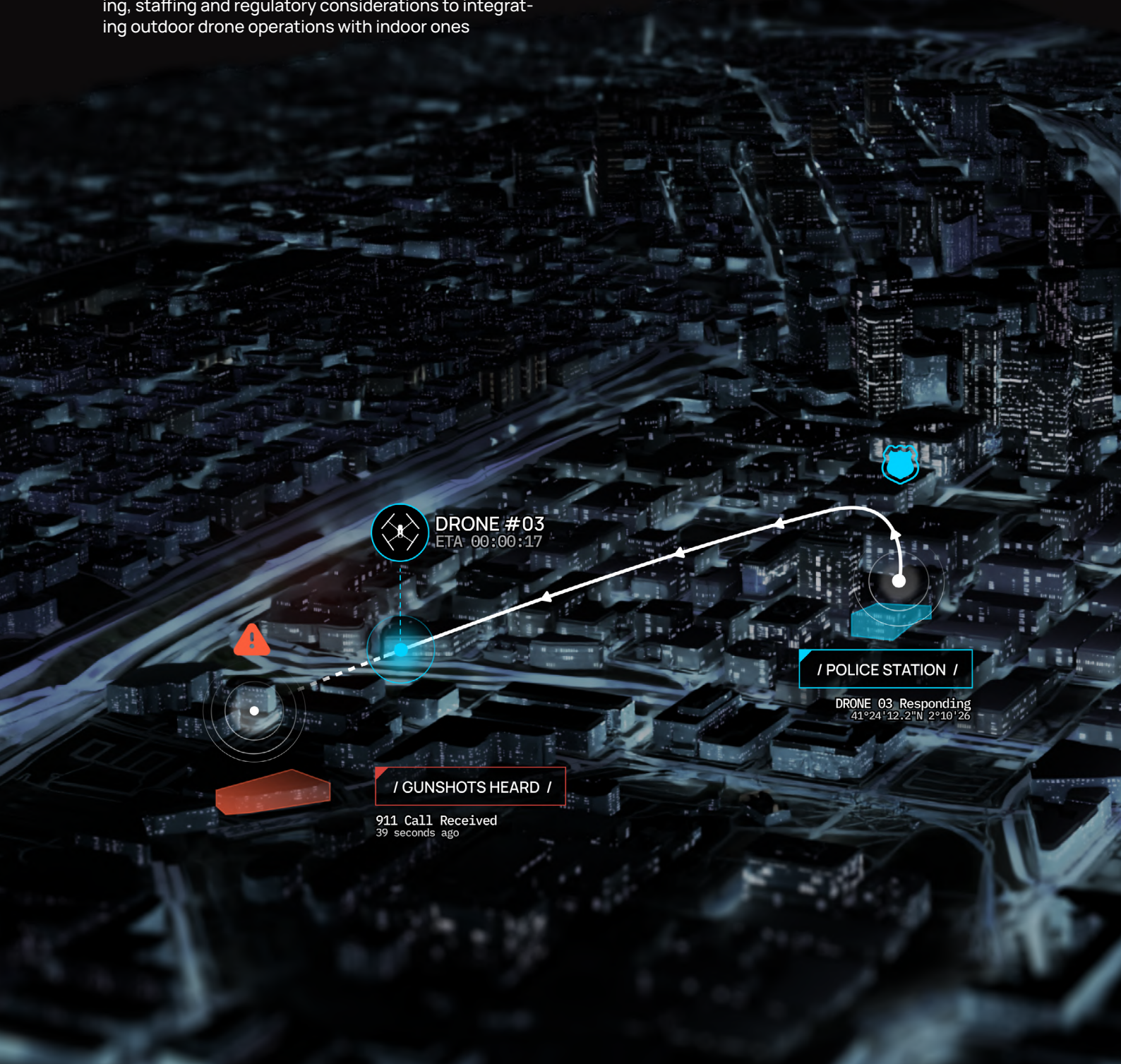
brinc

DRONE AS FIRST RESPONDER

Playbook

A comprehensive guide to implementing and managing Drone as First Responder (DFR) programs. From funding, staffing and regulatory considerations to integrating outdoor drone operations with indoor ones



Written By

Don Redmond

Vice President,
Advanced Public Safety Projects

Retired Chula Vista Police Captain Don Redmond has over 25 years of law enforcement experience. As a Police Captain, Don managed the Chula Vista Police Department's groundbreaking UAS program including the Drone as First Responder (DFR) and is active in UAS community.

He is a published author in Police1 Magazine, FBINAA Magazine and was a contributing writer for the California P.O.S.T. De-Escalation Strategies and Techniques publication.

Reimagine Emergency Response Through Democratized Aerial Assets

The urgency to reevaluate traditional emergency response methods has grown in recent times, driven by a broader conversation on efficient crisis management and proactive intervention strategies. Emphasizing the importance of timely, accurate information during both critical incidents and routine calls, drones, or small Unmanned Aerial Systems (sUAS), have emerged as indispensable tools, augmenting the capabilities of emergency services and supporting more informed interventions.

The longstanding benefits of aerial support in crisis scenarios are undeniable. Real-time video feeds and communication from trained aerial observers have provided essential guidance, leading to safer and more effective outcomes on the ground. While helicopters have played this role for years, the advent of drones offers a modern, agile and accessible solution for proactive assistance across a wide range of emergency situations.

Content

Glossary

ACRONYM/ABBREVIATION	DESCRIPTION
BVLOS	Beyond Visual Line of Sight
DFR	Drone as First Responder
FAA	Federal Aviation Administration
IPP	FAA Integration Pilot Program
SPD	Schenectady Police Department
NAS	National Airspace System
Part 91 / COA	FAA Certificate of Authorization
Part 107	FAA Part 107 Certification
PIC	Pilot in Command
Return Home	Return to Home Feature for Drone Flight
RPIC	Remote Pilot in Command
sUAS or UAS	Small Unmanned Aerial Systems
TO	Teleoperator
UTM	Unmanned Traffic Management (system)
VLOS	Visual Line of Sight
VO	Visual Observer

Part 1

A Primer to Drone as First Responder Programs

What is Drone as First Responder?

Drone as First Responder (DFR) refers to a program in which public safety sUAS (small unmanned aircraft systems) are strategically pre-positioned within designated service areas, primed for immediate deployment upon receiving an emergency service call. DFR scalability allows for configurations ranging from a single drone to multiple units, serving one or several areas based on operational and geographical requirements. These drones can be operated either by a designated Pilot in Command (PIC) or remotely by a teleoperator employing specialized software.

The primary objective of DFR is to furnish first responders with real-time situational awareness from a drone teleoperator pilot and through real time live-stream video.

Looking forward, DFR initiatives will incorporate the delivery of critical payloads, such as AEDs to inaccessible locations during medical emergencies, Narcan during drug overdoses, first aid kits and more.

When fully developed, DFR programs will prioritize high levels of automation to ensure safe flights. This will allow first responders to focus on the emergency at hand, freeing them from the intricacies of piloting an sUAS. The system's operations will automatically initiate the launch of a strategically pre-positioned drone situated nearest to the incident. To enhance safety and efficiency, the essential pre-flight protocols and safety checklists are to be seamlessly integrated with the agency's Computer-Aided Dispatch System (CAD) and the sUAS's advanced docking system. Even though current technological constraints and regulatory stipulations necessitate the involvement of a remote pilot in command (rPIC) and visual observers (VOs), collaborations between BRINC and select agencies are in progress to pioneer DFR operations that are fully automated, integrating seamlessly into the National Airspace System (NAS) via tools such as Remote Identification (Remote ID) and Unmanned Aerial System Traffic Management (UTM).

Equipped with AI software, these sophisticated sUAS units will possess capabilities for object avoidance and the execution of automated missions. As of now, while rPICs and Teleoperators manage the majority of flight operations manually, the envisioned advancements in DFR are set to introduce more streamlined procedures, encompassing direct point-to-point flight patterns, orbits, or preset routes requiring minimal input from the teleoperator. The Teleoperator's role, typically fulfilled by an adept first responder, will transition to primarily managing camera controls, strategic decision-making, and overseeing incident dynamics, **ensuring optimal viewpoints for first responders on the ground**. Under specific circumstances, the Teleoperator might initially serve as the incident commander, spearheading the early stages of an emergency response.

At present, DFR programs are in nascent stages, with current technologies and operational strategies converging to formulate programs that cater to today's agency requirements while simultaneously preparing for future advancements. This playbook serves as a comprehensive template, guiding the attainment of stakeholder buy-in, securing appropriate funding, and lending structured direction to your DFR program for the forthcoming years.

DFR and Law Enforcement

The Need to Rethink Response

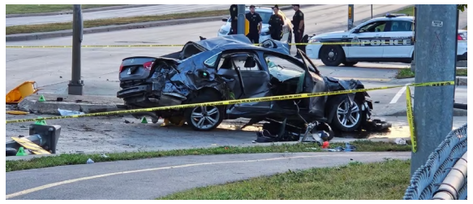
In an era characterized by significant staffing constraints, increasing workloads, prolonged response times, and the inherent challenges of the profession, modern law enforcement agencies face an array of pressing challenges. Amid the growing calls for police reform and an emphasis on "de-escalation," there is a paramount need for innovative tools to empower officers effectively.

DFR programs provide a strategic solution to these challenges, ensuring immediate on-site visual assessment, enabling officers to craft informed, proportionate responses with a primary emphasis on de-escalation.

Key Applications

Domestic Violence

One of the most dangerous and frequent calls law enforcement face on a day to day basis. Having the ability to see what is occurring prior to arrival, is crucial in keeping officers safe.



Traffic Collisions

DFR provides responding officers and fire department personnel the ability to determine the seriousness of a collision before they arrive on scene. They can determine if the driver is still trapped in the vehicle or if the vehicle is overturned and leaking fuel.

Suspicion Persons

DFR allows law enforcement to evaluate the nature of the call from a distance. If the person is not committing a crime or is a danger to themself or others, a determination can be made as to whether or not to contact the individual.

Active Shooter

The ability to have real-time information within seconds of a dynamic situation can save lives. DFR is available for those rare but deadly mass shootings that have occurred throughout the country.

DFR and Firefighting

Rapid and Informed Decision Making

Drones have emerged as indispensable tools for firefighters, providing vital situational awareness shortly after arriving on-site. With the introduction of DFR, firefighters can gain expedited access to this crucial information by dispatching a drone as they approach the scene.

This preliminary assessment allows for more strategic positioning of vehicles and selection of entry points, potentially making a critical difference in life-saving efforts.

Key Applications

Traffic Collisions

DFR empowers responding officers and fire department personnel with a pre-arrival assessment of collision severity. By leveraging drone visuals, they can ascertain situations such as entrapment within a vehicle or potential hazards like overturned vehicles leaking fuel.

Structure Fire

Drones, when fitted with thermal cameras, become indispensable during structure fires. Heavy smoke often masks the exact location of flames, but live-streamed thermal imagery provides first responders with a clear heat signature. This timely intel enables them to devise an effective strategy to combat the fire's spread swiftly.

Brush Fires

The unpredictable nature of brush fires, exacerbated by shifting winds, makes immediate situational awareness vital. With DFR, firefighters obtain a vantage point that helps them preemptively address the fire's path, safeguarding homes and critical infrastructure in the process.

DFR and Emergency Medical Services

More Than Eyes in the Sky

DFR programs are not limited to live-streaming videos. Future drones will have the ability to deliver life-saving medical services within seconds of a crisis. Drones that are payloads equipped with an AED, NARCAN, or life preserver can be critical in saving lives.

Key Applications

Heart Attack:

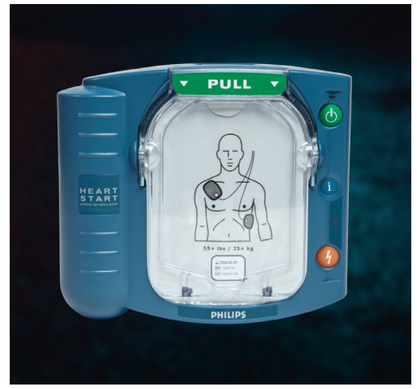
Individuals who are having a medical emergency that live in rural areas, have a potential long delay for medical response. DFR drones equipped with an AED can be critical in improving the survivability of a heart attack.

NARCAN Delivery:

The drug epidemic in cities is a critical priority for communities. Having a drone deliver naloxone nasal spray for an opioid overdose within seconds of a 911 call, can be critical in saving a life.

Life Preserver:

Water rescue is a critical response for public safety. Drones can not only locate a distressed swimmer, but can also lower a life preserver to assist the person until emergency personnel can arrive.



Part 2

Considerations when Starting a DFR Program

Regulations and Policy

DFR operations are governed by FAA regulations and may also be influenced by state and local ordinances. As such, agencies contemplating the adoption of DFR must possess a comprehensive understanding of FAA waivers and the requisite legal operational standards. To legally pilot drones, individuals can acquire certification through the FAA's Aeronautical Knowledge Test. Upon successful completion, each participant is awarded a Remote Pilot Certificate (FAA Part 107), a foundational step for both trialing drones and initiating a program. It is worth noting, however, that this certification comes with specific flight limitations and restrictions to include flights within visual line of sight (VLOS), operations at night, operations of a single aircraft, and operations over people and vehicles.

For a more flexible operational scope, agencies can pursue the FAA Part 91 Certificate of Authorization (COA). This certification empowers agencies to set their own standards and implement the necessary evaluations for members to attain drone pilot status. Although obtaining a Part 91 COA is a more extensive process, it affords pilots a broader range of flight permissions.

The establishment of policies and procedures for any unmanned aerial vehicle system falls under the department's administrative purview.

Such policies should encompass the rationale behind the system's use, as well as its operational methodology, timing, and location of deployment.

To bolster public transparency and foster community trust, it is advisable for these policies and procedures to be readily accessible on the agency's website for public perusal.

Moreover, it is crucial to recognize that not all drone hardware shares the same caliber of design and functionality. **Certain equipment may come equipped with a more comprehensive set of safety features,** which are pivotal for ensuring advanced, automated operations are executed both safely and in compliance with regulations.

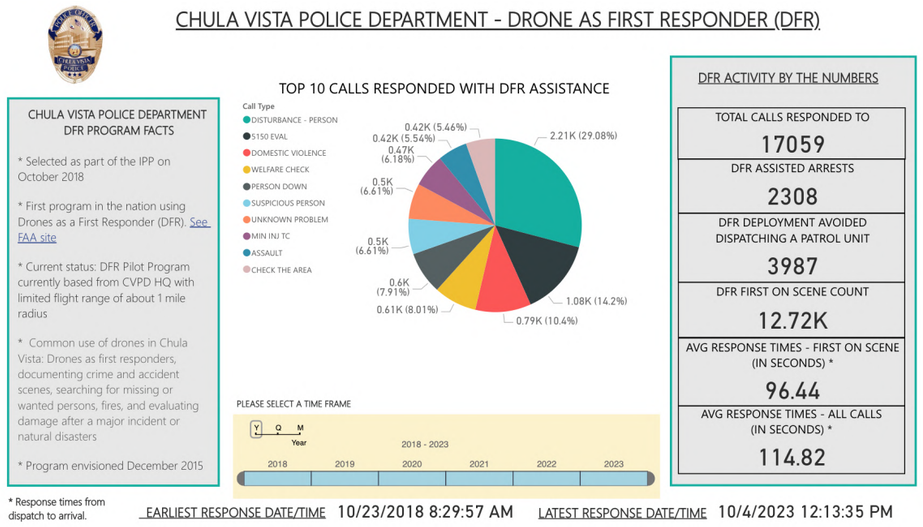
Privacy Concerns and Transparency

In the development of a DFR program, **early community engagement is paramount** to address pressing concerns regarding public trust, civil liberties, and the public's right to privacy. Proactive outreach to community organizations, jurisdictional leadership, the media, and other pertinent stakeholders facilitates the formulation of policies and operational guidelines under full transparency. This demands a consistent and open communication channel, geared towards addressing any evolving concerns associated with DFR implementation and operations.

It is prudent for agencies to maintain a public record of daily flights, delineating the purpose, location, flight telemetry, date, and time of each flight. Such a measure ensures that if community members wish to ascertain the reasons behind a public safety drone's presence overhead, they can conveniently refer to the agency's website. Additionally, an analytical dashboard is recommended, capturing the frequency of drone deployments during emergencies, their involvement in arrests, and instances where DFR preempted the need to dispatch patrol units. **Transparent drone utilization and public endorsement are pivotal for the success and longevity of any DFR initiative.**

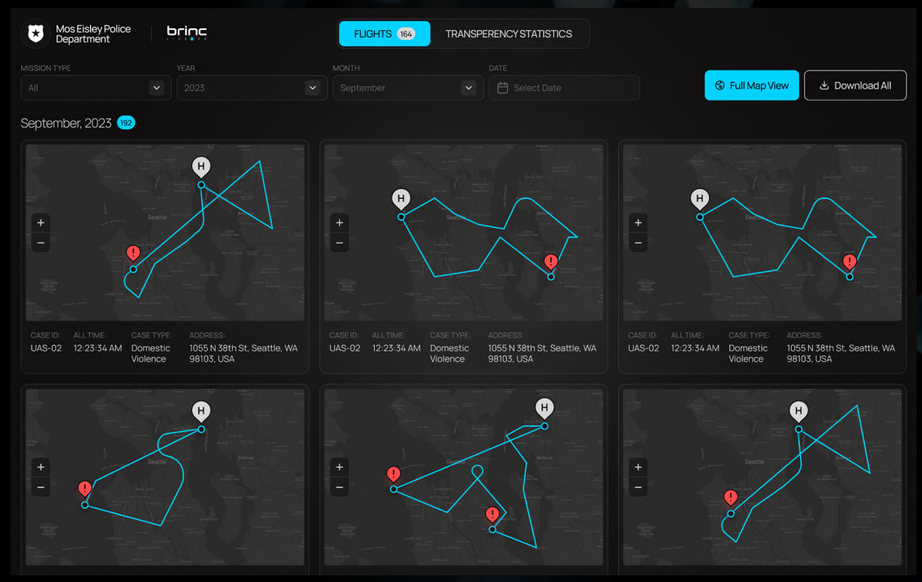
The Chula Vista Police Department (CVPD) pioneered the implementation of DFR as part of the San Diego UAS Integration Pilot Program (IPP) in October 2018. During DFR operations, the UAS is dispatched and directed to the scene of incidents. These may encompass crimes in progress, significant accidents, officers requiring assistance, or any other situation where acquiring a preliminary understanding of the scene would enhance the safety and efficiency of incoming police and fire first responders.

The efficacy of the DFR approach is corroborated by the data accumulated on CVPD's "Drone-Related Activity Dashboard", as well as an accompanying flight data page.



All Agencies Should Have a Public DFR Website Including:

Public record of all flights including purpose and flight telemetry



Program dashboard including frequency of program usage and involvement in arrests

Budgeting and Manpower

Establishing a Drone as First Responder (DFR) program demands foresight, patience, and concerted effort. DFR represents a transformative approach to emergency response. Crafting a long-term strategy to sustain this innovation is pivotal for an agency's enduring success. To mitigate initial expenditures, agencies are encouraged to explore inventive funding strategies, whether through grants, donations, or asset forfeiture in addition to normal budgeting procedures.

Given the multifaceted benefits of DFR — which extend across law enforcement, firefighting, EMS and more — it is prudent for agencies to collaborate with others on co-financing initiatives when available. Moreover, leveraging personnel, such as long-term light-duty officers or retirees, can offer a transitional solution to eliminate or reduce outside staffing needs and associated costs.

Cybersecurity Concerns

As DFR programs expand, the volume of information captured and potentially stored by drones and associated software will increase significantly, covering aspects of our towns, cities, and other regions.

This demands a meticulous approach in vendor selection and data storage protocols.

These cybersecurity risks can be categorized into three primary areas: data in transit, data at rest, and data governance.

Data in Transit: This pertains to the information being relayed between devices, for instance, between the drone and its operator. It is imperative that all data transmitted in this manner is encrypted end-to-end to prevent unauthorized interception and access.

Data at Rest: This concerns the data stored within a device. Measures must be in place to ensure that access to storage mediums like SD cards or any other form of data repository is safeguarded through password protection and physical security measures.

Data Governance: This is about the trust placed in chosen vendors. It's essential for agencies to guarantee that all data remains exclusively within the country and software is CJIS compliant. CJIS compliance ensures that law enforcement agencies adhere to the security standards set by the FBI for storing, transmitting, and accessing criminal justice information. Additionally, the software in use should be devoid of development or influence from entities connected to foreign governments that may pose data security concerns.

Integration with All Daily Public Safety Operations

Drones should be envisioned not merely as standalone equipment, but as integral components of a comprehensive UAS program. Applications such as indoor flying, tactical response, mapping, and DFR have already proven invaluable across various jurisdictions. A comprehensive evaluation of agency-specific needs is vital, followed by the seamless integration of UAS operations into established law enforcement, firefighting, and EMS daily protocols.

An essential evolution involves embedding drone functionality into core emergency response strategies. By thoroughly integrating drones into routine operations, agencies can cultivate a deeper organizational understanding of this potent tool's capabilities. Such integration efforts should be orchestrated by a diverse team of stakeholders, ensuring a robust outcome that garners widespread internal support.

DFR isn't confined to prioritized life-threatening situations; it serves as an emergency response tool when real-time insights are paramount.

In a landscape where many agencies grapple with staffing challenges, the capability to swiftly assess and allocate personnel to unfolding situations is pivotal for delivering exemplary community service.

Examples

Road Hazard:

DFR allows agencies to respond immediately to determine the nature of the hazard, (down tree, stalled vehicle, etc.) and clarify whether a patrol response is necessary. Has the hazard already been removed? Is this a call better suited for Public Works or a tow truck?

Unknown Problem:

Agencies regularly receive calls for service with little information. The call may be of a person screaming, wandering in the streets, or just walking through a neighborhood. DFR provides the ability to observe from a distance if a police response is necessary. Is the possible fight in the park actually a football game? Is the person sleeping on the bus bench or in need of medical attention?

BRINC LiveOps

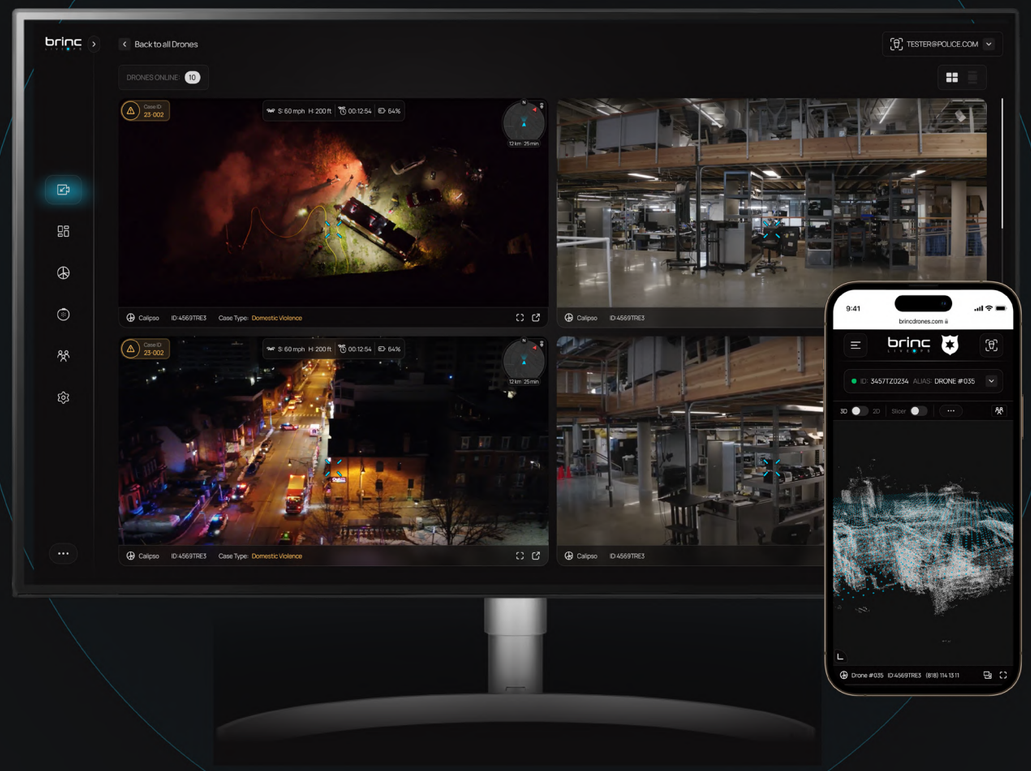
BRINC offers a fully integrated public safety drone and technology solution,
accessible through a single web application on any device – mobile, laptop or desktop.
BRINC LiveOps critical aerial information in hands of first responders.

Unified Operations Platform

360°
DFR Solution

OUTDOOR

- Command and Control Center
- BRINC DFR Drone
- BRINC DFR Dock



360°
De-escalation Solution

INDOOR

- BRINC LEMUR 2
- BRINC Ball
- AI Transcriptions

- Drone Deployment and Teleoperation
- Integrated Video Streaming
- Data and Transparency

Part 3

Implementing a DFR Program

This roadmap delineates a structured, phased transition and the requisite implementation steps to evolve your existing UAS program to encompass a DFR program. This journey towards modernization is segmented into three distinct phases, outlining the fundamental actions the agency must undertake to realize its strategic objectives.

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DFR Phased Implementation Timeline

PHASE 01

0-6 MONTHS

Standardization & Normalization

1. Strategic Plan
2. Public Acceptance Campaign
3. Certificate of Authorization (COA)
4. Data Matrix
5. Integrated Drone Operations
6. Comprehensive Drone Solution
7. Ongoing Transparency Plan
8. Implementation Plan

PHASE 02

7-12 MONTHS

Expansion

1. Training
2. Single Location
3. Data Validation
4. Integrate into Emergency Response
5. Community Transparency

PHASE 03

2+ YEARS

Sustainment & Integration

1. Technology Integration
2. Autonomous Launch
3. Docked Network
4. New Site Expansion
5. Continuous Improvement Plan

Phase 1:
Standardization and Normalization

This initial phase emphasizes immediate and foundational actions related to the current state of operations, planning, and structural shifts. The primary focus is on fostering community trust, solidifying governance, defining leadership roles, standardizing documentation, orchestrating strategic planning, managing risks, organizing staffing, and evaluating technology.

Key features include but not limited to:

DFR Mission Definition:

It's crucial to comprehensively document both how DFR will and will not be used. This not only aids strategic planning but is critical in garnering community support. Forming a dedicated DFR Leadership and a UAS Committee can facilitate the crafting of policies and operational procedures.

Program Leadership Designation:

Assign a UAS Commander within the Department, ideally at a managerial level, to act as a bridge between the UAS Team and top-level management. Depending on the department's resources, this role can either be full-time or an additional responsibility.

UAS/DFR Committee Formation:

Engaging local stakeholders is paramount for fostering trust and transparency. This committee can solicit and incorporate feedback concerning the UAS/DFR program's operations.

Policy Refinement:

A robust departmental policy is the cornerstone of an efficient Safety Management System (SMS). It steers organizational decision-making and outlines protective measures for personnel while ensuring mission success.

Addressing Privacy and Ensuring Transparency:

Engage consistently with local officials, community representatives, and organizations like the ACLU. The aim is to maximize transparency and foster public acceptance. This includes presenting DFR proposals to the City Council, welcoming public input, and conducting other community outreac initiatives.

Communication Strategy Development:

A DFR program necessitates a well-defined communication plan for both internal and external information sharing, emphasizing collaboration amongst community members, City IT, Police Department, Fire Department, and other local stakeholders.

Certificate of Authorization (COA) Application:

DFR operations mandate an FAA COA. Specifically, a First Responder Beyond Visual Line of Sight (FR-BVLOS) 91.113 waiver is required.

UAS Team Staffing:

Ensure the UAS Team is adequately staffed, either full-time or as additional duties, to meet the program's goals and objectives. This must also include Part 107 certification.

Geographical Area Definition for DFR Responses:

Collaborate with crime analysts and DFR providers to pinpoint optimal launch locations, adopting a phased "crawl, walk, run" approach for operational expansion.

Technology Upgrade Strategy:

Given the rapid evolution of UAS technology, adopt a proactive approach to upgrades. Typically, a drone's lifecycle spans 12-18 months before a more advanced model becomes available.

Phase 2:
Expansion Phase

This phase underscores the significance of strategic planning and the need to implement sUAS activities into daily operations. It offers a systematic path in introducing sUAS service for the agency and community. Activities within this phase describe a timeline in establishing project management frameworks, assessing policies, and ascertaining the IT workforce is prepared to facilitate the UAS strategic objectives.

Key features include but not limited to:

Acquiring UAS Workforce Resources:

The changes required to implement the sUAS Strategic Plan impact the existing structure of job classifications and reveal gaps in the current structure that should be addressed to effectively implement the workforce recommendations for the UAS Program.

Understanding the UAS Environment:

To start the process of upgrading the Department's UAS environment, the agency should:

- → Document existing issues with current UAS operations
- → Diagram and document existing high-level workflows
- → Identify and document current UAS customizations and configurations.
- → Identify and document current and future UAS needs.

Validation Data:

It is important to capture data for analysis in determining the success of the program. The number of flights, types of emergencies, response times, response outcomes, crime impact, and de-escalation incidents are potential indicators in justifying the DFR program. Agencies need to work with DFR providers to ensure a system for capturing this data is implemented.

Phase 3:
Sustainment and Integration

This phase emphasizes the long-term sustainment and seamless integration of the DFR program. The principal activities within this phase involve identifying strategic partners, expanding operations for maximum coverage, and ensuring the agency maintains and refines the operational model established in the preceding phases.

Key features include but not limited to:

Advocate for Implementation of an Uncrewed Traffic Management (UTM):

UTM is defined by the FAA Concept of Operations document as "the manner in which the FAA will support operations for UAS operating in low altitude airspace. UTM utilizes industry's ability to supply services under the FAA's regulatory authority where these services do not currently exist. It is a community-based traffic management system, where the operators and entities providing operation support services are responsible for the coordination, execution, and management of operations, with rules of the road established by FAA".

Work Towards a Stronger Drone Ecosystem:

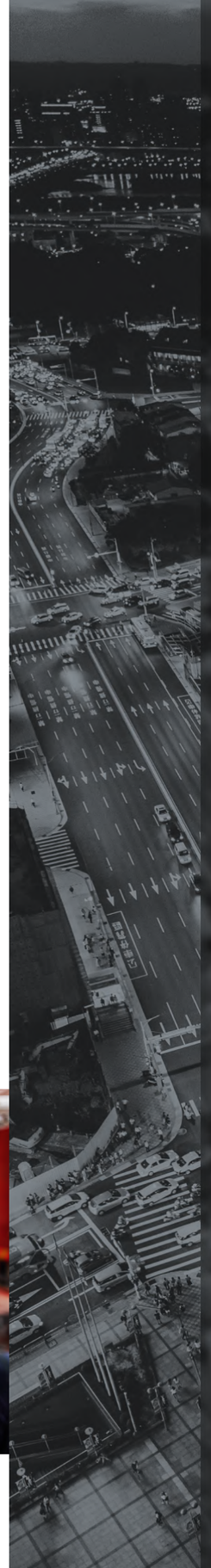
The drone ecosystem should be considered a living entity. Ever evolving and changing through its lifetime. The agency should be active players in driving the buildout of the ecosystem and help guide vendors and solution providers to the necessary solutions to meet the ever-changing environment.

Maintain Close Relationship with FAA:

Maintaining a close relationship with the appropriate levels within the FAA can help an agency maintain a leadership role in the continuation of FAA goal setting.

Improved Program Data Dashboards (Internal & External):

Making key data available to all stakeholders, both internal and external, is critical to maintaining the public trust and keeping key staff informed regarding flight operations. These dashboards can also play a key role in risk management as the data can be constantly analyzed and help identify areas requiring more attention, analysis, and intervention.



How to Get Started

Step 1 — Free Consultation

Schedule a no-obligation session with our team to understand the possibilities and intricacies of a DFR program tailored for your agency.

Step 2 — Expertise from Former Law Enforcement Officers (LEOs)

Our staff includes former LEOs who deeply understand the unique challenges and nuances of public safety. Their insights and experiences will prove invaluable in shaping your DFR program.

Step 3 — Comprehensive Starting Guide

We'll provide you with a detailed guide to kick-start your DFR journey. This manual will be your roadmap, covering essential steps, considerations, and best practices.

Step 4 — Learn from Success Stories

Benefit from the knowledge gained by our early adopters. Their experiences, challenges, and successes can offer you invaluable lessons and shortcuts in setting up and optimizing your DFR program.

To embark on this transformative journey and ensure that your agency remains at the forefront of technology-driven public safety, contact BRINC today.

Let's Redefine Response Together

206.659.6046
sales@brincdrones.com

Additional Resources

Below are some more additional resources that are worth reading to help guide the development of your DFR program.

[Roadmap to Implementing an Effective UAS Program]

by Police Executive Research Forum

[Drone as First Responder Programs: A New Paradigm in Policing]

by MITRE

[Eyes in the Sky Policing Needs Strict Limits]

by the ACLU

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