HAPS Challenge

FAQ

Sir Lawrence Wackett
Defence & Aerospace Centre

RMIT UNIVERSITY

Question Responses

Who do I contact if I have questions about the HAPS Challenge?

All questions should be directed to HAPS.Challenge@tasdcrc.com.au

Further information and the answers to your questions may be found in this FAQ or on the website at:

https://www.rmit.edu.au/defence-aerospace/haps-challenge

Question Responses

The impact of patents with broad claims on the ability of applicants to deliver e.g. Google Loon?

The organisers expect that technology being developed by applicants does not infringe other organisations' intellectual property.

Applicants are expected to undertake due diligence on existing patents.

The organisers may assess proposed technologies against known patents as part of the assessment process.

Treatment of background and third-party IP is covered in the Challenge T&Cs.

Question Responses

Is there a Law aspect to the Challenge?

The HAPS Challenge is a technology development program.

Applicants are required to present a business case as part of phase 2 and it might reasonably be expected that this business case would consider legal and regulatory issues pertinent to the use of the system for both civil and military applications.

We could welcome input outside the HAPS Challenge on the topic from interested parties.

Question Responses

For stream 1. Are the cost of gas & consumables included or separate to the $50,000 costing target specified in the guidelines?

The preferred unit price specified in the guidelines is for a production scale product, covering all system costs, but excluding the cost of operations and logistics.

Consumables would not be considered part of the purchase price.

It might reasonably be expected that regulatory and certification costs would be amortised into production costs.

We have a preferred indicative unit price in volume of 50K or less, but **we are interested in cost-performance trade-offs**.

Question Responses

For stream 2. Does development and maintenance of any software fall within scope of the funding grant?

Within the published budget limits, software costs can be supported if they are critical to the research program.

It is unlikely software maintenance would be applicable given the short-term nature of the research project.

There is no additional funding for research inputs (including software) beyond the published cost caps.

Question Responses

Can the challenge facilitate the process of applicants forming teams?

Yes. Applicants looking to collaborate with other applicants for the purposes of assembling a proposal should provide the following information to the Centre NLT Friday 7th May:

- Entity (Company name and location);
- Point of Contact (name and email);
- Detail on the technical area you can contribute to;
- Detail on the technical area you are looking for expertise/collaboration in.

This information will be anonymised (no names or entity information will be supplied) and circulated to all registered parties by COB 10th of May with a requested response to the Challenge email by the 12th of May.

Responses will be collated and parties will be connected directly via email shortly thereafter.

Question Responses

Are there any limitations on eligible expenditure for the use of the funds?

We do not have specific categories of expenditure that are excluded from the HAPS Challenge, except for those defined by the fact that Stream 2 operates under a government grant.

For Stream 2 therefore, funds can not be used for building works.

Budgets should be detailed, with expected expenditure categorised, to help support the assessment of applications.

Question Responses

Is it ok to work with international suppliers and partners?

The intent of the Challenge is to generate sovereign capability.

To this end, the activity to support the Challenge should be substantially conducted in Australia.

Provided IP resides with an Australian entity and work in substantially done here, engaging foreign partners as team members is acceptable.

International supply chains are also acceptable and are expected given the globalisation of many technical elements relevant to the Challenge.

Question Responses

Are you interested in technologies for deploying HAPS or satellites?

Deployment technologies are only of interest in the sense that they support the development of a capability that can achieve the defined performance objectives defined in the HAPS Challenge Guidelines.

A proposal simply focussed on a deployment system in and of itself would be unlikely to meet the HAPS Challenge objective.

The HAPS Challenge is attempting to sitmulate investment in technologies that embody some attributes of space-based systems(including persistence and station-keeping) without relying on orbital deployment.

Question Responses

For Stream 2, is the 10kg payload the mass of the instrument or does it include the mass budget for power generation, thermal management, etc?

Total payload should be at least 10kg. If this cannot be done, a design rationale for the selected payload must be provided. Payload suite should include:

- Redundant long-Range (100+km) and high-bandwidth (>5mbps) communication to ground (via direct LOS or bent pipe)
- Redundant low-bandwidth radio (telemetry only)
- High resolution (>50mpx) colour camera
- Thermal Camera
- LWIR camera and/or Hyperspectral camera
- Barometer
- Temperature sensor
- High precision IMU and Gyro unit
- Jetson Nano central computer
- GPS
- Energy source for 7+ days of operation
- Housing (if appropriate)

Question Responses

How much electrical power does the "standard payload module" require when it is operating?

It is estimated that the required power to operate the payload module would be approximately 40 Watts.

It is not expected that all components systems in the payload suite would operate simultaneously all the time.

Any proposed HAPS solution would need to acquire and integrate all payloads needed to support the demonstration of the physical system against the performance objectives. However, payloads not essential to this do not need to be included in the demonstration.

Non-essential payloads might be meaningfully represented with ballast and a power sink, for example.

Question Responses

Is it safe to assume that the payload module requires no integration other than physical accommodation, electrical power, and thermal management?

The HAPS Challenge organisers will not supply the payload.

Participants are expected to supply enough of the payload needed to demonstrate against the performance criteria.

Participants are expected to provide the necessary communications and telemetry links to support safe flight.

Where a specific sensor is not needed for purposes of meeting the challenge objectives (for example, the imaging payloads listed above), these may be usefully represented using ballast and (if necessary) power sinks to prove the system can accommodate such payloads in use.

Question Responses

Do you want station-keeping like GEO without ground tracking or using ground tracking to determine HAPS location?

Stream 1 wants a platform to be developed that can maintain position and manoeuvre as required.

Tracking may be required to provide a ground environment with knowledge of where the platform is if that can't be communicated via telemetry.

Tracking may also be provided to support the platform manoeuvring to station-keep.

The ability to station-keep might be achieved with the support of off-board tracking information supplied to the HAPS platform.

Question Responses

What is the relationships between the HAPS Challenge and the Firefly Pathfinder Project being run by RMIT?

The **Firefly Pathfinder** is focussed on validating cooperative positioning algorithms for balloons that were first developed for UAS, using simulation and real-world balloon flights.

The balloon flights are being used to collect platform dynamics data, and to assess some aspects of payload control and performance in conjunction with Jericho, to support simulation.

While companies engaged in Firefly are developing their platform technologies, the Firefly Pathfinder is providing minimal support to this and is not focussed on platform performance.

The **HAPS Challenge** is focussed on advancing high altitude pseudo satellite platform performance against key benchmarks related to persistence, endurance and station-keeping, and to payload control. The performance benchmarks in the HAPS Challenge are more ambitious.

Question Responses

What might be the next steps for engagement after the HAPS Challenge for deploying payload technologies?

Please contact either Dr Simon Ng (TAS Defence CRC) or Mr Peter Kerr (SmartSat CRC) to discuss potential for engaging outside the HAPS Challenge.

Question Responses

Is the ground segment being developed at the same time as the platforms?

The ground segment should be a consideration as part of the overall solution to the HAPS Challenge, specifically as it supports the performance objectives.

However, considerations of how a HAPS capability would be operated in the context of airspace management and deconfliction, remote-split operations and collision-avoidance are issues outside the specific parameters of this Challenge.

A submission may speak to these, but the proposal should not request funding to support the development of technologies related to these issues except in so far as they support the performance objectives defined in the Challenge Guidelines.

Question Responses

How will the HAPS Challenge support CASA approvals?

Funding may be used to support the process of achieving CASA approvals for flights.

We offer guidelines on the website for what to consider when it comes to obtaining approvals on flight operations from CASA.

Mr Tom Putland from TAS is available to answer questions, noting that advice does not constitute acceptance of responsibility for failure to obtains approvals from CASA.

The Centre will attempt to provide a CASA point of contact to participants to support obtaining approvals from CASA.

Question Responses

Does Stream 1 include the airframe or equivalent solution as part of the system?

Yes.

Figure 2 in the Guidelines defines the general system boundaries that should be considered for Stream 1.

Stream 1 involves the development and demonstration of a prototype system capable to sustained station-keeping and manoeuvre at stratospheric altitude, and so should encompass all components necessary to enable that.

Use of off the shelf components is permitted.

Question Responses

In Stream1, is there any prohibited fuel? No.

Question Responses

Sea-launch is noted in the Guidelines. Can you please expand on the thinking that drove that element?

Sea-launch, like runway independent launch, is a potential mode of launch that we would like applicants to think about in developing their concepts.

It is not expected that trials or demonstrations would necessarily be required to conduct a sea-launch, but the Challenge may assess applications based on their general suitability for eventual sea-launch.

Key Dates

Prof Michelle Gee

(Sir Lawrence Wackett Defence & Aerospace Centre)

HAPS Challenge Announcement	29th March 2021 (past)
Phase 1 Submission Due Date	24th May 2021
Phase 1 Shortlist for Phase 2 completed	25th June 2021
Phase 2 Commencement	28th June 2021
Phase 2 Submission Due Date	8th October 2021
Phase 2 Shortlist for Phase 3 completed	12th November 2021
Phase 3 Commencement	15th November 2021
Phase 3 Completion and Demonstration	20th May 2022

Thankyou

For further information:

HAPS.Challenge@tasdcrc.com.au

https://www.rmit.edu.au/defence-aerospace/haps-challenge

rmit.edu.au/defence-aerospace
defence&aerospace@rmit.edu.au
@DefenceAeroRMIT
@DefenceAerospaceRMIT
linkedin.com/company/defenceaerospacermit