flytnow

DEFINITIVE GUIDE

SETUP DRONES
PUBLIC
SAFETY

Drone as a technology has come a long way, especially when it comes to adoption by state and local government agencies, and public safety officials. In the 2020 coronavirus pandemic, drones have proven to be quite an effective tool in the fight against COVID-19; especially in countries like China and India.

We are witnessing a widespread adoption of drones across different use cases, and public safety is one such application that has yielded significant social and public health benefits. One such example is how drones saved the lives of 279 people, as shared by DJI at AirWorks2019. The total global number is, of course, orders of magnitude more, given the increasingly common use of drones for disaster monitoring, emergency response, search-and-rescue, etc.

In the US, law enforcement agencies are rapidly adopting UAV technology for the following reasons:

- Drones provide better accessibility to places that are dangerous for humans.
- Drones are ideal for capturing video evidence in the form of aerial footage, thus freeing up valuable manpower that can be deployed elsewhere.
- Drones are an effective tool in search and rescue operations since they can cover large swathes of land in relatively less time.
- Drones can provide real-time situational awareness in delicate incidents such as hostage situations.
- Armed with different payloads and sensors, drones can keep an eye on groups of people involved in suspicious activities.

In a study conducted by Bard College, they concluded that 910 state and local law enforcement agencies across the USA have incorporated drones as part of their operations. It is safe to say that drones will play a growing role in public safety and emergency response.

# Why Drones are the Perfect First Responders

Drones as first responders refer to the deployments of drone fleets that reach the site of emergency first, even before human responders. Drones are turning out to be perfect first responders for the following reasons:

- They are fast, agile, and nimble and can reach a location quickly. By doing so they can provide critical, real-time support. Researchers at Tu Delft have come up with the concept of a drone ambulance where a drone carrying an Automated External Defibrillator (AED) can fly to a person suffering from a cardiac arrest and provide time-critical medical support.

- Drones can aid human responders by going to an emergency situation first, assessing it, and sending information back, and based on which human responders can better prepare for the situation.

Understanding a Drone-based First Response System

A drone-based first responder system could be a standalone local system, or work as part of a bigger nationwide network. In either case, such a system would require the optimal combination of hardware and software, so that it can operate in an intelligent, reliable, and scalable manner. The below illustration provides an overview of such a system.
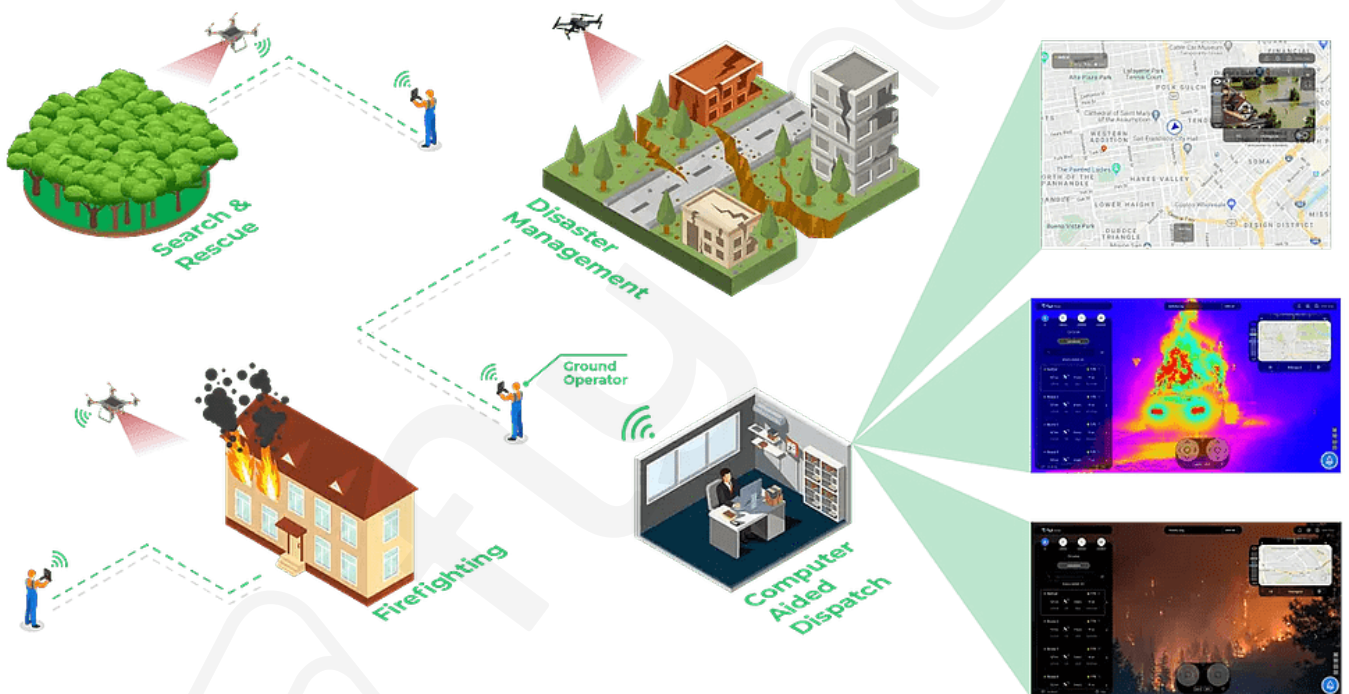
There are several components of such a system; the key ones are listed below:

Hardware

This primarily means drones that can be bought off-the-shelf or those that can be custom-built for specific purposes. Below are some specific drone models suitable for such operations:

DJI M300 RTK

Approx. Weight	: 2.7 kg
Max speed	: 23 m/s / 82.8 kph
Flight time (with payload)	: 55 min
Operating Temp.	: -20ºC to 50ºC (-4ºF to 122º F)

DJI M210 V2

Approx. Weight	: 1.45 kg
Max speed	: 50.3 mph / 81 kph.
Flight time (with payload)	: 24-38 min
Operating Temp.	: 4º to 122º F (-20º to 50º C)

RHEA 160 Hexacopter

Max Speed	: 50 kph
Approx. Weight	: 28 kg
Temperature Range	: -10º to 40º C
Flight Time	: 90 minutes

FOXTECH Great Shark 330 VTOL

Approx. Weight	: 5 kg
Max speed	: 22 m/s / 79.2 kph
Flight time	: 2.5 to 3 hours
Operating Temp.	: N/A

DJI Mavic 2 Enterprise

|	
Approx. Weight	: 2.7 kg
Max speed	: 82.8 kph
Flight time	: 55 min
Operating Temp.	: -20ºC to 50ºC (-4ºF to 122º F)

Fleet Management Software

At the heart of a drone-based first response system is a cloud-connected solution like FlytNow, for the following reasons:

- First-responder applications require the management of a fleet of drones.
- Public safety use-cases may require autonomous drone flights in order to minimize the reliance on human pilots.
- Emergencies may happen in remote areas and hence require beyond the visual line of sight (BVLOS) capabilities.
- Being an aircraft, each drone must respect airspace management rules and regulations so that there is no conflict with manned aircraft or other aerial vehicles.

Such capabilities are available in FlytNow, a robust drone automation platform that supports drone fleet management, BVLOS operations, and third-party integration with UTM service providers for airspace intelligence. FlytBase customers are already using FlytNow to power their first responder systems.

A Texas, US company called Phirst Technologies has developed a solution called First iZ using FlytNow to deploy a fleet of drones via the computer-aided dispatch (CAD) system that powers the 911 emergency services in the US. The system works by allowing a 911 operator to dispatch drones from a unified dashboard to gather situational awareness on an emergency situation, and thus assisting human responders before and after they arrive.

Onboard Software
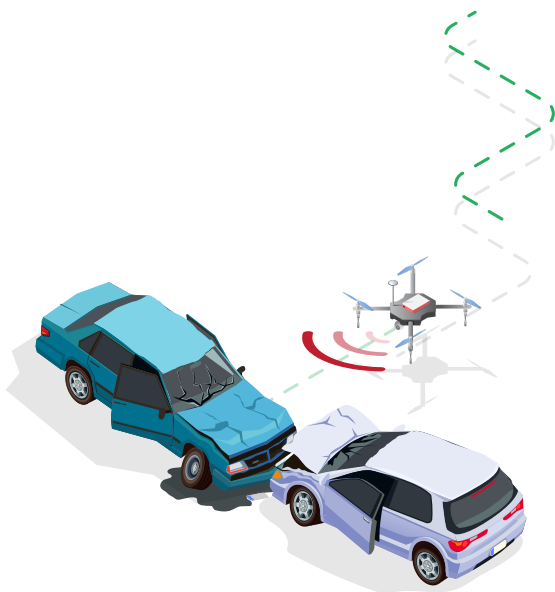
FlytCAS
(Collision Avoidance System)
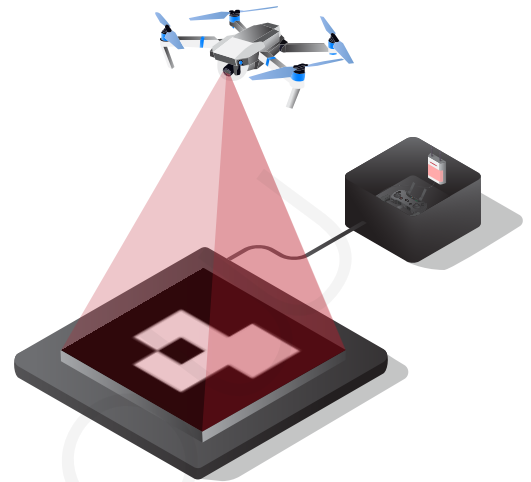
FlytDock
(Autonomous Precision Landing)

This refers to the operating software that goes into a companion computer which is then integrated with the flight controller of a drone. The software acts as the brain and keeps the drone connected with the fleet management system at the base station.

FlytNow Business/Enterprise comes with its own 'edge level' software (FlytOS) that provides the following capabilities:

- BVLOS or EVLOS operations over 4G/LTE/5G networks.
- Precision landing and hover features that can be used to land a drone on a charging pad (see FlytDock).
- Collision avoidance, a critical feature in BVLOS flights (see FlytCAS).
- Remote control of payload attachments and camera gimbal.

Drone-in-a-Box (DiaB) Hardware

A 'drones as the first responder' system requires the support of ground-based hardware like charging pads, launch systems, etc. The hardware is required to automate the launch of a drone and putting a drone to charging mode when it returns from a mission. FlytNow offers integration with third-party DiaB hardware from some of the following solution providers:

The integration capabilities of FlytNow combined with smart automation has enabled Phirst Technologies to deliver a public safety solution using drones (First iZ). One of the unique capabilities of the First iZ system is that it can send a drone to a location and capture the required data autonomously; this wouldn't be possible without FlytNow's support for ground-based hardware.

Airspace Intelligence
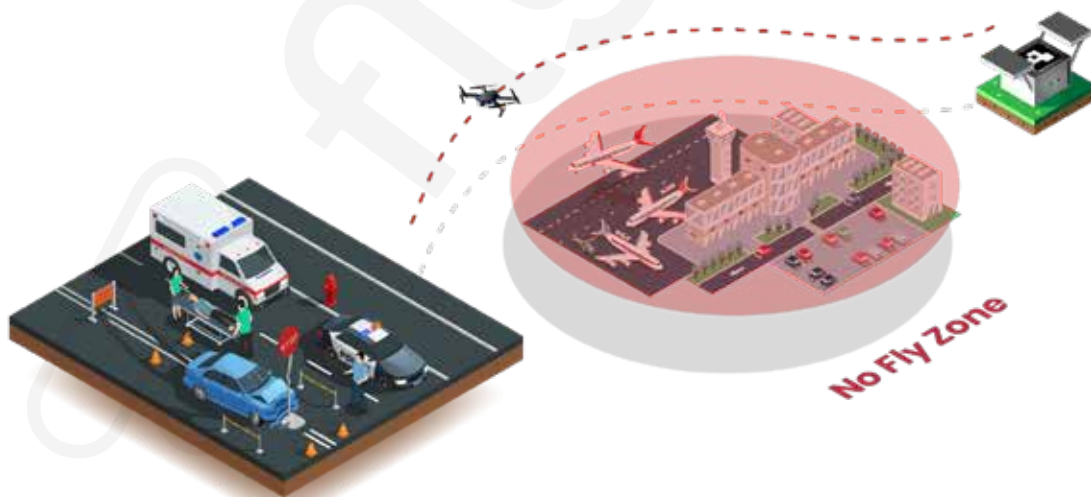
BVLOS flights in remote, rural areas must be enabled by a first responder system. When conducting BVLOS drone flights, it is important that they don't interfere with manned-aircrafts or break static, as well as dynamic, airspace norms. Such airspace intelligence is usually available from UTM service providers, whose solutions can be seamlessly integrated into FlytNow so that operators can conduct safe and legal flights.

Airspace Intelligence

Depending on the situation, drones require specific payloads to get the job done. For example, in a search and rescue mission, a drone may use an IR sensor to locate the missing person. Such payloads and sensors can be remotely controlled via FlytNow, including:

- **IR Sensor**: Commonly known as a thermal camera that captures infrared radiation.
- **Loudspeakers**: Useful in making announcements and riot control.
- **Spotlights**: An important attachment for search and rescue.
- **Beacons**: Such devices are used to make a drone visible from the ground in low light.

Loudspeakers   Spotlights   Beacons

Advanced Failsafes

Despite rigorous flight tests, drones can sometimes fail from the sky, posing a threat not just to the drone but more so to the people and infrastructure below. This highlights the importance of fail-safes i.e. a set of actions to be automatically taken in the event of such an emergency.
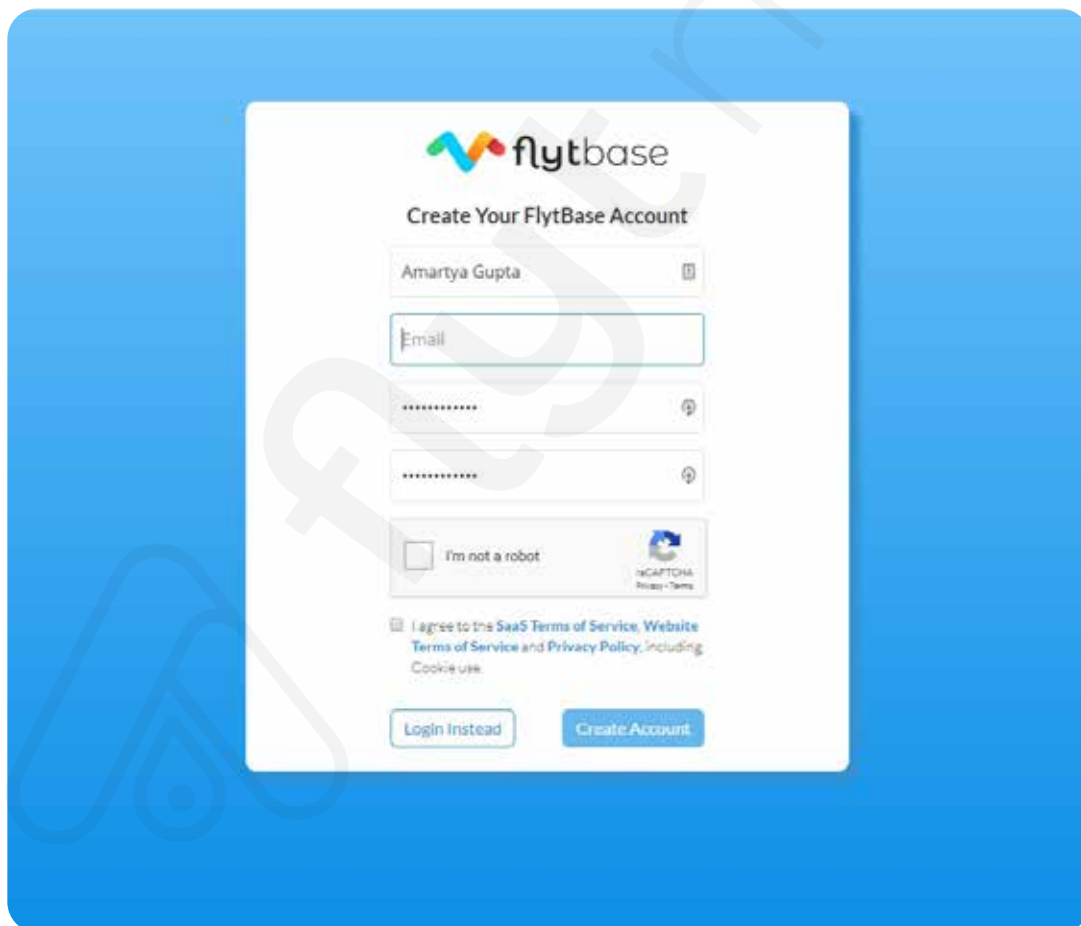
FlytNow offers out of the box failsafe features like RTH (Return to Home) and ELP (Emergency Landing Point).

How to Quickly Demo First Response System Using FlytNow Pro

FlytNow Pro is a lighter version in terms of features compared to our business and enterprise versions. But it is perfect for someone who is looking for a solution to quickly validate a first response system using drones. After a successful POC, he/she can upgrade to our business or enterprise version for the full-fledged implementation.

How to get started with FlytNow?

Step-1: As someone who is looking for a solution for a quick PoC. You need to first sign up for our 28 days free trial from https://app.flytnow.com/

Step-2: Once you are done with your account setup and email verification. Add your drones by following our Get Started guide.

Step-3: This is an optional step. If you don't have real drones then you can use our virtual drone. Your FlytBase free account comes with one free virtual drone that you

can add by following this guide.

Step-4: A mission is a set of instructions that tells a drone where to go and how to go. In the context of a first response system, the feature can be used to tell a drone to visit a location and investigate why there's an emergency. Go to the MISSION tab from the dashboard and click on Add Mission.
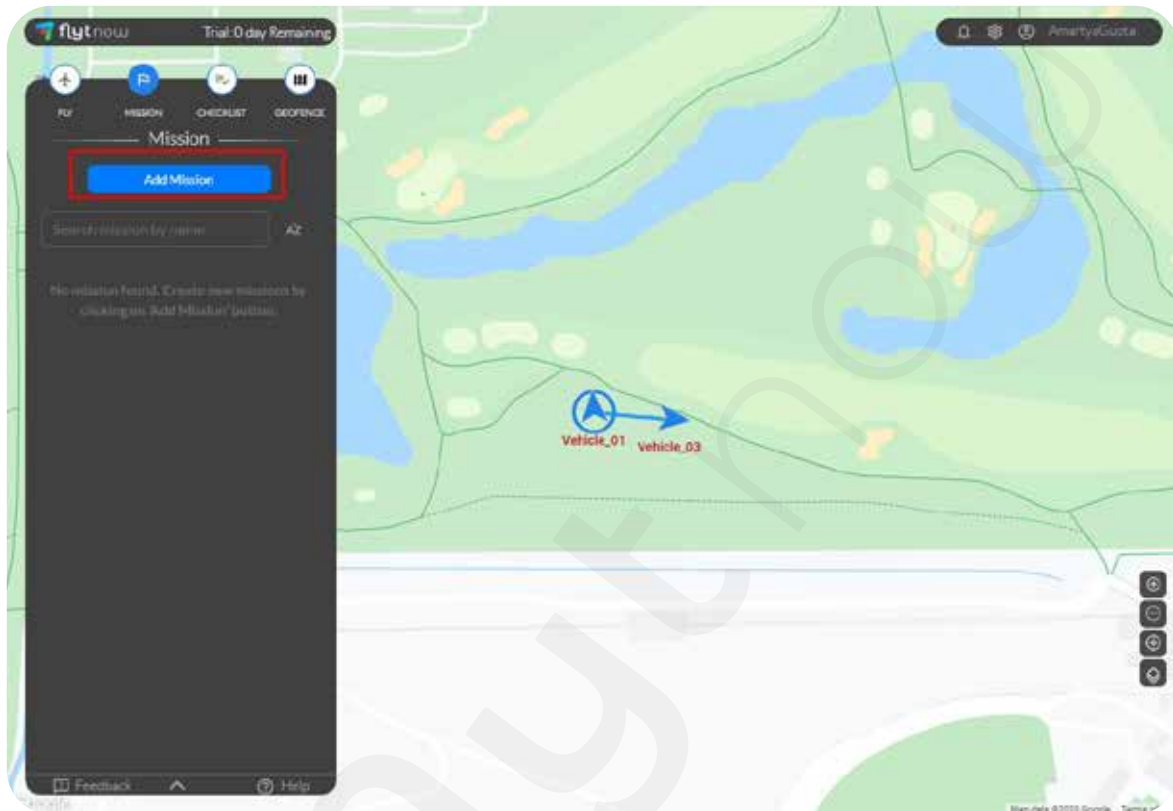
Give a name to your mission and click on Add Waypoint. By using the drop pins you can create a route to any location. While defining a route you can limit the speed and altitude.

When creating a route, you can also define a finish action that tells a drone what to do when reaching a location. Currently, there are three options in the system:

- Hover
- Land
- Return to Home
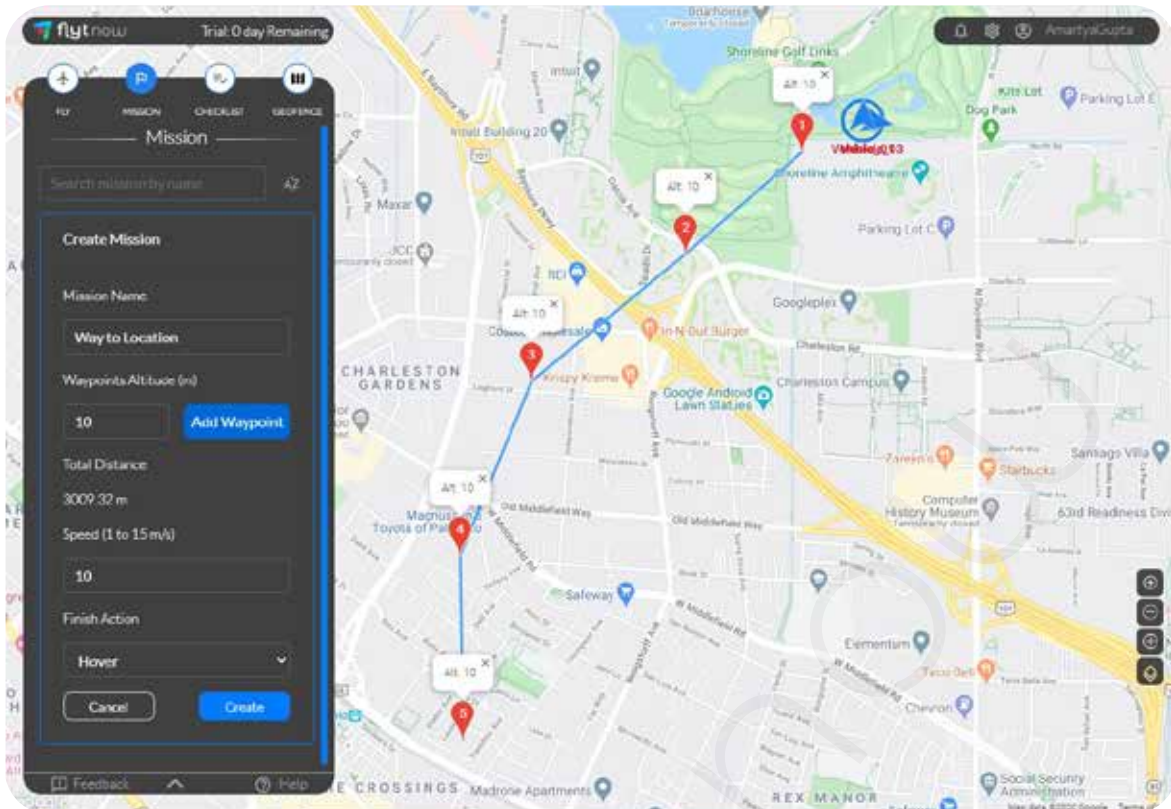
Step-5: Set up a geofence, which defines a drone's area of operation. In FlytNow Pro, a geofence is a circular region within which a drone can fly. A first response system is more likely to function within a specific region and a geofence is a perfect feature to define that region. Follow this guide to create a geofence.

Note: A drone cannot fly beyond its defined geofence. In the enterprise version, polygon geofence is supported.

Step-6: Create Pre-flight Checklist items. FlytNow comes with a list of items that you have to check before executing a mission. The checklist serves to remind you of the important things that you have to keep in mind before sending a drone out for a mission. You can add items to the checklist by going to the CHECKLIST tab -> Add to Checklist.
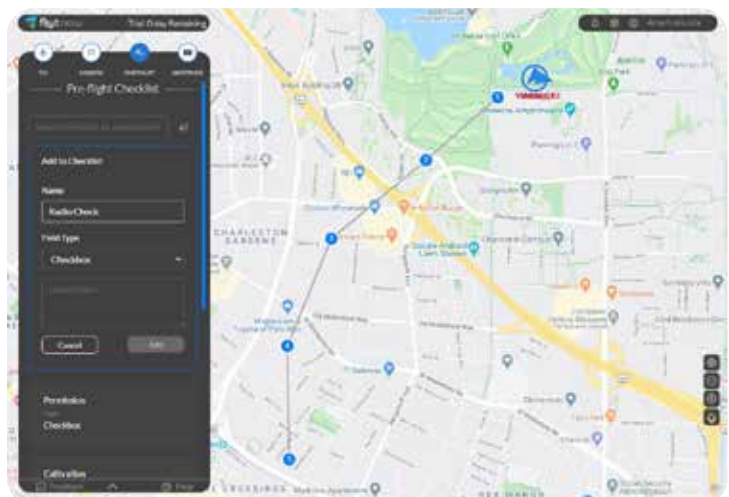
Step-7: Enable video live streaming. When a drone is out on a mission, you can stream the live video from the drone and even share it via email. This feature is critical in the context of First Response because when a drone reaches a location, you can assess the situation from the live video feed sent by the drone. FlytNow also supports the streaming of video from multiple drones on a single dashboard. Refer to this guide to use video live streaming.
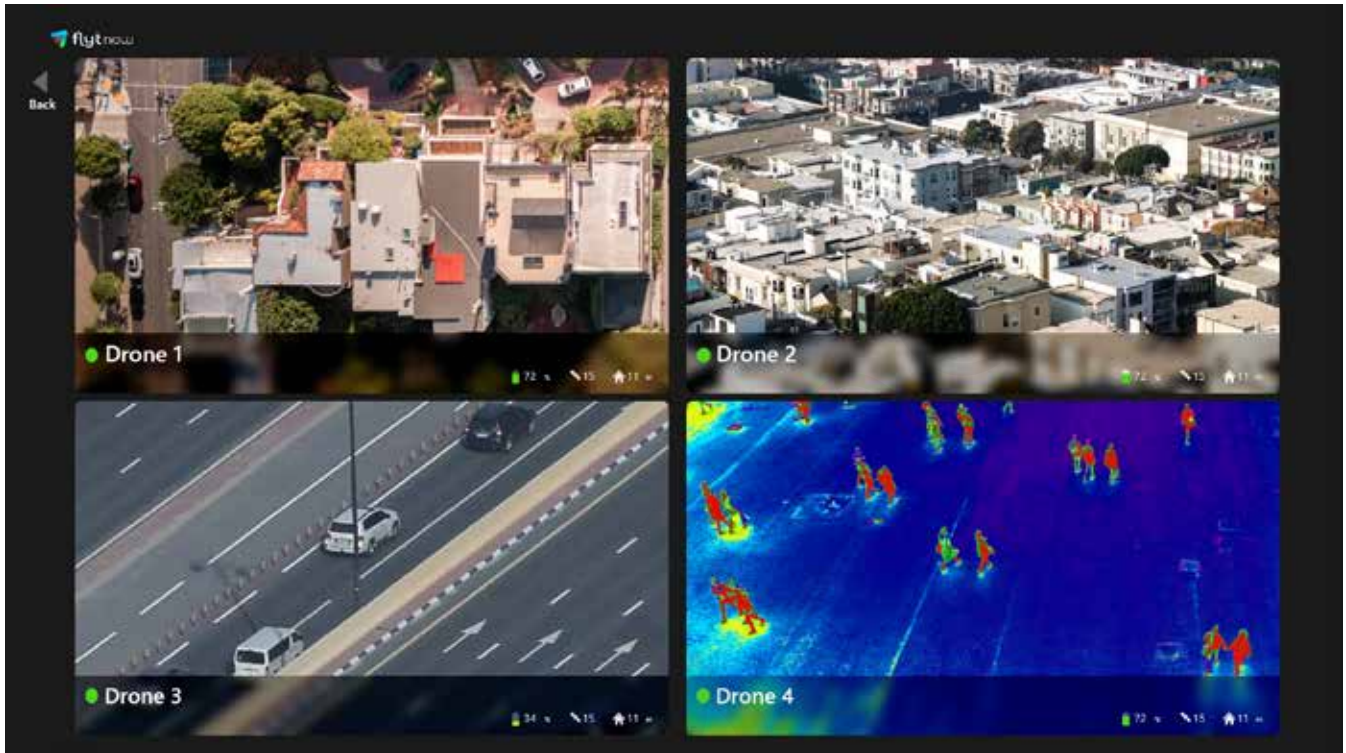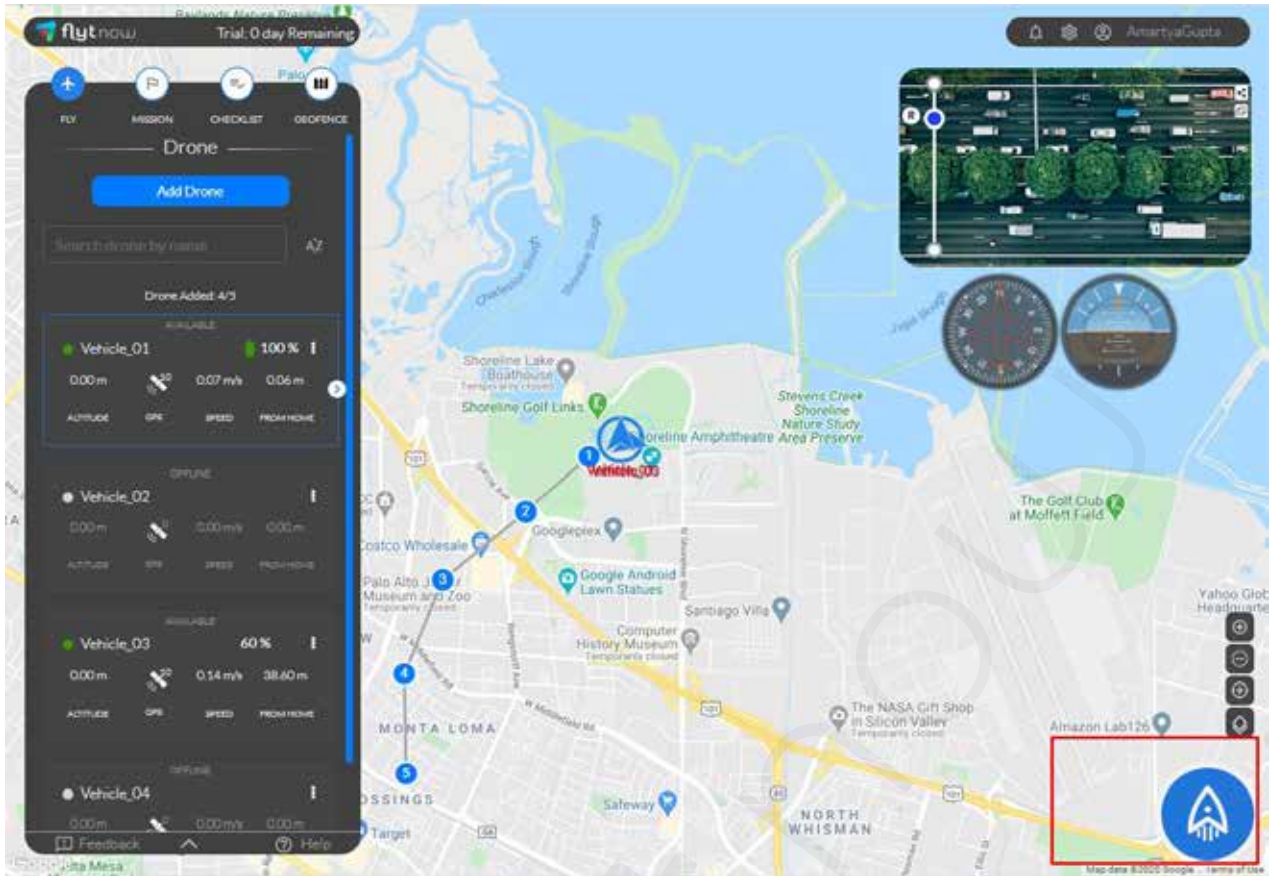

## Initiating a First Response Mission

This is how you will demonstrate your system. Consider a situation, where you have received an emergency alert and you have to send a drone. To execute a drone flight you will follow the following steps:

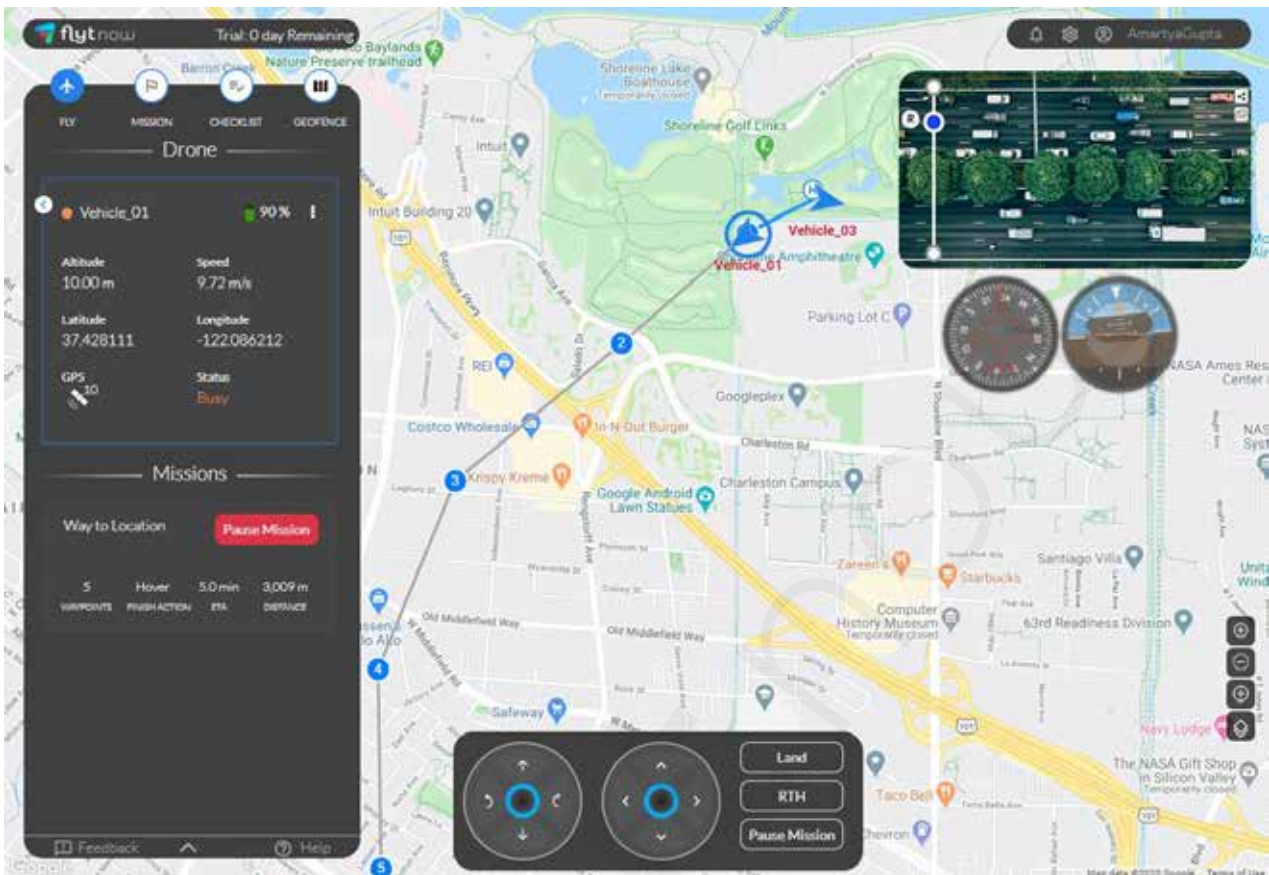**Step-1:** Create a mission for a drone so it can reach that location.

Step-2: Select a drone and click on the launch button.

Step-3: Select the mission that you just created.
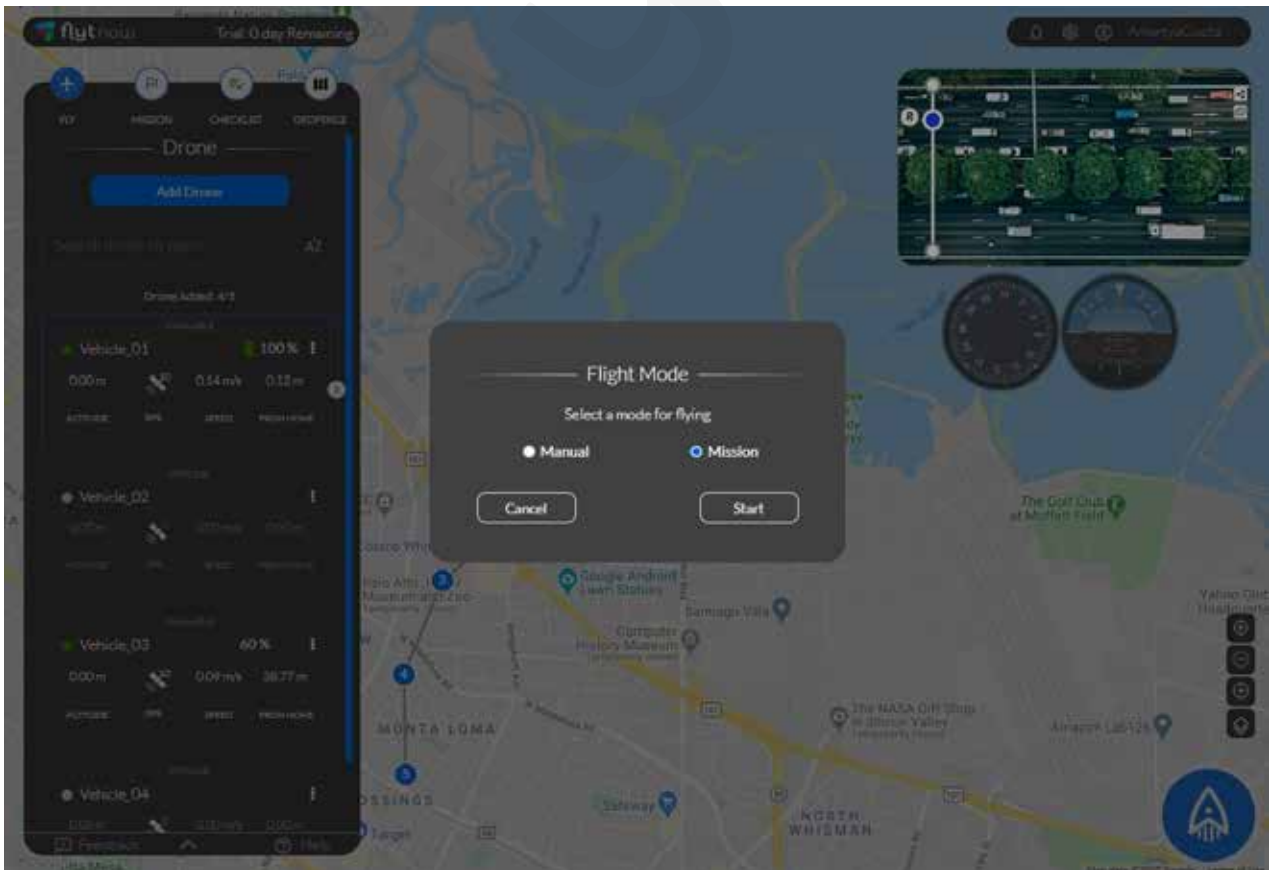
Step-4: The system will present you with a pre-flight checklist; mark all of them as complete and Execute the mission.


FlytNow Business/Enterprise – A Complete Solution for First Response System

The above demonstration gives a quick, cost-effective option to prove, conceptually, a first response system, using FlytNow. Once the PoC is successful, users can transition either to the business version or the enterprise version that provides additional features, such as:

- Team management & administration.
- Support for polygon geofence.
- Precision landing so that drones can land on charging pads automatically.
- Localization of language based on a user's region.
- Thermal camera integration.
- Supports DJI M2E payloads.
- Mission log.
- Support for custom build drones based on PX4 and Ardupilot.
- Integration with third-party UTM services providers, for BVLOS and EVLOS flights.

FlytNow business is an out-of-the-box solution for public safety operations. During the 2020 COVID-19 pandemic, Indian police officials in the state of Gujarat flew drones to monitor the streets of Ahmedabad (an Indian city) for unlawful gathering with support from a local startup (Dronelab). Dronelab worked with the government officials to establish a drone command center using FlytNow, which allowed public safety officials to centrally access the video feed of all the drones flying over the city. Drone pilots who wanted to volunteer used the FlytOS mobile app to connect his/her drone to the FlytNow dashboard that was being used at the command center. Read the complete case study.

Both the versions include the support for our cloud connect kit that can be loaded in a companion computer, which in turn can be integrated with the flight controller of DJI enterprise drones and custom drones based on PX4 and Ardupilot. The companion computer coupled with our onboard software enables a drone to connect with FlytNow over 4G/LTE/5G networks. The enterprise version also provides support for DiaB (Drone in a box) hardware which generally includes a charging pad. A drone can land on a DiaB box using its precision landing feature.
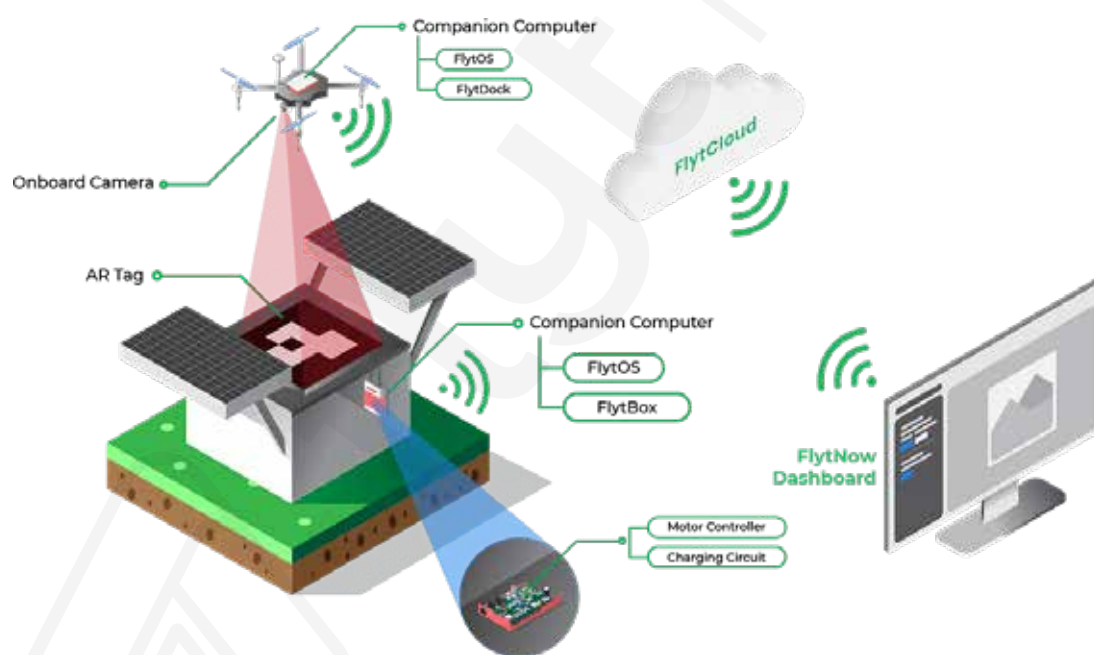
Schedule a 30-min free consultation with our expert to learn more about the FlytNow Drone Delivery Software Solution, contact us at https://flytnow.com/contact/

Try for free

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