

Glasgow Airport
Living Lab Digital
Twin Competition
Application Guidance



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What is the Glasgow Airport Living Lab Digital Twin Competition?

The Glasgow Airport Living Lab Digital Twin Competition presents a significant opportunity for businesses to apply their existing technology solutions to real-world challenges at Glasgow Airport.

The programme offers financial support, mentoring, and the chance to showcase innovations, ultimately leading to substantial rewards for successful participants.

Competition Overview

Participants in this competition will be given the opportunity to develop, showcase and potentially trial a use case for their digital twin solution at Glasgow Airport, with the overall competition aim being to improve the efficiency of airport operations using digital twin technology.

Eligibility Criteria

This competition is open to all businesses, including micro, small, and medium-sized enterprises. Our aim is to support digital twin solution projects that increase accessibility and contribute towards the advancement of aviation environments.

We strongly encourage applicants to consider their own Equality, Diversity & Inclusion (EDI) practices, to foster a future diverse innovation system that inspires improvements in EDI across the UK.

In addition to these criteria:

- You must be a UK-registered business.
- Your innovation solution must be at least TRL (Technology Readiness Level) 5 or higher.
- Your solution must address one or more of the identified challenge areas.
- You must be willing and able to travel to Glasgow Airport as required.

Equality, Diversity, and Inclusion (EDI)

Promoting equality of access to the competitions and supporting a diverse portfolio of companies is integral to Connected Places Catapult. We seek to ensure that the organisations we work with are also committed to demonstrating EDI practices in both current and future projects and operations. We recommend all applicants demonstrate their commitment to EDI as best as possible in their application.

The competition will ask applicants to consider their own Equality, Diversity & Inclusion (EDI) practices and how EDI is built into the proposed solution design. This will help foster a future diverse innovation system that enables and inspires improvements in EDI across the United Kingdom.

Equality, Diversity, and Inclusion defined:

- **Equality:** Involves allocating resources based on the requirements of diverse populations, thereby facilitating the realization of their optimal abilities.
- **Diversity:** Encompasses the inclusion, engagement, and acknowledgment of the distinct needs of individuals from varied social, economic, cultural, and ethnic backgrounds, as well as different genders, abilities, sexual orientations, religions, and more.
- **Inclusion:** Entails the creation of an environment where individuals or members of marginalised groups feel embraced, heard, respected, supported, and empowered to achieve their utmost potential, irrespective of their background, identity, or disabilities.

Challenge Areas

The competition addresses 3 key challenge areas, which are covered in more detail below:

- **Challenge 1** – Asset Replacement
- **Challenge 2** – Passenger Movement
- **Challenge 3** – Energy Management

Challenge 1 – Asset Replacement

To enhance decision making for airports, we need a deeper understanding of the asset lifecycle.

Airports have complex and dynamic surface usage patterns that involve multiple types of aircraft, varying traffic volumes and different operational activities.

Sophisticated data analytics techniques are needed to analyse and interpret patterns to set priorities for replacing pavement assets. The main goal of this challenge is to develop a methodology for identifying optimal pavement replacement priorities at airports, ensuring a balance of safety, operational efficiency, and cost-effectiveness.

This challenge also aims to uncover how we can support Glasgow Airport to monitor other assets such as vehicles and lighting, understanding how your proposed solution can increase asset resilience, climate resilience and improved HSE, within the envelope of a sustainable business model.

Questions to Consider

1. How might we have better understanding of asset lifecycle to make more informed decisions?
2. How can we incorporate data on airfield surface usage to develop a data-driven methodology for determining optimal pavement asset replacement priorities at airports, balancing safety, operational efficiency, and cost-effectiveness?
3. How can we best use the existing airfield infrastructure at Glasgow Airport and monitor other assets such as vehicles and lighting?
4. How can the solution support the airport in, increased asset resilience, climate resilience, improved HSE and support sustained economic business model?

Challenge 2 - Passenger Movement

Passenger capacity is set to increase at Glasgow Airport, bringing with it the same pressures many airports face, such as limited terminal and gate infrastructure space.

Expanding infrastructure to accommodate increasing passenger numbers may be costly and subject to space limitations, especially in urban areas.

This challenge focuses on how we can maximise the capacity of the existing terminal at Glasgow, improving their journey experience, and how the digital solution would integrate with the current infrastructure and systems at the airport, achieving dynamic planning.

The aim of this challenge is to better observe, forecast and influence passenger footfall to inform better decision making of end-to-end journeys in airports

The proposed solution must also factor in the potential for future airport expansions.

Questions to Consider

1. How might we better observe, forecast and influence passenger footfall to inform better decision making of end-to-end journeys in airports?
2. How might we maximize the capacity of the existing terminal at Glasgow Airport to accommodate increased levels of passengers whilst maintaining or improving their journey? Ensure future airport expansions are factored in if answering this.
3. How might the digital solution integrate with the current infrastructure and systems at the airport and achieve dynamic planning?

Challenge 3 – Energy Management

Energy management in airports presents several challenges due to the complex and multifaceted nature of airport operations, and with the addition of new forms of transport such as eVTOL aircraft, this issue will only grow with time.

Due to the potential for new EV based transport, this will present new and unique challenges energy management due to their novel propulsion systems and operational characteristics.

This challenge aims to understand the impact on energy supply and operational capacity of eVTOL operation within an airport operation by observing the current energy management models.

The learnings from this challenge should include how we might reduce energy consumption and operational costs through an accurate representation and modelling of the system, to accommodate for future operations.

Alongside this, how can we observe the introduction and rolling out of EV charging on landside (and/or airside), to understand the impact on energy supply and demand (specifically carbon monitoring, cost models).

Questions to Consider:

1. How might we reduce energy consumption and operational costs through accurate representation and modelling of the system and accommodate for future operations?
2. How can we understand the impact on energy supply and operational capacity of an eVTOL operation into an airport operation by observing the current energy management models.
3. How can we observe the introduction and rolling out of EV charging on landside (and/or airside) to understand impact on energy supply and demand (specifically carbon monitoring, cost models) ?

Application Guidance

Applications will close at 17:00 on Thursday, 7 March 2024.

Late submissions will not be considered.

1. **Guidance Document:** Carefully read this guidance document before preparing your application.
2. **Online Application Page:** Complete your application form on the online application page.
3. **Clarity:** Your answers should be concise and to the point. Use clear and straightforward language to convey your ideas. Avoid jargon or overly technical terms.
4. **Word Limit:** Only information in your application form will be assessed. Keep within the maximum word counts noted in each of the sections of the application form.
5. **Terms of Submission:** Please note that by submitting an application, you accept that any resulting offer shall be subject to the provisions of this guidance document, and the terms and conditions.
6. **Relevance:** Illustrate how your innovation aligns with the challenges and aims of the competition.
7. **Proofread and refine:** Review your response for clarity, accuracy, and coherence. Ensure that you effectively communicate how your innovation embraces inclusivity for all individuals.
8. **Inclusion:** We welcome and encourage applications from people of all backgrounds and are committed to making our application process accessible to everyone. This includes providing support, in the form of reasonable adjustments, for people who have a disability or a long-term condition and face barriers applying to us.
9. **Accessibility:** Applicants requiring assistance in completing the application or alternatives forms of accessing the application should contact the project team at innovation_funding@cp.catapult.org.uk as early as possible (at least 10 working days before the competition closes) during the open application process to allow for appropriate support and sufficient time for the completion of the application.

How your Application is Assessed

Only applications that meet the Eligibility Criteria (see page 3) and scope of the competition will be formally assessed. Connected Places Catapult reserves the right to declare applications unsuccessful and/or out of scope.

Applications will be assessed against the scoring criteria, detailed in this document (see page 8).

Applications that progress to the assessment stage will be reviewed by a panel of assessors. Please ensure your application is written clearly and in simple and plain language, avoiding acronyms and obscure jargon.

Following the initial assessment, a number of applicants will be shortlisted for a virtual interview via Microsoft Teams. During the interview, you will be asked to discuss your application and how your organisation will effectively deliver the project.

Interviews will take place during mid-late March 2024. With regret, we will be unable to accommodate individual requests for interview slots. You will be provided with interview guidance.

The final decisions will be made upon completion of all interviews.

Notification of Outcome

If your application progresses to the assessment stage but is not shortlisted for interview, we may not be able to provide in-depth feedback to all unsuccessful applicants due to the volume of expected applications.

If your application progresses to the interview stage but is ultimately unsuccessful in achieving funding, you will be given the option to receive some written feedback.

It is expected the final funding decisions will be made in early April 2024. It is the lead applicant's responsibility to inform the other consortia members about any funding decisions.

Successful Applications

If you are successful, you will receive key documentation that you must sign and return by the deadlines that will be communicated in due course.

The documentation includes:

- Grant Offer Letter
- Grant Terms & Conditions
- Grant Claim Form
- Minimum Financial Assistance (MFA) Declaration
- New Supplier Registration Form

Phase One

There will be up to 5 successful awardees for Phase One who will each receive a grant of up to £3,000.

Phase One programme participants must:

- Produce a use case proposal about your digital twin solution must include the following (a word template will be provided):
 - Executive Summary
 - Introduction
 - Technical Approach
 - Potential Impact
 - Deployment Plan
 - Resource Requirements
 - Team and Expertise
 - Data Privacy and Security
 - Conclusions
 - References/Appendix

- Attend and showcase your digital twin solution at an event at Glasgow Airport. Parameters of the display will be provided in advance. You must provide a summary of what your stand will include within the provided parameters.

Please note that Connected Places Catapult will make travel and accommodation arrangements for the showcase event in Glasgow. Subsistence will be at the participants own cost.

Assessment Scoring Criteria (Phase 1)

This section details the assessment scoring criteria that the competition assessors will use when scoring the applications.

The applications will be marked on their responses against the following five criteria:

For each of the five categories, there is a maximum score of 5 points available.

Criteria (For Phase 1)	Weight
Solution	40%
Programme Fit	20%
Impact	20%
Traction & Financials	15%
Team	5%

For each of the five categories, there is a maximum score of 5 points available.

Solution

This assessment criterion will evaluate the uniqueness, market potential, and overall viability of your proposed digital twin solutions in the aviation sector within the context of the challenge you have selected for this competition.

Programme Fit

This assessment criterion examines the alignment of your proposed digital twin solution with the program's objectives, in order to identify innovations that best fit with this competition's challenges, feasibility and technical requirements.

Impact

The potential or expected impact of your proposed digital twin solution is crucial in identifying innovations that can truly transform the aviation sector and benefit all stakeholders.

Traction & Financials

Your innovation must offer transformative potential for the aviation industry while also demonstrating practical feasibility, financial viability, value for money and the potential for scalability within the context of digital twins in aviation.

Team

Your proposal should clearly describe the roles, skills, and relevant experience of the team and how they will be instrumental in delivering the digital twin solutions within aviation.

Phase Two

One finalist will be selected to progress to Phase Two and will receive up to £70,000. We will be contracting this work under pre-commercial procurement rules and therefore will not be subject to subsidy and MFA rules.

Phase two is expected to last approximately 6 months. Further details will be shared in due course.

Project Reporting

Phase One – Project Reporting

Throughout the programme you will be required to check in regularly with a representative from Connected Places Catapult, highlighting progress, opportunities, changes, issues, and risks.

You will be required to keep a clear record of project expenditure. We will provide you with guidance and a template.

Phase Two - Project Reporting

If you are accepted onto Phase Two, you will be expected to submit monthly reports for the development of your digital twin solution.

You will check in regularly with representatives from Connected Places Catapult and Glasgow Airport, highlighting progress, opportunities, changes, issues, and risks.

You will be required to keep a clear record of project expenditure. We will provide you with guidance and a template.

Payment Schedule

Phase One – Funding Rules and Payment Schedule

For Phase One, one grant payment of £1,500 will be made at the start of the programme (upon submission of key documentation) and a second grant payment of £1,500 upon completion of the use case proposal, statement of grant expenditure, and showcase at Glasgow Airport.

Grant funding requires you to record and track all project expenditure, so you must ensure every receipt, every invoice and every proof of payment is kept in a folder and returned upon request at the end of Phase One.

The funding awarded to successful applicants will be given as Minimal Financial Assistance under the subsidy rules.

- This allows an organisation to receive up to £315,000 of state support during the current and previous two fiscal years.
- You will be asked to declare any other public aid which your enterprise and any enterprises linked to it may have received during your current and previous two fiscal years so that we can ensure that any grant support given to you under this scheme does not constitute a subsidy.
- Public aid includes not only grants but also assistance such as free or subsidised consultancy services, marketing advice etc which were funded by a public body.
- The payment of this Grant in accordance with this Agreement is believed to be outside the scope of VAT, but if VAT is chargeable, all payments of this Grant will be deemed to be inclusive of all VAT and Connected Places

Catapult shall not be obliged to pay any amount over and above the amount of the Grant.

- If you expect to pay VAT during the delivery of the research, (e.g. for consultancy/sub-contracting charges, material costs and other expenses), and you are unable to recover VAT from HMRC, you must ensure that the cost of these VAT payments is included in the finance section of your Grant Application Form.
- Any VAT payment during delivery of research that is not recoverable from HMRC and not identified in the finance section of the Grant Application Form will not be paid under this programme.

Phase Two – Payment Schedule

If you are selected for the Phase Two of the competition, you will receive up to £70,000 via pre-commercial funding to conduct a full trial at Glasgow Airport.

Payments for Phase Two will be staged. An up-front payment of 60% of the total trial cost will be made. At the end of the project, the remaining 40% will be paid once your final project report has been approved.

Dates and Deadlines

The following dates and deadlines are indicative timings; we will adhere to this schedule as accurately as possible. The closing date for applications is fixed and will be 7 March 2024.

Applications submitted after the deadline will not be considered. Extensions will not be granted under any circumstances.

Competition Opens	8 February 2024
Competition Closes (application deadline)	7 March 2024 17:00
Notification to Shortlisted Applicants	Early March 2024
Interviews	Mid March 2024
Contracts Issued	April 2024
Event at Glasgow Airport	May 2024

Contact Details

If you have any questions about the programme, please get in touch with our team via email.

Please use both email addresses when getting in touch.

Anna.Kerr@cp.catapult.org.uk - Innovation Funding Manager

Innovation_funding@cp.catapult.org.uk – General Enquiries Email

We wish you all the best with your application!

Appendix 1: Application Questions Guidance

In addition to the information included in the application form, further guidance on what should be included in your response to the application form question is given below. You should refer to the assessment scoring criteria section as that will help maximise your score.

Question 48 also gives you the opportunity to upload an additional supporting note (no more than 3 pages) about your digital twin solution.

The following section provides guidance to the questions within **Section 4** of the Application Form.

Use Case Proposal

Q 35) If your proposed twin solution is already in use within another transport sector, which one is it?

- **Sector Specific:** Please only pick the transport modes that your digital twin solution has been used in.

Q 36) Please indicate the challenge that your project is associated with.

- **Pick a Challenge:** Please refer to the Challenge section of this document.
- **One Challenge:** Please only indicate one challenge.

Q 37) Project Title

- **Keep it Simple:** Please try and keep your project title to ten words.

Q 38) Project Summary - Please include a succinct summary of your Use Case in no more than 100 words.

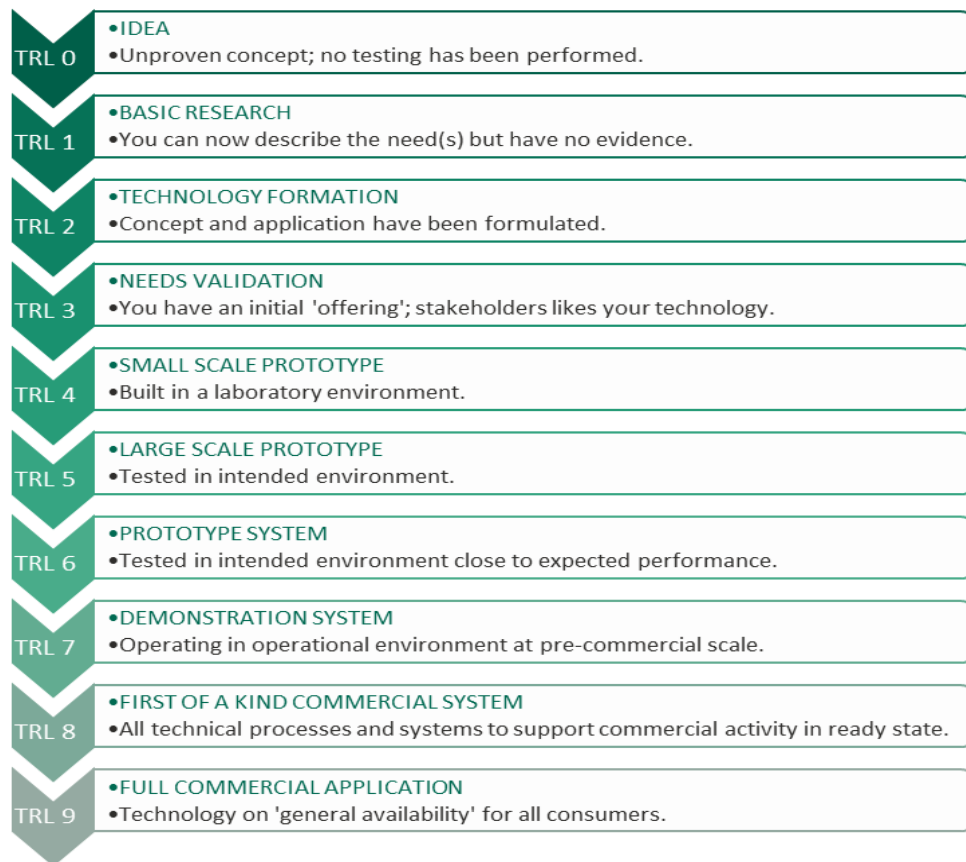
- **Understand the project proposal:** Ensure you have a clear understanding of your proposed trial. Identify the main goals, objectives, and intended outcomes of your project.
- **Define the aims:** Begin your response by stating the aims of your trial.
- **Explain approach/methodology:** Describe the methodology, strategy, or approach you plan to employ to achieve the aims outlined above.
- **Highlight tangible outputs:** Mention the tangible outcomes you expect to achieve through the successful execution of your trial.

Q 39) What is the current Technology Readiness Level (TRL) of your solution?

- The Digital Twin at Glasgow Airport Competition funding route is intended to support projects that are at or above Technology Readiness Level (TRL) 5 (see Figure 1).
- The aim of the funding is to enable innovators to progress towards TRL 7 by developing a functioning real-world demonstrator (or pilot system) in an

operational transport environment.

- Please see below an overview of the TRL stages.



Q. 40) Briefly describe how your digital twin solution will be developed and could be deployed within Glasgow airport and the aviation sector.

Consider the following factors when writing your answer:

- **Solution Overview:** Start by succinctly summarizing the core functionality of your digital solution and how it aligns with the needs of the aviation sector.
- **Development Process:** Outline the key stages of development, including initial research, design, prototyping, and testing. Highlight any innovative methodologies or technologies you will employ.
- **Technical Viability:** Explain how your solution is technically feasible within the current aviation landscape. Address integration with existing systems and compliance with industry standards.
- **Deployment Strategy:** Describe the steps you will take to deploy your solution, including any pilot programs or partnerships with airports or airlines. Consider scalability and adaptability to different aviation environments.
- **Value Proposition:** Emphasise the benefits your solution offers, such as improved efficiency, safety, sustainability, or passenger experience. Be specific about the measurable outcomes you aim to achieve.

Q 41) How does your digital twin solution address the challenge(s) of this competition?

- **Connect your solution:** Explain how your technology directly addresses one of the competition's challenges.
- **Provide examples:** Offer concrete examples or scenarios.
- **Highlight stakeholder benefits:** Clearly articulate the benefits that your innovation brings to various stakeholders, such as passengers, Airport operators, businesses, and other relevant stakeholders.
- **Demonstrate impact with supporting information:** If possible, quantify the expected impact of your solution. Use metrics, data, or estimates to evidence this.

Q 42) Please describe the impact(s) of your solution.

You should consider impact from the perspective of Glasgow Airport, the wider industry, and your own business. Please also provide your approach for evaluating the impact of your solution.

- **Audience-Centric Impact:** Begin by detailing how your solution will affect your selected audience i.e. end-users, operational staff, or airport management.
- **Industry-Wide Influence:** Expand on the broader implications for the aviation industry. Discuss how your solution might set new standards, solve common pain points, or foster innovation within the sector.
- **Your Business Benefits:** Reflect on the impact on your own business. Will it enable you to create new products, services or internal processes that could improve your future business growth.
- **Evaluation Methodology:** Outline how you will measure the impact of your solution. This could include key performance indicators (KPIs), user feedback mechanisms, or data analytics strategies. Consider both quantitative and qualitative methods.
- **Sustainability and Scalability:** Address the long-term effects by considering how your solution ensures sustainability and scalability. How does it contribute to ongoing industry transformation?
In this context, sustainability refers to your innovation and business model sustainable in the long term.

Q 43) How do you aim to integrate your solution with existing systems?

- **Understand existing systems:** Begin by showing your understanding, identifying the existing systems and how your solution integrates with them. This could be data exchange, communication protocols, interoperability, APIs, data connectors, middleware, adapters, or other integration tools.
- **Address challenges:** Demonstrate that your solution addresses the challenges. If there are potential challenges or obstacles to integration or innovation development, address them and propose solutions.
- **User experience:** Explain how the integration will benefit the end-user experience.

Q 44) Specify any support, resources, datasets, infrastructure, or expertise that your organisation requires to further develop and scale your innovation within this project.

Q 45) Have you previously attempted to apply this digital solution to solve this or similar problems? Briefly describe your prior experience.

- **Previous Solution Success:** Start by stating whether you have applied this digital solution, or iterations of it, in the past. If you have, briefly describe the problem it was addressing.
- **Solution Description:** Give an overview of the solution, focusing on its core features and functionality. Highlight the attributes of your project that demonstrated its versatility and contributed to its success.
- **Outcomes and Learnings:** Share results that highlight the effectiveness of the solution. Use data and statistics to quantify its impact. Discuss any challenges encountered and how they were overcome, emphasizing the evolution of the solution.

Team & Expertise

Q 46) Describe the key members of your team involved in the development and implementation of your innovation, highlighting their relevant expertise and experience.

- **Identify key team members:** List the individuals who will be part of the delivery team.
- **Highlight relevant expertise:** For each team member, outline their relevant expertise and experience. Outline a skills matrix which demonstrates your team's capability to deliver the project.

Project Finances

Please provide a detailed breakdown of your project's costs, including labour cost, equipment, materials, and other expenses.

Please download the template linked on the application form.

- **Labour Costs:** List each team member involved in the project and their associated costs. Include roles, hourly rates or salaries, and the estimated time each person will spend on the project.
- **Equipment Costs:** List any equipment, devices, or materials that are necessary for the project. Provide item descriptions.
- **Testing Costs:** List any testing costs associated with the project.
- **Contracted Services Costs:** If you are contracting any external services (e.g., consulting, fabrication), include the details of these services.
- **Other Costs:** Please list any other costs associated with your project i.e. travel and subsistence.
- **Demonstrate Value for Money:** Explain how the costs align with the value your project will deliver. Highlight how the proposed budget is reasonable and necessary for achieving the desired outcomes.

Q 47 A) Please upload your completed proposed project finances here.

- **Use Provided Template:** Please ensure you upload the completed template we have provided.
- **Double Check:** Double-check the calculations, totals, and descriptions before submission.

Q 47 B) Total Budget sought from this competition

- **Total Requested Funding:** Please provide the figure of funding you are looking to receive from this programme.

Q 48) Additional Technical Supporting Note

As part of our application review process, we conduct a technical review led by experts at Connected Places Catapult. While this is not a scored metric, any additional information that demonstrates the technical feasibility of this project is welcome.

All information and optional images provided in this technical document should relate to answers given already in the Section Three. Please upload a maximum of 3 pages.

Target Market

Q 49) Identify the specific market segment or audience / end users for your innovation within the Aviation Industry.

- **User Identification:** Identify the group of individuals or entities that will directly benefit from your innovation. Consider the following points:
 - Who will use your innovation?
 - What are their characteristics and specific requirements?
 - How does your innovation address their specific challenges.
- **Segment your Audience:** If your innovation has multiple user groups, segment your audience based on their roles or needs. For instance, passengers, airport staff, maintenance crews, and management might have different needs and expectations.
- **Provide Examples:** Offer examples or scenarios to illustrate how your innovation caters to the needs of your target market. This adds depth to your response and demonstrates your solution's applicability.

Differentiation and Market Potential

Q 50) Explain how your innovation differentiates from existing solutions or competitors in the market

- **Unique Selling Points:** List the specific aspects of your innovation that differentiate it from competitors within your field i.e. what are your solution's Unique Selling Points (USP)?

Q 51) What do you think is the market potential and scalability of your innovation within the Air industry?

- **Scalable within Aviation:** Explain how your solution is scalable within the context of Aviation. Provide evidence of how or why your innovation or solution is likely to be able to scale effectively.

Q 52) Are you planning to raise an investment round in the next 12 months

- Yes
- No

Q 53) Are you planning to raise an investment round in the next 12 months

- Seed Funding
- Series A
- Series B
- Series C
- Not Decided

Q 54) Please tick this box if you would like to receive investment readiness coaching and an opportunity to pitch to investors.

Q 55) Intellectual Property - Describe the intellectual property status of your innovation (e.g., patents, trademarks, copyrights).

- **List Intellectual Property:** List any existing intellectual property that is relevant to your innovation. This could include patents that cover unique technological aspects, trademarks for branding, and copyrights for creative elements.
- **Discuss future protection plans (optional):** If you have plans to apply for additional intellectual property protections in the future, briefly mention your intentions and the rationale behind them.

56) SME Affiliation - Highlight any awards, recognitions, or notable achievements related to your company or innovation.

- Please share information about your engagement with potential customers or partners, highlighting any ongoing discussions, partnerships, or expressions of interest from relevant stakeholders.
- Mention any awards or industry-specific honours received.