vislink

Case Study

Seamless, Real-Time Airborne Video Connects Agencies

San Diego County Realizes Benefits of Wide Area Receive Network

Public safety organizations routinely deploy airborne assets, such as helicopters and fixed wing aircraft, for a multitude of missions, including scene assessment, investigation support, surveillance activities and in the search for missing persons. These assets are often the first on-scene, providing mission-critical imagery to ground teams, and are present at nearly all public gatherings, tactical incidents and disaster response missions. If video coverage is interrupted for any reason, on-scene ground teams and remote stationed command staff lose important decision making information that may directly affect the outcome of the mission.

San Diego County in southern California is home to more than 3.5 million people and is the eighth most populous county in the U.S. It encompasses more than 4,400 square miles, including a shared border with Mexico. San Diego County stretches from the coastline of the Pacific Ocean east to the Laguna Mountains, and is comprised of varying terrain, including hills and small canyons.

The San Diego Police and Sheriff's Departments recognized the importance of providing seamless airborne video surveillance coverage to ground teams and understood the difficulties of delivering uninterrupted video over the County's vast and varying terrain. In 2008, along with the City Communications Division, they pooled their resources to deploy a unified and interoperable digital video airborne downlink solution. This system included helicopter transmitters and fixed receive site infrastructure.

The Challenge

This initial system included the installation of several fixed, single input, non-diversity digital receive sites. These fixed receive sites did not have the benefit of multiple antenna input receive diversity and were not linked together, so as the air asset flew in and out of the coverage area, a ground operator was required to manually switch the video to the receive site providing the best downlink image, which allowed for somewhat continuous video coverage.

While this system met all of the requirements set forth by the agencies, the process itself had downfalls, including gaps in video continuity caused by lack of area coverage, terrain obstructions, and aircraft maneuvering.

In 2012, San Diego again approached Vislink to develop a solution that could provide greater area coverage, was multi-aircraft expandable, scalable, and would automatically generate a seamless video stream without the aid of a dedicated and trained ground operator.

The Solution

Vislink worked with San Diego to design, develop, demonstrate, and construct a Wide Area Receive Network, which removed the complexity of a manual receive site-switching process through automation. This ensured a seamless, real-time, high quality video image from the aircraft to the Emergency Operations Center.

Vislink was able to leverage San Diego's existing IP network infrastructure to interconnect six high-gain, multi-sector diversity receive sites to ensure complete signal coverage throughout the required region. Omni-directional antennas with downlook capability were installed on the aircraft, so that signals could be sent simultaneously to both the fixed diversity receive sites and to handheld and mobile command vehicles operating in the area below.

Recognizing the value of seamless video and shared assets, Cal Fire, another San Diego County agency, is currently in the process of adding its air assets to this network for further interagency operability.

The Technology

Vislink strategically placed the six receive sites to create overlapping coverage areas, so that an aircraft is always transmitting to two or more receivers simultaneously. As the aircraft maneuvers in and out of a region, connecting to multiple sites minimizes the potential for gaps in video coverage, helping to ensure a consistent stream of video.

The IP video generated at each fixed receive site is transported over the customer's private and secure data network to a central collection point containing the Vislink Automatic Site Selector. This selector automatically selects the best available stream and generates one seamless video output.

From this point, the customer has several options for viewing the IP video content. They can view it on their existing Content Distribution Network or Video Wall, or it can be streamed out over 3G/4G LTE for remote viewing.

Finally, a video media server allows San Diego staff to securely login to the system and view the video stream over a wide range of edge device platforms, such as iOS, Android and other mobile desktop platforms, at varying bandwidths. Therefore, anyone with a smartphone or tablet can view the video regardless of their location.

The system is completely scalable with the ability to install additional receivers at each site to allow multiple aircraft to operate in same region, or various locations throughout the county. Currently, the system covers approximately 2,500 square miles, however additional receive sites can be built to expand the coverage area.

The Result

Implementing Vislink's Wide Area Network Receive Solution provided the City of San Diego with a complete and autonomous video downlink system, which allows aircraft to fly several mission profiles over a large geographic area with varying terrain, while providing a seamless and secure IP video surveillance stream, without the need for dedicated operator intervention.