Drones integration in the Israeli national airspace | Ofer Haruvi, Chairman of regulation Branch.

The last two weeks of March 2021 were very special for the Air Mobility community in Israel. A unique, first of its kind experiment, in which hundreds of drone flights were performed over the area surrounding Hadera, took place. The experiment was carried out as part of the NAAMA initiative (Hebrew acronym for: Urban Air Mobility) that is operated jointly by the Israel Innovation Authority, Ayalon Highways, the Ministry of Transportation, Civil Aviation Authority of Israel (CAAI), and is part of a plan to create an innovative and smart grid of national drones carrying payloads in an urban managed airspace. The Whole initiative started in March 2020 and includes number of pilot programs that enable companies, customers, and regulators to explore the commercial potential of drones and ways to use them safely.

Figure 1- Drone deliveries in urban area by "Simplex" - part of the NAAMA initiative

The main goal of the experiment was to demonstrate the ability to fly hundreds of drone flights, by different operators in a joint airspace, coordinated by an autonomous control system -UTM (Unmanned Traffic Management). The March experiment is the first of eight that would take place in the next two years. Eventually, the initiative should lead to the ability to commercialize drone flights in the Israeli airspace and promote the Israeli drone echo system to a leading position worldwide.

The commercial applications and opportunities for unmanned aircraft system (UAS) operations, across many sectors from inspection, to survey, to monitoring, to package delivery, present enormously incentives and business cases. Especially, the air above us is a cheap asset with great potential to reduce some of the density from transportation infrastructure using Air Mobility capabilities.

To promote this potential UAS should be able to integrate into the national airspace with the ability to coordinate between themselves and with manned aircraft transportation.

In the last few years both the FAA in the USA and EASA in the EU are in process of defining their CONOPS (Concept of Operation) for UAS operation in coordination with their national airspace. Although there are differences between the CONOPS in the US and the EU some insights are mutual. Majority of the UAS transportation should take place in the Very Low Level (lower than 500ft). This space is not intensively used by manned aircraft and can be allocated for UAS transportation. The manned aircraft coordination system which was built to plan and coordinate tens or hundreds of aircrafts cannot meet the need for thousands of unmanned systems. The commercial applications of UAS requires autonomous, real time coordination system that can approve for example a delivery flight in less than a second, considering all the relevant constrains like other UAS traffic, manned aircraft in the area, population density, weather and more.

Israel was one of the leading countries in developing and implementing UAS for defense applications. Having a strong UAS community it can become a leading country in the implementation of UAS for commercial applications as well. The Hadera experiment and the NAAMA initiative certainly promotes that vision and has significant importance in promoting regulation and engineering for UAS in Israel and beyond.

Bringing together all relevant stake holders - regulators, municipality, emergency forces, financing etc., to support such an experiment, is not an easy task and requires vision and determination, and Ayalon Highways deserve all compliments for succeeding in doing that. Carrying out hundreds of drone flights (300 each day) some of them beyond vision line sight and some over urban areas, with no significant safety events shows very high competence and maturity of all participants.

One of the “lessons learned” from the experiment deals with the way such regulation should be developed in Israel. In the USA and EU working groups, led by the regulator, and involving stake holders and professional experts, had developed CONOPS and architecture to enable the operation of UAS in the national airspace. Israel can lean on those efforts, but a discussion is required and a specific CONOPS should be formulated. Skipping that stage into large scale experiment without agreed upon CONOPS might lead the whole initiative to wrong directions – this will be harder to fix as the experiment advances The Hadera experiment is a great trigger for such a discussion that should take place before the next phase. Is there a role for AEAI and the Autonomous Systems Association within AEAI in such a prosses? The engineering community and AEAI need to be involved and can certainly contribute to such revolutionary process.