



In late September, *MissionCritical Communications* posted several online articles about network-based and wireless handset-based emergency location technologies that will provide local public-safety answering points (PSAPs) the physical location of wireless callers dialing 9-1-1. These articles coincided with the FCC's implementation of Kari's Law, which Congress enacted this year.

Kari's Law was enacted in response to an unfortunate incident where a young girl in a hotel room repeatedly dialed 9-1-1 but failed to reach the PSAP because the hotel's phone system required a "9" be dialed as a prefix to secure an outside line. The legislation targets wireline voice technology, which increasingly, is limited to relatively large commercial locations. Operators of small businesses and individuals, including persons who lease their residences in multi-family dwelling units, are abandoning use of landline service.

In early October, *MissionCritical Communications* highlighted the public-safety community's concerns over wireless carriers promoting Z-axis location accuracy of 5 meters or more as the dispatchable location standard. It was noted that this technology could report a caller's location

Wireless carriers largely determine the underlying availability and reliability of their services within high-rise residential and commercial properties.

By Douglas Jarrett

either one floor below or above the calling party's actual location, across the street or in a different building. Also noted was that substantially more accurate standards of 3 to about 1.8 meters are achievable.

Unfortunately, even assuming network-based or handset-based technologies will perform flawlessly, wireless emergency calling from in-building locations remains problematic. The efficacy of in-building wireless communications requires that RF signals be transmitted from and received by wireless callers within the buildings. Energy-efficient building materials impede RF signals, and persons above the 20th floor often do not receive a reliable signal from wireless carriers' networks, particularly in dense urban areas or other high-density cluster environments.

Distributed Antenna Systems

The principal solution is an in-building distributed antenna system (DAS) built using off-the-shelf tech-

nologies and leveraging proven RF engineering practices. DAS enables in-building connectivity for multiple wireless technologies — Wi-Fi, public safety and commercial mobile radio service (CMRS). Whether a home, hotel or venue, a property's owner or operator largely determines Wi-Fi connectivity. A public-safety DAS is often required by statute.

With the rollout of the First Responder Network Authority (First-Net), AT&T's participation in DAS arrangements should increase. Whether in-building voice and broadband CMRS is available requires a wireless carrier's participation and financial commitments from building owners. DAS supporting CMRS may be carrier specific or capable of supporting multiple service providers, referred to as a neutral-host DAS.

In-building DAS configurations require wireless carriers to extend their networks to a venue or building, typically installing baseband and RF equipment in a basement vault or equipment room. The wireless carrier

operates this equipment. The RF signal is transmitted via in-building wiring — increasingly, fiber-optic cable — to antennas on one or more locations on each floor or every other floor to maximize coverage through an in-building distribution network. In a neutral-host DAS, multiple wireless carriers' terminal equipment first connects to the owner's neutral-host equipment, which in turn connects to the in-building distribution network.

The ecosystem of consultants, equipment, technologies and firms providing turnkey in-building DAS solutions is reasonably mature. Fiber-optic cable is the preferred wiring because of its extended useful life and substantial capacity. Major tower management companies that operate outdoor DAS networks are among the leading DAS providers in major venues. These entities may lease access to their in-building networks to the wireless carriers.

Business Models

Whether a DAS is deployed in a given building or venue turns on a series of business decisions. Foremost, a wireless carrier determines whether its network would benefit from an in-building DAS by offloading or minimizing traffic on a carrier's macrocell/outdoor network or if competitive pressures dictate that its service be available within the venue or building. Whether to extend its network into a major sports and entertainment venue is an easy decision for a wireless carrier.

Beyond these venues, wireless carrier participation is inconsistent, at best. In countless wireless infrastructure forums and conferences, wireless carriers emphasize their resources are limited and acknowledge they cannot extend their networks into every building requiring in-building coverage. Because of wishful thinking or a lack of due diligence by a systems integrator or property developer or owner, more than a handful of well-designed, fully constructed in-building distribution networks are not active because wireless carriers did not commit to

extend service to the buildings.

The decision to make the investment for an in-building distribution system belongs to a property developer or owner. Wireless carriers rarely provide financial support for in-building distribution systems. Even if a property owner is willing to make this investment, the question remains whether the wireless carriers will extend their networks into the building and install their equipment

to provide service. Many buildings don't make the cut.

A Combination Solution

A combination equipment and financing solution that may improve carrier engagement in supporting in-building wireless communications exists. Cheytec Telecommunications established a relationship with the principal wireless equipment vendors to acquire the same baseband and RF

SAVE 10% ON YOUR ORDER PRYME.COM/PROMO/MC

PRYME[®]
DUAL ADAPTER

NEW!

No battery charging needed. Powered by the radio!

PRYME's Dual Adapter allows you to use the same Apple® compatible wired headset or earpiece for both your 2-way radio and smartphone or tablet, using a Push-to-Talk over Cellular (PoC) software app.

Use your earpods/headset for both your phone/tablet AND your 2-way radio.



Control your radio or add a wireless PTT

Add an OPTIONAL Wireless PTT Button (to control radio) BT-PTT-Z (MINI) shown

Also available:
BT-PTT-FOB
BT-PTT-RING
BT-PTT-STRAP

WTX-523-DUAL (FOR MOTOROLA XTS)

WTX-583-DUAL (FOR MOTOROLA APX)

Like us on Facebook
facebook.com/prymeradioproducts

911 Mariner St., Brea, CA 92821
PH: 714.257.0300
TOLL FREE: 800.666.2654
WWW.PRYME.COM

PRYME[®]

Wireless carriers and regulators should acknowledge and recognize the challenges associated with in-building wireless communications.

equipment deployed by the carriers in their networks. Cheytec “takes the investment” in, retains title to and assumes the maintenance for the in-building wireless network equipment, charging the property owner a monthly licensing fee. Further, wireless carriers are authorized to operate and control this installed equipment as part of their networks.

The solution lowers a wireless carrier’s cost of extending its network into a building but still obligates the owner to fund the in-building distribution system and pay the monthly equipment-licensing fee.

Whether an owner takes this step depends on the owner’s economic analysis of providing wireless connectivity for its tenants or residents.

Some property owners now view indoor wireless as an essential utility for their tenants. These decisions are made on a case-by-case basis. Wireless carriers could better support property owners by entering into DAS agreements with terms beyond five years, allowing the property owner to recover the cost of the in-building distribution system over a longer period.

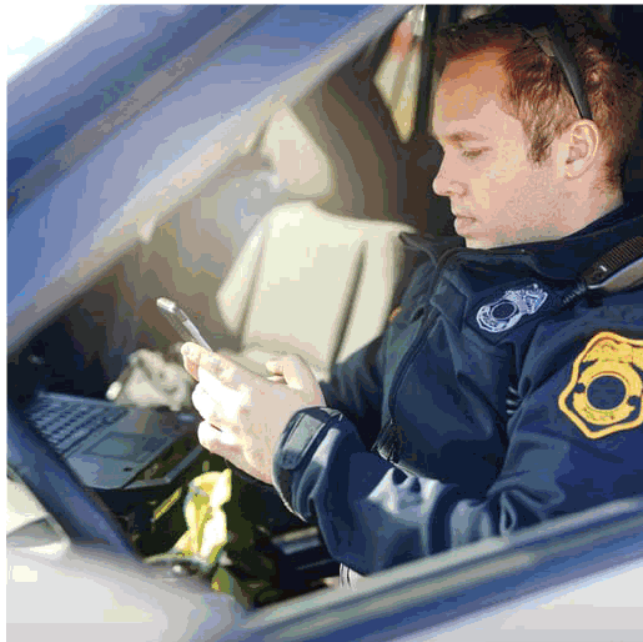
Conclusions

Without question, dispatchable location standards must fully support public-safety emergency response activities. Equally important, policymakers and legislators must recognize that wireless carriers largely determine the underlying availability

and reliability of their services within many high-rise residential and commercial properties.

There are no easy solutions because substantial financial commitments are involved, but the challenges associated with in-building wireless communications should be acknowledged by the wireless carriers and recognized by regulators. Without open dialogue, an underlying issue in emergency wireless communications will persist indefinitely. ■

Douglas Jarrett is a partner with Keller and Heckman focusing on FCC wireless and broadband policymaking, licensing (including auction procedures), compliance and related transactional matters, including spectrum acquisitions and dark fiber leasing. As part of Jarrett’s transactional practice, he represents real property owners in negotiating agreements with service providers to ensure the delivery of wireless and wireline broadband services for their residents and tenants. Contact him at jarrett@khlaw.com.



Stay Effective. Stay Connected.

Drive 4G-X Fleet Cell Signal Booster

Give your team the cellular signal strength they need to track vehicles and communicate with staff with weBoost’s Drive 4G-X Fleet cell signal booster, specifically designed for fleet vehicles. Our product boosts all carriers for every cellular device simultaneously, keeping you in contact at all times.



weBoost.com/fleet