The Boeing Company
Dr. William Lyons
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WHAT WE DO TODAY

The Next 100 Years

COMMERCIAL AIRPLANES
Boeing 7-series family of airplanes leads the industry

DEFENSE, SPACE & SECURITY
World’s largest manufacturer of military aircraft and satellites and major service provider to NASA
Large-scale systems integration, networking technology and solutions provider

GLOBAL SERVICES
A dedicated services business focused on the needs of global defense, space and commercial customers

BOEING CAPITAL CORPORATION
Financing solutions focused on customer requirements

Connect and protect people globally

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What Will Change Aerospace?

Digitization
Artificial Intelligence
Autonomy
Advanced Manufacturing
Electrification
Increased Competition
Increased Access to Space
How Do We View Innovation?

Customer needs

Military

Government

Airlines

Services

Strategies to create and sustain key objectives

Innovative solutions

Partners
Academic, industrial, trade associations, government and international
Research & Development at Boeing
Robust and widespread

BR&T

Internal

External or Joint

Boeing Commercial Airlines
Boeing Defense, Space & Security
Boeing Global Services

11 BR&T Research Centers

Universities
Partnerships
Contract Research and Development contracts
Trade/Industry groups
Supplier relationships
Global customers
USA Boeing Research & Technology consortia
Delivering advanced technology in collaboration with industry, academia and government partners
An important structure that helps maximize our R&D ROI
International Boeing Research & Technology consortia

Delivering advanced technology in collaboration with industry, academia and government partners

**United Kingdom**
- AMRC: Advanced Manufacturing Research Center
- AFRC: Forming technologies
- IVHM: Health management – Cranfield University
- TWI: Welding and Joining

**Netherlands**
- TPRC: Thermoplastic Research Center – Univ. of Twente

**China**
- ASRC: Aviation Services Research Center (Hong Kong)
- NCAIR: Manufacturing (ITT-B)
- ANRC: Systems & Networks

**India**
- KICP- KAUST: Structures and light weight materials

**Saudi Arabia**
- MASDAR: Biofuels (Masdar Institute)

**United Arab Emirates**
- A*STAR: Manufacturing and support technologies
- LIVE WELL: Cabins & Interiors

**Canada**
- CCMRD: Canadian Composite Manufacturing R&D
- CRN: Composites Research Network
- NSERC CRSNG: Canadian Network for Research & Innovation in Machining Technology
- GARDN: Green Aviation Research and Development Network

**Germany**
- DMRC: Digital Manufacturing – Univ. of Paderborn
- CCeV: Carbon Composites e.V.

**Japan**
- CMI: Consortium for Manufacturing Innovation

**Singapore**
Government co-investments & collaborations

- DARPA, ARL, NASA, NRL, FAA
- CDTI, EU H2020
- ATI
- LuFo, EU H2020
- METI, JADC
- COMAC
- MoTIE, Samsung
- KAUST, KACST
- STRATA
- NRC, UV, UBC
- University of Victoria
- THE UNIVERSITY OF BRITISH COLUMBIA
- CSIRO, UQ
- DARPA, ARL, NASA, NRL, FAA
- CDTI, EU H2020
- ATI
- LuFo, EU H2020
- METI, JADC
- COMAC
- MoTIE, Samsung
- KAUST, KACST
- STRATA
- NRC, UV, UBC
- University of Victoria
- THE UNIVERSITY OF BRITISH COLUMBIA
- CSIRO, UQ
Strategic Technical University (STU) focus areas

- CALTECH
  Aero sciences, applied physics, electronics

- CAMBRIDGE
  Analytics and simulation, cyber security, materials

- CARNEGIE MELLON
  Robotics, automation, cyber security, materials

- GEORGIA TECH
  Advanced manufacturing, materials, flow control

- HOWARD
  Materials, tribology

- INDIAN INSTITUTE OF SCIENCE
  Manufacturing, materials, structures

- MIT
  Autonomy, applied physics, flight sciences, robotics

- STANFORD
  Flight sciences, data analytics, systems

- TSINGHUA
  Biofuel, cabin technology, advanced materials

- UNIVERSITY OF ILLINOIS URBANA CHAMPAIGN
  Trusted network, cyber security, data analytics

Partnerships with the world’s leading universities
BR&T Research Centers

**BR&T-Alabama**
- Simulation and Decision Analytics
- Lean Characterization Cell
- PSO

**BR&T-California**
- Flight Sciences
- Electronics and Networked Systems
- Structures

**BR&T-Missouri**
- Systems Technology
- Digital Aviation and Support Technology
- Rate Independent Production
- Next Gen Materials

**BR&T-South Carolina**
- Manufacturing Technology
- Composite Fuselage Manufacturing

**BR&T-Washington**
- Manufacturing Technology Integration
- Composite Wing Manufacturing

**BR&T-Europe**

**BR&T-China**
- Biofuels, Advanced Materials, Support 7 Services, Cabin Technology

**BR&T-Brazil**
- Biofuels, Metals, ATM, AeroSciences & Remote Sensing

**BR&T-India**
- Adv. Computational Methods, Active Flow Control, Propulsion, Composite Optimization
- NDI, Coatings, Polymers, Metallic Processes
- ATM, Cyber Security, EME, Airplane Health Management, Data Analytics

**BR&T-Korea**
- Smart Factory, Smart Cabin
- Avionics Vertical
- Autonomy
- Materials & Parts
Our Challenge

Focus innovation around customers, who expect more for less

Generate greater value than the sum of our many parts

Improve development-program performance

Apply lessons learned; prevent repeat of missteps on future efforts

Find ways to innovate for significantly less cost

Use diversity, global footprint, partners and know-how around the world to excel in innovation

*Boeing's Global Footprint and Innovative culture is the key to future innovation*
Protecting the Second Century
Innovation that gives you a competitive edge

Leading aerospace innovation that defines Boeing's second century