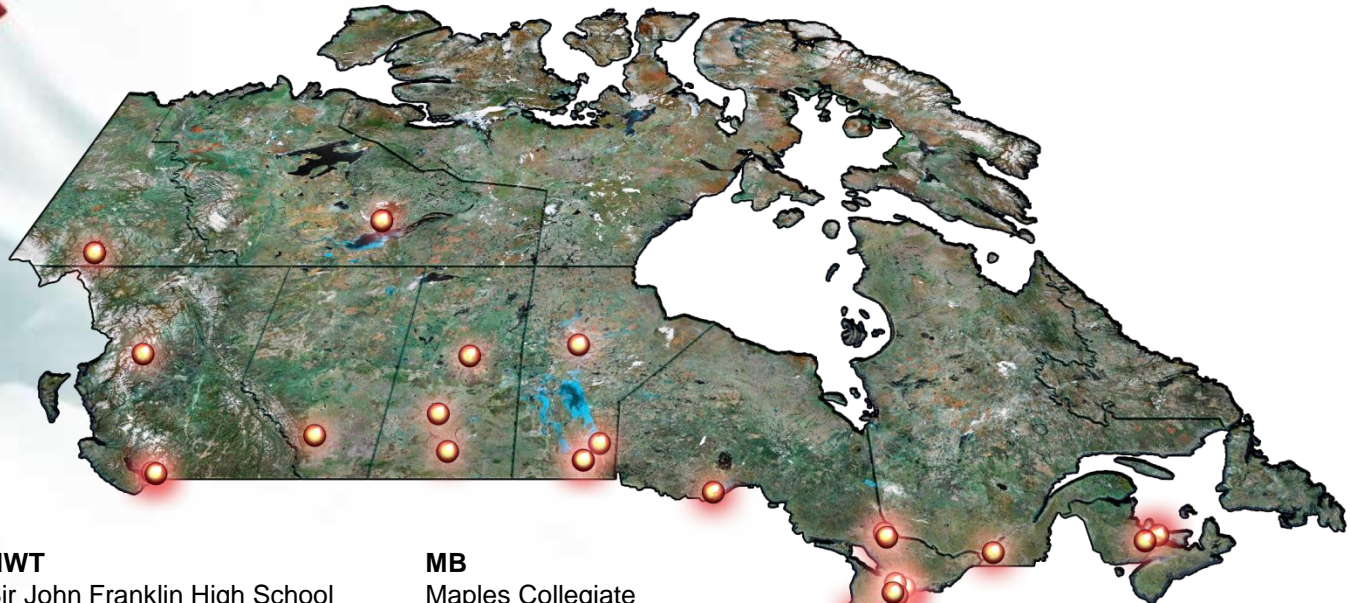
ON
Canador College
Centennial College
Confederation College
Fanshawe College
Mohawk College
Renaissance Aeronautics

NS
Nova Scotia Community College

NFLD
College of the North Atlantic

CCAA Secondary School Programs

Aviation Maintenance Orientation Programs (AMOP)
in 24 high-schools, 8 Provinces and 2 Territories
Air Cadet League of Canada – Across Canada



NWT

Sir John Franklin High School

YK

Vanier Catholic Secondary School

BC

Rick Hanson Secondary School
Smithers Secondary School

AB

James Fowler High School

SASK

Albert E. Peacock Collegiate
Mount Royal Collegiate Institute

MB

Maples Collegiate
Sagkeeng Anicinabe High School
Tec Voc High School

ON

Air Cadet AATC-AM
Bradford District High School
Georges Vanier Secondary
Holy Cross Catholic Academy
John Paul II
St. Robert Catholic High School
Sinclair Secondary School
Superior Collegiate and Vocational Institute
West Ferris Secondary School

QC

LaSalle Community Comprehensive High School

PEI

Three Oaks High School

NB

Moncton District High School

4. CCAA Certification of Individuals

- Certifies competence as defined by the Occupational Standard in the 27 trades
- Provides National recognition of competencies and capabilities.
- Facilitates the employer's recruitment process.
- Proven to reduce accidents and incidents.
- Can reduce insurance costs.
- Recognized by third party auditors and regulators (e.g. Transport Canada, FAA).

4. Benefits of Certification

- International standardization of workforce competencies.
- Enhanced internal mobility of employees.
- International recognition of a certified workforce.
- Certification of your supplier's workforce improves their performance.

5. CCAA Training

- Most initial industry training is provided by colleges or universities via multi-year programs, supplemented by OJE.
- Industry identified a need for short, focused training to respond to new technologies or new regulations.

Example: SMS Focused Training

Quality Systems Auditor (QSA)

- This 2 day workshop is an introduction to the skills and responsibilities of QSAs.
- It ensures an organization's processes are effective and compliant with regulations.
- Based on the Occupational Standard for QSA.

Quality Assurance Manager (QAM)

- This 1 day workshop is based on the Occupational Standard for QAM.
- It includes an examination of common areas of weakness for organizations implementing Safety Management Systems.

Fatigue Risk Management (FRM)

- Helps employees recognize the risks associated with fatigue and manage that risk.
- Based on Transport Canada materials provided to CCAA.
- Employers – ½ day
- Employees – 1 day

Short Courses

- Document Navigation / Canadian Air Regulations (CARS) - Introduction and Refresher
- Accountable Executive
- Audit Management
- Aviation Manager

5. CCAA Training

Example: SMS Focused Training

Initial Human Factors Recurrent (HF) – 2 day

- This 2 day workshop is designed to meet the highest standards of excellence for the aviation maintenance industry, CCAA'S Human Factors (HF) and Safety Management System (SMS) program offers a unique cost-effective, best-of-practice solution.
- Transport Canada compliant
- Facilitator led classroom training includes:
 - Module 1 - Human Factors and Safety Management
 - Module 2 - The “Dirty Dozen”

Initial Human Factors Recurrent (HF-2)

- Work at your own pace with this real-time, web-based recurrent training program to refresh the principles and practices of your HF and SMS training.
- Covers key components of HF training including the “Dirty Dozen” (e.g., human performance, types of errors, susceptibility to errors, etc.).
- Exceeds Transport Canada’s requirement for recurrent training.

Persons Responsible for Maintenance Control (PRMC) – 1 day

- This 1 day workshop is focused on the regulatory requirements for the PRMC role and the responsibilities of individuals in this position.
- Individuals currently in the role of PRMC looking for a refresher on responsibilities.
- Accountable Executives wishing to understand the roles of the PRMC.
- Quality or Management personnel wanting to learn more about the regulatory requirements for the control of maintenance and the responsibilities of the PRMC.

5. CCAA Training



“After reviewing numerous options available at the time, StandardAero University selected and launched the CCAA (then CAMC) Human Factors and Safety Management Program in January 2003. We used a top-down approach to ensure our executive and management teams would understand the new concepts and language...”

*“Since 2003, StandardAero has delivered over 100 courses to 2000 of its employees **around the globe**. Our course evaluations indicate the CCAA Human Factors and Safety Management course is **one of our highest rated offerings**, with an average overall course score of 3.75 out of a possible 4.”*

*Ricky Lawrence, Director of Training & Development
StandardAero University*

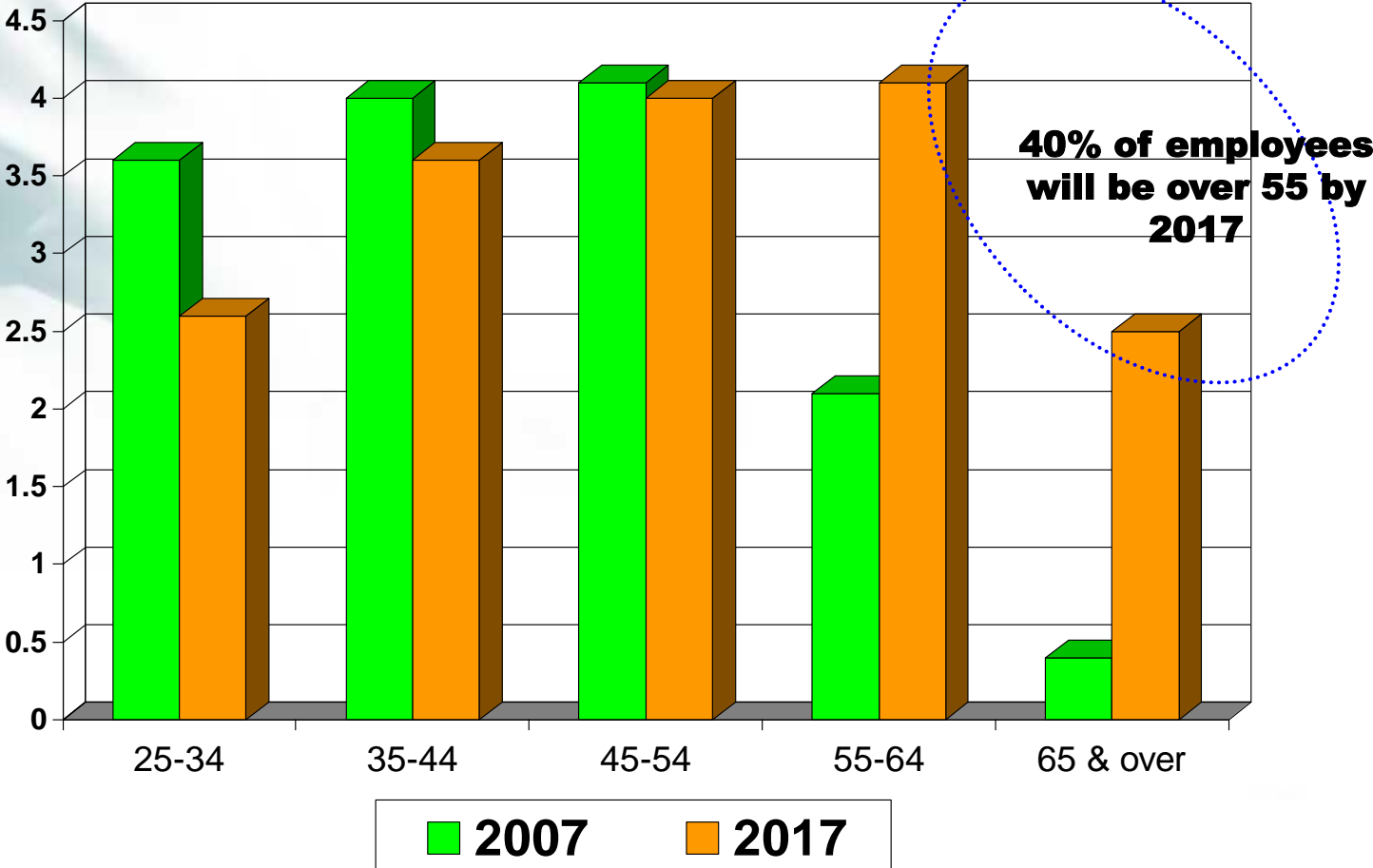
Global Demographic Trends to 2050

- In 1998 those over 60 years of age in the developed world outnumbered those under 15 for the first time.
- In 2047 the same thing will happen worldwide.
- In 1950 there were 12 people of working age (15-64) for every person 65 and over (12:1).
- In 2010 the ratio dropped to 9.1.
- By 2050 it is expected to fall to 4.1.



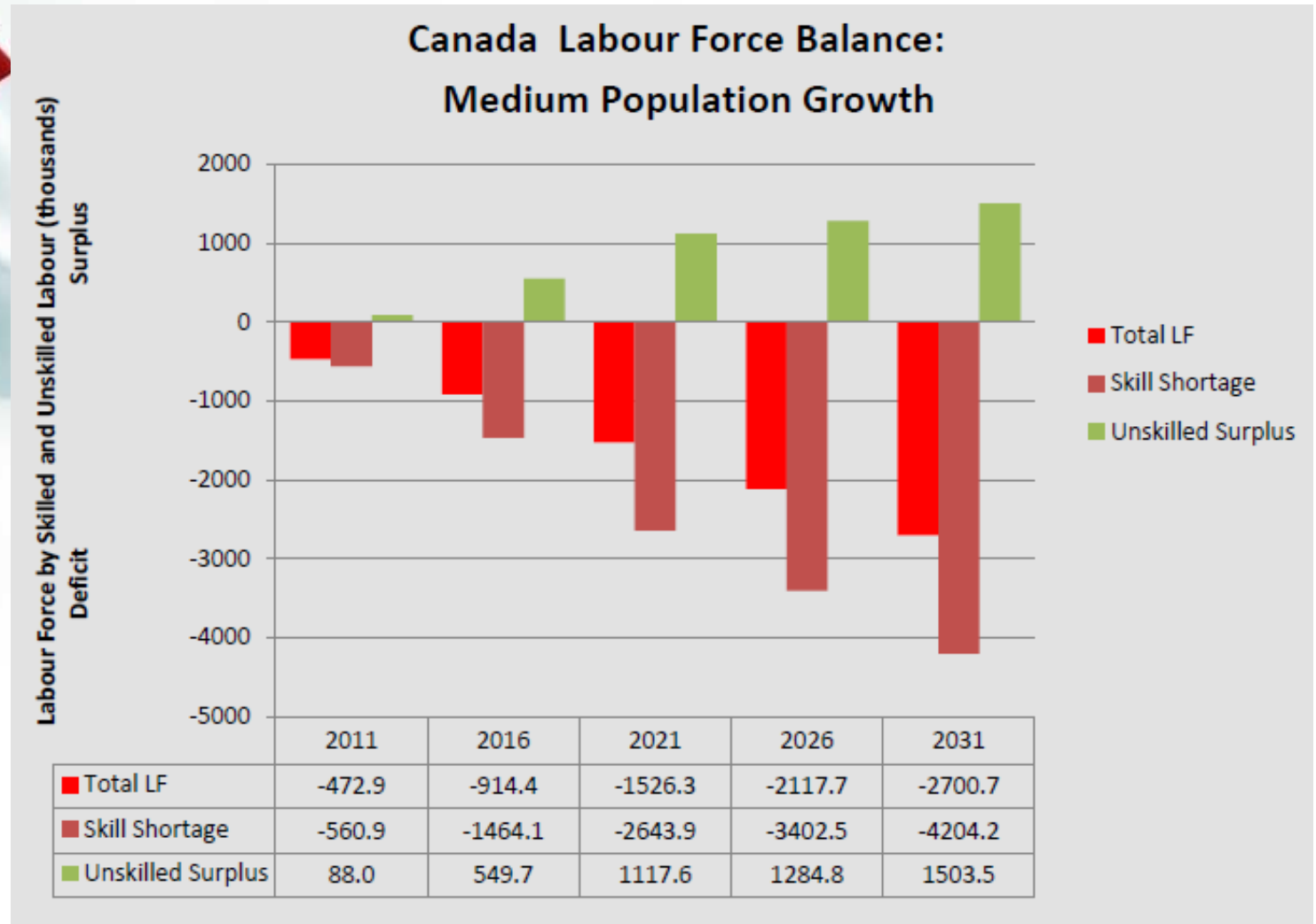
2007 > 2017 Canadian Labour Characteristics

(# of employed individuals over 25)



People without Jobs, Jobs without People

Canada's Labour Market Future



From Rick Miner, Ph.D. Miner Management Consultants

Industry Demographics

International Data: ICAO / IATA

Pilot and Training Demand	2018	2026
Total new pilots needing early private flight training (additional aircraft and retirement)	207,600	352,900
Total new pilots needing transition training on replacement aircraft	59,930	122,700

Maintenance Demand	2018	2026
Total mechanics needed for additional aircraft	247,100	420,000
Total mechanics including retirement	405,500	739,000

Boeing International Forecast

	Pilots	Maintenance
North America	97,350	137,000
Europe	94,800	122,000
Africa	13,200	15,000
Middle East	32,700	44,500
Latin America	37,000	44,000
Commonwealth of Independent States (former Soviet Republics)	11,000	14,000
Asia Pacific	180,600	220,000
Worldwide	466,650	596,500

Human Resources Challenges

Example: Bombardier Aerospace

- Hiring 1,500 new engineers and trades people.
- 10-20% of their hires will be recent graduates from specialized Canadian programs (e.g. SAIT, BCIT).
- Will also institute call-backs of senior and skilled workers.
- Global recruiting drive.

“Some of the jobs are so highly specialized and tailored to the aerospace industry that Bombardier recently sent a team of recruiters to the United Kingdom and France to find just the right mix of skills, talent and experience it required...one position took 700 days to fill...”

“They are highly specialized skills that we need to search the whole planet to find.”

Derek Sankey – Postmedia, published in the Montreal Gazette, Saturday, March 5, 2011

Labour and Skills Shortages in Key Aerospace Occupations Project

Objective:

- Establish whether labour or skills shortages have been identified in key aerospace manufacturing occupations in Canada.

Overview:

- Identify 10 key occupations in airframe manufacturing.
- Establish whether labour shortages have been identified in these key occupations.
- If labour shortages have been already identified in these key occupations, indicate the identified reasons for these shortages.
- Determine the current situation for these occupations, as well as the projected two to five year outlook.
- Identify the university, college, and institutes of technology programs and courses that are relevant to aerospace manufacturing.
- Canvass aerospace engineering, and related, programs to determine the number of yearly graduates.
- Report findings in a geographical breakdown of four identified regions across Canada.

Education and Training by Region

Aviation and Aerospace Specific Programs

Program	West Region	Ontario Region	Quebec Region	East Region	Total
Aircraft Avionics Technicians	46	106	21	22	195
Aircraft Electrical Assembly			36		36
Aircraft Maintenance Technicians *	303	269	106	44	722
Aircraft Mechanical Assembly			73		73
Aircraft Structures Technicians / Aircraft Structural Assembly	50	42	117	30	239
Aerospace Construction			38		38
Aerospace Manufacturing Engineering Technologist / Aerospace Manufacturing Technician	30	23			53
Avionics Basic			14		14
Gas Turbine *	15			9	24
Introduction to AME	11				11
Machining Technique / Tooling *	5		35		40
Precision Sheet Metal / Sheet Metal Technicians	24		36		60
Total	484	440	476	105	1505

*These numbers do not include apprentices/journeymen

Aerospace Engineering by Region

Approximately 200 students per year graduate from Canadian aerospace engineering programs, though numbers fluctuate.

The following chart lists the number of the aerospace engineering program graduates in each of the four regions in 2011.

Chart 14: Undergraduates and Graduates in Aerospace Engineering

	<u>Undergraduates</u>	<u>Graduates</u>
Ontario	226	90
Quebec	1489	141
West	0	0
East	0	0

Recently Completed Projects

- Labour Market Information System (LMIS) (demand).
- CCAA / CADA Aviation and Aerospace Courses / Programs Survey (supply).
- Human Resources Study of the Commercial Pilot in Canada.
- Airports Occupation Rationalization Study with CAC.
- Short Courses Training needs Assessment .
- Prior Learning Assessment and Recognition (PLAR):
 - Welder
 - Aviation Maintenance Technician
- Safety Management Systems.
- Skilled Workforce for the Future (Promoting the industry to Youth).
- Commercial Pilot Occupational Standard.
- Aviation Maintenance Technician (AMT) Curriculum Update.

CCAA Active Projects

1. Composite Fabricator Curriculum Development
2. H.R. Needs Assessment for employers and training organizations
3. New Occupational Standards
 - Transportation of Dangerous Goods Trainer
 - Airside Worker
4. Short Course Development
 - Document Navigation / Canadian Air Regulations (CARS) Introduction and Refresher
 - Accountable Executive
 - Audit Management
 - Aviation Manager

6. Transition and Student Workforce Issues

- Transition of skilled personnel from other sectors and the military to our sector
- Apprenticeship
- Dual Credits (e.g. for high-school AMOP graduates)

7. Commercial Pilot Instructor Curriculum

- Migration of CCAA tools to other sectors
- Collaboration with CAMPE



Thank you