

Mission Awareness: A FREE TECHNOLOGY RESOURCE FOR PUBLIC SAFETY AVIATION

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The request arrives late in the afternoon. A ground team needs aviation support at a location identified by coordinates rather than an airport. The mission may continue after sunset, the weather is changing along the route and the crew has limited time to develop a plan.

The aircraft could be a helicopter assigned to search a confined area or an airplane providing surveillance over a wider region. In either case, the pilot must consider much more than the distance to the scene. Weather, airspace, terrain, daylight, known hazards, crew readiness, fuel and the possibility of changing mission requirements all become part of the decision-making process.

This is where aviation technology can be most useful—not by replacing a crew's established planning process or judgment, but by helping develop a clear picture of the mission ahead. One resource available to public safety airplane and helicopter pilots is the electronic flight bag application, such as ForeFlight, Garmin Pilot and the newly developed Hughes App, built specifically for public safety aviators.

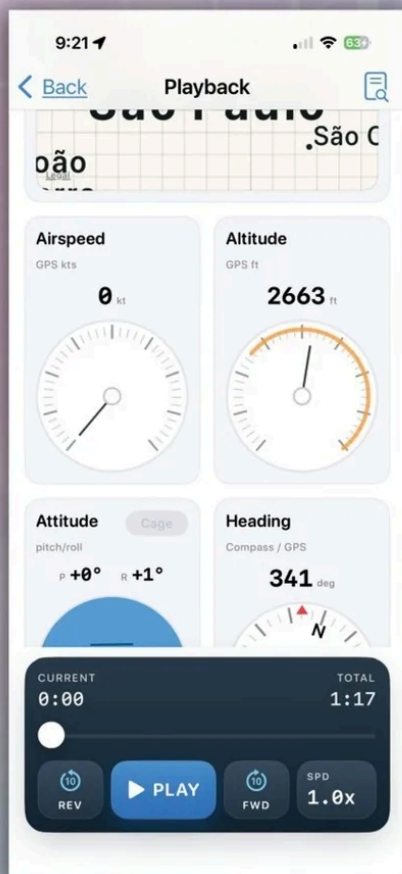
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Building the Mission

EFB apps, which offer flight planning, weather, risk management and safety features, are typically available for both smart phones and tablets. Most are free to download but may carry subscription fees. For example, the Hughes App, developed in conjunction with the U.S. Helicopter Safety Team, is available at no charge.

The first challenge with which EFBs can assist is identifying exactly where the aircraft needs to go. Public safety missions do not always begin and end at airports, and a destination may be provided as a street address, coordinates, a landmark or a general search area. Within modern EFB apps, pilots can build a route using airport or heliport identifiers, enter latitude and longitude coordinates, or draw the intended route directly on the map. The route can then be viewed with geo-referenced VFR, IFR and helicopter charts, along with other aeronautical information. Some of the apps support both airplane and helicopter operations and may include specialized information for helicopter pilots, such as ZK routes and special instrument procedures.

As the proposed route takes shape, the pilot can begin evaluating the conditions that may affect it. One of several tools bundled into Hughes Flight Intelligence is the VFR Prediction Tool, which displays forecast conditions along the route using color-coded segments for VFR, marginal VFR, IFR and low IFR. Pilots can look at current conditions or move the forecast ahead as much as 24 hours. For a mission



beginning late in the day, the tool may help the crew consider not only whether conditions are acceptable at launch, but also what may be developing while the aircraft is on scene or returning to base.

EFB apps cannot make a go or no-go decision for a crew. They give the pilot another way to examine the proposed route and identify areas that may require closer attention.

Looking Along the Route

Conditions at the departure point do not necessarily represent the conditions the crew will encounter during the mission. Weather may vary considerably along the route, especially when crews operate over mountains, remote areas, coastlines or changing terrain. This is true whether an airplane is traveling between locations or a helicopter is responding directly to a scene.

Some modern EFB apps provide access

to METARs, TAFs, radar, forecasts, icing information and available FAA Weather Cameras along a route. Selected information can also be shared with a colleague by text or email.

Weather reports describe conditions at a particular place and time. A weather camera can add a visual perspective by showing what an area actually looks like. Used together with forecasts, reports and the pilot's other approved weather resources, the cameras can help provide a more complete understanding of the conditions ahead.

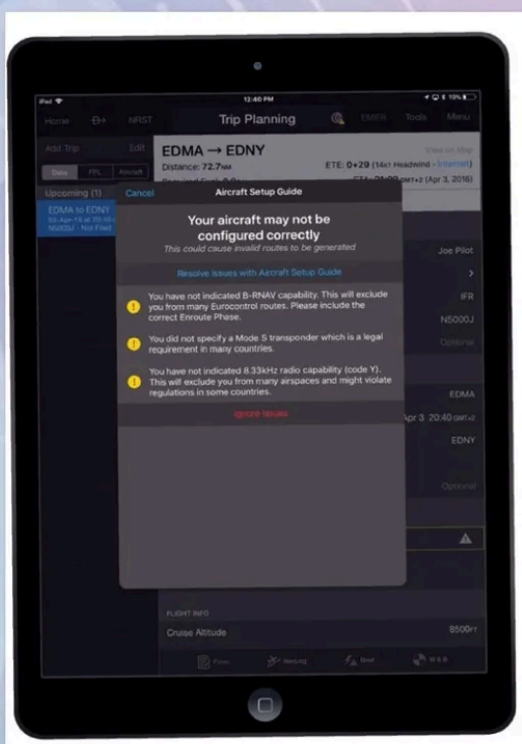
The Hughes App also searches for NOTAMs associated with locations along the planned route, rather than limiting the search to the departure and destination—particularly relevant to public safety flights that may pass near several airports or heliports without intending to land at them. A notice connected to one of those nearby locations may still contain information important to the mission.

When Day Becomes Night

As the crew continues planning, another issue becomes apparent. The mission is expected to begin during daylight, but it may not end before dark. Sunset is only part of that assessment. Moonrise, moonset, moon illumination, cloud cover, terrain and ambient light can all affect night operations. For crews using night vision goggles, those factors take on additional importance.

The Hughes App provides sunrise and sunset information, as well as moonrise, moonset and illumination data, within the same mission-planning environment. The resources support NVG planning and allow crews to consider anticipated lighting conditions while evaluating the route and mission timeline.

An airplane crew conducting surveillance may remain on scene for several hours. A helicopter crew may be flying into an unlit landing area or searching close to terrain. In both cases, the transition from day to night



can change the risk picture. Recognizing this change during planning gives the crew an opportunity to adjust the mission, equipment, staffing, fuel plan, altitude or route before takeoff.

Hazards Difficult to See

Public safety aircraft frequently operate at low altitudes. Airplanes may conduct patrol, surveillance, search or observation missions, while helicopters may work close to terrain, structures and confined areas.

In low altitude environments, some of the most dangerous hazards can also be the most difficult to detect. Wires, temporary obstructions and other objects may be nearly invisible from the air, particularly when they blend into terrain or vegetation.

One new resource within Hughes Flight Intelligence is slackline awareness. Slacklines and highlines can be stretched between trees, poles, buildings, bridges or canyon walls, sometimes crossing areas used by low-flying aircraft. The app incorporates a worldwide database of more than 7,000 known and reported slackline locations. When a pilot creates a route, the VFR Prediction Tool searches for reported loca-

tions along the corridor. A pilot can select a location to review available information, which may include photographs and the slackline owner's contact information. A line that has not been reported, has been recently installed or is inaccurately located may not appear.

From Planning to Landing

The crew has examined the route, weather, forecast trends, daylight conditions, NOTAMS and known hazards. The next step is deciding whether the mission can be conducted within the organization's limitations and the crew's capabilities.

Some modern EFB apps include risk assessment tools that allow crews to document relevant risk factors as part of the planning process. Risk assessment tools produce a risk score, but they also create a deliberate pause in which the crew can identify concerns, discuss mitigation and determine whether the plan should change.

The Hughes App also includes closed-loop safety management system reporting capability. Pilots can document a safety concern, obstacle or chart issue and include

location information and photographs when appropriate. Issues involving public Part 97 procedures can also be reported.

Technology can continue to support the crew after the mission is complete. For example, the Hughes App includes a Flight Operations Quality Assurance tool that can turn an existing iPad or iPhone into a data-collection device. After landing, the system parses, renders and analyzes recorded flight data into several postflight products, including an executive summary, a detailed analysis, sensor and data-recording quality information and a weather snapshot. A playback dashboard displays the route with a map and flight instruments, allowing pilots to review the flight privately or share it with a colleague by email. A flight recording may reveal a destabilized approach, high sink rate, long or hard landing, overbanking or another undesirable aircraft state, supporting a future training discussion, crew debrief or review of a route flown into an unfamiliar area. The technology does not replace an operator's formal flight data or safety programs, but it can provide another resource for learning from routine operations.

Modern EFB apps typically include aviation reference materials, such as the



Federal Aviation Regulations, the Aeronautical Information Manual and the FAA Helicopter Flying Handbook. The apps may also include in-app chatbot support to help users search the materials and locate relevant information. As with any AI resource, a chatbot's responses should be confirmed against current official publications before they become the basis for a regulatory or operational decision.

The Hughes App provides a direct connection to the U.S. Helicopter Safety Team. Helicopter pilots can join the team through the app at no cost and access safety information, educational materials and the Helicopter Peer Pilot Program. The program connects members of the helicopter community with trained industry members who understand the professional and personal pressures associated with aviation.

Supporting the Next Decision

The mission requested late in the afternoon may ultimately launch as planned, launch with changes, be delayed or be declined. The aircraft selected may be an airplane or a helicopter, depending on the mission, distance,

terrain, availability and required capabilities. EFB apps do not determine which aircraft should respond or whether the mission should launch. Those responsibilities remain with the pilot and organization.

EFB apps provide another resource for examining the mission before takeoff. They allow crews to plan a route, consider forecast changes, review weather and NOTAM information, anticipate night conditions, iden-

tify reported hazards, assess risk and retain information for postflight review.

Public safety aviation will always involve changing conditions and imperfect information. No technology can eliminate every unknown. Resources that help pilots identify more of what is known, however, can support better questions, stronger briefings and more informed decisions before the aircraft leaves the ground.

