

16 - Small Autonomous VTOL Electric Drone

Instantaneous access to critical goods and supplies is not a reality in underdeveloped areas with no access to all-season roads. This makes supplying these regions with goods through conventional methods such as delivery trucks extremely difficult, if not impossible, as road networks are inaccessible throughout the rain season. An especially troubling case is the supply of resources with high urgency, such as medicines, as these are often requested without much prior notice and need to be delivered within a short time after the request. Conventional solutions to this problem are only applicable in the long term. This problem is, at its core, the need for time efficient logistics during the delivery of critical goods. This need originates in countries where these critical goods are centralised in one location and cannot be transported to other regions within a reasonable span of time, which can be due to the aforementioned infrastructural shortcomings. Sri Lanka is a prime example of such a country. This issue has already been identified by the Sri Lankan government, and they are openly eager to invest in medical drone delivery to suffice for it.

Mission Objective

SAVED aims to solve this issue by proposing a drone delivery service, including ground operations and logistics. Instead of trying to transport blood bags to all hospitals in the country once they need it, these are transported to only a few locations systematically, decentralising the goods and allowing for their delivery in a flexible manner, covering for all unpredictable circumstances.

System Design

The vehicle design consists in a four rotor flying wing, with Vertical-Take-Off-and-Landing (VTOL) capability and long range (150 *km*), with a maximum payload weight of 3 *kg*. The set of unique features in the SAVED drone offers for the first time a compromise between long range and highly manoeuvrable flying vehicles. Given the exponential growth in interest for drone delivery, SAVED is expected to play a key role in the vibrant market, and speed up the development towards a nominal standard.

To open the scenario of a wide fleet operating at low cost and high safety, a set of stereo cameras, LiDAR and autopilot is implemented with state of the art software for full autonomy. Service costs and environmental impact

are further reduced via the use of electrical propulsion charged through renewable charging stations and a sustainable decommissioning program.

