

WG 3: E9-1-1 Location Accuracy

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Description: The Working Group shall address questions referred to CSRIC in PS Docket No. 07-114, "Wireless E911 Location Accuracy Requirements." In particular:

Outdoor Location Accuracy

The Working Group shall develop approaches to outdoor location accuracy testing criteria, procedures, and timeframes that are reasonable and cost-effective, considering alternatives to current FCC Office of Engineering and Technology OET Bulletin 71. It shall also develop recommendations concerning the feasibility of flexible testing criteria and methodologies, and gather detailed cost data relating to particular testing methodologies from stakeholders to substantiate concerns about potential expense of periodic testing.

Indoor Location Accuracy

It has been widely recognized that indoor location accuracy testing poses unique challenges for carriers. For example, indoor environments are more diverse than outdoor environments. In addition, most homes and buildings are privately owned, thus, access to indoor environments for testing can be difficult.

It is frequently noted that existing location technologies do not perform effectively in all environments. Thus, issues of yield, not just accuracy, are relevant. For example, Assisted Global Positioning System (A-GPS) may not work deep inside a steel-and-concrete building, or even in a suburban residential basement, but may work in wood frame construction, or near office windows.

The FCC's Public Safety and Homeland Security Bureau (Bureau) has not been presented with reliable statistics on the percentage of 911 calls that are made indoors, nor has the Bureau been presented with reliable statistics on the number of emergency calls that are placed within different types of indoor structures (e.g., the fraction of calls placed from concrete-and-steel vs. wood frame construction), or the displacement within the building (e.g., near windows vs. deep inside the structure).

Today, a carrier is likely to locate an indoor 911 caller by using a combination of A-GPS and network triangulation. In the near future, additional location technologies may be able to provide indoor location determination for 911 callers, such as Wi-Fi positioning and femtocells. The Working Group will address the following questions:

Do you agree with the basic premises of the paragraphs above?

1. Define the scope of "indoors." Should it include non-residential structures, such as airports, stadiums, malls, and warehouses?
2. Is it necessary to establish the ratio of indoor vs. outdoor 911 calls? If so, how should such a ratio be determined? Should indoor testing be a separate parameter that is independent of outdoor

measurements? In this scenario, a Commercial Mobile Radio System (CMRS) provider would have to independently meet both the indoor and outdoor criteria.

3. Should indoor locations be sampled in a statistical manner within each county or PSAP coverage area? This approach would be based on the Commission's decision in its 2010 Location Accuracy Second Report and Order. Should the Commission establish a set of typical indoor scenarios and test each handset model, or class, in one or more model environments? This approach may be appropriate if performance is likely to depend on handset characteristics, such as the GPS chipset, or antenna configuration. Are there other test methodologies that should be considered?

4. For CMRS providers that primarily rely on A-GPS, would measuring the effective sensitivity (e.g., measured in dBm) of the GPS receiver, using a suitable bench setup, be sufficient to estimate the achievable indoor location yield and accuracy? Are there other factors that should be taken into account?

5. If a GPS sensitivity measurement were used to predict indoor yield and accuracy, how would the receiver sensitivity be translated into these parameters, given the difficulty of statistically estimating the GPS attenuation characteristics across indoor locations? Should such a translation be avoided?

6. Some networks use hybrid location technologies, i.e., combine A-GPS with triangulation. As long as an indoor location allows wireless carriers to provide service, would the performance of the triangulation technique differ substantially indoors, e.g., due to differences in multipath characteristics for indoor locations, or strong dependence of the technology on signal strength?

7. When testing for location accuracy and yield, should the ability of a carrier to use distributed antenna systems, WiFi, or femtocells be considered? If not, should these techniques be considered at a later date, when they are more likely to be used for 911 purposes? If such techniques should be considered now or at a later date, how should they be considered?

Leveraging Commercial Location-Based Services

The Working Group shall explore and make recommendations on methodologies for leveraging commercial location-based services for 9-1-1 location determination and provide recommendations on the feasibility or appropriateness for the Commission to adopt operational benchmarks that will allow consumers to evaluate carriers' ability to provide accurate location information.

Duration:

1. Report on Outdoor Testing Criteria: March 22, 2012
2. Report on Indoor Testing: September 12, 2012
3. Report on commercial location-based services: March 6, 2013

