# CARIC:

## A National Collaboration Initiative for the Canadian Aerospace Industry

CARIC

CONSORTIUM FOR AEROSPACE RESEARCH AND INNOVATION IN CANADA | CONSORTIUM EN AÉROSPATIALE POUR LA RECHERCHE ET L'INNOVATION AU CANADA

FUNDING PARTNER | PARTENAIRE FINANCIER

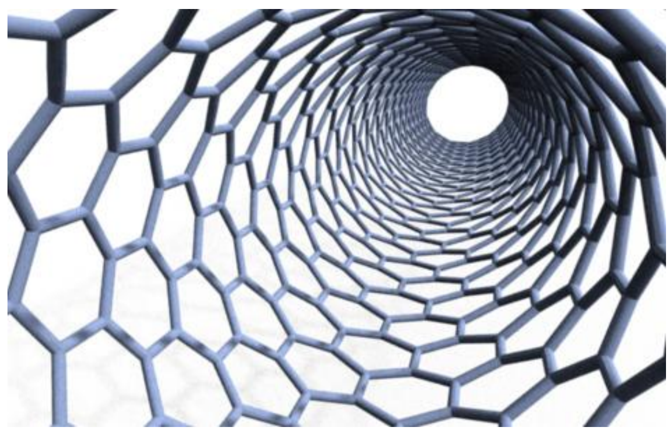
Innovation, Science and Economic Development Canada | Innovation, Sciences et Développement économique Canada

Dwayne Lucas – Regional Director
BCIT/AIAC(P), December 12. 2016

# CANADIAN AEROSPACE INDUSTRY

# CANADIAN AEROSPACE INDUSTRY - *INNOVATION*

- 20% of the industry’s activity is R&D
- Each year the industry invests $1.7 billion into R&D
- 5 times R&D intensity of Canada's manufacturing average
- R&D investment increased by close to 40% in the last five years



# ABOUT CARIC

# CARIC'S PURPOSE

1 Delivering innovation to position industry for success

2 Building a network to create synergy coast-to-coast

3 Training personnel to ensure sustainability

# OUR *RAISON D'ÊTRE*

- Our **core business**: R&D projects that lead to **innovative solutions**
  - Industry focused

- Our **vision**: a **key facilitator** for the Canadian aerospace research and technology development

# CONTRIBUTING TO AEROSPACE INNOVATION SINCE 2014

27

collaborative R&D projects for a total value of $36,4M

3

international projects with 7 countries

+50

students participating in CARIC projects – more to come!

108

Industrial and research members

+1500

participants at CARIC National Research Forum, in Montreal and Toronto

# INDUSTRIAL MEMBERS

BOMBARDIER

Pratt & Whitney Canada
Une société de United Technologies / A United Technologies Company

Bell Helicopter
A Textron Company

CAE

Esterline CMC Electronics

THALES

L3 MAS

MDA

SAFRAN Turbomeca Canada

3M

HÉROUX DEVTEK

GE

Mastering Innovation DELASTEK L'innovation en tête

SONACA MONTREAL

dema aeronautics

Avior

SIEMENS

HUTCHINSON

StandardAero

OPAL-RT

3DSemantix

marinvent CORPORATION

meloche

SAFRAN Messier-Bugatti-Dowty

TRANSTRONIC inc.

GROUPE SOTREM-MALTECH

3vGEOMATICS

creaform

JMJ Aéronautique

CS COMMUNICATION & SYSTEMS CANADA

Nutaq INNOVATION TODAY FOR TOMORROW

RAAS

edmit inc

CONAIR AERIAL FIREFIGHTING

Génik IMAGINER · IMPLANTER · INNOVER

asco

Aerosystems International Inc. AS9100 ISO9001 CAGE 3AC69

Atom RF & MICROWAVE

AÉROPORTS DE MONTRÉAL

CORIOLIS composites

SINTERS AMERICA

solaxis Ingéniosité Manufacturière

LAFLAMME AÉRO

LIBURDI AUTOMATION

socomore

TEXONIC

ABIPA

E-KUT ELECTRO-KUT INC.

Exonetik

GLOBVISION

HUYS

CRAY

FusiA

isoneo solutions

APN

GASTOPS

NETUR USINER POUR PROPULSER

L'art de l'étanchéité ELASTO PROXY The Art of Sealing

IMSTRAT CORPORATION A Proven Geospatial Solutions Leader

GLOBVISION

NGC INTERNATIONAL

TEKNA

LATITUDE Optimize every flight.

iders

mds Measured by the Power of Precision

COMTEK Advanced Structures

MESOTEC

ADVANCED POWDER COATING

PLASMIONIQUE

MD PRÉCISION 1994 INC OUTILLEURS · MACHINISTES

sonaca MONTRÉAL

VIGILANT

STELIA NORTH AMERICA

TECHNI PRODEC FABRICANT DE PIECES FIABLES

RTI | Claro, Inc.

urthecast

# UNIVERSITIES AND COLLEGES

POLYTECHNIQUE MONTRÉAL
ÉTS
Université Concordia University
Université de Sherbrooke
McGill

Université Laval
UQAC Université du Québec à Chicoutimi
UQTR Savoir. Surprendre.
UQÀM
Université de Montréal
Carleton University

CTA Centre technologique en aérospatiale
CDCQ Centre de développement des composites du Québec
uOttawa
CRVI Centre de Robotique et de Vision Industrielles
OPTECH Montréal
HEC MONTRÉAL

CMQ Centre de métallurgie du Québec
Groupe CTT Group
Solutions Novika
University of Windsor
UBC
UNB University of New Brunswick

University of Manitoba
University of Victoria
Ryerson University
Queen's University
University of Ontario Institute of Technology

# RESEARCH ORGANIZATIONS AND ASSOCIATE MEMBERS

Canada NRC·CNRC

CRIQ PARTENAIRE D'INNOVATION

INO

INRS Université d'avant-garde

Canadian Light Source | Centre canadien de rayonnement synchrotron

Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

CSA Group

AIAC

CRIAQ

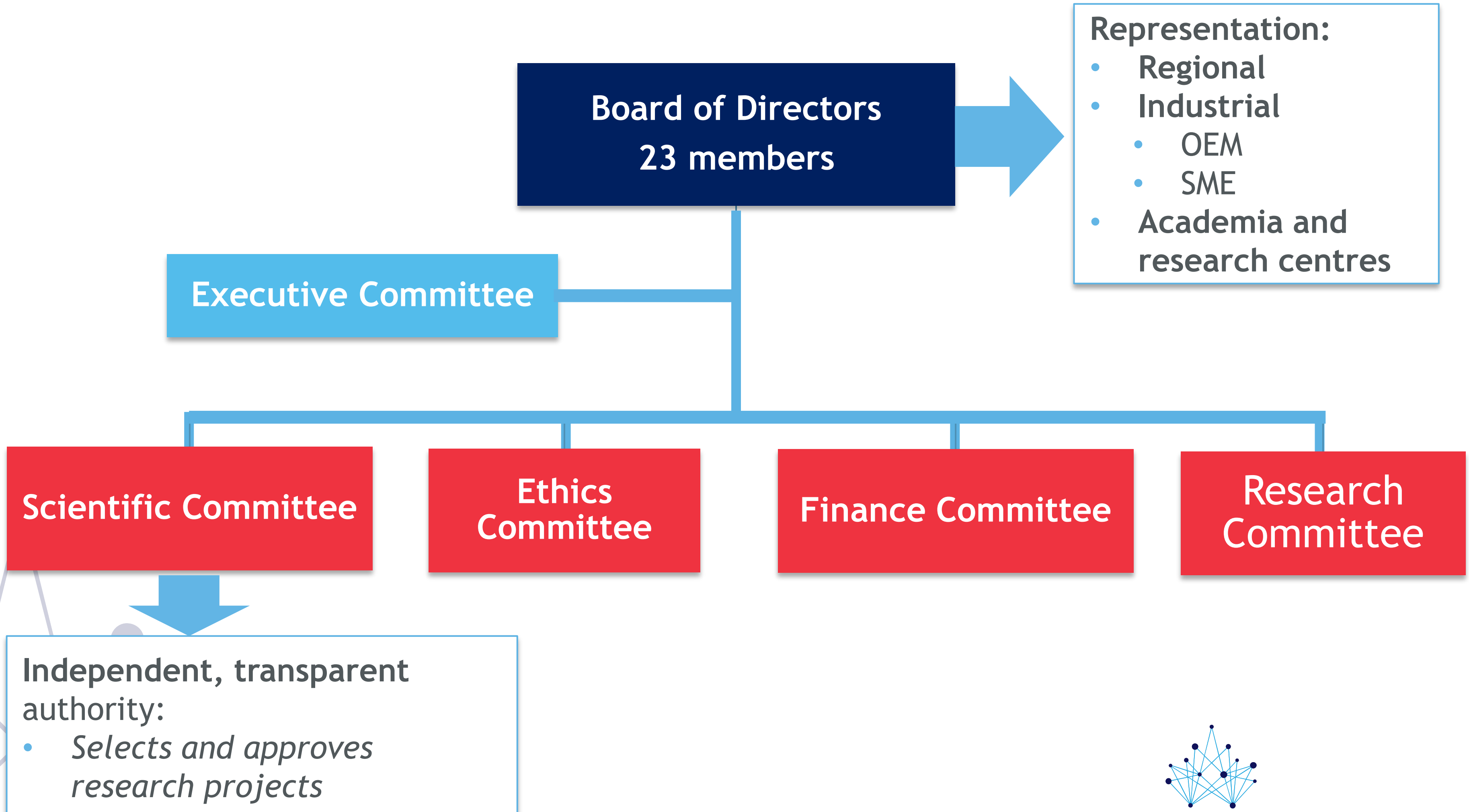
OAC ONTARIO AEROSPACE COUNCIL

Springboard Bringing Research to Life

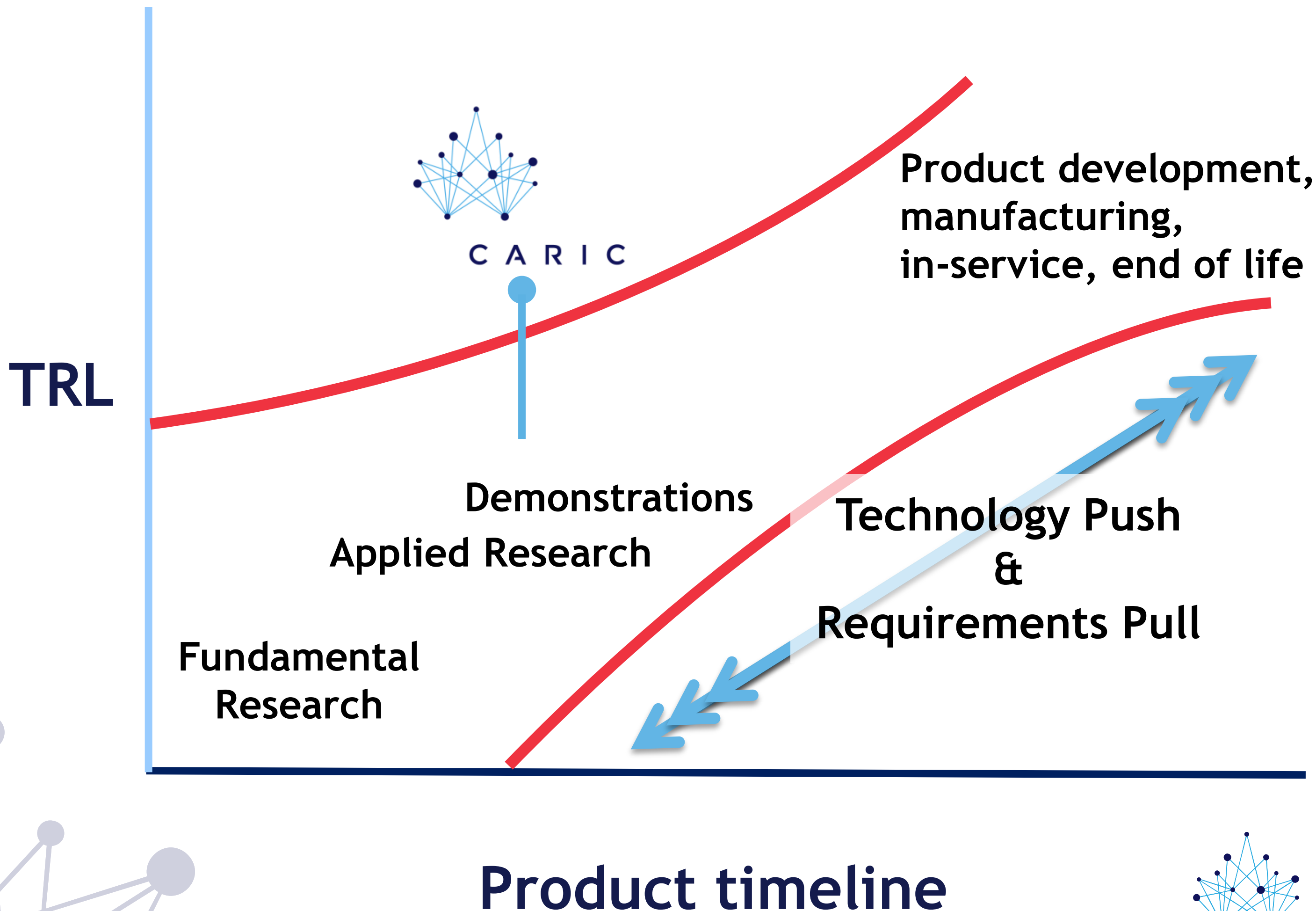
MANITOBA AEROSPACE

# COAST-TO-COAST FOOTPRINT

# GOVERNANCE


Board of Directors
23 members
Representation:
Regional
Industrial
OEM
SME
Academia and research centres
Executive Committee
Scientific Committee
Ethics Committee
Finance Committee
Research Committee
Independent, transparent authority:
Selects and approves research projects

# CANADIAN AEROSPACE RESEARCH CONTINUUM



# TACKLING REAL-WORLD ISSUES

# TACKLING REAL-WORLD ISSUES

- **Fabrication costs** (new materials, robotics, optimized processes)
- **Cost of operations** (optimized routes (IT), avionics, control systems)
- **Protection of the environment** (fuels, optimized routes, noise reduction)
- **Airborne security** (information systems, sensors, certification of materials)
- **Airfield security** (sensors for traffic control, de-icing)
- **Well-being** of the crew and passengers (interior design, human factors)
- **Training** (simulation)

# RESEARCH THEMES
# *PROGRAM MANAGEMENT FRAMEWORK*

| | | |
|---|---|---|
| Acoustics, noise control, environment, security, icing (ENV) | Composites (COMP) | Modeling, simulation, multidisciplinary optimization (MDO) |
| Air operation and human factors - organizational innovation (*OPR*) | Diagnostics, pronostics, surveillance of components (DPHM) | Product and system development, productivity (PLE-P) |
| Autonomous systems (AUT) | Interior design (INTD) | Supply chain optimization and LEAN (LEAN) |
| Avionics and control (AVIO) | Manufacturing and assembly processes, quality assurance (MANU) | |

# PROJECT LAUNCH PROCESS

# CARIC COLLABORATIVE PROJECTS

| | Low TRL - Understanding Technology  | Mid TRL - Maturing Technology  |
|---|---|---|
| **Partnership** | 2 industrial partners + 2 academic partners | |
| **Stacking limit** | 75% | |
| **CARIC funding** | max. 10% of eligible project expenditures | max. 50% of eligible project expenditures |
| **Funding recipients** | Universities, colleges, research organizations delivered | Industries, universities, colleges, research organizations delivered |

# CONCLUSION

Collaboration and mobilisation are the keys to consolidate Canada's competitiveness…

…and CARIC is the tool enabling it.