

Impossible Air Support

Drone as a first responder program overview

Air Support:

Air Support is a complete turn-key unmanned airborne policing and first response system. It enables agencies to send high performance drones from rooftops or other mobile command centers within seconds of a 911 call, providing immediate video intelligence that can be distributed real-time to anyone the agency chooses. We supply the aircraft, training, IT connectivity support, camera systems, routine maintenance, FAA certifications, training and program support. On the agency side, you may need some internal IT support which most agencies already have in place, and rooftop access or safety improvements if required.

What are the benefits?

Many law enforcement agencies have discovered the benefits of drones in police work. But the applications are limited because it takes time to get a drone to the scene and even more time to deploy. The power and benefits of airborne law enforcement have been proven over the years, and agencies that can afford helicopters have high success rates in suspect search, pursuits, and apprehensions. The ability to observe a scene from the air is extremely powerful. But helicopters are too expensive to use for many types of calls, and have many limitations compared to drones; they can't respond to multiple scenes at once, they can't get to the scene quickly unless they are already in the air, and they can't safely fly very low.



Air Support enables drones to respond quickly to emergency calls by deploying in seconds from rooftops

The Impossible Air Support program enables agencies to respond to calls within seconds. This rapid response provides many unique benefits. A lot can happen within the first couple minutes of a call. Getting eyes on scene quickly can provide instant intel and capabilities to include:

- Suspect descriptions, vehicle and license plate information
- Gather evidence quality video
- Observe and document discarded evidence
- Alert officers to the presence of weapon threats
- Thwart some criminal activity
- Track fleeing suspects
- Provide warrant service overwatch
- Aerial perspective of vehicle crash scenes
- Respond to nuisance, tagging or smash and grab calls inexpensively
- Provides safety for officers, suspects and bystanders

The powerful cameras integrated into our unmanned aircraft can deliver similar performance to those found in expensive helicopters, because drones can fly much lower and get closer to the action.

Helicopters normally maintain an orbit (forward flight) so they have enough speed to perform an autorotation in the event of an engine failure. This orbit requirement makes it difficult to keep eyes on the suspect, as they drop from view as the aircraft moves behind buildings and trees.

The drone is fast and quiet, and equipped with a 30X zoom camera, thermal camera, a loudspeaker, search lamp, and flashing blue and red lights. It will become immediately apparent to a suspect that he has been found and video of his actions are now on file. Remote drone operators can use the loudspeaker to instruct suspects to comply and inform them that their actions are recorded.

We propose that deploying drones as first responders will have a deterring effect on many crimes in the same way that security cameras have changed criminal behavior. Criminals know that they have a certain amount of time (several minutes in many cases) to operate before law enforcement teams can get on scene. And a drone can chase even the fastest suspect. They can jump fences, run into darkened areas, climb trees and many other evasive maneuvers and the drone can keep up with them safely.



Detailed video from the scene is transmitted anywhere the agency chooses, including smart phones and other remote command centers

Unmanned aerial law enforcement offers enormous promise for public service agencies. And Impossible Aerospace is dedicated to creating and supporting mission capable systems that will keep public service agencies on the leading edge.

How it's done:

We come to you and provide a detailed proposal that defines coverage areas, mission profiles, flight freedoms and equipment needs. Once the program is defined, budgeted and approved, we begin training and FAA clearance work. We work with your IT team to prepare and test the video distribution infrastructure, and provide any guidance needed to your facilities teams to ensure flight line readiness. Your pilot and fleet management teams study the online training content pass all the exams, and we provide flight checkout training at the time of aircraft delivery. Depending on the technical capabilities of your airborne team, we may request that you send your technical team leader to the Impossible Aerospace factory for in-depth system training.

Is Air Support a fit for your agency or mission?

The Air Support program is well suited to deployment in dense urban areas, and a typical installation will support a 2-mile radius.

A mobile command center can offer flexibility to an agency that needs an aircraft positioned in high crime areas, but the line of sight limitations will vary. The current FAA regulations require that the pilot keeps the aircraft within the line of un-aided sight, but we expect the FAA to allow first responders to fly beyond the line of sight in the future. FAA rules are in flux now, but all indicators suggest that first responders will have airspace priority over all other drone users.

Agencies in rural areas can also benefit from the Air Support program. A mobile command solution can provide value for warrant service overwatch, search and rescue, and many disaster response support missions.

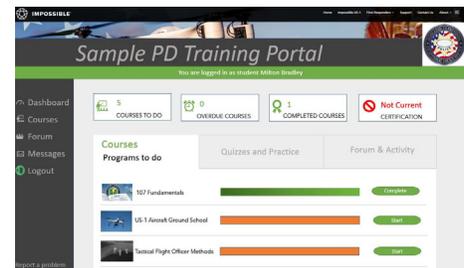
It's likely that the FAA will expect agencies to demonstrate an airborne program management success record prior to extending flight beyond the line of sight privileges. The Air Support program can provide the training, record keeping, compliance and demonstrated success measurements to help satisfy these requirements.

Training and program management:

Among the most common challenges we hear from agencies is that there is no standardization for training and program management. Most public service agency teams are fully engaged in day to day operations, and they don't have the luxury of allocating personnel to standing up new capabilities. Starting an unmanned airborne law enforcement program is complex, and it requires a substantial investment in time. The Air Support program provides the full roadmap and all the training tools to accomplish this requirement.

There are several layers to the training program:

- Part 107 / COA (FAA Certificate of Authorization) clearance
- Aircraft flight operations (Aircraft specific training)
- Tactical Flight Officer skills (methods for using the drone in police work)
- Imaging Fundamentals (understanding thermal imaging and advanced camera operations)
- Pilot refresher course



Video based training saves time and can keep pilots current

Program Management:

Operating an unmanned airborne law enforcement program is challenging and has a variety of compliance and reporting duties. Our Air Support program offers templates and tools to accomplish these, but your agency has the freedom to customize them as you see fit. Some of the baseline requirements and capabilities include:

- Agency policy for the use of drones (template)
- Cadet and training requirements
- Public facing policy and awareness video (for PR)
- Pilot training portal and current status (readiness)
- Flight records, pilot in command, flight paths (can be public facing)
- COA reporting requirements
- Aircraft inventory, maintenance minders (airworthiness status)

Your agency will define what training requirements must be met before pilots are allowed to fly, where and when they can fly, and what the operational boundaries are. We simply provide a move-in ready framework for this. We recommend that public service agencies secure and operate under an FAA Certificate of Authorization, which simply provides special clearances to fly where and when they need to. We will craft and submit this clearance on your behalf as a service in the Air Support program.

There are several reasons we recommend operating under a COA as a public service agency:

- Part 107 pilots can be held to a higher standard of personal liability for damages or injuries caused by the drone while using it. Operating under a COA can reduce exposure for the pilot and the agency.

- Airport waivers are built into the COA airspace, so you get streamlined access to airport towers and more freedom to fly near airports. Airport waivers are usually more restrictive for Part 107 pilot's than for agencies flying under COA's.
- It's faster to start up a full program using the COA strategy than by having individual pilots secure Part 107 clearance (see the examples below).
- There's more to unmanned aerial policing, SAR, or firefighting than simply passing a Part 107 test, and the COA allows your agency leadership to establish training requirements. Under a COA, you can self-certify as many officers as you need for your program. Understanding the fundamentals covered in the Part 107 training is vital, and most experts will encourage you to have pilots pass the 107 exam or create your own variant of the test.
- A COA can allow you to fly in other counties and states for emergency support/ FEMA events
- Depending on your aircraft equipment and mission requirements, you may be able to secure the clearance to fly over people and operate at higher altitudes if required.
- Each officer flying under Part 107 must apply for waivers uniquely (night-time flight), and Part 107 waivers can expire at different times as well as varied duration. This can be a nuisance to keep track of if you have several pilots.
- The COA reporting systems CAPS (Certificate of Authorization online application system) captures and records your flight history which builds credibility with the FAA. A successful track record of flight operations may prove invaluable as future capabilities come along for public service agencies, including flight beyond the line of sight, drones as a first responder, and flight above people.
- Part 107 pilots will have to take a recurrent test every two years costing \$150/each. No such testing is required if you operate under a COA.
- Refreshing COA clearance is simple and straightforward for a public agency. It's simply a resubmittal of the existing documentation with any additional aircraft or other mission or access changes you require.

What our full Air Support COA Service provides:

- Precision guidance from start to end.
- The COA is written specifically for the agency and will include all necessary waivers (night operations, airport, etc.) and is valid for each officer.
- Submission services that overcome LexisNexis challenges with the FAA.
- Pre-crafted submission forms tested and proven to pass on the first submission.
- Air Worthiness Statement with special LE language.
- Public Declaration letter template.
- Legal language for AWS ensured to pass FAA review.



COA submissions are time consuming and tricky; Air Support makes it easy

Connectivity:

Many agencies already have a secure video and data distribution solution. If you already have this capability, we are happy to work with your IT teams to provide a network feed. Fixed or mobile command centers will need a high bandwidth connection to feed real-time video to the internet so it can be viewed on phones, in cars, or in other administrative dashboards. If you don't have this capability, we can provide a secure streaming solution that you can share across the agency. The requirements to accomplish this are not complex, but high-speed access can vary.



We can work with your IT team to accomplish your data needs, or we can offer a full solution

Mobile Command Center:

A mobile command center is a useful tool for agencies that can't easily deploy from a rooftop. The key benefit of the Air Support program is that the aircraft are ready to fly at a moment's notice. A mobile command center can enable an immediate drone deployment almost anywhere. They can be parked in high crime areas, near public events, or in the field for search and rescue missions. The mobile command center is a fully self-contained flight operations center with power, connectivity, monitors and comm's. It can be a trailer or a vehicle, yours or ours. We can provide a quote for a mobile command center, or we can provide support to integrate flight operations into an existing asset.



A compact trailer can serve as a cost effective mobile command center

Program Mechanics:

Every agencies' needs will differ, and we are happy to customize a solution to help you accomplish your goals. Agencies can opt for elements of the program in an al-a-carte fashion, and we will provide a formal quote based on your needs.

Air Support is a cost-managed system, so you only pay for what you need annually. This reduces planning and budgeting frustrations.

The full Air Support framework offering includes:

- Agency needs assessment (onsite visit, research, proposal)
- Unmanned aircraft (as needed to ensure required airtime)
 - Aircraft are updated and replaced as necessary
- Camera system (based on mission profile)
 - Camera systems are updated and replaced as necessary
 - Additional Payloads
- Standard maintenance
- Full COA crafting and submission
- Annual COA compliance submissions
- Stationary command center monitors (as needed)
- Mobile command center (trailer or vehicle as needed) (mobile command centers may require a longer lease, and/or we can support existing vehicle updates)
- Program management system (secure online, agency branded ecosystem)
- Training management system (secure online, agency branded ecosystem)
- Onsite pilot checkout certification
- Continuous aircraft health monitoring (real time)
- Team leader advanced training program (your champion, our facility, 1 day)
- IT hardware and software, as required, to distribute video
 - Video Distribution System
- IT support as required (some agencies already have this in place)
- California based support
- Scheduled site visits as needed
- No hardware purchase (other than permanently attached IT or monitors)

As aircraft wear out, or camera systems become obsolete, we simply replace them with the latest offering from Impossible Aerospace. We provide routine maintenance on the aircraft. The agency will provide insurance in the event of aircraft loss or damage. If we supply a mobile command center, the agency will provide insurance for that vehicle. We are happy to discuss customizations based on your needs.

Agency costs:

Typical agency costs, personnel aside, include an annual program lease fee, and incidentals related to aircraft damage and some IT and IT related hardware costs. Agencies flying from rooftops will likely have some infrastructure improvement costs. These will vary based on roof access, fitness for use and OSHA requirements.

About us:

Impossible Aerospace was founded on the notion that aircraft of the future will be small, autonomous, and electric. But all progress in aviation technology is extraordinarily slow. Our goal is to rapidly iterate the foundational technologies of future aircraft by building small unmanned aircraft today -- aircraft we can use to save lives, protect property and improve livelihoods.

Who we serve:

We are committed to serving the needs of government agencies, first responders, private security providers, and those working to keep our critical infrastructure working at full potential.

Our team consists of experts in aviation, engineering, and law enforcement and come from some of the most progressive companies in the US including SpaceX, Tesla, NASA, FLIR Systems and Icon Aircraft.

Feel free to reach out to our technical team if you have questions about Air Support.

650 262 7184