

DHS Science and Technology Directorate

The Hybrid Public Safety Microphone (Turtle Mike)—Land Mobile Radio (LMR) Systems Converging with Broadband

Leverages commercial broadband networks and traditional LMR networks

First responders use narrowband LMR for critical voice communication. Today, first responders also augment LMR communications with smartphones that use commercial cellular broadband networks. These networks can serve as a valuable resource for first responders despite lacking the mission critical voice elements found on LMR networks – e.g., push-to-talk, radio-to-radio. Smart devices, however, have enhanced information exchange capabilities including imagery and video. The Hybrid Public Safety Microphone, also known as “Turtle Mike,” is a bridging solution that enhances legacy radio system capabilities by using commercial broadband networks to improve communication interoperability. Currently in development by



the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) and Interop Solutions, LLC, the Turtle Mike’s capabilities include added resilience, redundancy, and expanded coverage. This bridging solution is important because commercial broadband networks cannot currently provide the same elements as LMR systems, and first responders will likely continue to use LMR for the foreseeable future.

Low cost, add-on solution

The Turtle Mike’s hardware and software components function independently, providing first responders with the ability to communicate on either LMR or commercial broadband networks. It can be added to any existing LMR system to provide access to cellular networks. The Turtle Mike software integrates multiple communication devices

on cellular voice networks and can be downloaded onto any smart device. The software allows first responders to access LMR channels and set up separate broadband conferences on cellular networks from their smart device. These supplemental broadband conferences allow first responders to create unlimited separate conferences that can be tailored for each incident. The software enhances coordination with responders who may not have access to LMR radios. Furthermore, Turtle Mike does not require costly replacement of existing communication equipment and infrastructure.

2013 Initial Pilot

In 2013, DHS ST&T conducted a Turtle Mike pilot with the Kearney Police Department in Kearney, Nebraska. Additional participants included the Buffalo County Sheriff’s Department, the Nebraska State Patrol, Good Samaritan Hospital, South West Ambulance, and Buffalo County Public Works. Pilot coordinators created a LMR event channel on the LMR State Mutual Aid frequency to achieve interoperability. Coordinators also set up a broadband conference for all participants with a Turtle Mike device, allowing both LMR and cellular participation. Using the Turtle Mike hardware with LMR devices and the software application on smart devices allowed for diversification of communications and enhancement of resiliency. Additionally, by using the Turtle Mike, conversations were conducted on the broadband channels, freeing up the limited number of LMR channels for other users.

Turtle Mike Benefits

- Provides an unlimited conference function for voice communication (e.g., one-to-many, many-to-many) via broadband
- Connects legacy radio channels to internet voice broadband conferences via cellular or Wi-Fi
- Increases coverage, redundancy, and resiliency by providing the ability to leverage both LMR and commercial broadband networks on the same device
- Provides public safety recording and instant playback

Next Steps

DHS S&T and Interop Solutions are actively engaged in ongoing prototype development for the Turtle Mike solution. A final product is planned for commercial availability in 2015.



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To learn more about the Hybrid Public Safety Microphone (Turtle Mike), contact SandTFRG@hq.dhs.gov.