Georgia Tech Center for Advanced Communications Policy
500 10th Street, NW
Atlanta, Georgia 30332

VIA ECFS

April 4, 2022

Marlene H. Dortch, Secretary
Office of the Secretary
Federal Communications Commission
445 12th Street, S.W.
TW-A325
Washington D.C. 20554

Re: Consumer And Governmental Affairs Bureau Seeks Comment On The Accessibility Of Communications Technologies [CG Docket No. 10-213]

Dear Ms. Dortch:

Enclosed for filing in the above-referenced Public Notice are Georgia Tech's Center for Advanced Communications Policy (CACP) comments.

Should you have any questions concerning this filing, please do not hesitate to contact me via email at salimah@cacp.gatech.edu.

Respectfully submitted,

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Enclosure

Before the
Federal Communications Commission
Washington, D.C. 20554

CONSUMER AND GOVERNMENTAL AFFAIRS BUREAU SEEKS COMMENT ON THE ACCESSIBILITY OF COMMUNICATIONS TECHNOLOGIES FOR THE 2022 BIENNIAL REPORT REQUIRED BY THE TWENTY-FIRST CENTURY COMMUNICATIONS AND VIDEO ACCESSIBILITY ACT

CG Docket No. 10-213

REPLY COMMENTS OF
GEORGIA INSTITUTE OF TECHNOLOGY (GEORGIA TECH), CENTER FOR ADVANCED COMMUNICATIONS POLICY (CACP)

INTRODUCTION

The Georgia Institute of Technology's Center for Advanced Communications Policy (CACP) hereby submits comments to the above-referenced Public Notice seeking comment on the accessibility of communications services. CACP is recognized at the state and national levels as a neutral authority that monitors and assesses technical developments, identifies future options, and provides insights into legislative and regulatory issues. CACP engages in several broad approaches to explore the impact of technology on society. A key overarching objective of CACP is to understand the social impact of digital technologies, domestically and internationally, by conducting objective, evidence-based research, analysis, and development. Center activities provide the foundation for assessing and analyzing issues that inform our contribution to federal rulemaking, input into public sector policy-making processes, and generation of technical guidance for business and industry.

Research activities range from foundational social science research, providing evidence-based input for policy formation and regulatory filings, to applied policy research analysis and studies to inform the development, implementation, and adoption of a wide range of information and communication technologies. Lab-based studies focus on the intersection of technology and the user: accessibility and usability studies, user testing, and human factors analysis, all of which help industry better understand the needs of a wide range of users, especially the aging and people with disabilities.

Regarding the latter, over the past 20 years, subject matter experts at CACP have been involved with research and regulatory issues concerning accessible technologies and services, conducting research and development in the domain of communications access, equity, and inclusion. CACP researchers have commented on and been cited in the FCC's Congressional Reports to Congress concerning compliance with the Twenty-First Century Communications and Video Accessibility Act of 2010 (CVAA) going as far back as the 2014 report. In large part, our comments have been informed by our Biennial Review of Mobile Phone Accessibility[1],[2],[3] (Accessibility Review), conducted specifically for this proceeding. The comments respectfully submitted below are based, in part, on the preliminary results of the 2022 Accessibility Review, and the subject matter expertise of CACP developed over the past 20 plus years.

METHODS

The Accessibility Review included current mobile phone models from the top four wireless carriers and five Lifeline Carriers.[4] Using the providers' web pages as a reference, researchers identified 103 mobile phones from the top five providers and 53 mobile phones from the Lifeline providers for inclusion in the study. Data were collected on the presence of 55 features that impact accessibility and/or were designed to provide access to people with vision, hearing, cognitive, and mobility disabilities in each phone model. Sources of accessibility feature data included the Mobile Manufacturers Forum Global Accessibility Reporting Initiative (GARI) database,[5] user manuals,[6] and phonescoop.com. The features identified for the study include those used to access the phone, the content displayed on the phone, or connect to external

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[1] LaForce, S., & Bright, D. "Biennial Analysis of Mobile Phone Accessibility: Comparative analyses reveals pain points and progress," Research Report, National Institute on Independent Living, Disability, and Rehabilitation Research, NIDILRR grant number 90RE5025-01-00, September 2020.

[2] LaForce, S., Bright, D., Garcia, A., "Mobile Phone Accessibility Review," Research Report, National Institute on Independent Living, Disability, and Rehabilitation Research, NIDILRR grant number 90RE5025-01-00, January 2019.

[3] Mitchell, H., LaForce, S., Linden, M., Bennett, D., Touzet, C., "Optimizing Ability of Message Receipt by People with Disabilities: Market Analysis of WEA Capable Phones and Assistive Alerting Technologies." Report C.3.4.4 for the DHS S&T, contract # HSHQDC-14-B0004, September 2014. [Note: The first Accessibility Review contained in this report focused on WEA-capable devices.]

[4] A random number generator was used to select five Lifeline carriers for inclusion in the review. The top five carriers were excluded from inclusion in the Lifeline carriers, and Lifeline carriers that did not list their phones on their websites were also excluded.

[5] The GARI is a project of the Mobile & Wireless Forum (MWF). Some of the data referred to in this paper was sourced from the information available from the GARI website www.gari.info and used with permission of the MWF, although all views and conclusions are the authors alone.

[6] These sites include the carrier's webpage and the phone's manufacturer.

assistive technology (AT) or other smart devices that can be controlled via the phone. With wireless emergency alert accessibility being tied to phone accessibility to some degree, WEA-capability was also assessed. Except for hearing aid compatibility (HAC) rating, accessibility features were coded as either 1 = "yes," 0 = "no," or 2 = "information not available." Summary and comparative analyses were produced using Microsoft Excel.

The analysis is ongoing, and the results presented below are preliminary, summary results. More comprehensive results that report change over time and an analysis of the accessibility of WEA-capable devices will be included in our filing in response to the anticipated call for input on the *Tentative Findings for the 2020 Twenty-First Century Communications and Video Accessibility Act Biennial Report*.

Study Limitations

A limitation of this Accessibility Review results is that the 55 features included in the Review are not an exhaustive list. Language in the user manuals was not consistent, so it is possible that a phone had a feature but was not captured by keywords or a general search. Standby/Talktime (SBTT)[7], the feature that indicates how much time remains on the battery, was difficult to assess. Some manufacturers included it in their manuals, but most did not. However, that does not mean that the phones do not have the feature, just that it is not listed. However, it could be argued that since this feature is difficult to find and requires deep searching, it is not accessible to the average consumer.

COMPLIANCE WITH SECTIONS 255, 716, AND 718 0 ACCESSIBILITY

People with disabilities are the largest minority population in the United States. According to data published by the U.S. Centers for Disease Control and Prevention (CDC), 25% of the U.S. population is comprised of adults with disabilities,[8] up from the U.S. Census Bureaus' estimated 20%.[9] As such, people with disabilities represent a significant market

[7] The standby/Talktime feature is particularly important to persons with disabilities who use accessibility features and apps that are considered “battery hogs.”

[8] Okoro, C. A., Hollis, N. D., Cyrus, A. C., & Griffin-Blake, S. (2018). Prevalence of disabilities and health care access by disability status and type among adults. *Morbidity and Mortality Weekly Report*, 67(32), 882–887. Retrieved from https://www.cdc.gov/mmwr/volumes/67/wr/mm6732a3.htm

[9] U.S. Census Bureau. (2012). Nearly 1 in 5 people have a disability in the U.S. Census.gov. Retrieved from https://www.census.gov/newsroom/releases/archives/miscellaneous/cb12-134.html

segment with $511 Billion in disposable and discretionary income (i.e., purchasing power).[10] Using the CDC's data, one in four persons with a disability is a potential customer, and consumers with disabilities expect meaningful choices for wireless technologies that enable them to engage with and fully participate in society. The data shared below can be used to identify where growth is needed to provide expanded mobile phone options for persons with disabilities.

Paragraph 6: Aare the input, control, and mechanical functions of telecommunications and advanced communications services and equipment locatable, identifiable, and operable (1) without vision, hearing, speech, or color perception; (2) with limited vision, hearing, color perception, manual dexterity, reach and strength, or cognitive skills; (3) with prosthetic devices; and (4) without time-dependent controls?

Accessibility Features for Vision Disabilities

In evaluating the accessibility features for vision disabilities, the study focused on the percentage of phones with individual features that improve access for people with vision disabilities. Table 1 shows a comparison of the presence of accessibility features from the top five providers compared to the Lifeline-provided phones. Mobile phones provided by the top five providers outperformed Lifeline-provided phones on ten of the 14 features assessed. But not always by a very large margin. And Lifeline-provided phones outperformed top carrier-provided phones on four of the 14 features. The features that are present on less than 50% of the sampled phones from the top five and Lifeline-provided phones include audible cues (34% compared to 24%, respectively), Braille Display Support (25% compared to 24%), Haptic Feedback (24% on Lifeline-provided models), Physical Keyboard/Number Pad (17% compared 12%). For the top five providers, only two features were present in more than 90% of phones, and for Lifeline providers, only four features were present in more than 90% of phones. Therefore, there is room for growth in all categories for both provider types. Greater uniformity of accessibility features across provider types would better ensure the accessibility of affordable phones.

The physical keyboard and number pad feature are expected to be low given the changes in form factor to touchscreen phones. However, some people with vision disabilities prefer to navigate the phone using tactile inputs. Increasing the presence of the Audible Cue, Braille

[10] Shaewitz, M. Y. D., Overton, C., & Smith, D. M. (2018). A hidden market: The purchasing power of working-age adults with disabilities.

Display Support, and Haptic Feedback features to be available in more than 50% of phones provided would improve the odds of an individual with vision disabilities finding and purchasing a phone with the appropriate suite of accessibility features for their needs and enjoyment, even more so if all modern form factor features were available at rates akin to Adjustable Font (99%).

Table 1: Accessibility Features for Visual Disabilities (Top Providers Compared to Lifeline Providers)

Visual Disabilities	Top Five	Lifeline
Adjust Font	99%	90%
Audible Cues	34%	24%
Braille Display Support	25%	24%
Contrast Adjustment	87%	72%
Dedicated and clearly distinguishable key to lock the screen	80%	98%
Dedicated and clearly distinguishable volume keys	80%	98%
External Keyboard Support	83%	58%
Haptic Feedback	51%	24%
No Screen Timeout	97%	84%
Physical Keyboard/Number Pad	17%	12%
Screen Magnifier	86%	98%
Screen Reader	81%	54%
Text-to-Speech	86%	88%
Voice Notes (Allows you to record, save, and playback a short voice reminder)	59%	52%

Accessibility Features for Hearing Disabilities

Table 2 shows a comparison of the presence of accessibility features from the top five providers compared to the Lifeline provided phones for persons with hearing disabilities. All features are available in more than 50% of phones regardless of provider type except for Haptic Feedback. To indicate that a "button" was pressed, Haptic Feedback may be useful to people with hearing disabilities who prefer an alternative to audible feedback. In all categories, top five-provided phones outperformed Lifeline-provided phones. However, for the top five providers, only three of the 12 features assessed were present in more than 90% of phones, and for Lifeline providers, only one feature exceeded 90%.

Increasing RTT and two-way video capabilities in Lifeline-provided phones would increase the likelihood of consumers with hearing disabilities identifying and purchasing a phone

that has the suite of accessibility features needed for effective communications with both people who are Deaf (e.g., two-way video) and those who are hearing (e.g., RTT). Likewise, increasing the rates of inclusion of all accessibility features across provider-type would better ensure that consumers with disabilities could select a mobile phone based on their wants and needs, including financial needs.

Table 2: Accessibility Features for Hearing Disabilities (Top Providers Compared to Lifeline Providers)

Deaf/Hard of Hearing	Top Five	Lifeline
Adjustable Vibration	96%	88%
Closed-Captioning	83%	62%
Configurable Audio	82%	66%
Flashlight notification	60%	58%
HAC Rating[11]	99%	84%
Haptic Feedback	51%	24%
No Screen Timeout	97%	84%
Real-Time-Text (RTT)	85%	54%
Speaker-phone capable	100%	94%
Supports Gesture-Based Navigation (alternative to voice)	86%	76%
Touch input (alternative to voice)	89%	88%
Two-way video (allows for sign-language)	79%	54%

Accessibility Features for Cognitive Disabilities

Table 3 shows a comparison of the presence of accessibility features from the top five providers compared to the Lifeline-provided phones for persons with cognitive disabilities. All features are available in more than 50% of phones regardless of provider type except for Automatic Redial. However, for the top five providers, only five of the 14 features were present in more than 90% of phones, and for Lifeline providers, only four features exceeded 90%. Again, the data indicate a need to increase the availability of features across provider-type to better serve consumers with cognitive disabilities in purchasing an appropriate phone that is within their budget.

[11] Analysis of HAC Rating will be provided in response to the FCC's tentative findings.

Table 3: Accessibility Features for Cognitive Disabilities (Top Providers Compared to Lifeline Providers)

Cognitive Disabilities	Top Five	Lifeline
Biometrics	82%	74%
Alternative to Biometrics	96%	96%
Dedicated and clearly distinguishable key to lock the screen	80%	98%
Speed Dial	97%	90%
Voice Notes	59%	52%
Automatic Redial	58%	44%
Automatic Answer or Any Key Answer	54%	52%
Predictive Text Input	97%	62%
Intelligent Personal Assistant	100%	84%
No Screen Timeout	97%	84%
Speech-to-text/Dictation	86%	88%
Screen reader	81%	54%
Simple display	79%	52%
Dedicated and clearly distinguishable volume keys	80%	98%

Accessibility Features for Mobility Disabilities

Table 4 shows a comparison of the presence of accessibility features from the top five providers compared to the Lifeline-provided phones for persons with mobility disabilities. Fourteen of the 17 features assessed were available in more than 50% of top five-provided phones, whereas 13 features were in more than 50% of Lifeline-provided phones. However, for the top five providers, only three of the 17 features were present in more than 90% of phones, and for Lifeline providers, only two features met or exceeded 90%. Eye Tracking had a particularly low presence in Lifeline-provided phones (2%). Again, the data indicate a need to increase the availability of features across provider-type to better serve consumers with mobility disabilities in purchasing an appropriate phone. Specifically, increasing the presence of features that enable alternative input, ease of navigation, and connectivity to external assistive technology devices would improve mobile phone access and equity for persons with mobility disabilities. Additionally, form factors that improve stability (e.g., anti-slip features) were also identified in other research as important to some people that experience gripping difficulty.

Table 4: Accessibility Features for Mobility Disabilities (Top Providers Compared to Lifeline Providers)

Mobility Disabilities	Top Five	Lifeline
Anti-slip Features	41%	28%
Assistive Touch	82%	54%
Automatic Answer or Any Key Answer	54%	44%
Automatic Redial	58%	52%
Easy Battery Placement	40%	36%
External Keyboard Support	83%	58%
Eye Tracking	18%	2%
Hand Movement	83%	54%
Intelligent Personal Assistant	84%	84%
No Screen Timeout	97%	84%
Predictive Text Input	97%	62%
Simple display	79%	92%
Speed Dial	97%	90%
Stylus or Prosthetic Device support	83%	80%
Supports Gesture Based Navigation	86%	76%
Switch Control	49%	48%
Voice Notes (Allows you to record, save, and playback a short voice reminder)	59%	52%

Accessibility Features for All Disability Types

Finally, Table 5 shows a comparison between accessibility features from the top five providers compared to Lifeline-provided phones that are not disability-specific. Regardless of provider type, all features are available in more than 50% of phones except for NFC, which is only available in 38% of Lifeline-provided phones. NFC is increasingly used in banking and purchasing and provides an alternative to physically accessing ATMs and swipe terminals. Though these features enable persons with disabilities to connect to external assistive technology devices, receive emergency information, and wayfind, with the exception of the Accessibility Menu and Accessibility APIs, none of them were designed specifically for persons with disabilities. Still, only five of the 14 features assessed were included at rates that met or exceeded 90% in top five-provided phones and seven in Lifeline-provided phones. Notably, Lifeline-provided phones had a greater incidence of WEA capability than top five-provided phones, bucking the trend revealed in the 2018 and 2020 analyses.

Table 5: Accessibility Features for All Disability Types (Top Providers Compared to Lifeline Providers)

All	Top Five	Lifeline
Accessibility Menu	86%	82%
Battery Saver or Adaptive Battery Settings	87%	86%
Biometric Login	82%	74%
Bluetooth	100%	96%
Emergency Services & Location	70%	90%
FM Radio	58%	68%
GPS Capability	100%	90%
Headphone Jack	99%	100%
Mirror Link	80%	90%
Near Field Communications (NFC)	67%	38%
Smartphone	89%	88%
Supports Accessibility APIs	86%	88%
USB	96%	94%
WEA-capable	91%	94%

In conclusion, during the conduct of the Accessibility Review, it became evident that for some features, there is low transparency between manufacturers and consumers on the topic of inclusive features. Multiple consumer-facing sources were utilized to evaluate mobile phone devices' input, control, and mechanical functions. The average consumer with a disability may not be willing to go through these considerable lengths to determine a phone's accessibility. Furthermore, for some features, information about whether it was included in the phone could not be found using the sources in this study. This is a missed opportunity, as clarity on whether a device has the accessibility features that consumers seek could improve consumer satisfaction and potentially reduce call center complaints concerning access issues. The ideal state would enable individuals with disabilities to select from the full range of commercially available devices. This means increasing the presence of accessibility features in all devices on the market.

Respectfully submitted,

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Dated this 4th day of April 2022