

FACTSHEET ON THE CALL-FOR-PROPOSAL FOR UNMANNED AVIATION PROJECTS

The Ministry of Transport (MOT) and Civil Aviation Authority of Singapore (CAAS) jointly issued a Call-For-Proposal (CFP) for unmanned aviation projects in November 2017, with the objectives of enabling development of the fast-growing Unmanned Aircraft Systems (UAS) sector to benefit Singapore and enhance CAAS' capabilities in performing its regulatory roles.

After careful evaluation, four proposals have been selected to proceed with the development and trials of their proposed solutions.

The CFP will provide up to 50% funding for each successful proposal, with the funding amount capped at S\$1.5 million dollars. Successful proposals will be given a period of two years to complete their proposed solutions.

The lead applicants to be awarded and their proposed solutions are as follows:

Avetics

Avetics Global is a drone solutions company based in Singapore and Malaysia, serving Southeast-Asia. Avetics provides end-to-end drone services with a key focus in the industrial space using their customised drones. With demand, Avetics also takes on R&D projects to come up with solutions that uniquely solves problems by combining mechanical, systems, robotics and software expertise.

Proposed solution: Aggregate drone services for maritime

Avetics' proposal aims to develop a 24/7 drone operating center that specifically serves maritime sector. A common fleet of drones with interchangeable payloads will help to serve different clients. Economies of scale will be achieved by consolidating demand from various customers, and engaging the same flight where feasible.

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Garuda Robotics

Garuda Robotics is a Robotics and Artificial Intelligence technology company headquartered in Singapore and developing enterprise drone data solutions.

Proposed solution: *Connected Urban Airspace Management for Unmanned Aircraft*

Garuda Robotics will develop systems and capabilities to enable a single framework for managing, authorising and tracking large numbers of heterogeneous aircraft. These capabilities include the rapid generation and approval of digital flight plans; identification and authentication of aircraft and operators against a secure registry; and a highly reliable and redundant communications network.

The airspace management framework will be trialled for high-impact use cases such as disaster response supply chains; medical test sample delivery; and rapid response to security incidents.

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Nova Systems

Nova Systems is a Professional Service Provider, specialising in the provision of engineering and management services to industry and government, with world class independent expertise in delivering complex projects and solving technologically challenging problems. The company has significant experience in system integration and supporting military and civil sector UAV and UTM test and evaluation, safety case development, planning and trial management.

Proposed solution: *Safe and Effective Package Delivery via UAV*

Nova System's proposal seeks to develop technologically capabilities in UAV Traffic Management (UTM) and UAV based package delivery in urban environments. The scope of the project includes:

- Development and implementation of UTM prototype suitable for Singapore
- A suite of trials to ultimately demonstrate a wide-scale, BVLOS (beyondvisual-line-of-sight), multi-UAV, multi-site product delivery demonstration
- Research and development in enabling areas such modelling and analysis of network coverage, applying communications, surveillance and surveillance (CNS) principles for route design.



These will provide insights to the development of a UTM system, enabling beneficial use of UAS in Singapore.

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Wilhelmsen

Wilhelmsen is a global maritime industry group, and a leader within the industry. With the world's largest maritime network on call 24/7, Wilhelmsen delivers Ships Agency services in 2,200 ports and handled 75,000 port calls in 2017. Through innovation, local knowledge and commodity expertise, combined with strict operational and safety standards, Wilhelmsen's ships agents are able to meet the challenges and needs of the world's global fleet, whenever, and wherever, they operate.

UAS technology in the maritime industry is still in its infancy stage, and requires adaptation to comply with the maritime environment and its regulations. Despite these hurdles, Wilhelmsen is confident that in years to come, UAS will revolutionize shore-to-ship operations.

Proposed solution: *Development of UAS for Singapore Maritime service deliveries to improve safety, productivity and reactivity*

Understanding the potential and scalability of using drones in the maritime sector, Wilhelmsen's proposal focuses on maritime deliveries that UAS could potentially help to make a difference in for the maritime sector. The project will be addressing key technological areas such as ship localisation and precision landing, payload release system, light and reliable private 4G/LTE communications, onshore parcel station and an automated package delivery system. With Wilhelmsen's maritime know-how, the one of a kind project will explore the commercial potential of maritime UAS deliveries.

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