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ATTORNEYS AT LAW

November 16, 2013

Marlene H. Dortch
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Washington, DC 20554

Re: *Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114

Dear Ms. Dortch:

T-Mobile submits this ex parte in response to the November 13, 2013, filing by TruePosition regarding location accuracy issues.

In reviewing location accuracy standards and technology in next week's workshop, it is critical that the Commission focus on core principles, most importantly that E911 location technologies must accommodate a wide variety of use cases. Wireless 911 calls originate both indoors and outdoors in urban, suburban and rural locations. As T-Mobile and others have noted repeatedly on the record, there is no single technology that can provide low latency, high accuracy, high yield location estimates in all of these locations. Thus carriers and public safety have worked to develop technologies and standards that provide the best possible location estimate given this reality.

At its core, TruePosition paints a self-serving picture that A-GPS never functions well indoors. That is simply not the case. As T-Mobile previously stated,[1] it now gets an A-GPS estimate on its UMTS network for 77 percent of calls over 30 seconds (that is, long enough to be measuring whether A-GPS is capable of producing an estimate)—which is up from one year ago. If three-quarters of wireless 911 calls are placed from indoors, as some have speculated but for which there is no hard data, then at least two-thirds of all of T-Mobile's indoor UMTS 911 calls of more than 30 seconds in length are getting position fixes based on A-GPS. Thus, while a minority of calls are still located through some other method, A-GPS is reasonably the foundation of wireless E911 location for both indoor and outdoor locations.

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[1] Letter from John Nakahata, Wiltshire & Grannis LLP, to Marlene H. Dortch, Secretary, FCC, PS Docket No. 07-114, at 2 (filed Sept. 27, 2013).

Moreover, TruePosition ignores the fact that network-based providers such as T-Mobile were prompted to migrate to A-GPS and away from U-TDOA as their primary location technology because (among other reasons) U-TDOA could not meet the FCC's accuracy requirements on a county-based level in all counties—even at the 100 meters / 300 meters accuracy threshold. Because of rural environments, and environments such as highways, beaches, edges of service areas, and other settings with suboptimal cell geometry, U-TDOA could not provide adequate location estimates;[2] T-Mobile estimates that U-TDOA is capable of performing within the 100 meter / 300 meter requirement in fewer than half the counties in which T-Mobile provides service. Thus, in establishing the phase-in for county-level accuracy requirements, which has now also been buttressed by the Commission's determination to unify accuracy requirements at 50 meters / 150 meters, the key factor pacing the phase-in was how fast providers such as T-Mobile could expect to shift their subscribers to A-GPS-capable handsets. The Commission's accuracy standards are premised on A-GPS.

Having lost the battle to be the primary wireless E911 location technology, TruePosition now tries to argue that the FCC should mandate U-TDOA's adoption as the "fallback" technology to be used when A-GPS does not deliver a fix, or even first to then be improved-upon by an A-GPS fix. All of these arguments present problems and trade-offs that TruePosition fails to acknowledge or discuss.

TruePosition argues that a technology other than Cell ID should be used for routing calls. Carriers and PSAPs from the inception of wireless E911 have agreed on the use of Cell ID for routing because it creates no added call set-up delay. If U-TDOA, for example, were to be used for routing, call set-up would have to be postponed for approximately five seconds (or even more) for the initial location estimate to be returned. Doing so would increase consumer frustration and confusion in an emergency, as they would potentially hang up and redial during the five second (or more) post-dial delay, thinking that their call had failed in the network. Cell ID, on the other hand, is always and instantly available any time a wireless 911 call can be made. Given that most callers can report their own location and a minority of calls require transfer among PSAPs, it seems more reasonable to route on Cell ID and then redirect the limited number of calls that need re-routing than to hold up the call set up for all calls in order to reduce re-routing.

TruePosition also attacks carriers for both their choice and labeling of alternative "fallback" technologies. TruePosition argues that unlike U-TDOA, other fallback technologies are "non-compliant" and thus should not be labelled as "Phase II."

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[2] This is not just T-Mobile's experience. In 2007, AT&T cited an observation by the New Jersey Office of Emergency Telecommunications Services that, to meet the network accuracy standards on a PSAP-by-PSAP basis using network-based technologies, carriers would have to build cell sites in the ocean solely for the purpose of enabling location estimates. Comments of AT&T, PS Docket No. 07-114, CC Docket No. 94-102, WC Docket No. 05-196, at 9 (filed July 5, 2007).

With respect to labeling, TruePosition ignores the fact that the FCC's rules themselves create and define the labels "Phase I" and "Phase II." Under Section 20.18(d), "Phase I" specifically refers to the provision of "the telephone number of the originator of a 911 call and the location of the cell site or base station receiving a 911 call from any mobile handset." In contrast, Phase II is defined as "the location of all 911 calls by longitude and latitude in conformance with Phase II accuracy requirements." Notably, Phase II accuracy requirements are not judged call-by-call, but are evaluated as a weighted average accuracy across all calls within a county. Thus, by definition, any location estimates delivering latitude and longitude of the caller, rather than cell site location, are Phase II. This does not mean that other information regarding accuracy cannot be conveyed (and it is, in the form of call-by-call uncertainty estimates), but it does mean that both primary and fallback location technologies are properly labeled as "Phase II." This has also been reflected in industry standards and best practices.

Fallback technologies, by definition, must reliably (*i.e.*, near 100 percent of the time) produce a Phase II location estimate whenever the primary technology, A-GPS, for whatever reason, cannot. It is well understood that U-TDOA does not perform well or at all in rural areas, along highway corridors, shorelines, edges of service areas, and other settings with suboptimal cell geometry; and is, therefore, unsuitable as a fallback technology.

In short, the technologies themselves are neither "compliant" nor "non-compliant," and it is misleading for TruePosition to label them as such. It is a carrier's Phase II system that is compliant or non-compliant with the Commission's accuracy requirements, not the individual technologies. While it is true that, on average, one technology may perform better than another, that may not be the case for a given call.[3] So there is no basis to exclude other technologies as "non-compliant." Referring to a technology as "compliant" or "non-compliant" is confusing and misleading. By TruePosition's own reasoning, U-TDOA would have to be labelled "non-compliant" in many counties.

To address this, and because all Phase II location technologies involve trade-offs between accuracy, yield, and latency (including U-TDOA and carrier fallback technologies like RTT), T-Mobile and other carriers provide call-by-call uncertainty estimates to those PSAPs that want the information. These uncertainty estimates can provide PSAPs with what is functionally the most helpful information—an estimate of how large an area around the location estimate must be included for the carrier to be confident to a specified level (90 percent for T-Mobile) that the caller is located within that area. While uncertainty is not the same as accuracy, it does indicate to the PSAP the likely search radius. This addresses the issue of variability in location estimates—which occurs within a technology as well as across technologies—in the most targeted manner, through the provision of relevant information.

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[3] Contrary to TruePosition's claims, RTT functions well as a fallback technology when A-GPS is not available, including indoors. RTT typically provides good, medium-accuracy results, especially in high density deployment areas where RTT tends to be relied upon more often.

It is important to recognize that notwithstanding the issues related to implementation of indoor location information at the PSAP—issues such as the absence of accurate indoor maps correlated to above-ground level measurements—no candidate technology has demonstrated the ability to reliably tell a PSAP which building a caller is in. Even the best-performing technologies in the CSRIC Test Bed could not reliably place calls in the right buildings.[4] Of course, because TruePosition withdrew from CSRIC, the Commission and carriers cannot draw an apples-to-apples comparison, but there is no reason to believe U-TDOA will perform any more reliably than the other candidate technologies from CSRIC.

While wireless E911 location works well today—and will especially work well if PSAPs utilize rebids and uncertainty estimates—there is still room for improvement as networks transition to LTE. Under the LTE standards, for the first time carriers will be able to run location queries on multiple technologies simultaneously; for legacy networks, they must be run one at a time. The LTE standards also contain other important provisions that facilitate accurate E911 location determinations. These changes will enable carriers to use technologies in combination for the same call, utilizing the best of multiple simultaneous location estimates.

Just which technologies will be most effective remains to be seen, but both the Commission's and carriers' decision-making processes will be greatly enhanced by apples-to-apples technology comparisons, such as through the CSRIC Indoor Test Bed. As CSRIC IV contemplates, a permanent test bed should be established, and those LTE-based location methods which were unavailable for testing during the initial CSRIC Indoor Test Bed should be quickly and thoroughly evaluated and analyzed in the context of their potential to complement A-GPS in various environments. These would include GLONASS, OTDOA, and possibly WiFi-based methods, as well as U-TDOA should TruePosition choose to participate.

The simple fact is that no short term measure will provide better accuracy across indoor and outdoor locations than is already available—or that will occur through the improvements in GPS that are already occurring. The best near term solution is the one that nearly everyone is focused on—using the tools that are available (including rebids and the provision of uncertainty information to PSAPs) while developing new tools available with LTE for the longer term.

The good news is that, notwithstanding TruePosition's attempt to manufacture a crisis atmosphere, there is no public safety crisis with respect to location performance. The Commission should allow the cooperative and data-driven processes already underway to

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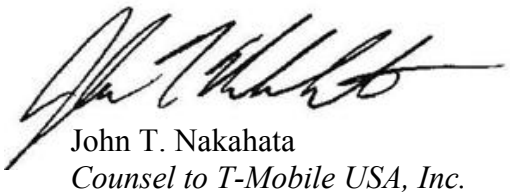
[4] *See* Communications Security, Reliability and Interoperability Council III, Working Group 3, Indoor Location Test Bed Report at 54-55 (2013).

complete the evaluation—and ultimately rollout—of new location technologies to supplement existing ones.

Sincerely,



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