2022 Blue Skies Competition
Q&A Session Summary Document
November 9, 2021; 3:00-4:30 PM Eastern

General Technical Questions Received in Advance

1. **What type of future airplanes is this project most interested in? Sustainable fuel (e.g. hydrogen) planes, electric airplanes, eVTOLs, etc.? Is there a certain type of these airplanes that the project is more geared toward?**
    - A large part of the theme is climate friendly aviation. Which type of planes and what kind of fuel they use is up to you to select and justify based on your research of the technology and 2050s aviation landscape.

2. **What is the expected capacity for the airport? How many customers, how many airlines, what is the expected daily volume?**
    - Many airports see their capacity change over time. Your chosen airport location and your assessment of the 2050s aviation landscape should help determine capacity.

3. **What type of aviation is this focusing on? (commercial, non-commercial, private, etc.)**
    - Many airports serve multiple aviation market types. Based on your 2050s aviation landscape research and airport design assumptions, you may decide to include multiple types.

4. **Should we consider parking structures in the design of gates?**
    - If it is something that needs modification because of assumed technology advancements or changed airplane designs, you should consider it.

5. **Is there a specific location that the project is based in?**
    - No, the location is up to the student team.

6. **Should our design take into account multiple terrains, weather conditions, and elevation or can we design for a specific location? In other words, is it a universal design or can it zone specific?**

- Either. You may make your design more generic or zone-specific. However, terrains, weather conditions, elevation, and other factors that affect assumptions and design choices should be considered.

7. **Should we plan to work with a large international airport that will have dated infrastructure?**
   - This is up to the student team. The current aviation industry -- and you as part of the future of it! -- will have to upgrade our existing airports to support the climate friendly aviation industry of tomorrow.

8. **Is there a budget to be considered when designing the airport?** **Similar questions:** **Should we consider budget as a determining factor? Are there financial constraints for the airport design (i.e. predicted costs shouldn't exceed a certain amount)?**
   - There is no specific budget, but you may want to consider general financial feasibility when making design choices.

9. **What can we and what can't we design for runways especially their length and orientation to each other?**
   - You may design any of the runway aspects you deem necessary, but this should not be a focus area in your Technical Paper (as stated in Project Description section).

10. **Define "Airport." Does this refer to just the building or the whole site?**
    - An airport is usually more than just one building and includes a multitude of technologies and facilities to enable aviation operations.

11. **What are the size requirements?**
    - There is no size requirement. Your research and location choice may influence your airport size.

12. **What specifically are you looking for in terms of safety concerns and specifications?**
    - Various vehicle types, fuels, and technologies come with their own safety concerns which should be considered when making design choices.

13. **Should hangars be included in design plans?**
    - If your airport concept needs hangars, you may include them in the design.

14. **Is an ATC Tower needed in design?**
    - You should not focus on air traffic management in your technical paper, but you may include an ATC Tower in your design.

15. **Can we assume that other airports have the same type of alternative fuel?**
    - Yes, assumptions are up to the student teams to make and justify.

16. **Do we have to design for protection against natural disasters?**
    - If natural disasters can happen in the location of your 2050s airport, you may want to consider that when addressing Safety for your new technologies and fuels.

17. **Should we include the altitude of the airport?**
    - Airport altitude is an important factor to consider when making design choices.

18. Do we have to consider the temperature and general climate effect on the efficiency of exterior systems?
- Yes. Factors that affect assumptions and design choices should be considered.

Miscellaneous Questions Received in Advance

1. Are you expecting a 3D model of our design? Similar Question: Does the final submission include a model or virtual model?
- No. The only visual requirement is a digital infographic that is due at the time of the technical paper submission (March 3rd), for all teams. Similarly, there is no requirement for a model or virtual model for the finalist teams' presentations.

- Although it's not required, teams may incorporate a model or virtual model into any of their submissions, if it is on a platform that is accessible to all of the judges (i.e., please do not use any non-standard software that the majority of the public doesn't have access to).

2. What will the poster generally have on it?
- Finalist teams will print their infographic to display at the 2022 Blue Skies Forum as their poster.

- It is up to each team to determine the best way of displaying their concept via an Infographic.
  i. The infographic should be a visual representation of your 2050s airport design choices and incorporate supporting information from your technical paper, in a way that is easily understood by audiences from non-technical backgrounds. The infographic should be a blend of both visual and textual information (with more emphasis on the visual aspect).
  ii. The infographic should reflect only the information discussed in the technical paper (i.e., it should NOT be used to add additional information that didn't fit within the 7-page technical paper page limit).
  iii. The infographic should justify presented design elements in a visually compelling manner.

3. Is all the work prior to the design meant to describe what our design ideas are?
- The question is a bit unclear. The Technical Paper is meant to be a research paper that includes key findings from your research that have informed your design ideas.

- The Tech Paper is generally comprised of two sections:
  i. Description of 2050s aviation landscape assumptions / Research background
  ii. Design concept description and discussion of how assumptions and research informed the design. ***(Emphasis is placed on this section)***

- The Tech Paper should include the following information:
  i. Identification and implementation of alternative/renewable fuels and complementary aeronautics concepts/shapes and designs **(VERY IMPORTANT!)**
  ii. Assessment of the 2050s aviation landscape and appropriate landscape altering factors.
  iii. Inclusion of innovative capabilities/technology
  iv. Indicate WHY you chose your design/configuration/system/approach in terms of VALUE in the areas of technology readiness, system performance, safety, and affordability.

1. Analysis and research supporting key airport design choices o Realistic technology assumptions, including realistic Technology Readiness Levels (TRLs) and justifications
2. Consideration of the effects of assumptions/design choices downstream and on the upgradeability of any evolutionary architecture.

v. Timeline of key technology advancements to achieve your 2050s airport design

4. **What specifically counts as a federal employee acting within the scope of employment?**
   - Any civil servant who is currently working for and getting paid for that work by the federal government. This includes Pathways Interns or other federal co-op students. It does not include Pathways Interns or other federal co-op students who are in an INACTIVE and UNPAID portion of their co-op (i.e., if they are not currently working as a paid federal co-op this semester, then they can participate in the Blue Skies competition this semester).

   - Because finalist teams receive stipends to support full participation in the Forum, this eligibility constraint has been implemented to avoid double sources of federal income going to any finalist team member who may also be receiving other payment from the government for similar work.

5. **How much space should we allot for justifying when which types of aircraft and fuel should be used?**
   - It's up to each team to allot appropriate space to describe and justify their 2050s aviation landscape. Because each team will focus on different aspects of that landscape, space allocation will be different for each team. A good rule of thumb is to provide enough information to justify your vision for the 2050s landscape, but allocate more of your available space to your team's design in response to that vision.

6. **Can we justify certain choices by predicting airline companies will help finance certain key infrastructure pieces?**
   - Teams are welcome to make any design choices that they believe are justifiable, if good rationale is provided.

7. **Will we require advanced knowledge for some things?**
   - Teams must conduct research on the types of future aviation markets, airplane designs, fuels, etc. that are already being discussed and/or considered. Make some assumptions (based on this research) about the 2050s aviation landscape and design the external elements of an airport to accommodate those changes.

Programmatic Questions Received in Advance

1. **Are we allowed to add team members throughout the process?**
   - Yes, if the team size limit of 6 total members is not exceeded.

2. **Can a team still participate if a NOI was not submitted?**
   - Yes. However, submitting an NOI form at your earliest convenience is in your best interest. Once we have contact information for the team lead and faculty advisor, we can ensure you are kept updated on any changes or provide you with helpful resources. Submitting an NOI also benefits

NASA: it helps us know how many technical papers to expect so that we have the appropriate number of reviewers lined up to judge the submissions.

3. **What should I do if I don't yet have a faculty advisor?**
    - Start asking professors if they are willing to serve as your team's advisor. Each team MUST have an eligible US citizen faculty advisor listed at the time of the Technical Paper Submission.

    - Role of Faculty Advisor: Faculty advisors take on the role as mentors, and if a team is selected as a finalist, help manage any monetary awards sent to the university, ensuring they are disbursed appropriately (according to your university's protocols) to enable the team's full participation in the Forum at NASA Langley Research Center next June. The student team leader and advisor will also jointly receive email updates and reminders about the competition to disburse to the rest of the team.

4. **Can teams have more than one advisor?**
    - Yes.

5. **Can permanent residents participate in the competition?**
    - Legal permanent residents (i.e. green card holders) may participate in the competition, but would be not be eligible to receive the competition prize (NASA internships).

6. **Are the internship applications available after the finalists are chosen?**
    - Yes. Upon selection, all finalist teams will be provided with specific directions for applying to the Blue Skies internships.

7. **Can we have a team member participate who is less than 18 years old?**
    - Yes, if student is enrolled in the team's college/university. Participants under age 18 at the time of the Forum must be accompanied by a parent/guardian. Individuals under 18 years may not be eligible for the competition prize (NASA internship).

Questions Received on the Call

1. **Is there a scale of square footage we should be using as a guideline? What size airport are we designing around? Is it going to be O'Hare, Pittsburgh, Norfolk? Operation scale will greatly impact technological choices and research.**
    - See Question #11 in Technical Questions Received in Advance section, above.

2. **How much space should we spend justifying what type of fuel our planes would use and what they look like? That alone seems like it could take several pages. | How in depth would you like the designs to be explained in the report? Would you like the design choices to be explained in depth of how they work?**
    - See Question #5 in Miscellaneous Questions Received in Advance section, above.

3. **What location/climate is the airport set in?**
    - See Question #18 in Technical Questions Received in Advance section, above.

4. **You mentioned that we should not focus on ground transportation to the airport, can we discuss air transportation?**
    - NASA is doing a lot of research on subjects like urban air mobility. This research may factor into your vision of the 2050s aviation landscape, and if this future landscape includes localized air transportation to the airport, it may require airport elements that are very acceptable to include in your design. For example, if your vision is that air travelers are not taking a ground taxi to the airport, but instead taking an air taxi, you may include infrastructure such as a UAM vertiport in your airport design to accommodate that vision.

5. **Is focusing on land use around the runway different from runway design? (i.e. technologies put in place around the runway)**
    - Any aspect of the runway can be included in the airport design. However, the competition does not focus on runways so it's recommended to not focus much time and report space on them. Regarding technologies put in place around the runway, let's clarify: Perhaps your research-based assumption for the future is that there's going to be autonomy in the future, and that autonomy is going to require certain technologies around the runway. You'd need to include those elements and justify them through your research and your 2050s aviation landscape ideas. It's acceptable to include these if it's relevant to the technologies involved in the future landscape.

6. **If you do federal work study, are you eligible to participate in the competition?**
    - Federal work study through, say, a Pell program or through FAFSA does not preclude you from participating in the competition.

7. **Are the intern location set in Virginia, or other NASA locations?**
    - There are no specific locations for the NASA internships. They may be located across the country at a variety of NASA centers, depending on factors that will be determined with finalist and winning teams later in the competition.

8. **What's the title of the internships that will be offered?**
    - Internships will be input into the NASA NIFS internship database once finalists are selected. They will be titled or otherwise denoted as "Blue Skies Finalists Only." These will be internships for which finalists may apply, and finalists will receive specific directions on how to do so. Once the Blue Skies Forum takes place and the six winners are announced, we will work with the winners to determine strengths and interests and link them with opportunities at the NASA Centers to create a good match.

9. **Does the faculty advisor have to be from our university?**
    - Yes. The primary advisor must be from your university and be able to handle financial awards on behalf of your team, according to university protocols. However, teams may also have additional faculty serve as mentors from other universities.

10. **How many finalist teams will be invited to Hampton next June?**
    - Up to 8 finalist teams will be selected following the Technical Paper, Infographic, and Video submission in March. These teams will be invited to participate in the Blue Skies Forum in Hampton, VA.

11. **How should we cite our sources for some of the predictions that we will be making?**

- There is no preference in citation formatting, but references must be formatted uniformly and correctly. Just linking sources is not acceptable.

12. Will the citations still count as a page being used up on the report?

- Appendices, which can be used for references, are not included in the 5-7 page limit. The 5-7 pages are for the body of the technical paper. See the Competition Guidelines for more details.

13. Must the faculty advisor be a U.S. Citizen or can they be a legal permanent resident (i.e. Green Card holder)?

- A faculty advisor may be a legal permanent resident (i.e. Green Card holder). If they are a U.S. Citizen or a legal permanent resident, we are allowed to send funds to the university on their behalf.

14. How are the six available internships allotted? Is it true that not just the winning team can get internships?

- If a winning team has six members that are all interested and eligible for the NASA internship, all six would receive invitations to intern. However, if the winning team doesn't have six members, there may be an opportunity to open more internship slots to members of other finalist teams. Allotments will be determined at program management discretion toward the end of the competition timeline.

15. Does the GPA requirement of 3.0 to qualify for NASA internships also apply to participating in this competition? Do all team members need to have a 3.0 or higher GPA?

- A team member who has a GPA lower than 3.0 may participate in the Blue Skies Competition. There is no GPA requirement for the competition itself. The 3.0 GPA requirement is for NASA internships only: An applicant must have a 3.0 or higher to be eligible – there are no exceptions to this rule for NASA internships.

16. Can we have footnotes or tags to the appendix if the judges would like more information about certain calculations/justifications?

- Use appendices for citations and references only. Judges are not required to review material included in your appendices. As such, be sure no information vital to your design concept or its justification is included in the appendices. You may include citations, calculations or other information you think judges may find interesting, but be sure it's not integral to your project before putting it in an appendix.