June 29, 2018

Via Email
Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

> Re: ATIS Report on Device-based Geo-Targeting
>   *Ex Parte* – PS Docket Nos. 15-91, 15-94

Dear Ms. Dortch:

In its *Second Report and Order and Second Order on Reconsideration* in the above-referenced dockets, the Commission acknowledged the work taking place within the Alliance for Telecommunications Industry Solutions' (ATIS) Wireless Technologies and Systems Committee (WTSC) to analyze device-based geo-targeting for wireless emergency alerts (WEA). Specifically, the Commission noted that ATIS WTSC was analyzing whether existing or legacy wireless devices can be modified via an update to the devices' software to support WEA geo-targeting capabilities. ATIS is pleased to provide the results of this work below.

ATIS WTSC brought together service providers, original equipment manufacturers (OEMs), operating systems (OS) vendors, and government agencies to further evaluate whether existing or legacy devices can be modified through software to support WEA device-based geo-targeting capabilities.[1] ATIS WTSC notes that WEA device-based geo-targeting continues to be a complicated issue, in no small part due to the incomplete nature of evolving WEA standards. Industry standards to support device-based geotargeting, while progressing, are not expected to be finalized until early 2019.

Alert Area Recommendation. ATIS WTSC notes that, to provide device-based geo-targeting consistent with the Commission's geo-targeting regulations, the mobile device must be provided the alert area as specified by the Alert Originator. This requirement is a change from current WEA operations in which the alert area is not sent to the mobile device. In order to transmit the alert area through WEA to mobile devices in a way that minimizes impact to critical mobile wireless network system operations, ATIS WTSC is developing a solution whereby the alert area is added to the *System Information Block* (SIB12) WEA alert message in a new separate parameter (or Information Element).

ATIS WTSC concludes that leveraging SIB12 to provide the alert area to the mobile device provides the best path to standardization, development, and deployment, while ensuring backward compatibility to the existing WEA deployment. WEA device-based geo-targeting capable mobile devices will use this new alert area parameter to perform geo-targeting to determine the mobile device proximity to the alert area; the device will present the WEA alert to the user based on whether the device determines it is within the alert area. An existing WEA-capable device (i.e., one which supports current WEA standards) would need to

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[1] *Second Report and Order and Second Order on Reconsideration,* PS Docket No. 15-91 ("ATIS is expected to complete its analysis of device support for this requirement by June 30, 2018").

have its modem firmware updated in order to recognize this new parameter, making this new functionality both a firmware and software upgrade. The primary advantage of the new parameter in the SIB12 message is that it avoids possible negative impacts on legacy devices -- devices that support only legacy WEA messages will not recognize the new parameter and ignore it, maintaining current WEA capabilities.

Other Approaches. ATIS WTSC also considered other approaches to deliver geo-targeted information to the devices, such as including the alert area as part of the WEA text message (separated by a special delimiter). However, devices supporting existing WEA standards would not be aware of this special delimiter and likely would display the alert area to the user as random characters, resulting in confusion. Several other approaches were also considered that require the addition of new message IDs (which also requires firmware updates) to distinguish geo-targeted alerts from non-geo-targeted alerts. However, ATIS WTSC experts concluded that solutions involving additional message IDs would also require modem firmware updates and, more consequentially, multiply the number of SIB12s that would be broadcast in an extremely limited and time-critical radio channel.

ATIS WTSC technical experts are aware of and have reviewed the WEA device-based geo-targeting solution demonstrated by AC&C, LLC for a specific device OEM (Sonim Technologies) using the Android operating system. While ATIS WTSC appreciates the work of AC&C, LLC and Sonim Technologies, ATIS WTSC experts determined that AC&C's method chosen to implement the device-based geo-targeting capability on the handset makes certain assumptions on how WEA messages are broadcast to the device that are not in alignment with the approach under development in standards that ensures the efficient use of carrier's network and radio resources. For example, AC&C's solution requires a new range of message identifiers to broadcast geo-targeting data to the device and would multiply the number of messages to be broadcast for each alert, whereas the ATIS WTSC standards agreement is to modify the SIB12 Information Element (IE) to include geo-targeting information required by the device. As previously noted, the SIB12 approach has the advantage of being designed to minimize the impact on the device and network load. Multiplying the number of message identifiers and messages would be contrary to that important WEA objective.

Upgradeable Devices. With regard to specific types of WEA-capable devices that could be updated to support device-based geo-targeting, ATIS WTSC has concluded that non-smartphone devices (e.g., feature phones), cannot be modified through software to support WEA geo-targeting capabilities. Feature phone manufacturers typically use a proprietary, custom-designed firmware, third-party software and user interface. Proprietary operating systems are not designed to handle the intensive applications found on smartphones and lack the advanced functionality of a smartphone; thus, these types of devices are not readily software upgradable.

Future WEA-capable devices developed to be in compliance with the in-progress ATIS and 3GPP standards will support device-based geo-targeting, given enough lead time between standards completion and device availability; however, availability of firmware updates across the various mobile device platforms is a factor that will determine the availability of WEA device-based geo-targeting functionality in these devices.

Upgradeability Conditions. For those smartphones that can support the ability to upgrade software and firmware over the air, the primary conditions necessary to support software upgradability for WEA geo-targeting are:
1. The devices must have updated firmware and software supporting the adopted standards addressing the May 2019 WEA obligations[2] (e.g., 360 characters, new message identifiers for Public Safety messages, Spanish language, etc.).

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[2] *Report and Order and Further Notice of Proposed Rulemaking*, PS Docket Nos. 15-91, 15-94.

2. The device firmware must be able to be updated to support recognition of the new SIB12 alert area IE under standards development. Firmware update decisions are made by carriers, chipset vendors, and OEMs based on technical considerations (can the device support additional firmware functionality), developer resources (are there developers available to add firmware functionality), and business considerations (cost justification of adding the additional functionality). These considerations must be applied to each and every device model.

3. The device software, which includes the OS and basic functions supporting WEA message display, must be capable of being updated to support WEA geo-targeting standards. Upgrading device software is an OS vendor and OEM decision, based on the same considerations described above for firmware updates– can the device be updated, are the resources (developers) available to make the software updates, and have business considerations for adding the additional functionality been addressed?

ATIS WTSC notes that not all smartphones will meet these conditions as some legacy smartphones will not have the minimum set of WEA capabilities defined-above required to support the enhancements for device-based geo-targeting. As a general rule of thumb, the older the device, the less likely all of these conditions can be met; or, put another way, newer devices will be more likely to meet these conditions. Moreover, ATIS WTSC notes that it is expected that the number of devices meeting these conditions will decrease rapidly after being on the market for over a year because at that time some devices will likely be outside the lifecycle when the OEMs and OS vendors provide support for such devices. In all events, it will remain a challenge to incorporate WEA device-based geo-targeting capabilities for devices by November 2019 due to the need for both firmware and software updates.

Other Factors Impacting Upgradeability. ATIS WTSC cautions that hardware, firmware, and/or software constraints will dictate the potential upgrade options for a particular handset, and some devices will be incapable of being cost-effectively updated. Further, while ATIS WTSC has not identified silicon impacts at this time, the ATIS WTSC experts believe that the geo-targeting solution will require updated firmware drivers, which will further limit the scope of legacy devices that can be updated.

ATIS WTSC also recognizes the challenges with device certification and management of software updates, with responsibility residing across OS vendors, OEMs, carriers, and end users. End users ultimately are responsible for performing any updates to their device, therefore the wireless industry cannot guarantee all users/devices will have the latest updates, resulting in inconsistent behavior across devices.

Conclusion. ATIS WTSC believes that smartphones that meet the conditions outlined above may be able to be updated through firmware/software modification to support WEA geo-targeting capabilities. Given the incomplete nature of evolving WEA standards, ATIS cannot specify which specific handset makes and models will support firmware/software modification at this time. As standards are completed, OEMs and OS vendors will develop products and software to meet those standards. At that time, the industry may have a better understanding of which devices can be updated through firmware/software modification to support WEA device-based geo-targeting. ATIS WTSC will continue to provide further updates to the Commission on its progress to enhance WEA.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Thomas Goode
ATIS General Counsel

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