

USE CASE

POP UP TELECOMMUNICATIONS

Cell On Wings (COW) for Morehead's Fazoli Festival



Context

The Fazoli's Freedom Festival is the annual Independence Day celebration of the city of Morehead, Kentucky, USA. An estimated 10,000 spectators attend the event on a single day.

An event like this taking place within the city presented a complex challenge for the emergency services. The presence of numerous buildings made it compulsory to find a safe, reliable and flexible way for the police and the first responders to communicate continuously.

The FCC (Federal Communication Commission) allocated Morehead Police Department and Rajant 50MHz in the 4940-4990 MHz band, also known as the 4.9GHz band, the Public Safety Spectrum; as well as a waiver to fly an Elistair tethered drone integrated into a kinetic mesh network during this large outdoor event

If there's an issue, we need to know where it is as quickly as possible, who's involved, how many people need to respond, who needs to respond, and that all starts with communication.

Jim Tom Trent, Morehead Mayor

12km²

Coupled with a DJI M600 drone and designed to meet demanding missions in the safest conditions. The Elistair Safe-T tether station was essential in obtaining UAV flight authorization for an event of this size.



10k Attendees

10, 000 persons attended the last day of the Festival for Independence Day. Such a high profile event for the municipality required effective solutions for public safety.



4.9 GHz

Kinetic mesh networks can run on licensed, unlicensed and military bands. The tethered drone's on-board module was permitted to use the 4.9GHz band.



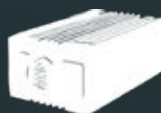
40MPs/sec

The signal speed of 40 MBps/s for the covered area included traffic cameras, police radios in small vehicles and the tethered drone to connect it all together..



Airborne system

Rajant designed its InstaMesh airborne module to improve coverage by downsizing the size of the ME4-4950R tag, going from 1,8kg to 600g. It is a 300% weight reduction.



10 hours

The drone flew for 10 consecutive hours whilst connected to Elistair Ligh-T tether station. This provided continuous communications before, during and after the event, enhanced and uninterrupted situational awareness for police and first responders..



ISSUES & NEEDS

Continuous and secure telecommunications

In small communities like Morehead, large and high profile events can put strain on existing infrastructure. With thousands of additional people expected in the areas during the 4th of July event, the city's first responders entities needed reliable and secure communications.

Infrastructure cost: For temporary public events such as festivals or other gatherings, building new cell towers are expensive and labour intensive for local authorities. A tethered drone providing a "pop up" airborne network requires less investment of funds, time and logistics.

Network congestion: Choice of frequency is key to ensure smooth and uninterrupted communications, especially during an emergency. Use of the Public Safety frequency alleviated pressure on the local networks and ensured constant and clear communication between the police department and other first responders.

Viability of a temporary aerial wireless network: By elevating the wireless mesh node above the height of obstructions, Rajant were able to increase the footprint of the existing available wireless network.



Airspace restrictions, altitude, extremely low temperatures, difficult access, were as many obstacles to overcome.



In a kinetic mesh, everything is constantly moving, including the infrastructure, allowing an expansive network footprint.

Bob Schena, Rajant CEO

SOLUTION

Leveraging the power of the Kinetic Mesh technology already available in the city, Rajant installed its 600g Breadcrumb ME4 Portable Wireless Mesh Network Node onto a DJI S900 drone powered by an Elistair Ligh-T tether station. This created a secured COW (Cell On Wings) without the need to building permanent cell towers to expand the existing network.

Mobile: Weighing only 600g, the ME4 node is extremely lightweight, easily portable and enables several mounting options.

Versatile: It is an ideal alternative for adding wireless infrastructure into your existing network and an excellent solution to expand coverage. It allows high bandwidth for data, voice, and video applications.

Efficient: With the InstaMesh software integrated to the device, the most efficient pathway between two points, e.g. ME4 nodes, will be chosen, even when they are in motion. New links are established to keep the network intact

FEEDBACK

The tethered drone pop-up communication operation was a success thanks to the drone mounted node's ability to seamlessly integrate into the existing network.

Set up: In less than 15 minutes the equipment was set up and the drone was airborne. This fast and efficient deployment provided a truly pop up capability and freed up personnel for other duties.

Debit and coverage: Network speed was about 40MBps/sec in the area covered by the signal, approximately 12km around the centre of the built up area.

Results: The tethered drone flew for 10 hours straight during the 4th of July celebration and for 7 hours on average during the first 3 days. This allowed for a constant and secured communication network exclusively for the Police Department and other first responders.