Before the
Federal Communications Commission
Washington, DC 20554

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In the Matter of	)	
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Accessible Mobile Phone Options	)	CG Docket No. 10-145;
for People Who Are Blind,	)	DA 10-1324
Deaf-Blind, or Have Low Vision	)	
	)	

Reply Comments of the Rehabilitation Engineering Research Center on Telecommunications Access

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I Introduction

The Rehabilitation Engineering Research Center on Telecommunications Access (RERC-TA)[1] submits these comments in response to the Federal Communications Commission's (FCC or Commission) Public Notice seeking additional information about Accessible Mobile Phone Options for People Who Are Blind, Deaf-Blind, or Have Low Vision. The RERC gave spoken and written comments in the May 13, 2010 workshop, "Expanding Disability Access with Wireless Technologies" referenced in this Public Notice.[2] Given our opportunity to comment during the workshop, we offer this document as reply comments in this proceeding.

The FCC rules implementing Section 255 went into effect over ten years ago and the

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[2] Harkins, J. (2010, May). *Panel II: Technology Trends and Recommendations.* Paper presented at Expanding Access with Wireless Technology: Disability Access Workshop, Federal Communications Commission, Washington, DC. Retrieved from http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-298730A1.pdf

authorizing legislation, nearly 15 years ago. During the past decade, there have been numerous development cycles within companies of considerable size, and memory and processing power of the phones have greatly increased at all cost points including the most inexpensive. Speech functions have been added for mainstream customers. Yet such speech features were not used to make the many visual/text features on today's wireless phones accessible to people with visual disabilities. Instead people with visual disabilities must purchase high end phones and then pay extra to get access, when it could have been built into the phones (Pierce ref 7020911846). Speech output from screen text would be readily achievable if designed from the start. Of particular concern is the lack of accessible phones at the lower price points – or accessible phones without the need for add-on technologies at user expense. This inquiry is therefore timely.

The ubiquity of a technology is an indicator of the potential for causing problems for people with disabilities. For a growing number of people in the U.S., the wireless phone is the person's only phone, usually for economic reasons. For family communication, wireless phones have become essential for keeping in touch in our mobile society. More than half of all emergency calls are made from mobile phones. As CTIA notes in its comments, there are more than 600 models of phone sold in the U.S. at any given time. How many may a blind person choose and have full access?

Some companies and some carriers have made progress and offered no cost accessibility in both low and high end phones. And they are to be especially applauded for making the effort when their competitors are not being required to also conform to the guidelines. Other carriers however either offer phones from the same manufactures (as the accessible phones) that are not accessible, or make users with disabilities pay high costs for 3rd party solutions that are not included in the price of the phone. Often these 3rd party solutions also require the person to purchase a more expensive phone as well in order to get access. (Richert ref 7020912012)

Lack of access, or severely limited access through only high-cost solutions, not only puts people with disabilities at a disadvantage for personal communication, but also reduces their competitiveness in work . In addition, it can limit their ability to move about safely, recover from errors in travel, and seek help in an emergency from 9-1-1 or from family, friends, or others. This is especially important in general emergencies where 9-1-1 services may be overwhelmed and users must seek and find their own rescue.

II Replies to comments grouped by FCC comment.

1. [What are] The wireless phone features and functions in the current marketplace that are not accessible for people who are blind, have vision loss, or are deaf-blind and [what is] the extent to which gaps in accessibility are preventing wireless communication access by these populations?

TIA (ref 7020912048) and others have referenced the 'essential features' of phones providing brief lists. We would like to elaborate a bit on what is essential and why. Essential information is displayed visually on virtually every phone, and visual prompts are used to navigate devices. In order for people who are blind, who have low vision, and who have combinations of hearing and vision disabilities to be able to use the phones, it is likewise essential that they be able to access all of the phone functionality and be aware of all of the phone status indicators. The visual information on phones could be vitally important yet in many cases even the existence of it or the possibility that it could be accessible to them is unknown to these users.

Some examples of features that need to be accessible include:

- Signal strength, power status, and other operating details are important for all users – a phone would not be sold without them – and they are equally important to people who have visual disabilities. In fact, because the phones often act as a safety lifeline, knowing when they will work and for how long, can be even more important.

- Features such as contact lists have been a ubiquitous feature for years; and since people with low vision or blindness may not be able to easily consult printed notes or a pocket address book for numbers, access to a directory may be more important than for people who can see. Similarly, access to voicemail is an essential feature and visual navigation to an inbox may be required, depending on the device.

- SMS has become an essential form of communication for many when they cannot reach someone, for employment, for social contacts, being aware of family's doings (e.g., Twitter feeds) and other functions. According to industry figures (CTIA's semi-annual industry survey), 1.5 trillion text messages were sent or received over carrier networks during 2009 (almost 5 billion per day at the end of the year). SMS is also important for getting emergency information, as it is used by some local governments for this purpose. For example, in the Washington DC area, disruptions to rail service are routinely sent out by SMS. As a standard feature on mainstream phones SMS

needs to be accessible. Someday, when VoIP is used for all cell phones, real-time text will hopefully be available for people who are deaf-blind to allow them to receive calls. Until then, access to SMS is their only mechanism for telecommunication.

- Voice output is often not the best method of access for people with low vision – so techniques to allow significantly enlarged text (from the minimum text size) for all text and all functions is important. This includes access to the information conveyed through the small status icons on the home screen (through – for example – inclusion of the information in a menu as well as the home screen).

As pointed out in industry comments by Sprint and others, open platforms are permitting new applications that enable some functions that potentially benefit people who are blind or who have low vision. What is lacking is a wide range of devices that can be used by everyday people who have limited technical knowledge, limited income, directly from their carrier and with adequate information to easily find accessible phones. People with visual disabilities should not have to purchase high end phones or be familiar with use of applications on a phone in order to use it. In addition, tracking of models that are accessible is commonly a problem for consumers, as noted by the American Foundation for the Blind.

In short, third party applications and open or friendly platforms can help, but there are too many missing pieces to make a viable system for people who are blind or who have low vision – especially among the elderly. Both CTIA and TIA cite the Wireless RERC web survey of people who have disabilities. As the Wireless RERC will be the first to attest, this is a convenience sample of people with much higher levels of employment and lower age than the population of people with vision loss or blindness; and all respondents are technically savvy enough to access a web survey. Thus the results do not give an accurate indication of what percentage of the general blind population can use today's mainstream phones in an accessible fashion. A quick random sample of people representing the full range of people who are blind will quickly confirm that these numbers are not representative of the general blind population or the rapidly growing population of those who are older with visual disabilities.

2. [What is] the cost and feasibility of technical solutions to achieve wireless accessibility for these populations?

As noted in the AFB's comments, only high-end solutions and a very small number of low-price-point solutions are available. Information about even these limited choices is not made readily

available to consumers by wireless companies. And the low end phones have limited accessibility.

Fortunately adding access to modern phones is fairly straightforward if done at the time of manufacture and does not need to add any hardware or other parts to the design of a phone. All of the hardware and infrastructure, even to add text-to-speech, is available even in most basic phones. In fact in 2004 (following a formal complaint against Verizon by a blind consumer) LG took a phone that had been on the market for almost a year, and, with just a software upgrade, made it into a talking phone with text-to-speech capability for messages. They re-released it through Verizon for sale to the general public as a mainstream phone at Verizon's major stores for $29.95.

Basic phones today have much more processing power and memory – and, with text-to-speech, they could provide access to all text in the phone by simply having the text sent to the text-to-speech routine and spoken at the same time the text is displayed or selected. Such a "Speak all text displayed/selected" function could be an option that could be turned on at the user's option so that it was available only to those who wanted it. It would ensure that, for example, CMAS emergency messages would be accessible to blind users and others with limited access to visual information.

By adding a single additional "Status" entry on the main menu under which all of the status indicators would be listed, all of the information on the home screen, including power, signal strength, etc., could be easily accessed. The user would just select that menu item and be presented with an easily navigated list of all the status indicators and their current values. This would provide access for people with a variety of visual disabilities. People using spoken menus could hear the values read to them. Those with low vision, who cannot make out the small icons on the main screen, would see the values in the large menu text. And those who are deaf-blind and using external displays would have the menu items, including the status values, presented on their external displays along with all the rest of the menu items.

By allowing people to also (at their option) have the text sent out via Bluetooth instead of (or in addition to) being spoken, individuals who are deaf-blind could view the text on external Bluetooth connected braille or other tactile or enlarged displays. This would allow people who are deaf-blind to have the same access on the same phones with the same plans as everyone else – using either braille displays or more rugged, portable, and affordable alternatives such as special versions of Morse code. (Slower, dual location Morse code can be easier to learn than

braille, especially for people who have lost sensation in their fingertips.) To make it even simpler for handset manufacturers to implement, phones could send out the text via Bluetooth and leave all the translation up to the display device.

Actually more difficult than speech output is enlarged text. This is due to the small size of some screens and the need to re-lay-out the display if font sizes are increased. Today, many phones have large display of the "number dialed," but then have tiny text for other features that can be more important and are more unknown to the user than the phone number which they just entered (e.g., the dialed phone number is large but the unknown roaming or battery status is tiny). Allowing all information to be available in large text (word wrapped fields or menus), and providing an option to send all information to an external display, can be an effective strategy here – and avoids the problem with screen re-layout.

It has been argued that making all text large leads to a display that is not attractive, but this is a user option, so people who do not like its looks, and do not need its functionality, can easily avoid using that mode of operation.

Even providing access to people who are deaf-blind, could be done with little additional code. (Note: the cost to develop the accessibility code for the first time is often cited. This time and testing cost, while not negligible, is a very small fraction of the time and testing costs that went into developing the phones to the point they are today. If these costs had been borne in parallel with the development of the phones, they would now be negligible since they would be incorporated both into the base software and also into the minds of the programmers who would just include the small additional code when they wrote, or revised, the software for each new phone model.)

3. [What are the] reasons why there are not a greater number of wireless phones--particularly among less expensive or moderately-priced handset models--that are accessible to people who are blind or have vision loss?

CTIA and TIA both provide reasons for why there are not greater numbers of phones that are accessible. We would like to add another – that underlies many of the other reasons. It is difficult for a company to make a case for changing a design (to make it accessible) when the net costs of the change (including any offsetting profits) is perceived to be greater than the costs (including penalties if any) of not making the change. So even if putting accessibility into the

base phone and technologies from which all the phones are built is less than one percent of the total, the cost of accessibility is still a real number. And in a very competitive market, the pressure to ignore an accessibility feature is great. When required to do so in the face of a fine or penalty, however, as in the 2004 LG/Verizon case, access was quickly added to a phone already on the market, by means of a software upgrade. This was a breakthrough for blind telephone users.

An unwillingness to include access features in products if it is not net profitable (or more profitable than other use of the same engineers and funds) should not be taken as pejorative. It is simply good business in a publicly traded company in a highly competitive market. All changes that will stick across models and time must have a good business case. Either one created by the natural market forces – or one that is induced by regulation and either a purchasing advantage or a financial penalty.

When people within mainstream telephony companies are asked what the primary barrier is to them in their own efforts within their company to get more accessible features into their phones, the number one answer is the lack of a sufficient and recognized business case. If a business case does not exist naturally (e.g. market size or benefit to mainstream customers), but if the change is technically feasible and readily achievable, and if there is clear public benefit, then a level playing field needs to be created by some type of regulation. The small number of options available to users who are blind or with low vision for accessing screen information, and the incomplete nature of readily achievable built-in access more than 10 years after the Section 255 rules were issued, is indication that the current regulatory process is not working.

4. [What are the] technical obstacles, if any, to making wireless technologies compatible with Braille displays, as well as the cost and feasibility of technical solutions to achieve other forms of compatibility with wireless products and services for people who are deaf-blind?

1. It would be most useful to industry if there were a common format for driving braille displays. Then, instead of just exporting unformatted text (which would be a great and simple advance in itself), companies could format the information somewhat to make it even more informative.

2. A standard format for exporting text (cues and content) in real time via Bluetooth would be helpful.

3. A standard format for sending alerts to an external vibrotactile signaler would facilitate sending more alerts other than the 'ring signal' that is already sent to Bluetooth headsets. These external signaler can be stronger than small phones can generate – and/or can be work on the wrist or other location with good and consistent contact to the body.

All of these are achievable in a fairly short timeline with moderate effort.

5. [What are] recommendations on the most effective and efficient technical policy solutions for addressing the needs of consumers with vision disabilities, including those who are deaf-blind?

As noted above, if you want to see more access features in phones, empower those inside the companies who are working to make the products more accessible. The best way to do this is to give them a business case they can use within their company.

If a natural business case does not exist with normal market forces, then create a business case by using regulations to create a new market force. These can be push (ala section 255 or the emergency communication requirements) or pull (ala 508).

Creating rules that are not enforced or have weak enforcement mechanisms, however, only creates a disadvantage for those that conform to the rules. They spend resources to make something accessible but receive no advantage over competitors that spend their resources elsewhere. A level playing field – (reward or neutral treatment rather than commercial disadvantage for those that make phones accessible) – can only be achieved if everyone has to follow the same rules. For example "pull" legislation like Section 508 of the Rehab Act does not reward a company that conforms if a genuine sales advantage is not given to those that conform.

- create an incentive to (or disincentive to not) provide accessibility features or functionality
- create enforcement mechanisms that are real, effective, and easy (and affordable) for consumers to use
- enforce the rules that are in place rigorously so that those that conform are not disadvantaged

Encourage information projects in industry to communicate in usable ways to consumers which products can be used and which information can be accessed. Recently CTIA has set up an Accessibility Advisory Council for assisting the trade association in meeting the FCC's challenge to make information more available. The FCC should evaluate the results of the project.

6. [What are] recommendations on actions that the Bureaus or the Commission should take to address the current lack of access. For example, is additional guidance needed on specific access features that should be included in wireless products? Should the Bureaus or the Commission facilitate a dialogue among stakeholders in order to reach a specific agreement to address the accessibility concerns outlined herein?

Some actions or approaches recommended:

- (As cited by CTIA – ref 7020912101 and Sprint ref 7020912095) Build awareness of the accessibility solutions that do exist and where to find them.

- Recognize the role that effective communication plays in emergencies – not just to 9-1-1 centers but to others in an emergency. Require under emergency communication authorizations that basic accessibility features be in standard phones at all price points to ensure that affordable phones that are accessible exist in every place that sells phones and at prices affordable to all consumers. For features such as those identified above, that could today be built into most every phone with no hardware change to the phone, require that the features be added to most new phones.

- Require carriers to have 50% of phones sold have essential access features that work with **all** telecommunication features (voice, text and video) on the phone. (Note that the "*number of models with accessible features"* is not recommended as the criterion in order to keep the features on popular mainstream phones that will appear in all of the stores, rather than having the features on phone models that are not generally offered for sale in stores or not generally desirable.) It is not suggested that all phones be required to be accessible, because certain phone form factors may not support all of the essential access features. But phones of all features sets and price points should be available with accessibility features.

- When reviewing reports of phones with accessibility features it is useful to ask the following questions.

1. Do the phones in the list have all of the essential functions accessible? Or does each phone have only some aspects accessible?
2. How many phones have all essential features accessible?
3. How many of the phones with all essential features accessible are available to consumers without extra cost to users with disabilities?
4. When talking menus are listed – does this include all menus – and the ability to set as well as read them non-visually with audio feedback - or just some?
5. Would they be able to sell a phone to mainstream users if only the accessible features worked on a phone (or if the only menus mainstream users could use were the ones that are accessible)?
6. What percentage of the total number of phone models do the phones that have all essential features represent? (and don't cost the user extra?)
7. Are the phones that have all essential features accessible – the same phones you find at the phone store or phone kiosk you see? (Are they the ones available via specially priced packages or sales?)
8. Are all essential features accessible via voice output, large print, and (where the phone has Bluetooth) available via Bluetooth to external text or tactile displays?

An industry-consumer advisory group consisting of at least 50% consumers or consumer representatives with a limited time-frame for action (e.g. 6 months) could establish what the ***essential access features*** would be to support general communication during emergencies. (The ***essential phone functionality*** that should be accessible should include all standard telephony functions.) The AFB's list ("sweet sixteen") cited in TIA's comments would be a start.

Announce the requirements and timetable, then convene a balanced consumer- industry group to advise jointly or separately. Do not allow lack of consensus to cause lack of action or there will be no consensus.

Finally, requiring that consumers with visual disabilities pay a premium (often equal to or greater than the price of the phone with a plan - Pierce ref 7020911846, Richert ref 7020912012) to make their phone accessible each time they buy a new phone rather than building access in, should not be considered an adequate or equitable solution when access can be, and is being built into mainstream phones (simple and advanced) by other companies. At a minimum, the cost of the additional software (if needed temporarily for some phones) could be amortized across the cost of all phones, where it would add a fraction of a dollar to each phone and persons with visual disabilities would pay the same for their phone as all others.

Thank you for this opportunity to comment on this important topic. The technology has advanced beyond the point where at least the software based access features can be implemented in very cost effective manners and should be incorporated into most phones. As can be seen from the comments, and a review of what is available, some companies are stepping up while others (even purchasing from the same suppliers) are not. Action to create a level playing field by requiring all to provide access can cause accessibility to catch up to where it should be given the power of even the lowest cost phones today. If done, it will change the face of telecom products just at a time when we are seeing an increased dependence on telecom and an increasingly aging population.

Respectfully Submitted,

/s/

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