Drone/UAV Situation in early 2026

In this document, I will summarize the types of drones that can be commonly encountered and/or easily acquired by a nefarious user who could deploy to disrupt the aviation sector. I will conclude by proposing means of preventing and eventually tackling disruptions to the aviation sector using the drones described.

What is a drone?
- An unmanned object capable of flight, controlled directly or indirectly by an operator on the ground. Most often equipped for aerial photography, but can be easily customized for any purpose. The most common type is the quad-copter, but can also take the shape of model aircraft or even animatronics that fly like birds in rare cases. The development of microprocessors, sensors and electronics in the last 15 years have made them easy and cheap to produce, hence their growing popularity.

Categories:


DJI Mavic Mini

- **Light Drones (<250g)**: These days they are the most popular type of drones, made popular by the fact that; in most countries a drone under 250g usually does not require and license or registration to operate. Many can be easily purchased over the counter typically for between 50 and 500 euros, and operated with little to no prior experience thanks to their suite of on board flight computers, cameras, GPS and proximity sensors. The most popular manufacturer is DJI with tens of millions of models sold worldwide and an 80-90% market share across all civilian categories, models from them in this category include the NEO, MINI and Flip. DJI used to enforce no fly zones by software blocking flight into published zones using GPS, but since early 2025 they have reversed this feature, putting the responsibility onto the user and unlocking flights anywhere. These are often marketed towards people wishing to do some aerial photography without the hassle of doing any formal courses.

Capabilities:
- can usually fly fully autonomous, including auto return to home in case of signal loss
- Flight time of up to 50 mins with batteries easily swapped in a minute or two
- range: capable of a round trip of up to 15km, with reception range quoted at up to 32km by DJI
- speeds up to 90km/h


Inspire 1 - 3.5 kgs
Inspire 2 - 4.25 kgs

- **Medium Drones (typically 250g-10KG, and up to 25Kg):** These were the most popular size of drone before the regulations affecting drones over 250g came into force. They were typically built by their operators from parts bought online and came in all shapes and sizes usually classed by the diameter of their propellers. Ranging from 3-12 inches, the most popular are the 4-7 inch class for their low price, good maneuverability, enough payload to carry an action camera but still fly between 5 and 15 minutes depending on the type of flying. These were often very basic and only employed rudimentary flight controllers capable of little more than a horizon keeping function, and were piloted using analogue radios taken from the world of remote controlled planes. It became popular to mount small analogue security cameras to them and use analogue video transmitters to fly them through screens or face mounted goggles, this is


Phantom 4 Pro - 1.38 kgs
Mavic - 907 grams

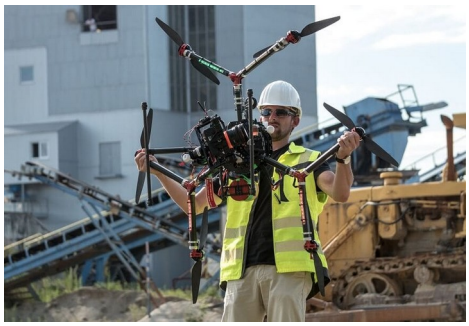

Air - 430 grams
Spark - 300 grams
Tello - 80 grams


Mavic Mini
- 250 grams

called FPV (first person view). Months or years of practice was required to develop the skills to build and fly these drones, so the community was quite small. In 2013 DJI released their first consumer drone, the Phantom 1, and quickly became extremely popular because it offered a ready to fly camera drone that was capable of semi autonomous flight using gyroscopes, barometers, GPS and ultrasonic sensors. Subsequent models only added to these features, and brought the prices down from several thousand to several hundred euros a unit over the last 13 years, lowering the bar of entry into this category of drones. These days, the category is regulated, but often only to the extent that the drone must be registered and a theoretical online test must be completed, but no proof of this must be presented at a point of purchase so they could easily be operated illegally without being able to trace the operator.

Capabilities:
- These days Over the counter variants are typically capable of fully autonomous flight with GPS, but cheaper self built models will omit the sensors required to do so and require manual flight. DIY versions have been made to fly using a cellular connection or long range UHF radios, giving the operators the ability to be in a different country if desired.
- Flight time of up to 50 mins with batteries easily swapped in a minute or two
- Range: here the over the counter drones have the advantage, capable of a round trip of up to 15km, with reception range quoted at up to 32km by DJI. Analogue drones are typically limited to line of sight or a few hundred meters.
- Speeds up to 90km/h for DJI drones, with the custom FPV drones reaching 200km/h and the world record sitting at 626km/h

- Large Drones (25+KG): This category of drones start to become outside of the reach of the general public due to the lack of availability of over the counter units or even parts to build them, and start to become prohibitively expensive as a hobby. The operators of these drones will typically be professionals who have a task to perform with them (agriculture, surveillance, inspections, mapping, etc…) and are required to hold special licenses that require formal training to operate in these functions. The chance that one of these inadvertently conflict with aviation is comparatively lower than the Light and Medium drones.



Capabilities:
- Fully autonomous flight directed from anywhere in the world using cellular or even satellite technology such as starlink, or following pre-programmed routes using GPS or inside out camera based auto-flight. The sky is the limit when it comes to these heavy lifters, if a technology exists it can probably be mounted to, rigged onto or dropped from one of these. With payloads reaching over a hundred kilos or more
- Flight times for electric only powered variants have reached up to 3hrs, with fuel powered or supplemented variants being able to fly for up to a full day
- Speeds typically up to 130-150km/h for industrial multi-rotors, but can of course be designed for any required speeds if built for purpose.

Threats to aviation:

- **Accidental:** ie: recreational drones inadvertently piloted into restricted zones
- **Amateur unintended/uneducated Disruptions:** ie: light or medium category drone pilot using their DJI to film aircraft landing at the airport without realizing the danger posed. Drone performing an automatic “return to home” sequence and flying through a restricted zone in a straight line back to it’s departure point
- **Amateur Intentional Disruption:** Drone operated by a malicious individual or group of individuals, taking advantage of cheap and capable Light or Medium type drones to cause disruption. Can be politically, environmentally, socioeconomically motivated to block an airport, or just a person who might think it’s fun to do so. Can also be coordinated to some degree across multiple airports.

- Professional Disruption: Well equipped and coordinated actors or groups that have more resources than an amateur. Capable of mass disruptions on a large scale.

Proposed Mitigation & Retaliation:

- Regulation & Geofencing: require by law that all drones sold to the general public in Belgium/Europe employ a software Geo-fenced no fly-system like DJI had in the past, where a drone is blocked by it's own software from entering restricted zones. This would be highly effective against Accidental, Amateur Intended and Unintended Disruptions. This could normally be retroactively applied with a software update to the majority of DJI units making up the bulk of the market as they were capable of it already in the past.
- Frequency Monitoring: although the frequencies used to control drones are very close to wifi and hard to track, most drones broadcast un-encrypted video feeds back to their operators. Scanners can be purchased that find and lock onto these feeds so that airport staff (tower, bird control, fire brigade, police) can be notified if a feed is detected near the airport, as well as use that feed to monitor the drone's position. Theoretically it would even be possible to use techniques similar to VDF to track the position of these drones, but hardware and software would have to be developed/found for this.
- Drones vs. Drones: Equip and train airport staff (bird control, fire brigade or police) to use "Interceptor" drones to take down intruders once they are detected. Something as simple as an inexpensive maneuverable drone surrounded by a square meter box of net could easily take down any drone in the light to medium class, or even the heavy class if designed for the task. An alternative is a ready-to-go System such as the "Anduril Lattice Counter Drone System"
- Firearms: A solution to consider, but with the obvious drawbacks that live ammunition is dangerous. Net cannons may be effective but have only a limited range and can be avoided by flying high enough from the ground
- Frequency Jamming: When a drone is detected, frequency jammers could be used to interfere with it's ability to operate. The effectiveness would range from extremely effective (analogue Medium drones without autonomous flight capabilities would just drop out the sky) to completely useless (Autonomous drones with fail-safe routines to just stay hovering in place if signal is lost). Frequencies used by drones are also very close to or shared with frequencies that aircraft operate on (1.2Ghz, 2.4Ghz, 5.8Ghz, 915Mhz, 433Mhz, GPS, Radio Altimeters, DME, TCAS/ADSB) and jammers could leak over and significantly deteriorate aircraft capabilities as well.