



**Testimony of Rosum Corporation
Skip Speaks, Chief Executive Officer**

**Hearing on Voice Over Internet Protocol (VoIP) and the Future of 9-1-1 Services
Before the Senate Committee on Commerce, Science and Transportation**

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(Testimony submitted in document form)

Chairman Inouye, Ranking Member Stevens, Members of the Committee. My name is Skip Speaks, and I am Chief Executive Officer of Rosum Corporation. Thank you for the opportunity to submit testimony on the subject of VoIP and the Future of 9-1-1 Services. 9-1-1 is a subject that affects all users of telephony services, and arguably all citizens, in some way or another, and I appreciate the Committee's thoughtful review of this important public safety issue.

Rosum was founded in 2000 for the precise purpose of developing reliable location technology that works indoors and in urban canyons. Our founders come from the GPS world – our Chairman and co-founder, Dr. Jim Spilker, was one of the original architects of the GPS constellation. Our founders intimately know the strengths of the GPS, and in turn know of its shortcomings in urban and indoor environments. Rosum uses analog and digital terrestrial television signals for position location, signals which can be thousands of times stronger than GPS indoors and which were designed to deliver TV programming to indoor receivers. Rosum works by detecting those signals, at far weaker levels than required to deliver picture, and measuring their time-of-flight from transmitter to receiver, much as you would with GPS. In sum, Rosum transforms the broadcast TV infrastructure into a high-power, multi-channel GPS equivalent, right here on the ground. The TV infrastructure is distributed and robust to disaster, and is already used for emergency services such as the Emergency Alert System (EAS). The National Association of



Broadcasters received commendation after its role in preserving communications in the wake of the Gulf State hurricanes of 2005.

Rosum has also combined TV with GPS signals for what we call “hybrid” positioning that utilizes the best available signals in a given location. This combines satellite GPS signals with terrestrial TV signals. TV is highly correlated with urban and suburban areas; conversely, GPS is strongest in more rural, open areas. The combination of the two gives us the best of both.

In rigorous all-indoor testing in various cities across America, we consistently deliver accuracy that meets or exceeds the FCC’s E9-1-1 requirements. Today our infrastructure has approximately 60 million people under coverage, with further plans to expand our coverage footprint in metropolitan areas of the US this year.

Living Up to 9-1-1’s Success

9-1-1 is arguably a case where industry success has created high expectations. Since its inception in 1968, 9-1-1 has conveyed peace of mind. One can expect that a 9-1-1 call made over the traditional home phone connected by copper wire will result in first responders going to the right address. The challenge before us is to deliver comparable service to the consumer, regardless of the technology they have chosen.

When I was with Ericsson’s Wireless Infrastructure division, we designed and built many of the systems used in wireless communications in this country today. We responded to Craig McCaw’s challenge of being able to dial a person, not a place, and made that vision a commercial reality. We also dealt with the issue of helping our carrier customers comply with E9-1-1 requirements. It is with some confidence, therefore, that I can say the wireless industry has spent substantial time and



resources working to address E9-1-1, but I can say with equal confidence that there is still work to be done, and that we can and must do better.

As such I support Federal Communications Commission Chairman Kevin Martin's recent comments on the need for more accurate location of E9-1-1 calls from mobile devices. I also thank this Committee for its attention today.

In-Building 9-1-1

The subject of today's hearing is VoIP and the Future of 9-1-1 Services. What I would like to do is present several trends in the consumer telephony market today that illustrate an overarching need for "In-Building 9-1-1", or 9-1-1 that works indoors, regardless of the technology or service used to make the 9-1-1 call.

Looking at the consumer telephony market today, there are four major trends or changes that draw a larger overall picture.

1 - Growth in wireless-only subscribers. Depending on the city, roughly 5 to 20% of households are now wireless-only, meaning that household uses its wireless handset not just as a mobile phone while on the go, but also as a primary home line. For Detroit, it's 19%. For Tampa, it's 15%. For Boston, it's 10%. In San Diego, where I live, it's also 10%. Those percentages may seem small, but they are forecast to grow. In numerical terms, Detroit's 19% corresponds to 280,000 households; Tampa's 15% corresponds to almost 180,000 households; Boston's 10% corresponds to 195,000 households; and San Diego's 10% corresponds to 105,000 households. These are numbers that make you stand up and take notice.



This trend is most notable among the 18-to-24 demographic, of which 38% is wireless-only. This means that this trend will likely continue to grow. For these subscribers, their wireless phone is both their mobile phone and their home phone. The boundary between the two is blurring.

2 - Data showing the majority of wireless calls and wireless 9-1-1 calls is now made indoors.

The Network Reliability and Interoperability Council (NRIC), a wireless industry standards group, in its NRIC VII final report in 2005, recommended that only 5% of E9-1-1 tests be conducted indoors “because no data currently exists that defines the actual number of wireless 9-1-1 calls made from indoors and because of practical limitations of location technologies currently deployed.” That data now exists. Recent data indicates that 60% of wireless calls are made indoors and the majority of wireless 9-1-1 calls are made from indoors. Here again, the boundary between the wireless phone and the home phone is growing blurry. Further, location technologies, such as Rosum’s, designed from the ground up to deliver reliable location indoors also now exist.

3 – Growth in residential VoIP subscribers. As of Q4-2006, there were 9.5 million residential VoIP subscribers in the United States. VoIP services offer a new freedom to the consumer – the ability to place calls from anywhere a broadband connection can be found. This enables a new form of “nomadic” telephony, which chiefly takes place indoors.

Here, too, industry has spent substantial resources addressing E9-1-1 implementation at a laudable speed. The VoIP industry is to be commended for addressing this public safety issue head on, without delay. Industry took an approach different than the automatic location approach taken in wireless – that of asking customers to self-provide their location, which, once verified, is then stored in a database and used to route the 9-1-1 call to the proper public safety answering point.



This bypassed the handset upgrade cycle necessary in wireless to get E9-1-1-capable handsets in the hands of consumers. While industry is to be praised for the speed with which it has implemented E9-1-1 service, it remains that some subscribers may not know their exact address, or may forget to update it after changing locations. Thus, the manual update model used today will face difficulty scaling over time, or in coping with more frequent nomadic usage. Here too, I will say that regardless of the technology or service they have chosen, consumers should expect rapid and accurate response to 9-1-1 calls, without the need for manual updates.

4 - New home base stations that augment residential wireless coverage. Home base stations or “femtocells” promise to alleviate residential wireless coverage issues by putting a mini base station in the home. Wireless subscribers can use their same wireless handset in the home. Calls are carried out over the Internet and then connected to carrier networks. For 9-1-1 purposes and subscriber activation purposes, base stations must be automatically locatable indoors. GPS, used in wireless both for E9-1-1 and for network synchronization, will not work in indoor environments. As these devices are generally deployed where wireless coverage is poor, cellular network-based location technologies also cannot be used for 9-1-1.

Conclusions

Looking at these trends, it is clear that there is increased diversity in services available to the consumer, and that the definition of what we once called the home phone has broadened. If 9-1-1 calls are made over these new services and devices, they will likely be made from indoors. It is this general need for indoor location capability that I referred to earlier as “In-Building 9-1-1”, or 9-1-1 that works indoors, automatically. Further, while I have referred to four market trends here, the



advance of technology ensures that new technologies will come to market. As such, policy that can incorporate new technologies will help us avoid our current situation of reacting to new services once they are already in the market.

Choice presents the consumer with added flexibility, improved quality of service, and potential cost savings. From a 9-1-1 perspective, this diversity of options represents a challenge. But as the boundaries between home, wireless and Internet telephony blur, it is clear that consumers should not have to sacrifice safety in choosing one option over another. There is every reason for consumers to expect rapid and accurate response to 9-1-1 calls, whether made indoors or out, regardless of the technology they have chosen.

Thank you for your time and attention.