July 14, 2017

On July 13, 2017, I met via a conference bridge with the FCC team from the Public Safety and Homeland Security Bureau. The FCC team consisted of the following:

Eric Manski; James Wiley; David Mansor; Linda Nagel; Marcus Brown

We discussed several aspects of the FCC’s Notice of Proposed Rulemaking on Wireless Emergency Alerts (WEA) Proceeding 15-91 and 15-94. The following notes are intended to memorialize our comments from that discussion.

Our discussion started with a question regarding whether a standard for issuing more specific geo-targeted messages would be helpful.

**Geo-Targeting**

DHS S&T research identified trust, both on the part of the Alert Originators (AOs) as well as the public, as a key factor in the success of the WEA service. Based on the analysis of our AO trust model research, maximizing AOs’ use of the service requires maximizing three key outcomes: appropriateness, availability, and effectiveness. Geographic specificity was identified as a critical component in building trust through appropriateness.

In terms of geographic breadth of WEA, our research found that AOs would use WEA more if the alerts could be targeted to the size and location of the geographic region impacted by the emergency event. The current county designations are effective in some cases, but not all. For some states, counties are huge, and notifications for an emergency in the far corner of a county sends useless information to many who are hundreds of miles away and can be annoyed by the intrusion. In major metropolitan areas where the distances are smaller but population density is higher, current WEA geographic granularity may result in many people receiving alerts for a localized event that is not relevant to them. Continued receipt of irrelevant alerts desensitizes the public to the alerting process, increasing the likelihood that recipients will opt out of receiving future alerts, and reduces the overall likelihood that they will receive and respond to future alerts that are indeed relevant to them.

More research should be conducted to determine if a more specific accuracy standard than .1 mile of accuracy would be needed.

Does WEA need to be firmware installed on the device or downloaded from the app store?

DHS S&T believes that of the two options available (an opt-in download; or a pre-installed application) each method would have drastically different impacts on the public’s participation.

DHS S&T believes that if a WEA application was pre-downloaded the effect on the public would be more impactful and effective.

DHS S&T believes it would be better for the public’s safety if the FCC overrode any geo-targeting limitation when the phone is unable to determine its location or if the phone was denying messages. The FCC could create a time deadline which automatically displays the WEA alert on the phone if the phone is unable to determine its location if the allotted timeframe expires.

DHS S&T believes this override approach is the best solution, even if there is a delay from when the phone receives the message, and releases the message after a predetermined time table. Releasing the message after a predetermined period of time allows the message to still be communicated even if the phone is unable to determine its location.

DHS S&T funded Johns Hopkins University Applied Physics Laboratory (JHU/APL) to investigate methods that can improve the accuracy of the WEA geo-targeting mechanism by utilizing the location-awareness of the mobile devices. The main focus of the research was to examine where alerts are broadcast to an area wider than the target area but are only displayed if the mobile device is inside (or, about to enter) the target area. The research was focused on enhanced geo-targeting capabilities only and not how the public would respond to a pre-downloaded application versus an opt-in option. A link to the full report is provided below.

www.dhs.gov/sites/default/files/publications/WEA%20JHU%20APL%20ASLAT%20Final%20Report.pdf

**Alert Preservation**

*If the phone stored WEA messages allowing them to be referenced could WEA’s effectiveness improve?*

DHS S&T research supports the notion that longer messages are better; and people will always seek out secondary and third sources of information.

Our research supports previous research that found that that more information given in a message will lead to a reduction of milling. Milling is an effect that causes people to ponder the information presented for reliability, and the tendency of individuals to verify the information with an additional source.

**Issue**: *Would it be useful to store the information in a WEA inbox?*

DHS S&T is not sure that it makes sense to store messages, because DHS believes alert recipients will seek out additional information immediately. DHS S&T also believes that alert messages are saved on a person’s device until the user deletes the messages.

DHS S&T would like to see additional research to determine if people actually go back at a later time to the stored WEA message and for what purpose.

**Multilingual**

**Issue**: *The FCC identified several languages from the 2012 census that could be helpful to people with a primary language other than English. Is this an effective way to choose the languages we will service with additional languages?*

DHS S&T believes sending text messages to a 911 call center in a person’s native language is important, and it should also apply to receiving WEA emergency alerts.

DHS S&T funded the Southern Mississippi University whose research demonstrated that Vietnamese populations or other pockets of foreign populations whom do not speak English as a primary language rely on the old fashion method of alerting like sirens or person to person alerting.

The same study also found that many people in these concentrated foreign populations do not have access to cell phones. However, this study was focused on the Gulf States Region of the country and should not be misconstrued to apply across the entire country.

**Issue**: *Other parties have identified three primary ways to get multilingual messages to recipients: (1) emergency management staff members write and send multilingual alerts directly to the population; or (2) a system automatically sends a pre scripted message in the foreign language; or (3) an application on the phone automatically translates the information into the recipient's native language. Which approach do you think works the best?*

DHS S&T believes that automatic translation will lead to miscommunication, because within each language is a subset of multiple dialects of the language.

DHS S&T cites the Spanish language as a great example.

DHS S&T strongly believes that interpretation is more important than just translation.

DHS S&T believes that a system that sends either prefabricated multilingual messages or translates the messages when received is better than nothing, even though, some of the population might misinterpret the message.

DHS S&T cited New York City’s efforts to develop prefabricated versions of the eighty most common alert messages in the twelve most common languages. DHS S&T noted that this is a fantastic attempt, and will be in some way effective.

DHS S&T also noted that we (Federal Government) is faced with somewhat of a doubled-edged sword in that IPAWS/WEA is a national system that must include everyone, and that multilingual alerting may not be a national issue. As providing support to First Responders, we know that most emergency events occur at the local level and may or may not expand to an event requiring additional response. Therefore, since we rarely see IPAWS/WEA being used for a national event and until someone develops a standardized method for resolving the language issue, we may want to continue addressing this at the local level.

**Multimedia**

**Issue**: *Is there any research that informs us of the effectiveness of multimedia in alert messaging?*

Yes, there is some research in the second START (University of Maryland) Report that indicates that maps alone are less effective than text alone, and maps with text produce the greatest level of comprehension.

Specifically, the START research results indicated that the effect of maps on message outcomes varies based on message length. In the absence of maps, longer messages have a greater level of understanding. This suggests that longer 1,380-character messages are most effective at motivating public protective actions in response to mobile alerts. Adding maps to shorter 90 and 140-character messages seemed to help increase message understanding, but adding maps to longer messages decreased message understanding. Adding maps to short 90-character messages, on the other hand, may increase response delay, but may help reduce delayed action-taking for longer messages. One possible explanation for the pattern of findings for at least some of the outcomes may be the increased amount of cognitive effort required to processes longer text messages in addition to processing the visual information contained in maps.

The START research found that none of the map elements tested had a statistically significant effect on message outcomes, and focus group participants varied widely in their reactions to the tested maps. Maps can be useful in message personalization, but the role they play varies based on message length.

Consequently, maps should not be used in WEA messages without further research examining the best way to craft such maps, as well as how they may impact message personalization and other outcomes. Specifically, additional research is needed to determine how to best communicate hazard and receiver location in maps associated with WEA messages. Future research also should examine the extent to which humans are able to process text and visual information in an emergency context.

The research findings concluded that while not a magic bullet, 280-character messages clearly are more effective at communicating imminent threats to at-risk public than are the current 90-character WEA messages. In addition, the order of the content contained in an alert – whether it is 90 or 280 characters – remains a critical consideration as does the message source.

Adding apps and hyperlinks to WEA messages appears promising, but merits additional research. Adding maps to 280-character messages, as was tested, was not promising, but merits additional research. In sum, searching for the “perfect” WEA may be akin to Goldilocks’ search for the perfect porridge. Instead, the best course of action may be to optimize WEAs as best as possible, realizing that some members of the public will always seek additional information and clarification from multiple sources.

The START research also found that including links that display additional general information and using apps that provide more personalized information may be useful strategies for expanding the number of characters available for writing WEA messages and can potentially lead to improved public message outcomes and warning response. For example, the research found that level of understanding was significantly higher for individuals who viewed the optimized 280-character WEA message that also included an app containing additional *personalized* information, and for those viewing a message that included an app containing additional *personalized* information plus a map, compared to those who viewed the 280-character optimized WEA message. The level of understanding also was significantly higher for individuals who viewed the optimized 280-character WEA message that also included a link to additional *general* information. Therefore, future research should examine how to best tailor mobile alert messages based on receiver location and other factors to achieve optimal outcomes and also the best way to include future potential links in WEA messages.

**Issue**: *Is there any research to support that either a direct image in a message or a clickable URL will be more effective?*

Amber alerts need to include a picture of the missing child. DHS S&T is indifferent about the application of an image embedded in the message or a clickable URL for this purpose.

DHS S&T defers its opinion on the matter to the experts at the National Center for Missing & Exploited Children.

DHS S&T believes more research should be conducted to determine how the public responds to clickable URLs compared to message embedded images.

**Miscellaneous Comments**

**Issue**: *DHS funded research for WEA penetration, and how tablets could be integrated. Should the definition of a mobile device include tablets for the purpose of WEA?*

DHS was not sure where to draw the line on which tablets to include or not.

However, the Department of Homeland Security S&T believes there is some place for WEA to be integrated onto tablets.

**Issue**: *Please accurately describe which devices should be mobile devices on WEA:*

DHS S&T believes that if the FCC were to adopt a definition of the mobile device, the definition should include is the ability to handle the common alerting protocol.

**Issue**: *Is there anywhere else you can see WEA being integrated in the future?*

DHS S&T believes that alert origination can and probably will so more in the future to be automated sensor technology.

DHS S&T cited the progressive movement towards the implementation of self-driving cars, smart homes, and smart cities using sensors in the future.

DHS S&T believes that as long as the FEMA Alert Aggregator that processes WEA originator requests using the Common Alerting Protocol (CAP) or any other standards, then it should not matter if the alert originates from a person or a machine activating the alert.

DHS would like to see future automation of the alert origination process.

# Sincerely,

/s/ Denis A. Gusty

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