SHOW US YOUR ANGLE.

BOEING INNOVATION CHALLENGE

Virtual Student Kickoff

September 10, 2019

SEPT 2019 - JAN 2020
PUGET SOUND, WA

Please contact your school faculty focal for student information package

9/10 BIC Kickoff Agenda

- BIC Challenge Overview
- Competition Requirements & Logistics
  - Eligibility Requirements
  - Key Dates
  - Judging Criteria
- Phase 2
  - Student Innovation Agreement
  - Virtual Cross-University Teaming
- Phase 3
  - 3 Day Hackathon
- BIC Contacts
- Q&A & Ref

The Boeing Innovation Challenge (BIC)

This is a multi-university competition that brings diverse students together to demonstrate their capabilities in a fast paced, open innovation teaming environment (Just like Industry)

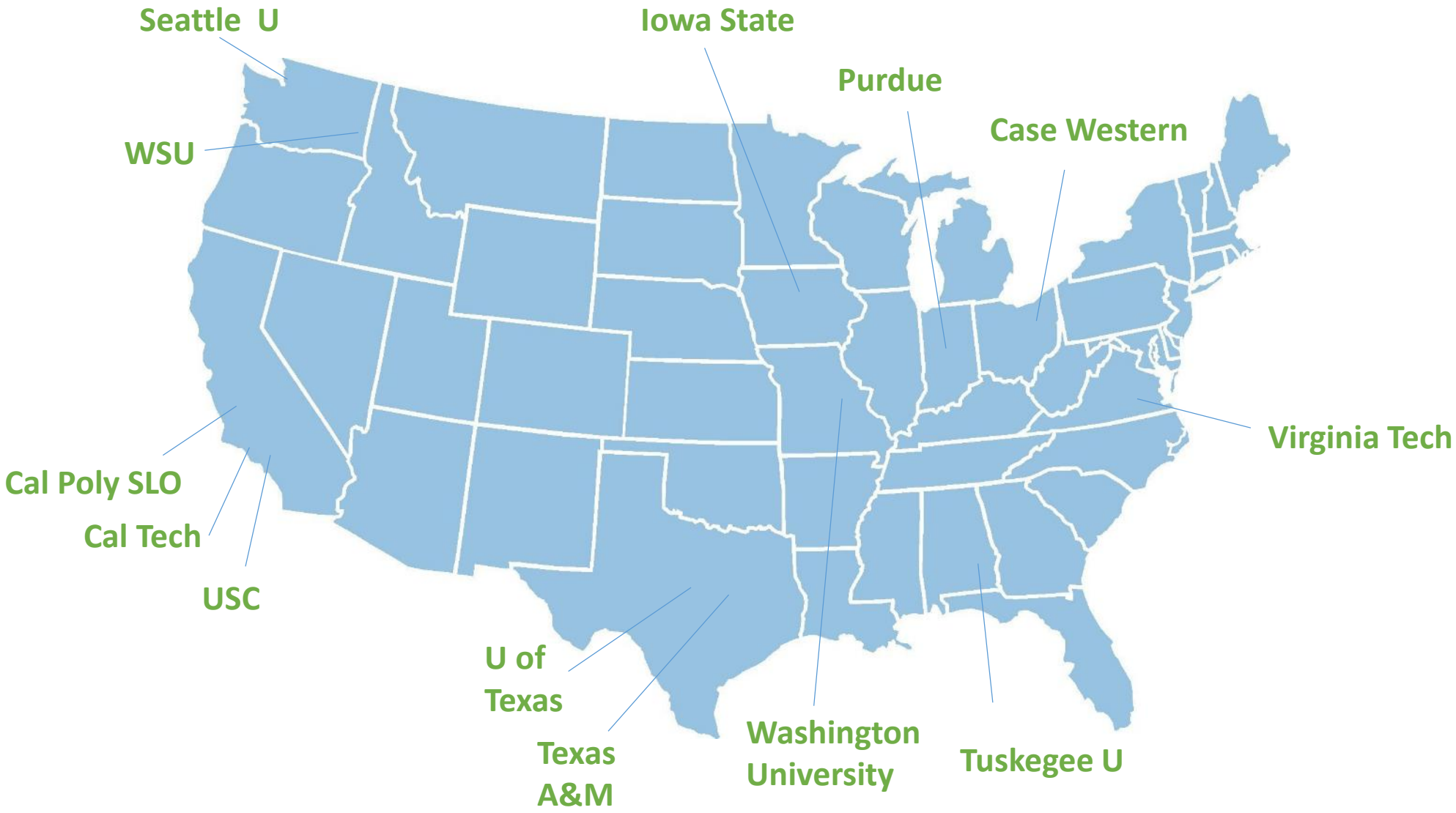
This Challenge is a unique student opportunity with diversity and inspiration to create solutions of value to Boeing and to the world.

Commercial Aircraft Innovation State of the Art:
The Boeing 787

Why participate in the BIC?

- Gain experience with real industry problems with faculty and professional mentors
- Demonstrate your innovation, diversity, teaming, and productivity skills
- Create a network of students, faculty, and professionals (including Boeing leaders)
- Win the opportunity to apply for exclusive Boeing internships (2nd phase participants only)

2019 BIC – 13 Participating Universities



BIC Student Materials -

1. **The Student Package** – From Your Univ. Student Coordinator

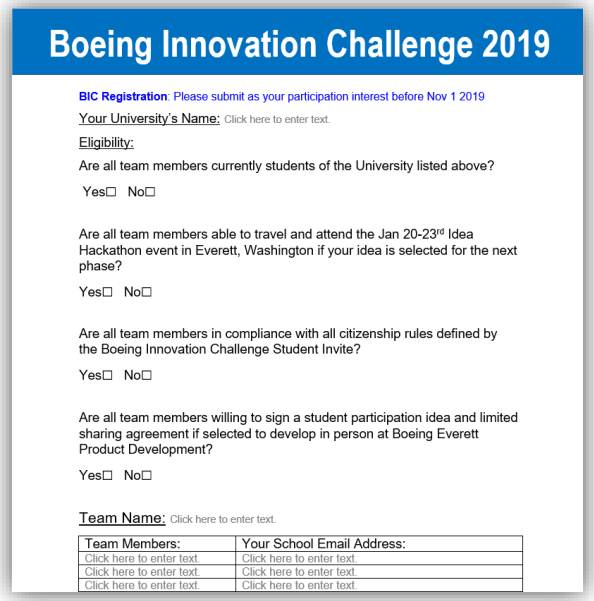
2. **Student BIC Registration** – Download from University Website (or other) – Students to register their participation by **Nov.1st** .

3. **Team Idea Submittal Form** – Students fill in each section of the Quad (see example or other) to well summarize their idea – if need more graphics, processes or ref. - attach a page 2 (one added page only) and submit final no later than **Nov 15th**.

4. **University BIC Web Page** – University coordinators to set up a quick University page they can post local BIC information and linked forms to the **Boeing BIC Web Page**. (In Work)

5. **Commercial Aircraft Innovation Ref. Guides –** See attached and updates on BIC Web

6. **BIC Contacts:** First – Your University Student Coordinator, Second your Boeing University Champion, Third – email: boeinginnovationchallenge@boeing.com



Boeing Innovation Challenge 2019

BIC Registration: Please submit as your participation interest before Nov 1 2019

Your University's Name: Click here to enter text.

Eligibility:

Are all team members currently students of the University listed above?

Yes☐ No☐

Are all team members able to travel and attend the Jan 20-23rd Idea Hackathon event in Everett, Washington if your idea is selected for the next phase?

Yes☐ No☐

Are all team members in compliance with all citizenship rules defined by the Boeing Innovation Challenge Student Invite?

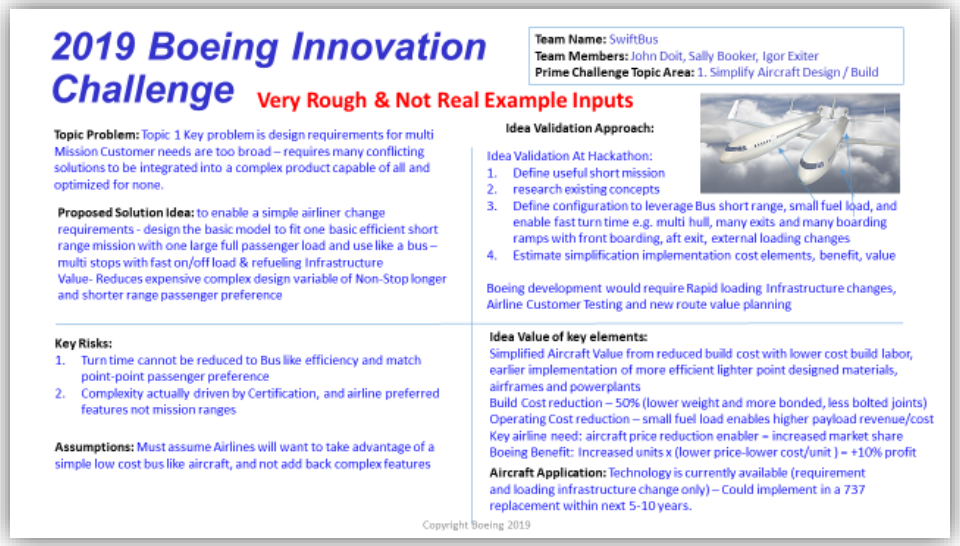
Yes☐ No☐

Are all team members willing to sign a student participation idea and limited sharing agreement if selected to develop in person at Boeing Everett Product Development?

Yes☐ No☐

Team Name: Click here to enter text.

Team Members:	Your School Email Address:
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.



2019 Boeing Innovation Challenge

Very Rough & Not Real Example Inputs

Team Name: SwiftBus
Team Members: John Doit, Sally Booker, Igor Exiter
Prime Challenge Topic Area: 1. Simplify Aircraft Design / Build

Topic Problem: Topic 1 Key problem is design requirements for multi Mission Customer needs are too broad – requires many conflicting solutions to be integrated into a complex product capable of all and optimized for none.

Proposed Solution Idea: to enable a simple airliner change requirements - design the basic model to fit one basic efficient short range mission with one large full passenger load and use like a bus – multi stops with fast on/off load & refueling Infrastructure
Value- Reduces expensive complex design variable of Non-Stop longer and shorter range passenger preference

Idea Validation Approach:

Idea Validation At Hackathon:
1. Define useful short mission
2. research existing concepts
3. Define configuration to leverage Bus short range, small fuel load, and enable fast turn time e.g. multi hull, many exits and many boarding ramps with front boarding, aft exit, external loading changes
4. Estimate simplification implementation cost elements, benefit, value

Boeing development would require Rapid loading Infrastructure changes, Airline Customer Testing and new route value planning

Key Risks:
1. Turn time cannot be reduced to Bus like efficiency and match point-point passenger preference
2. Complexity actually driven by Certification, and airline preferred features not mission ranges

Assumptions: Must assume Airlines will want to take advantage of a simple low cost bus like aircraft, and not add back complex features

Idea Value of key elements:
Simplified Aircraft Value from reduced build cost with lower cost build labor, earlier implementation of more efficient lighter point designed materials, airframes and powerplants
Build Cost reduction – 50% (lower weight and more bonded, less bolted joints)
Operating Cost reduction – small fuel load enables higher payload revenue/cost
Key airline need: aircraft price reduction enabler – increased market share
Boeing Benefit: Increased units x (lower price-lower cost/unit) – +10% profit

Aircraft Application: Technology is currently available (requirement and loading infrastructure change only) – Could implement in a 737 replacement within next 5-10 years.

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BIC Student Eligibility

Eligible participants must be:

1. A U.S. citizen or U.S. person (Green Card+) http://export.pitt.edu/overview/export-definitions/us-person-vs-foreign-person
   Note: Boeing is precluded from hosting citizens of Cuba, Iran, North Korea, Sudan, and Syria.
2. An active student at a participating school through the duration of the competition.
3. At least a sophomore.
4. Part of a two- to three-member idea-forming team.
5. Willing and able to participate in the next phase of the competition.
6. Willing to diversify their ideas and team if selected to participate in the next phase.
7. Willing to sign the “Boeing Innovation Competition Student Agreement” if selected for the next phase
   (Boeing Proprietary and Work Product IP Assignment)

Eligible participants must not be:

1. A direct Boeing employee or contractor working for The Boeing Company at any time during the competition.

Key BIC Dates

Phase 1

- Nov. 1, 2019 – Student Registration Complete
- Nov. 15, 2019 – Idea Entries Submitted
  (by Midnight Pacific Standard Time)
- Nov. 27, 2019 – First-round winning entrants notified

Phase 2

- Jan. 10, 2020 – Virtual Team Diversification
  - Self-formed re-teaming down to 8-10 separate ideas of greatest group interest

Phase 3

- Jan. 20-22, 2020 – Hackathon in Mukilteo, Washington to evolve ideas and present to Boeing leaders

Judging Criteria

Entries will be judged based on:

- Creativity - Surprising innovation
- Technical content, modeling, or analysis.
- Relevance to Commercial Aircraft Challenge Topics
- Lifecycle value, with increased flying travel preference.
- Clarity/ Organization – Diverse team synergy
- Potential for diversification – Integration into multiple opportunities

Phase 2 - Selected Student Innovation Agreement

Intellectual Property Agreement (per the Student Invite)

- By entering this competition, Participants understand that in order to proceed to Round 2 of the competition, Boeing will require the participants to sign the “Boeing Innovation Competition Student Agreement”.
- If selected to participate in the in-person event, information about projects developed may not be shared outside of The Boeing Company.
- Project titles and a team picture may be shared publically upon approval of The Boeing Company. If teams or students would like to pursue development of their projects beyond the end of the competition, students will have the opportunity to request a license from The Boeing Company to further explore their ideas.
- If there are any questions about intellectual property, please contact your school focal for guidance.

Note: No Student agreement is necessary to enter round 1 of the BIC

The Student Agreement is for selected winning students going to round 2 to enable upcoming work in person with Boeing specialists with assignment of their ‘Work Product’ IP to the Boeing Company, and agreement to not disclose to others Boeing proprietary information shared with them including the Work product – see the Student Agreement for full details.

BIC Phase 3 – Hackathon Overview In Everett Wa.

Jan 20-22, 2020

- Travel to Everett sponsored by Boeing
- Reception, Meet Boeing Executives
- Factory Tour
- Develop Ideas in Cross University Teams
- Presentation to Boeing Judges
- 2020 Intern Opportunity

BOEING

SHOW US YOUR ANGLE.

BOEING INNOVATION CHALLENGE

BUILD

Build your innovative ideas to shape the edge for the next generation aerospace on the given areas.

INSPIRE

Inspire Boeing experts with your ideas and come join an on-site challenge in the Boeing Puget Sound.

CONNECT

Connect with Boeing experts, work with students from other universities to show your new angle.

Aircraft design/ build Simplification

Adaptable Cabins

Applied Industry Innovation

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Please contact below for further information
(YourStudentCoord @ YourUniversity)

BIC Category Detail Overview

(See Student Invite for full descriptions)

Topic 1: Simplifying Commercial Airplanes

- Innovations to dramatically simplify an aspect of design, manufacture or operation.
- Significant design/build cost reductions over competitors, while improving useful functionality
  - Innovative structures architectures, and/or material systems.
  - Improvements in safety, quality or build costs.
  - Simplification or reduction of design requirement
  - Multifunctional, more integrated architectures (e.g. combining two or more of structures, systems, passenger cabin, propulsion, flight sciences.)

Topic 2: Creating Efficient, Adaptable and Flexible Airplane Cabins

- Innovations that strengthen the capability of the future Boeing Cabin by meeting the current and future needs of airlines and passengers.
- Getting people, baggage/cargo on and off the airplane more efficiently
- Reducing the time needed for servicing the airplane cabin, including: catering, cleaning, water and waste systems, and even fixing/checking something that is not working properly.

Topic 3: Cross Industry Aircraft Innovation

- Non-aerospace technologies with beneficial applications for airplanes, crews and passengers to enhance the total travel experience.
- Cross industry “not invented here” innovation applies concepts from non-aviation fields into new aviation applications to quickly enable significant value improvements – recent examples
  - Additive manufacturing.
  - WiFi communication.
  - Tablet computing.
  - Virtual reality.

Boeing Innovation Challenge – Useful Ref. Material:

(Also anything similar in your University Library – use for design drivers and known options)

Introduction to Aircraft Design
John P. Fielding
Cambridge University Press, 1999

Evolution of the Airliner
Ray Whitford
Crowood, 2007

AIRCRAFT DESIGN: A Conceptual Approach
Daniel P. Raymer, Ph.D.
AIAA Education Series, 1999

Value Proposition Design: How to Create Products and Services Customers Want (Strategyzer)
Alexander Osterwalder , Yves Pigneur , et al.
Wiley, 2014

Ten Types of Innovation: The Discipline of Building Breakthroughs
Larry Keeley
Wiley, 2013