AIR BEAT
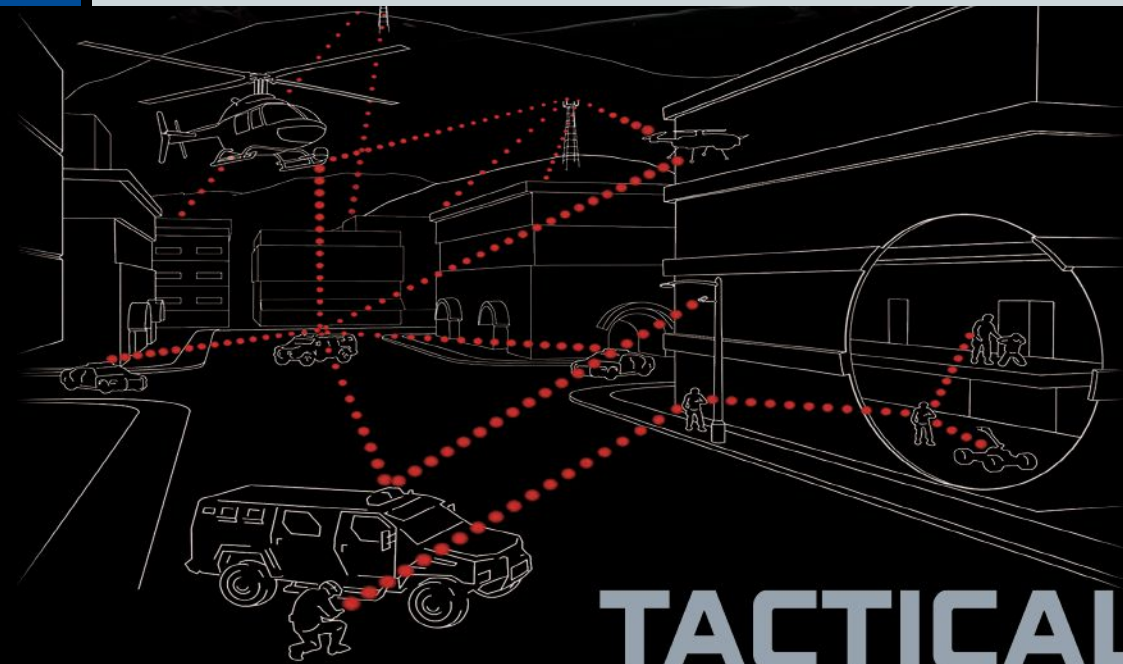
LEVERAGING TACTICS & TECH FOR

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SILVUS TECHNOLOGIES: TACTICAL MESH NETWORKS FOR PUBLIC SAFETY

By Greg Dunbar, *Director of Sales, Public Safety & Commercial, Silvus Technologies*

Leaders in every industry want perfect data intelligence to make optimal decisions quickly. And technology has evolved to produce intuitive cloud dashboards with single-view-pane information graphics to give leaders just that.

Public safety agencies are no different. Incident commanders and other command staff have the great responsibility to protect civilian lives and property, catch bad guys and ensure their personnel's safety. The challenge is that the data delivery technology rolled out into the public safety realm has been in the form of standalone systems, which have slowly migrated to dashboards or single panes. During actual incidents, the data is multi-layered, consisting of individual video feeds, photos, sensor imagery and traditional voice communications. For the information to be actionable, incident commanders need a network infrastructure that is robust enough—and intact—to provide a large amount of bandwidth. In normal operational environments, cellular networks are adequate. But in times of crisis, cell towers can quickly become overwhelmed.

Using its own waveform and chipset developed solving Defense Advanced

Research Projects Agency tactical communication challenges, Silvus Technologies has become an industry leading provider of mobile ad-hoc network (MANET) radios that can create high-bandwidth capable mesh networks without requiring a dedicated infrastructure. Silvus's StreamCaster MANET radios are deployed by the U.S. Department of Defense and every federal law enforcement agency. Agencies deploy StreamCaster MANET radios when a cellular and/or

land mobile radio network does not exist in a certain part of a city/county, the network has been destroyed by nature or man, or the network has been overwhelmed.

Major events, including sporting events, parades, protests, county/state fairs and emergencies, often cause cell towers to fail. Civilians flood the network to check in on family and post videos of whatever they are witnessing. If a public safety agency relies on the same cell network during such critical events, it will be negatively impacted.

So, how does MANET radio technology apply to public safety aviation units? Aviation assets have long served as standalone operations, but ground teams increasingly want airborne support integrated into their larger operational situational awareness picture so aircrews don't have to communicate what they see verbally. Downlinks for intelligence, surveillance and reconnaissance systems typically transmit video to a central location, then distribute the data across an available network to incident commanders. The result is a delay in transmission and one-way communication from the air to the ground, which reduces its operational effectiveness. Traditional video downlinks are also expensive and capabil-

ity-limited and require consistent updates. Silvus's StreamCaster MANET radios overcome many of the issues.

The Silvus Tactical Bubble is robust and scalable, enabling it to integrate video imagery from traditional airborne assets, unmanned aircraft and ground based robots. In addition, SWAT teams can deploy the Silvus PTZ camera with a magnetized base on buildings for additional on-scene viewpoints. Sniper teams can send images from spotter scopes or a DSLR zoom lens to their team leader. Imagery from pole cameras can show ingress and egress points. Proximity sensors and radar systems can be used in relatively large scale operations. When connected to Silvus MANET radio-formed mesh networks, ATAK or similar software from companies like Intrepid Response can consolidate diverse IP data sources, providing a single-pane point of view for incident commanders, showing position location information on a map along with video sources and other overlays.

ATAK has become an increasingly important part of the Silvus Tactical Bubble. Because the StreamCaster MANET radios behave as a layer 2 switch, Silvus mesh

communications networks can connect any tactical data-capturing device to the Tactical Bubble through a USB, serial, wired ethernet or wireless ethernet connection. The result is a self-contained, self-healing/forming and adaptive mesh network that does not require an internet connection or uplink to operate. If an uplink option is available via traditional satellite, such as a Starlink system, bonded cellular from Teradek or Dejero, or a Cradlepoint cellular connection, the data generated within the Silvus Tactical Bubble can be transmitted from the incident commander's location to wherever it needs to go.

A single Silvus StreamCaster SC4400 MANET radio with a Teradek encoder might be sufficient for a public safety operator's manned helicopter. Fixed-wing surveillance aircraft may have two to three radios, depending on the mission type and how the plane is flown. Silvus does not embed encoders into its radios because encoder technology changes more rapidly than radio technology. Cross-polarized omni antennas from Troll Systems can be installed on helicopters' skid crossmembers; fixed-wing aircraft can use blade antennas from Haigh Farr, among other

options, to increase effective range. In addition, the Silvus tactical communications mesh network can communicate with Aero-Computers or Churchill systems via the Teradek encoders; Troll Systems' solution is also widely used with Silvus radios.

Operationally flexible, the Silvus Tactical Bubble can be deployed via mobile command or tactical vehicles functioning as ground stations. Aircraft can automatically join the Tactical Bubble when they come into the mesh network's range. At the same time, the aircraft can act as nodes in the sky—an uplink option—for the ground team's Tactical Bubble radios and transmit back to headquarters. The U.S. federal government and some cities/counties have begun deploying permanent towers with Silvus StreamCaster radios and sector antennas from Southwest Antenna or Hascall Denke. The towers use high speed microwave, fiber or Starlink as backhaul options.

Together, these advanced technologies and Silvus StreamCaster radios and their scalable mesh network create a rapidly deployable, mobile and interoperable set of capabilities that can become force multipliers for public safety agencies anytime and anywhere. ▼