



**SmartSat Ideation Challenge 01: Firefly
Funding Guidelines**

Objectives

The objectives of this competition are as follows

1. To identify good ideas for implementation on a small surrogate satellite (stratospheric balloon) to contribute to national emergency services preparedness and response capabilities.
2. Support SmartSat CRC participants to provide staff with training and development to build capacity for AI research and development.
3. Testing concepts for Project Sprints as a way of engaging our creative community to identify solutions to complex problems at pace and then scale up to deliver effect.

Eligibility

Individuals or teams from SmartSat or SmartSat Aurora partner organisation. A letter of support from the lead and administering organisation will need to be included with the application.

Key Dates

Monday 13 July	Applications open
Monday 3 August	Applications close
late August	Funding announcement
Monday 31 August	Projects commence
Friday 25 September	Projects complete
Early October	Presentation and Demonstration of project

Definitions

Stage 0 – the ideation/proposal stage up until the date submission close.

Stage 1 – the funded two-month period during which a Minimum Viable Product (MVP) is developed for demonstration.

Stage 2 – Any follow on activity to Stage 1 supported by SmartSat CRC.

Project Scope/Requirements

Stage 0 applicants are required to submit ideas for an intelligent payload to be integrated with a high-altitude platform with alignment to the described competition challenge.

The payload should support sensing, sense making, dissemination or communications to augment failed or non-existent national critical infrastructure during times of civil emergency (for example, bushfires, floods, cyclones, earthquake etc.).

The host platform is assumed to be a commercial latex meteorological balloon that has been modified to increase its endurance and perform basic station keeping – perhaps as part of a multi-platform constellation.

Design Requirements are as follows:

1. Platform assumed to operate at approximately 80,000 ft and be kept at that altitude and within a 50km diameter position.
2. Endurance is 5 hours. The demonstration payload will not consume power from the balloon platform.
3. Payload mass is <4kg.
4. The payload compute platform (for sensor/communication interface and processing of payload data) will preferably be an Nvidia Jetson Nano (see www.core-electronics.com.au for information about the development platforms). This consumes 10W of DC power at full compute load. The preference is that successful funding recipients will source this platform (or equivalent Nvidia Jetson product) for development and demonstration in Stage 1. Strong arguments are needed to utilise an alternate development platform given Objective 2.
5. The focus on this activity is software implementation of an artificial intelligence/machine learning based solution. Minimal hardware development is expected during Stage 0 and Stage 1.

Stage 0: Ideation

We are seeking short, succinct submissions comprising a mandatory quad-chart (see submission template) and a maximum two-page word document with explanatory notes (optional) that will convince a small selection panel that this idea is worth supporting.

It should contain the following:

- An explanation of the idea/concept and how it contributes a solution to the challenge (or part of the challenge);
- A statement of the novelty (what is different to existing products and could it fly on the platform);
- How long it will take to implement a Minimum Viable Product (MVP) to demonstrate the idea (this will not be airborne);
- How you think the MVP might be scaled up to a full demonstration;
- How you might simulate the operating environment to demonstrate the idea; and
- Approval from an authorised agent of your organisation or organisations that, if successful, the applicant will be able to complete Stage 1 (with access to the defined resources from SmartSat CRC).

Submissions with contributions from more than one party are encouraged.

Stage 1: Consolidation

We anticipate awarding 10-15 applicants with financial support to implement and demonstrate the idea developed in Stage 0 within a very compressed time frame (less than two months).

SmartSat CRC may seek to merge Stage 0 ideas as a condition of progression to Stage 1 in consultation with the applicants.

Outputs from Stage 1 are

- A demonstration of a working MVP prototype (Mandatory)
- A report on lessons learned through Stage 0 and 1 (no more than 5 pages) (Mandatory)
- A optional draft Stage 2 proposal to move the MVP prototype towards a payload capable of integration on the platform
 - Engineering development (including dealing with the high-altitude environment)
 - Specific hardware development to optimise sensor/communication suite
 - Time and Resource requirements to further develop the idea.

Stage 2: Transfer to Tactical Research Fund Project or SmartSat CRC Project

Selected Stage 1 products will be supported to develop a SmartSat CRC EOI to progress towards a SmartSat CRC Tactical Research Fund activity (up to \$100k) or SmartSat CRC Project (> \$100k), potentially with the introduction of additional CRC Participant Organisations (and subject to agreement from the challenge applicant)

SmartSat CRC may seek to merge Stage 1 ideas to create larger scale research activities. This will be subject to agreement by the Stage 1 funding recipient(s)

Selection Criteria for Stage 1 Funding

Criteria and weightings for those criteria are as follows:

- Creativity/Novelty of the proposal (30%)
- Ability to deliver a demonstration in the time frame available (30%)
- Suitability of proposal for integration (especially size, weight and power) on an appropriate platform (balloon or satellite) (20%)
- Potential to scale up the proposal beyond the initial MVP (10%)
- Potential to accelerate delivery of an evolved project through collaboration (10%)

SmartSat CRC reserves the sole discretion of selecting applicants for progression. Brief feedback on decision making will be provided if requested but the decision will be final.

Intellectual Property

SmartSat will not seek ownership of any IP generated through either Stage 0 or Stage 1 activities.

Should the concept owner seek to further develop the idea within SmartSat through a Stage 2 activity, standard SmartSat Project IP arrangements will apply where SmartSat will own the Project IP arising from the project.

Applications

Applications comprising the following should be sent to info@smartsatcrc.com by no later than **9am (ACST)**, **Monday 3 August**:

- quad-chart (see submission template)
- optional explanatory notes (two-page maximum/Word document)
- letter of support from the lead and administering organisation