



Manitoba Aerospace Workshop

Panel 1: Manitoba Technology Priorities for Economic Development

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Boeing Canada Winnipeg



Headquarters at Murray Park Road location

Largest aerospace composite manufacturer in Canada

Boeing Canada Winnipeg

Our Vision

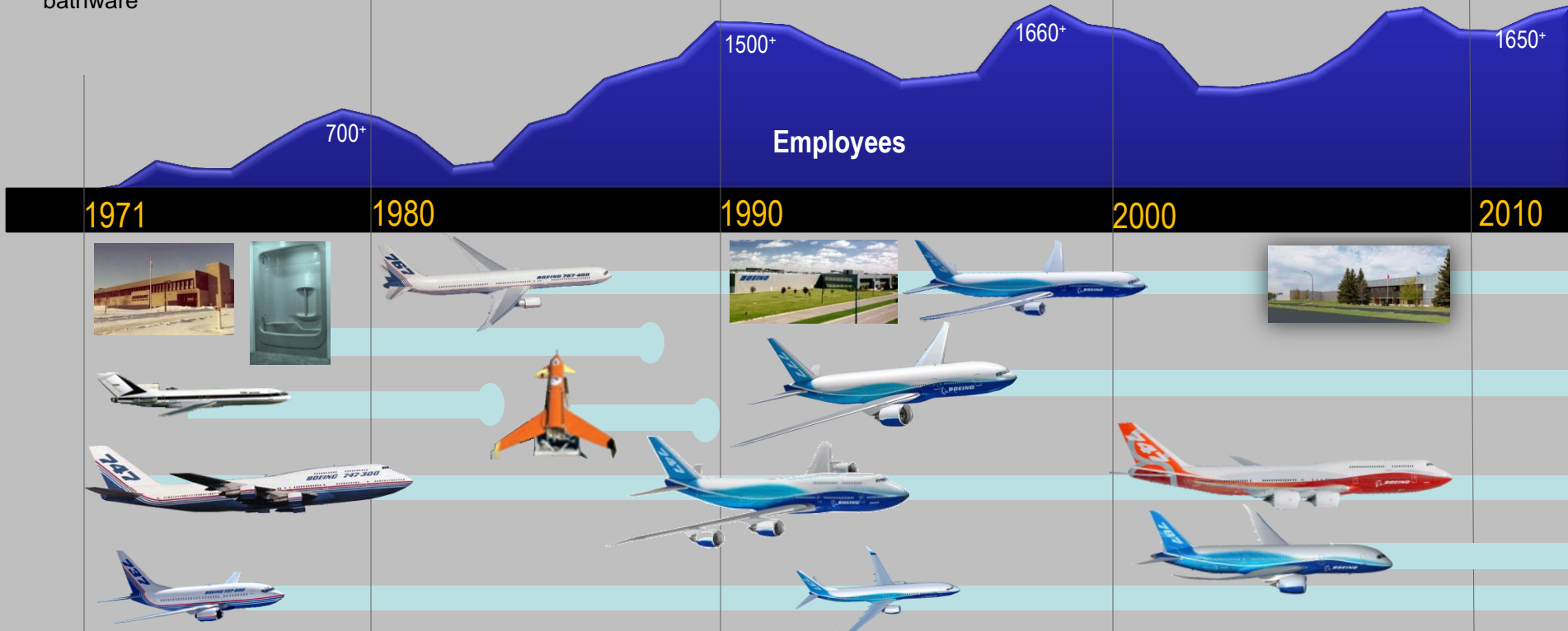
Together, we are a spirited and compassionate team creating innovative composite solutions to advance the future of flight.



Boeing Canada Winnipeg

Our History

- Murray Park site opens
- 72K ft² facility
- \$3.5 M Boeing aircraft structural fiberglass plant
- Low complexity fabrication
- 747 Wing Closeout Panels
- Expand to 130K ft² "Phase II"
- Higher complexity work: 727, 737, 747 SP WTBF
- Diversify into acrylic bathware
- Work on 737, 767 engine strut fairings and 747-400 WTBF
- Lease 96K ft² facility on Plymouth Ave
- Higher level of complexity and integration of purchased hardware
- Facility expands to 520K ft² with "Phase III"
- Develop 777 design build team and 737 integrated product team
- Lease Sask & Redwood – 210K ft²
- Expand MP by 21K ft² Autoclave #6
- Major investment in automated processing equipment
- Tier 1 Partner to design and build 787 WTBF
- Deliver first 787 assemblies in 2007



Boeing Canada Winnipeg

Our Products

Misc Ducts

747, 767, 777, 787

Engine Strut Aft Fairing

737, 747, 767, 777, 787

Engine Strut Fwd Fairing

737, 777, 787

Rudder Fairing

787

Vertical Fin Fairing

787

Wing to Body Fairing

737, 747, 787

Vertical & Horizontal Stabilizer Ribs

777

Nose Gear Door

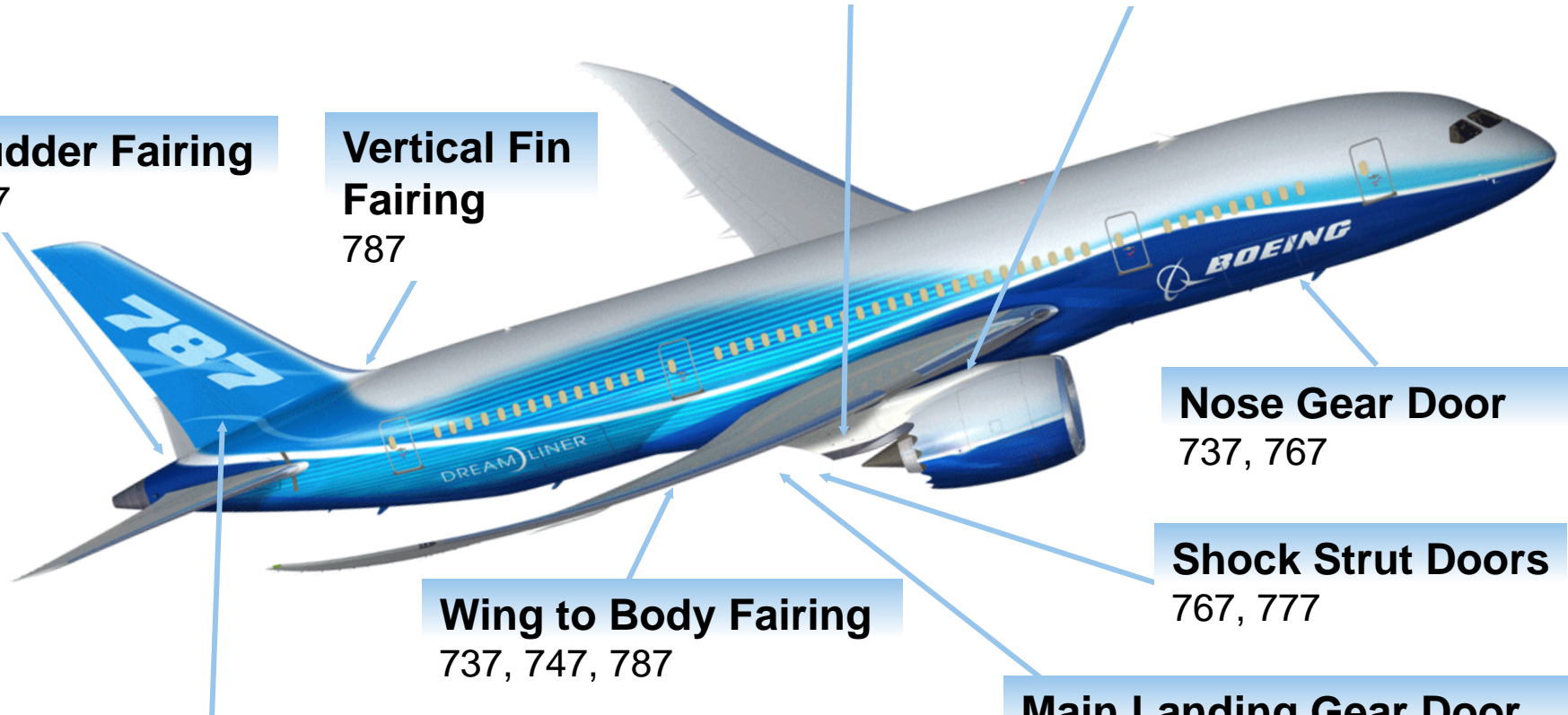
737, 767

Shock Strut Doors

767, 777

Main Landing Gear Door

787



Boeing Canada Winnipeg

Composite Manufacturing: Process Flow

NC Cloth Cutting



Core Fabrication



Lay-Up



Autoclave Cure



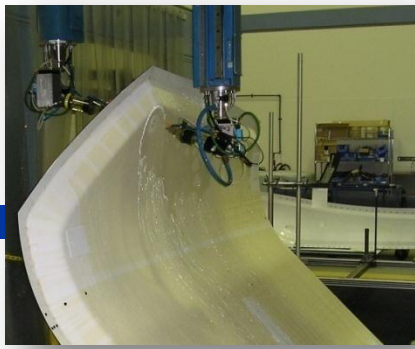
Paint



Assembly



NDI Scanner



NC Trim



Perspective on the Emerson Review

Key Messages

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- **“...focus on technologies where Canadian companies can build on its competitive advantage...” with flexibility and periodic review**
- **“...influenced... by... the need to increase aircraft efficiency and reduce fuel use and environmental impacts.”**
- **“A deliberate national approach to aerospace... will ensure that knowledge generated...reaches industry and is imbedded in the supply chain...”**

Boeing Canada Winnipeg Technology Roadmap

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Tech Strategy

Use technology and knowledge to increase product value

Target higher complexity strategic processes & products

Provide best value & Innovative Design solutions

Provide Boeing with world-class composite capability

Utilize Partnerships



Product Needs

Low Cost Materials and Processes

“Green” Materials and Processes

Labour Optimization

High Performance Materials

Continuous Flow Manufacturing

Capital Cost Reduction

Large Scale Structures/ Complex Components

Advanced Product Conformance



Development Projects

Project Domains

Adv. Mat'l & Processes (AMP)

- Develop, demonstrate and introduce new materials and processes to satisfy Products Needs and drive improvement Outcomes

Right Sized Equipment (RSE)

- Develop, demonstrate and introduce tools and equipment to support new materials and processes, product workstatement changes, and enable improvements and Lean activities



Reduced Manufacturing Costs



Increased Aircraft Performance



Reduced Product Life Cycle Costs



Reduced Non-Recurring Costs

Canadian Composites Manufacturing R&D Consortium (CCMRD)

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- **Industry led consortium with a mandate to develop and demonstrate advanced composite manufacturing technologies in Canada.**
- **BR&T (Boeing Research & Technology) initiative and funded by Boeing as a tier 1 Partner**
- **Facilitated / Managed locally by Composites Innovation Center**
- **CCMR&D is the preferred external composites research venue for BCW**
- **<http://www.ccmrd.ca/>**

CCMR&D Active Projects

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- **High Temperature Materials**
 - **This project will investigate the feasibility of several recently developed high temperature composite materials for aerospace structure applications. The aim is to increase the temperature limit where composite materials can be applied in a cost effective manner.**

- **Out of Autoclave Sandwich Panels**
 - **This project will develop and demonstrate industry expertise using out of autoclave materials and processes to manufacture aerospace quality sandwich panels. The aim is to reduce energy usage, labour and capital equipment costs.**

CCMR&D Active Projects

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- **Co-Process Development for Aerospace Structures**
 - This project will develop and demonstrate techniques to reduce manufacturing steps for the fabrication of large integrated composite structures. The aim is to reduce manufacturing steps, time and cost.

- **Next Generation Composite Factory**
 - This project will develop and demonstrate the benefits of advanced composite process control to reduce processing risk, scrap rates, lead times and process cycle times.

