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August 3, 2017

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VIA ECFS SUBMISSION

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

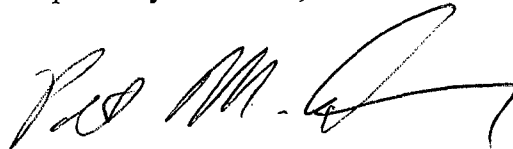
Re: United States Cellular Corporation
PS Docket No. 07-114
Wireless E911 Location Accuracy Requirements
Implementation Plan and Progress Report

Dear Ms. Dortch:

Pursuant to 47 C.F.R. § 20.18(i)(4)(i)-(ii), submitted herewith on behalf of United States Cellular Corporation, is the company's indoor location accuracy Implementation Plan and Progress Report.

Please contact the undersigned counsel should there be any questions.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Peter M. Connolly", with a stylized flourish at the end.

Peter M. Connolly
Counsel for United States Cellular Corporation



**U.S. Cellular Corporation Combined Implementation Plan & Progress Report for
Indoor 911 Location Accuracy
PS Docket NO. 07-114
August 3, 2017**

Pursuant to the E911 Fourth Report and Order, U.S. Cellular Corporation ("USCC") is required to file an Initial Implementation Plan (§20.18(i)(4)(i)) and Progress Report (§20.18(i)(4)(ii)) by August 3, 2017. Previously, on June 2, 2017, USCC submitted its Compliance Certification satisfying the requirement of 47 C.F.R. § 20.18(i)(2)(i)(B)) for reporting of 50-meter horizontal accuracy or providing Dispatchable Location for 40 percent of all wireless 911 calls by April 3, 2017.

A. Strategy for Horizontal Requirements

Under the rules of the Federal Communications Commission ("FCC"), non-nationwide wireless carriers are required to generate either a Dispatchable Location or X/Y location information within 50 meters for a certain percentage of wireless calls to 911 within specific timeframes. (*See* FCC, Fourth Report & Order on Wireless E911 Location Accuracy Requirements (rel. Feb. 3, 2015)), Section 20.18(i)(2) of the FCC's Rules). Dispatchable Location solutions provide the verified street address, plus additional location information from the planned National Emergency Address Database ("NEAD") that will help locate, with increased accuracy, a wireless device placing a call to 911. By developing Dispatchable Location solutions, wireless providers are leveraging evolving wireless technologies, such as WiFi and Bluetooth, to help improve the ability of first responders to efficiently and safely respond to wireless 911 callers that may be located indoors.

Within the past three years, USCC has made considerable progress toward emergency location enhancements with its existing technology (i.e., 3G CDMA) to ensure compliance with relevant location accuracy benchmarks (i.e., 40%, 50%, 70%, etc.) for 911 call percentages within 50 meters. Further improvements are underway for newer technologies, such as the location technologies associated with 4G LTE, to maintain location accuracy stability for those location accuracy benchmark requirements and to support Dispatchable Location where reasonably needed across the network.

1. Tools and Testing

USCC has procured a robust location performance management tool suite that supports performance monitoring of all live 911 calls and related archived data traffic for analysis. Visibility into potential areas of optimization is also available through the tool suite, including detailed reporting templates to comply with the Fourth Report & Order requirements. The platform is fully equipped to monitor yield and location estimates in accordance with FCC and Public Safety requirements.



Moreover, USCC has undertaken key optimization efforts across its base-station almanac (BSA) database, location platform data-fill specific to the maximum antenna radius (MAR), and cellsite positioning enhancements that all contributed to increased accuracy levels across its existing (CDMA) network platform. USCC has also conducted periodic drive testing for location accuracy to help maintain visibility into USCC's emergency services 911 operations and to guide network optimization efforts. Drive testing provides a real-world experience and view of 911 call flow and location. It yields results that capture areas of needed enhancement and serves as a baseline for reporting requirements.

All existing location methods (or position sources) used across USCC's commercial network have been fully-tested and vetted as proven technologies in the CTIA Test Bed. The roadmap ahead will include LTE/VoLTE related location technologies, such as AGNSS, Device Based Hybrid (DBH), and OTDOA, for customers and consumers with VoLTE-enabled handsets. USCC remains receptive to deploying emerging location technologies for emergency services offered and made available through the Test Bed. Concerning handsets, USCC's review process requires that device OEMs provide a validation that their device portfolio offerings will have handset features promoting location accuracy improvements that have been tested and certified according to standards and approved technical benchmarks.

2. National Emergency Address Database

Since the inception of the NEAD initiative by the wireless industry, USCC has maintained an active presence on the NEAD LLC Steering Committee, NEAD TAC, and the NEAD Working Group. Our regulatory and technical representatives carry-on regular conversations with the NEAD LLC about USCC's intention to participate in the NEAD platform and provide its customers and consumers with the advantages of Dispatchable Location service support. USCC has submitted initial filings of its reference point data (or Cellular Market Area (CMA) related information) for ATIS provisioning efforts on the NEAD platform, and a Terms of Use (ToU) agreement is pending delivery to USCC for production use of the NEAD. Strategic planning steps are underway to incorporate the recent ATIS and 3GPP-related standards (including LPPe) across the core network, in the location platform, and in all future handsets. USCC houses a weekly status call with the NEAD LLC to discuss any status updates and designed to achieve swift NEAD connectivity.

3. Small Cells

Formal steps have been taken, and testing is to be conducted, to implement USCC's plan to engineer an E911 solution that will include Dispatchable Location from emergency call originations on indoor enterprise small cells. This will enable customers and consumers in various indoor settings, where enterprise small cells have been deployed (e.g., business offices, retail stores, other high population traffic areas), to have suitable 911 emergency service access, including the availability of Dispatchable Location within those indoor venues.



B. Strategy for Vertical Requirements

As it stands today, the requirements for Z-Axis are pending the collaborative results and evaluations of the vertical solutions under consideration in the Test Bed LLC. According to previously filed status reports from the nationwide carriers, 2017 Z-Axis solution testing has focused on the performance of the vendor solutions. A decision on the appropriate metric for vertical location accuracy is anticipated by the latter half of 2018. We understand that once approved by the FCC this vertical location metric will become the second option to fulfill vertical requirements (i.e., either (1) dispatchable location, or (2) z-axis technology achieving Commission-approved z-axis metric in each of the top 25 CMAs by 2022 and 50 CMAs by 2024 for non-nationwide carriers).

1. Uncompensated Barometric Pressure Data

USCC plans to be network ready and handset capable of supporting Public Safety with uncompensated barometric pressure data within applicable FCC timelines. As previously stated, project efforts to incorporate LPPE on the control-plane side of the core network is already being undertaken. USCC will be dedicating a project team to develop relevant network architecture. Additional functional testing will be conducted on the location platform to ensure the relay of the atmospheric pressure information to the designated PSAPs. The USCC Device Engineering Team has crafted standards-based requirements for handsets to make uncompensated barometric pressure information retrievable to the core network.

2. Dispatchable Location and Z-Axis Roadmap

Initial CMA reference point data was submitted for testing purposes to the NEAD LLC. This reference point information of WiFi Access Point MAC addresses will ultimately serve as accessible data to support Dispatchable Location on the forthcoming NEAD production platform serving USCC and all participating users of the NEAD. The stated reference point information contains suite and floor level descriptions of itemized civic addresses where available. This unique information is projected to support significant identifiers to the elevated position of the emergency caller.

Conclusion

USCC takes its commitment to public safety seriously and treats a 911 call as the most important call its customers can make. To that end, USCC has been and continues to be actively involved in the planning and implementation of improved 911 indoor location accuracy for emergency services.