Before the

Federal Communications Commission

Washington, DC

In the matter of §

§

Location-Based Routing § PS Docket No. 18.64

For Wireless 911 Calls §

§

Comments from ROBERT OENNING

The comments in the notice of inquiry by themselves do a superb job of justifying a rule change to require911 call routing based on the caller location. Most of the questions asked are already answered in the discussions along with the direction the FCC has been taking toward assuring improvements to 911 systems. My comments rather than dealing with specifics are general in nature pointing toward the history of 911 call routing and location information delivery to the public safety agency taking the call, (the Public Safety Answering Point). That history illuminates the seriousness of the issue in regard to the expectations of those who call for assistance and the commitment made by local governments to meet those expectations.

I have been dealing with wireless location longer than the FCC, beginning before Washington State PSAPs add the emerging wireless (cellular) location issue to the to the filing that became FCC Docket 94-102. Even in 1993 the bricks or bags that were cellular phones were viewed by those using them as a tool for calling 911 for access to emergency services. After years of discussion routing by cell site, then sector, was as good as the carriers could commitment to with the technology at hand. Once implemented that rudimentary call routing became a standard. Better caller location became an additional feature, often time consuming as an on demand function of call processing that occurs after the call has been answered. As handsets became utilitarian devices location became critical to a host of valuable commercial applications to where today the location provided by the device is amazingly accurate. There is no hesitation in supplying location information to the phone user even to including geo-coordinate maps with walking directions to the nearest Italian food emporium. Yet 911 call routing continues to be based on the best we could do in the last century when wireless phones were only devices for voice communication and were often referred to as bricks.

The issue of call routing was first addressed with the great effort public safety undertook to implement Enhanced 911 (E911) to replace basic 911. Inaccurate call routing demanded some way to deal with Geopolitical boundaries as the key to where calls should be answered. The implementation of 911 dialing created a simple number to call that could be activated from a phone, reducing the necessity to know the local emergency number. Basic 911 was a relatively simple system that recognized the digits ‘911’ as a call with the end serving central office routing the call to an existing public safety phone line. But end serving central office boundaries did not correspond with geopolitical boundaries. In urban areas due to the likely high percentage of 911 calls that would need to be transferred to a different jurisdiction it was often not practicable to implement 911 dialing. Call transfers take time and delay the dispatch of response units, both due to the transfer itself and also due to the need to query the caller for location information. The answer was Enhanced 911.

At the time the first generation of wireless systems were being deployed across the nation efforts were underway to implement Enhanced 911 (E911) to replace basic 911 dialing. E911 solved the call routing issue by routing calls based on the known service address of the calling phone. Implementing E911 required extensive efforts to build address based call routing tables and one of the first implementations of computer telephone interfaces. E911 was based on some relatively proven technologies such as the ability to direct calls using a three-digit code attached to a phone number (speed dial) and the emerging technologies of linking mini-computers to telephone switching systems. Public Safety agencies that wished to implement E911 had the onerous task of assigning a routing number to an extract of the telephone company service address file. The detail was eased by being able to utilize address ranges to assign the correct routing digits to phone numbers showing to be within that address range. It was still a major effort that required in many cases modifying the physical address, that is re-addressing or re-naming streets. The effort was costly as well as having large public involvement component. Politically there needed to be additional benefit associated with the necessary expenditure and potential disturbance to something residents hold dear, their address. The additional benefit was the addition of a capability to display the caller’s phone number and address at the PSAP. E911 was sold to the public as a significant benefit most often with an associated additional fee or tax to support it, with that tax or fee frequently needing voter approval. E911 proved to be not only a lifesaving service but also a public expectation backed up by ongoing news stories. The call routing in many instances was perfect with the responsible PSAP always receiving calls that organization was responsible for answering. It became expected that dialing 911 will result in the call being answered by someone who can dispatch assistance. Public relations programs were developed to help the general public understand the importance of dialing 911 and to directly assist special needs communities. With E911 implemented that three digit number became the symbol for effective emergency assistance, and somewhat above reproach.

As E911 was spreading across the nation the commercial Mobile Radio Services were also being implemented. Wireless systems initially served huge areas from a single wireless central office, sometimes including parts of multiple states, making the correct routing of 911 calls virtually impossible. Agencies working to implement E911 noted the problem, but wireless, cellular, was at the time only a small percentage of the 911 call volume, and the E911 systems made transferring those calls far easier than it had been with basic 911. But wireless grew in volume as a commodity service with more 911 calls creating a demand for a solution to the call routing problem along with some basic information delivery such as the caller’s phone number. The FCC’s requirement for the implementation of Phases I call routing based on the cell site was a major improvement, but still nowhere as accurate as that done for landline calls by E911 systems. As cell site coverage became smaller with wireless system maturation the effectiveness of the routing was improved default but still is not at all aligned with geopolitical boundaries. The FCC requirements for Phase II wireless opened an option for improved caller location information, but only after the call had already been routed based on the cell site. That FCC requirement is what stands as the acceptable wireless call routing process today, close to a quarter century since it was implemented as the best that could be done by an infant CMRS industry.

Today calls from landline with their accurate address information are the small minority of 911 dialed requests for assistance. Because of the now antiquated wireless call routing process a significant number of 911 calls must be transferred to the agency responsible for dispatching assistance. Yes, 911 call routing has regressed to about where it was when Enhanced 911 was invented to solve the issue of accommodating geo-political boundaries. 911 call routing today for wireless appears to be not that different from the past where mini-computers were new innovations and 300 baud was an acceptable data transmission rate. Today the under five ounce device we carry with us has more power and communications capability than even the largest building filling main-frame computers did at that time. Capabilities in today’s pocket devices that instantly give us access to the world including very accurate location data that is instantly passed to applications that return information based on where the device is located. That is except for emergencies when 911 is dialed. If you want to see a map you see very close to your actual location. If you want others to see where you are that will be passed to them, instantly. That is except for emergencies when 911 is dialed.

The reason for this regression to call routing capability not that different form the capability of Basic 911 is simply that no definitive direction has been given to the industry to progress. The regulated CMRS carriers are clearly following the specific direction given them by the Federal Communications Commission regulations. Carriers are doing as directed, routing based on cell sector. It appears that there demonstrations have been done to show that calls can be routed based on the device location. It also appears that there may be multiple avenues toward achieving the desired result. Given the computational power and data transmission capabilities of today’s wireless networks 911 call routing based on the device location should be as noted by some responders not overwhelmingly difficult. But accurate 911 call routing may also be easily complexed by multiple solutions, some most likely utilizing closely held techniques backed by patents or linked to specific equipment brands employed by the PSAP. Any direction to use the best immediately available location information for 911 call routing must be universal to the degree that it does not create proprietary operations, and that it permits a fully competitive environment for PSAP equipment purchases.

The issue may center on who owns the geo-political boundary information, and how that information is maintained. There is no technical reason for there not to be a single nation-wide 911 routing file. CTIA and others have committed with the FCC to building a location determination tool that when completed could permit not only device location but also translation to a civic address for routing assistance. As noted, how the 911 call routing is actually accomplished should be uniform to maximize PSAP choices for equipment by limiting vendor specific capabilities. In following the success of E911 it may be feasible to utilize proven telecommunications technologies such as the call routing function of number portability and wireless internetwork signaling to route 911 calls based on a geopolitical boundary file. Most PSAPs have mapping tools in place that permit dispatch of units based on the location and those files may be made cloud accessible. The CSRIC V report clearly notes that location based routing can be done, with a coordinated effort. That coordination is the key that the FCC and other involved Federal Agencies can expeditiously forward.

Given the potential synergy between the various efforts the FCC has already enabled and the vast technologies at hand the FCC should simply replace the cell site based requirement with a device based routing requirement on a short time-line for implementation. The question is not if device location based routing can be done but rather how those in the industry who have already demonstrated an ability to collaborate on improving 911 services can be enabled to make it happen. The action the FCC takes to move forward location based routing should be tempered to assure that the industry does not again get trapped again into retaining 911 methodologies well past the point where it is practicable to move toward improved systems.

The American Public, often with votes supporting ongoing taxation, has supported 911 dialing. The expectation is that when 911 is dialed the call will immediately be answered by someone who can dispatch assistance. The caller’s expectation is that their location will be known and any questions will be related to sending help, not determine where the caller is located or where the call should be transferred. The expectations of excellence associated with 911 have become embedded in the psyche of the nation, and any delay in making correct call routing the implemented standard erodes that trust.

Respectfully submitted,

Robert Oenning

E911 Administrator, Ret.

P.O. Box 2405

Cape May, NJ 08204

[roenning@earthlink.net](mailto:roenning@earthlink.net)

202-239-2382