

The Use of UAS in Law enforcement

Erik J. Boulware

South Dakota State University

### Abstract

The growth of technology within the unmanned aerial systems field has exploded within the past decade. In today's world, the use of small unmanned aerial systems can be seen in almost every career field. One of the first places where the use of small unmanned aerial systems was for law enforcement and security use. Police agencies, law enforcement agencies, and security have found countless uses for drones as part of the tools they use in their inventory. Today we will be taking a deeper look into the types of drones that law enforcement uses, the utilization of these drones, and the pros and cons of manned versus unmanned systems.

## The Use of UAS in Law enforcement

### **Drone Types and Models**

Over the past decade, police forces all across the country and the world have incorporated drones into their work. Drones can often times give law enforcement a huge advantage in the field. These advantages can often tip the scales in the law enforcements favor when dealing with criminals. With this, police departments and law enforcement agencies also have budgets. They are typically not able to employ these of larger drones that the military uses. They need drones they are small enough to be stored in the back of vehicle, and, drones that break the budget. With the budget, they also need a drone that accomplish a multitude of jobs. Not just one drone for one job.

In the past few years, many police departments and law enforcement agencies have turned to the DJI Matrice 300 RTK. The Matrice 300 RTK allows for its users to equip 2 cameras on it. The cameras can be swapped depending on the job or mission that the drone needs to be used for. These cameras include, a regular video camera that provides high 4k resolution, a camera with a zoom lens that allows for the user to see targets as far as a half a mile away, and a thermal camera that allows the users to see thermal signatures. Unlike other drones available on the market for law enforcement, the Matrice 300 RTK is able to operate in some of the harshest weather conditions it may face in the field. The Matrice 300 is able to operate in a temperature range from minus 4 degrees Fahrenheit all the way to 122 degrees Fahrenheit. The Matrice 300 is also able to operate in rainy conditions and gusty winds. It also features a 55-minute flight time giving law enforcement a lot of time in the air. At a lesser price point, the DJI Mavic 2 enterprise comes in with a significantly smaller than the Matrice 300 RTK. The Mavic 2 enterprise is able to fold up its rotors and fit into a

compartment the size of glovebox in a car. The Mavic 2 enterprise comes with a regular 4k camera and a thermal camera right next to it. This way, the user of the Mavic 2 is able to see what the regular camera and thermal camera are seeing at the same time. The Mavic 2 enterprise features about a 30-minute flight time. Both of these drones are able to give police an aerial advantage of situations at a significantly less price point than operating a law enforcement helicopter. As a side benefit, drones are significantly better for the environment than gas guzzling helicopters. (DroneFly. "Police Drone Infographic." *Dronefly*, DroneFly 2020, 2017, [www.dronefly.com/police-drone-infographic](http://www.dronefly.com/police-drone-infographic). )

### **Utilization in the Field**

With the availability of such great technology to law enforcement, a drone can be used in almost any situation they may be faced with. This can include anything from pursuing a criminal to search and rescue. When it comes to search and rescue missions, minutes and seconds can often be the difference between life and death. Rescue and recovery teams cannot afford to make mistakes when lives are on the line. For these teams, drones have substantially increased recovery efforts in recent years. In the past, helicopters and rescue teams on foot have had the role of conducting search and rescue operations. Using people on the ground was very inefficient as it took hundreds of people to comb many acres of land at once to try and conduct the search and rescue. These search and rescue operations would also have to seize at night costing the team valuable hours to locate their target. Helicopters were able to help the cause as they could view large areas at once. However, helicopters were very expensive to operate and often took a long time to coordinate and get going. The use of drones in situations like these have cured many of these problems. Once a search and rescue call comes in, a recovery team can drive to the location

and get a drone up in the air in as little as five to ten minutes. Because of their small size, drones can also be launched in heavily wooded forests and sections of uneven land, whereas helicopters would have to depart from an airport or helipad. This costs the recovery team valuable times. Drones are also able to operate closer to treetop levels compared to helicopters or airplanes. Drones like the Matrice 300 RTK that can be equipped with thermal cameras can even be operated at night. In the past this was difficult to impossible as helicopters flying low at night can spell disaster. Search and rescue is only one of the jobs drones like the Matrice 300 RTK excels in. In years past, when police have had to deal with an active shooter situation, it put a severe risk on the officers responding to the situation, and many times, as lead to a loss of life. The use of drones in active shooter scenarios has significantly reduced the risk of officers responding to the situation. Similarly to search and rescue operations, the use of helicopters are very expensive and also have a risk of life. Drones allow officers to get eyes on the target from a safe distance. Drones also give the officers an aerial view of the situation, which gives them an unparalleled advantage against the active shooter. The aerial advantage allows police to see the location of the active shooter(s) and then coordinate where they need to put officers and vehicles to help apprehend the shooter. Search and rescue and active shooter operations only scratch the surface of what law enforcement can do with drones, as there are countless other uses for them in the field.

### **Pros and Cons**

Despite all of the advantages stated earlier, drones and uas still have their drawbacks. Because of their typically small size, drones are needed to be powered by lithium ion batteries. Because of this, they have significantly shorter flight times when compared to the likes of a helicopter. For instance, the Matrice 300 RTK only has a flight time of about 55 minutes. When

compared to the likes of a helicopter, this is significantly less time, as helicopters can stay in the air for four hours or more. Because drones are controlled remotely, they can sometimes lose connection and create “flyaways”, which can be a huge problem in the field and potentially put others in danger. However, I think the pros outweigh the cons. Drones can be taken to a location and launched so quickly I think it is worth the reduction in flight time. Also, if a drone battery does run out, it takes less than 30 seconds on most drones to quickly change the battery. Drones will continue to be a pivotal tool for the use of law enforcement operations for the foreseeable future.

## References

Altigator. "Drones for Search & Rescue Missions." *Altigator Drone & UAV Technologies*, 7 Dec. 2016, [altigator.com/en/drones-for-search-rescue-missions/](http://altigator.com/en/drones-for-search-rescue-missions/).

DJI. "Matrice 300 RTK – Built Tough. Works Smart." *DJI*, 7 May 2020, [www.dji.com/matrice-300](http://www.dji.com/matrice-300).

DroneFly. "Police Drone Infographic." *Dronefly*, DroneFly 2020, 2017, [www.dronefly.com/police-drone-infographic](http://www.dronefly.com/police-drone-infographic).

Staff, DroneSense. "UAS and Active Shooter Preparedness." *DroneSense*, 24 Sept. 2020, [dronesense.com/blog/uas-and-active-shooter-preparedness](http://dronesense.com/blog/uas-and-active-shooter-preparedness).

Figures



## TOP LAW ENFORCEMENT DRONE PACKAGES FOR 2017

In a study from the “Center For The Study Of The Drone” (Bard College) revealed that some departments owned two or more different drone models. The most popular models among law enforcement and public safety agencies are drones made by DJI such as the Inspire 1 and Matrice Series.



**Inspire 1 V2.0 + Zenmuse XT**

- Up to 23 minutes of flight time
- Compact and portable system
- Dual Operator Control
- Lower Cost



**Matrice 100 + Zenmuse XT + Z30**

- Flight time of up to 35 minutes
- Compatible with many payloads
- Additional expansion bays
- Dual Battery Compartments



**Matrice 210 RTK-G  
Zenmuse XT + Z30 Zoom**

- Extended flight time (up to 38 minutes)
- Dual Payload
- IP43 Water Resistant
- Advanced obstacle avoidance

DroneFly. "Police Drone Infographic." *Dronefly*, DroneFly 2020, 2017,  
[www.dronefly.com/police-drone-infographic](http://www.dronefly.com/police-drone-infographic).