AVEIRO
CÂMARA MUNICIPAL

TECH CiTY

Aveiro Tech City Challenges

Urban Challenge #1

CHALLENGE 1 – SURVEILLANCE DRONE PLATFORM

SCOPE OF THE CHALLENGE:

Following the vast majority of Inspection Actions, notifications are sent to violators with a deadline, with the objective of restoring legality, namely, at the level of Urban Supervision, but especially for Land Cleaning, whether unhealthy or fuel management.

The aforementioned Notifications presuppose a prior Inspection Action where all the necessary elements are collected for the identification, of the subject as well as of its holder.

After the deadline, the Notifications need verification, which is nothing more than the travel of a Team of Municipal Police Officers to the land, to acquire a photographic record, of the situation, often at the limit of the municipality territory.

This context could be an opportunity to implement Unmanned Aerial Vehicles (UAVs), aka DRONE in support of enforcement actions.

DEVELOPMENT OF THE CHALLENGE:

With the massification of the use of such Unmanned Aerial Vehicles (UAVs), aka DRONE, in various sectors of activity we will have, in the short term, clarification of this use as well as the publication of appropriate legislation.

Legality issues aside, we understand the use of Drone very beneficial, practical, efficient and effective as a complement to the activity of Surveillance.

In addition to being able to be used in preventive supervision through the verification of the execution of any constructive elements in sometimes inaccessible places, it would also be used for the objective verification of the situations that we need to validate as photos after notification.

The Environmental scourge with the deposition of RCD's (Construction and Demolition Waste) and other domestic materials in places of very difficult access, could be deterred with an Equipment that without Prior Notice would leave in Video Surveillance Mission by the county. Launched from the Base (Municipal Police Facilities in the Park of Fairs and Exhibitions of Aveiro), or closer to the sites, through a vehicle of the Municipal Police, where it is necessary to verify, it would quickly identify situations of illegality for consequent Inspection, objective and effective.

Drones are Unmanned Aerial Vehicles (UAVs), in addition to real-time driving, allow the autonomous collection of data through a prior programming of flight coordinates in which depending on the objectives of the photographic survey the most appropriate parameters are defined. This collection, if integrated in an inspection management platform, would allow the documentary treatment of the entire mission.

Mission examples and description of the digital process:

1. Verification of land clearing (unhealthy and fuel cleaning), knowing the location of the land to be checked, the flight coordinates and the place to be checked were introduced and quickly, objectively and effectively, we would have access to the current situation of the land to be verified;
2. The images collected by the drone would be sent to a computer platform and then analyzed in the Process by the Agent who closed it or continued with the diligences according to the case.
3. In this case where the operation is fully programmed, there would be no inconvenience to be carried out in outsourcing, in which the drone could be hosted and operated by a private company.
4. Verification of events that occur in urban channels, such as clandestine discharges of residual effluents and that through aerial sweeping, in a given area, could facilitate the location of its origin, with the identification of possible sources of contamination. in these cases the drone should be operated by an Police Officer with specific training for this purpose..
5. In cases where the use of the drone is intended for surveillance and surveillance in real time, as is the case of the deposition of RCD's and other household materials in places of very difficult access.

The following technical characteristics of the complete solution (Drone + Digital Supervisory Management Platform) should be the following.:

- The Drone to be supplied must have the following minimum characteristics:
    - Minimum operating time on a single battery: 40 minutes;
    - 2 packs of batteries extra to those equipped with the drone, in order to triple the minimum operating time from 40min to 120min.
    - Image sensor with a minimum of 20MPix
    - Minimum resolution of 4K / 60fps
    - Adjustable image aperture f/2.8-f/11
    - Omnidirectional obstacle detection
    - Ability to transmit real-time video in HD and up to 15km
    - Ability to fly by "waypoint flight"
    - Should include an operation console.
- Software with implementation with "opensource" tools / frameworks

- Platform with fully responsive backoffice, allowing you to run in browsers on a PC, tablet and smartphone.
- The platform should have a work area for mission management with two types (a) automatic and (b) manually piloted. Mission management should allow the recording of the coordinates and orientation of the drone in real time, marking in a timeline and geographical the records made (photos and videos)
- The platform should have a separate mission management area, which will be used for the procedural handling of each occurrence. The occurrence should allow to automatically generate a PDF/A file with the metadata of the occurrence (mission, date/time, duration, route, locations, evidence such as photos and snapshots of videos taken and links to the videos.
- Hosting of the backoffice solution, storage for the records and occurrences made, API and interfaces for the mobile application developed and support of operation and computer security in a period of 1 year after the end of the challenge;

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