LTE STANDARDS BODY CONSIDERS STUDY ON PUBLIC-SAFETY DIRECT MODE

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Public-safety LTE users could be able to communicate without having to rely on network infrastructure in the future, if a study proposal to develop and incorporate direct-mode communications into the 4G technology is successful.

Currently, the LTE standard requires that all traffic be transmitted over the network and does not support packets being transmitted directly between users. Public-safety officials have noted this characteristic as a shortcoming in LTE technology, because first responders often need to communicate when network infrastructure has been damaged or is otherwise unavailable.

Initially submitted by Qualcomm in August, the study proposal is designed to address this technology "gap" in the LTE standard to make it more attractive for public-safety and social-networking applications, according to Andrew Thiessen, lead electrical engineer for the **Institute of Telecommunications Sciences** (ITS) and technology committee vice chairman for the **National Public Safety Telecommunications Council** (NPSTC).

"We're just in the study-item proposal phase right now, but we fought hard to make sure that we could include public safety's requirements," Thiessen said. "It's not clear that this is even possible, but I know some vendors have been working on this for some time."

Although development of a direct-mode capability in LTE has been supported by several U.S. wireless carriers, opposition from a European carrier this summer caused the study proposal to be modified initially in a manner that would not support direct-mode capability unless the users were within network coverage. This change that would have made the proposal "basically useless to public safety," so additional support was sought to get the off-network language put back into the study proposal, Thiessen said.

During a meeting last week in Japan, the study proposal was amended to allow public-safety personnel to use the prospective LTE direct-mode capability outside of network coverage, Thiessen said. One key reason for the change was a letter from the **TETRA**

Association indicating that it is looking at broadband technologies for European first responders and would look at LTE more favorably if direct-mode capability is included in the standard, he said.

Having support from Europe not only is helpful to get the study proposal changed, but it also is an encouraging sign that LTE could be used by public-safety personnel outside the U.S, Thiessen said.

"What we wanted to see was a global market created for this capability that would bring down public safety's cost and allow them to continue to ride on the innovation curve that's going to exist in this commercial standard," he said. "Our intent here was to see this turn into a commodity capability."

With the study proposal approved formally in Japan last week, issue will be studied to determine the technical feasibility of meeting the requirement and then creating a work item to draft language that would be edited into a potential part of the LTE standard, Thiessen said.

"How long it's going to take from an R&D perspective is unknown," he said. "It all depends on how long it takes to get the requirements set up and who decides to bring forth proposals and solutions."

Under the current language of the study proposal, any direct-mode communications for public safety that are off network — voice or data — would have to be transmitted over public-safety spectrum, but the exact frequencies have not been identified, Thiessen said. In addition, there could be some consideration to use alternatives such as **airwaves in the TV white spaces**.

One of the biggest technical challenges to establishing a direct-mode capability for public-safety LTE devices is that commercial LTE devices are designed to transmit using 250 milliwatts of power, while public-safety users are accustomed to using devices that leverage up to 5 watts of power, allowing LMR direct-mode communications to work over greater distances.

"Supposedly, vendors have figured out a way to increase the distance that this service might work with a lower-powered device," Thiessen said. "Believe me, that is one of the

things we're concerned about."

But the fact that a direct-mode study proposal is being a considered is somewhat surprising, because many commercial wireless analysts have indicated that the 3GPP standards body would prefer to concentrate on features desired by the commercial market than those targeted primarily for the much smaller public-safety market. Thiessen attributed the early movement of the direct-mode proposal to Qualcomm.

"We're riding on the coattails of the fact that they wanted to introduce a study proposal for this for social networking," he said. "It was just an incredibly opportune moment."

Mobile wireless consultant **Andrew Seybold** said the fact that 3GPP is considering public-safety requirements is a "good thing" but expressed some concerns about the timing, noting that some officials may interpret the study proposal as a sign that mission-critical voice over broadband will be able to **replace LMR voice in the near future**.

"We're already having a problem with some elected officials who don't understand and are saying, 'I don't have to invest in my LMR systems anymore,'" Seybold said. "This could make that worse, which is doing a disservice to everyone.

"The bottom line is that we're going to have to operate parallel networks [LMR and LTE systems] for a long time."