



Thinking outside the sphere

In the Matter of Connecticut Siting Council Docket No. 445 Ridgefield, Connecticut

Isotrope Commentary on the Relevance of Public Safety Communications

The Connecticut Siting Council (the “Council”) has been left with an incomplete and misleading impression regarding the public safety radio technology and its relation to the matter at hand regarding the proposed cell tower at Old Stagecoach Road, Ridgefield. This paper addresses some of the discrepancies in the record.

1. It is simply impossible for the Town of Ridgefield, or any jurisdiction to “comply with P25.” The P25 standard as a *technical specification* that manufacturers follow to produce equipment that will work with other similarly designed equipment. Ridgefield is not a manufacturer – it is a consumer – of technology.

By analogy, when screwing a light bulb into a socket, the consumer who bought the light bulb is not “complying with” a standard called C81.61. That is the standard for manufacture of light bulb bases (ANSI ANSLG C81.61). The consumer is merely using a standardized technology to mate a bulb made by one company with a lamp made by another. By the same reasoning, Ridgefield is not “complying” with P25 if it chooses to use P25 technology. The Council should not be misled into thinking that the P25 standard imposes or even has the authority to impose operational mandates on municipalities.

P25 technology is the digital technology that has been used as a direct replacement for analog two-way radio communications. The Town could buy P25 portable radios from, say, Motorola, and P25 base stations from, say, Kenwood, and they would work



together because they conform to the same standard. The Town could do that today, if it chose to. Conversion to P25 technology requires wholesale replacement of analog radio equipment.

The Town of Ridgefield is under no regulatory mandate to adopt P25 technology.

2. FirstNet and P25 technology will be incompatible. The government agency responsible for FirstNet (the NTIA) has adopted the latest wireless technology, called LTE™. FirstNet technology does not fit into the channel plan that is presently used by analog and P25 digital radios. Two-way radio channels are narrow radio channels – essentially supporting one call at a time. FirstNet channels will be broadband channels capable of handling multiple simultaneous calls.

FirstNet is in its infancy, and no network plan has been developed. It is premature to assume anything about the facility siting requirements of FirstNet. It is incorrect to infer that to migrate to FirstNet technology sometime in the future there is any need to migrate from analog to P25 first. There is not.

3. The Council has taken administrative notice of a piece of ephemera (a transitory document not necessarily intended to have a long shelf life) from November 2010 on the Connecticut DEMHS web site. This document is a slide deck describing the state's I-Call/I-TAC Common Channel Mutual Aid Radio System.

The Common Mutual Aid Radio System document has nothing to do with personal wireless service coverage. With respect to public safety coverage, the slides show some aspects of public safety radio coverage planning that might illustrate best practices in public safety network planning. If Ridgefield were to develop a plan for improving coverage of its internal public safety communications, the plan would include, among other things, analysis similar to the coverage maps shown in the slides, but larger in scale. No such plan has been placed on the record.



The Common Mutual Aid Radio System is not for routine communications (Slides 7 & 8) and therefore has no bearing on the routine communications of Ridgefield public safety operations. As of 2010, the coverage maps show the Mutual Aid Radio System had a very high degree of penetration of mobile coverage statewide (Slide 17). In particular, coverage in Ridgefield, Danbury, Redding and Wilton was very thorough, with what appear to be minor pockets of substandard coverage in the area. The thorough coverage, even in Ridgefield, was obtained with repeaters on towers in Wilton, Redding and Danbury. As of 2010, the document indicates no repeater site is planned for Ridgefield (Slide 15).

The Common Mutual Aid Radio System slides also depict the then-existing portable coverage. Recall that portables operate with less power than mobiles and base stations/repeaters. The area in which the return signal from the portable can reach the repeater or base will be smaller than with the mobile. Slide 16 illustrates how there are localized areas of portable coverage in the Mutual Aid Radio System, in contrast to the very high penetration of mobile coverage throughout the state (Slide 17). The Mutual Aid Radio System was clearly designed to obtain substantial statewide mobile coverage. No evidence has been submitted suggesting that there is any role for the proposed tower in the Mutual Aid Radio System network.

Using current best-practices, two-way radio systems, and especially public safety two-way radio systems, address the portable coverage disparity with a network of “voting receivers.” In areas where the base station or repeater can reach the person in the field (“talk-down”), but the portable user cannot call back (“talk-up”), a voting receiver is installed to supplement the portable coverage. In Ridgefield, it would be a relatively easy task to install voting receivers on municipal property, such as school grounds, in areas where talk-down is OK and talk-up from portables needs help. This is a common practice in the public safety communications field, and should be employed in



Ridgefield, if it is not already so.

4. A new tower does not solve any real or imagined interoperability issues. It is the nature of public safety communications that often requires the juggling of various services on various frequency bands. The state Mutual Aid Radio System provides a way for multiple agencies in multiple jurisdictions to establish a common radio channel for an event. In addition, neighboring towns often share a local channel on their radios; when they respond to a call to support a neighboring town, they can participate in the joint operation. A new tower does not solve the juggling-of-radios issue, particularly when mutual aid may be on a band not supported by the current radios in a particular town. In such cases, separate radios are necessary, and a new radio tower does not address this fundamental disparity.

5. No assumptions can be made about the Ridgefield public safety communications without a properly documented study. No new frequencies have been identified. No analysis of the impact of reuse of existing licensed frequencies was performed. Generalized statements – such as those suggesting that the Docket 445 Site is supposedly ideal because, from there, a public safety transmitter can illuminate both sides of the ridge – are unsubstantiated; they lack analysis of the existing network and of critical factors such as the risk that a new facility on high ground might have too much coverage (that would cause interference to other public safety licensees in the region). Without a study, any statements of the supposed benefits of the site are speculation.

6. A new tower solves no urgent public safety radio need. If there were a crisis in Ridgefield public safety communications today (which apparently there is not), it could easily be mitigated today by the placement of additional voting receivers and/or simulcast repeaters on public property, including on school properties. If there were a critical need to consolidate Ridgefield public safety communications in a single frequency band, it only takes a frequency study to determine what is available and how the desired coverage could be obtained. Moreover, the Ridgefield Zoning Regulations



accommodate, by special permit, antennas and towers to be used primarily for public safety communications.

7. The proposed site is not shown to be an effective simulcast site. Simulcasting involves providing coverage that is more consistent and more thorough by the use of multiple transmitters that simultaneously broadcast the same information on the same channel in different locations. Simulcasting runs the risk of creating interference overlap areas where the signals of two or more transmitters overlap. One way to control overlap is to use the terrain to *block* the signal of one simulcast transmitter from reaching into the coverage area of another simulcast transmitter. By placing simulcast transmitter antennas in valleys (such as on the schools) rather than on ridges, the terrain is used to prevent simulcast interference instead of creating it from a ridgetop. A proper study is necessary to determine the efficacy of any public safety simulcast network layout. None has been proffered.

8. A point-to-point microwave link is not necessary for reliable public safety coverage. The premise that microwave links are more reliable than land line links is unsubstantiated. Both microwave links and land line links have their strengths and weaknesses. Both are engineered to meet the goal of “five nines” of reliability. Both are exposed to specific failure modes that the other is not (antenna icing, versus a tree falling on the utility lines, for example).

In summary, the purported benefits of the proposed tower to public safety communications are speculative and unsubstantiated. The insinuation that there are mandates 1) for Ridgefield “to comply” with P25, and 2) that the proposed tower is crucial to the Town’s public safety radio needs (with or without P25), is misleading and incorrect.

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