

# CLEAR 2 CONNECT

Protecting the right to communicate

May 14, 2019

## VIA ECFS

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

Re: *Misuse of Internet Protocol (IP) Captioned Telephone Service*, CG Docket No. 13-24;  
*Telecommunications Relay Services and Speech-to-Speech Services for Individuals with  
Hearing and Speech Disabilities*, CG Docket No. 03-123

Dear Ms. Dortch,

The undersigned members of the Clear2Connect Coalition respectfully submit the following to address the Commission’s ongoing efforts to modernize the IP CTS program.<sup>1</sup>

The Federal Communications Commission’s (the “Commission’s”) IP CTS program has been a remarkable success. When Congress enacted the Americans with Disabilities Act (“ADA”) in 1990,<sup>2</sup> it established a national mandate that the Commission make available services that enable individuals with hearing loss to communicate by telephone in a manner that is “functionally equivalent” to the communications of individuals without hearing- and speech-related disabilities.<sup>3</sup> Congress recognized that without such a mandate, individuals with hearing

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<sup>1</sup> The Clear2Connect Coalition represents organizations, advocates, and institutions working to preserve the right to communicate via IP CTS. As of today, the Clear2Connect Coalition has over twenty members. The Clear2Connect Coalition is a group dedicated to preserving the right for Americans with hearing loss to access the technology they need to communicate using a phone – as is their right under the Americans with Disabilities Act (ADA). The membership is comprised of a diverse range of organizations whose work involves advocating for the rights of the d/Deaf and hard of hearing communities, including veterans service organizations and disability and aging advocacy groups, as well as industry associations and educational and research institutions. These organizations reflect the broad diversity of IP CTS users, including American Veterans, business men and women, minority users, people who are older, and rural users. See Clear2Connect, *Members of the Clear2Connect Coalition*, <https://clear2connect.us/clear-2-connect-members/> (last visited May 8, 2019).

<sup>2</sup> The Americans with Disabilities Act of 1990, Pub. L. No. 101-336, 104 Stat. 327.

<sup>3</sup> 47 U.S.C. § 225(a)(3), (b)(1).

loss would be deprived the ability to communicate with family, friends, employers, medical professionals, and others—at tremendous consequence for them and for society more generally.<sup>4</sup>

Since the enactment of the ADA, the number of individuals with hearing loss has grown, as the Baby Boom Generation ages into hearing loss and as American Veterans return from war.<sup>5</sup> For many of these individuals, IP CTS has been life changing.<sup>6</sup> It is easy to use. It does not require a user to know American Sign Language or to engage in two-way text (which can be difficult for individuals who are older and may have dexterity and mobility challenges). And it allows users to speak in their own voices and to use residual hearing during telephone conversations.

Despite this incredible success, the Clear2Connect Coalition is concerned that the Commission may adopt changes to the IP CTS program that would harm and jeopardize the livelihoods of users who rely on this service. In particular, the Clear2Connect Coalition urges the Commission to conduct additional testing and to adopt service quality metrics and standards before authorizing any provider to receive compensation for exclusively automated speech recognition (“ASR”) service (*i.e.*, without the involvement of human Communications Assistants (“CAs”)). While the Clear2Connect Coalition agrees that the future of the IP CTS program may well include ASR-only services, and looks forward to the time when those services provide functional equivalence to consumers, they are not ready yet. As the attached White Paper explains, certifying a provider to deliver ASR-exclusive IP CTS now risks causing substantial harm to IP CTS users by subjecting them to lower-quality services.<sup>7</sup> Moreover, as explained below, ASR-only services also present significant privacy concerns and may feature implicit biases, both of which issues the Commission must take into account before certifying any provider of ASR-only service.

When the Commission invited providers to apply for certification to receive compensation for ASR-only IP CTS last year,<sup>8</sup> it relied upon incomplete and flawed studies about the effectiveness of ASR technologies. Those studies did not mimic real-world calls, and suffered from a variety of other problems, making it untenable to conclude, as the Commission did, that ASR-only services are now capable of delivering “functionally equivalent”

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<sup>4</sup> See, e.g., H.R. Rep. 101-485(II), at 28-29 (1990), as reprinted in 1990 U.S.C.C.A.N. 303, 310 (documenting that “historically, individuals with disabilities have been isolated and subjected to discrimination,” both of which are “still pervasive in our society” including in “telecommunications”).

<sup>5</sup> See *In re Misuse of Internet Protocol (IP) Captioned Telephone Service*, Report and Order, Declaratory Ruling, Further Notice of Proposed Rulemaking, and Notice of Inquiry, 33 FCC Rcd 5800, 5806 ¶ 12 (2018) (“*NPRM*”); see also U.S. Census Bureau, 2014 National Population Projection Tables, Table 3 (May 9, 2017), <https://census.gov/data/tables/2014/demo/popproj/2014-summary-tables.html>; Office of Research & Dev., U.S. Dep’t of Veterans Affairs, *Hearing Loss*, <https://www.research.va.gov/topics/hearing.cfm> (updated Aug. 12, 2016).

<sup>6</sup> *In re Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities Internet-Based Captioned Telephone Service*, Declaratory Ruling, 22 FCC Rcd 379 (2007).

<sup>7</sup> See Att. A.

<sup>8</sup> See *NPRM*, 33 FCC Rcd at 5827 ¶ 48. Clear2Connect recognizes that the FCC has not yet certified an ASR-only provider, but our members remain concerned that ASR-only provider applications are pending, and other providers may be preparing to file applications.

communications by telephone.<sup>9</sup> Indeed, the Commission is currently working with stakeholders to develop the very performance metrics and standards for IP CTS that would be necessary for such testing. As the Disability Advisory Committee (“DAC”) and others have explained, future testing of ASR must involve objective and uniform metrics and standards going forward.<sup>10</sup>

Rushing to certify ASR-only providers before those critical service quality protections are in place risks (1) exposing users to harm in three separate areas: service quality, user privacy, and algorithmic bias; and (2) thereby wasting precious TRS Fund resources to compensate providers for services that fail to meet the statutory mandates.<sup>11</sup>

*First*, the Clear2Connect Coalition urges the Commission to ensure that ASR-only service quality meets CA-assisted service quality; otherwise, users may not be able to engage in critical personal, professional, and emergency communications by telephone.<sup>12</sup> As explained in the Attached White Paper, the Commission currently lacks the ability to evaluate the quality of any ASR-only service.<sup>13</sup> Moreover, if ASR-only service is not capable of delivering functionally equivalent communications by telephone, the harms to consumers (including increased risk of dementia, isolation, depression, and hospitalization) and to the economy (including reduced productivity and increased healthcare costs) could be substantial.<sup>14</sup> Market forces alone will not prevent these harms by somehow ensuring that consumers choose only high-quality IP CTS: The Commission’s experience with television closed captioning—where market forces produced severely flawed service offerings, ultimately requiring the Commission to step in with objective service quality protections—as well as the demographics of IP CTS users—who are older and less sophisticated consumers—prove that if users receive low-quality ASR-only captioning, they are more likely to suffer in silence than to switch providers.<sup>15</sup>

*Second*, the Commission has not evaluated the ways in which ASR-only service raises unique and significant privacy concerns. When the Commission authorized providers to seek certification to offer ASR-only service, it assumed that a service that could be provided without a

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<sup>9</sup> See Att. A., Part III (discussing flaws with MITRE testing).

<sup>10</sup> *Recommendation of the FCC Disability Advisory Committee, Relay and Equipment Distribution Subcommittee: Internet Protocol Captioned Telephone Relay Service Metrics* ¶ 6 (adopted Oct. 3, 2018) (“*DAC Recommendations: IP CTS Metrics*”), <https://docs.fcc.gov/public/attachments/DOC-354522A1.pdf>.

<sup>11</sup> Sprint filed a Petition for Reconsideration of the Commission’s decision to authorize ASR-only service, raising many of these points. See Sprint Petition for Clarification or, in the Alternative, Reconsideration, CG Docket Nos. 13-24, 03-123, at 2-3 (July 9, 2018).

<sup>12</sup> See *DAC Recommendations: IP CTS Metrics* ¶ 7 (recommending that Commission “peg [performance standards] to current performance by [CA]-based IP CTS providers”).

<sup>13</sup> See Att. A., Part II.

<sup>14</sup> See Att. A at 6-7 (recounting studies confirming that hearing loss is associated with other health conditions including dementia, depression, and mortality; studies confirming that hearing loss drives down wages and productivity while increasing other healthcare costs; and studies that demonstrate *effective* assistive technologies can help mitigate these effects).

<sup>15</sup> See Att. A at 7-8 (describing Commission’s experience with closed captioning and demographic and market trends for IP CTS users).

human CA would inherently promote user privacy.<sup>16</sup> This logic was overly simplistic a year ago, and has since been significantly overtaken by recent events.

The Commission has failed to seriously evaluate the privacy risks that ASR-only services can pose. As recent revelations have made clear, even fully automated speech recognition technologies require “training.”<sup>17</sup> In the context ASR-only IP CTS, this process might involve humans listening to recordings to correct ASR-based captions after calls are completed, it could involve developing engines that train themselves through recordings during calls, or it could involve other permutations of information flows. Clear2Connect is concerned that the underlying ASR platforms—who likely would provide the wholesale service to ASR-only IP CTS providers—are companies that have very problematic histories when it comes to protecting privacy,<sup>18</sup> and no history of compliance with the FCC’s mandatory minimum. What the underlying ASR platforms are doing to train their engines, and what these practices mean for privacy simply have not been given adequate consideration, especially given the growing public outcry over privacy abuses by technology companies.

*Third*, ASR-only services may feature implicit biases in their engines that harm particular users or that make the technology unsuitable for particular types of calls. As noted above, underlying ASR platforms must develop and train their engines using audio inputs. The selection of those inputs will therefore exert tremendous power over how each engine functions when it confronts audio in real time. If those inputs do not represent certain speech patterns (including frequencies, volumes, accents, vernaculars, and so forth), the engine will not accurately caption speech that exhibits those patterns.

Recent experience with speech-recognition technologies in other markets demonstrates that, left to their own devices, ASR platforms will not train their engines with representative inputs that make IP CTS equally “available” across calls and speakers.<sup>19</sup> Instead, if they are not required to account for implicit bias, they will develop engines that perform less well for calls involving individuals who are not white, educated, upper-middle-class, native-born Americans.<sup>20</sup>

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<sup>16</sup> *NPRM*, 33 FCC Rcd at 5828 ¶ 50.

<sup>17</sup> See, e.g., Matt Day, Giles Turner, & Natalia Drozdziak, *Amazon Workers Are Listening to What You Tell Alexa*, Bloomberg (Apr. 10, 2019), <https://www.bloomberg.com/news/articles/2019-04-10/is-anyone-listening-to-you-on-alexa-a-global-team-reviews-audio>.

<sup>18</sup> See, e.g., Shoshana Zuboff, *Facebook, Google, and a Dark Age of Surveillance Capitalism*, Financial Times (Jan. 24, 2019), <https://www.ft.com/content/7fafec06-1ea2-11e9-b126-46fc3ad87c65>.

<sup>19</sup> See Drew Harwell, *The Accent Gap*, Wash. Post (July 19, 2018), [https://www.washingtonpost.com/graphics/2018/business/alexa-does-not-understand-your-accent/?utm\\_term=.0b85d19883f1](https://www.washingtonpost.com/graphics/2018/business/alexa-does-not-understand-your-accent/?utm_term=.0b85d19883f1) (finding Google’s and Amazon’s recognizers were 30 percent less likely to understand non-American accents than those of native-born users and quoting expert that voice assistants “are going to work best for white, highly educated, upper-middle-class Americans, probably from the West Coast”).

<sup>20</sup> See Adi Robertson, *A New Bill Would Force Companies to Check Their Algorithms for Bias*, The Verge (Apr. 10, 2019), <https://www.theverge.com/2019/4/10/18304960/congress-algorithmic-accountability-act-wyden-clarke-booker-bill-introduced-house-senate> (discussing Algorithmic Accountability Act). Moreover, Congress is exploring ways to prevent the introduction of implicit bias into technologies and systems. See Algorithmic Accountability Act of 2019, S. 1108, 116th Cong. (2019), <https://www.govinfo.gov/content/pkg/BILLS-116s1108is/pdf/BILLS-116s1108is.pdf>. The Commission should follow this approach, and make sure that it has protections in place to prevent the certification of an ASR-only provider utilizing a biased underlying engine.

It would flout the intent of the ADA—an antidiscrimination, civil rights law—to use the TRS Fund as a vehicle for compensating the provision of such services.

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IP CTS has been a critical life-changing service for individuals who are older, American Veterans, and others with hearing loss. To honor this country’s commitments to these individuals, the Commission should avoid taking any action that subjects them to substandard or otherwise harmful services,

Clear2Connect is not asking the Commission to stop the evolution of technology. Each of the risks discussed in this letter can be controlled if the Commission takes the sensible approach of subjecting ASR to more robust testing and developing new metrics and standards that *all* IP CTS providers, including ASR-exclusive providers, must meet to provide service, following the advice of the DAC, the Consumer Groups, and the industry.<sup>21</sup> This latter approach also would better achieve the Commission’s goal of avoiding wasteful expenditures from the TRS Fund—*i.e.*, subsidization of services that fail to achieve functional equivalence. Thus, Clear2Connect urges the Commission to prioritize its nascent efforts to develop service quality standards before trying to transition the industry to ASR-only services.<sup>22</sup> Fortunately, this work is already well underway.<sup>23</sup>

Sincerely,

ACCSES  
American Association of People with Disabilities  
Association of University Centers on Disabilities  
Blinded Veterans Association  
Code of Support Foundation  
Dixon Center for Military and Veterans Services  
Hearing Loss Association of America  
Home Care Association of America  
National Association of the Deaf  
National Coalition for Homeless Veterans  
National Disability Rights Network  
RespectAbility  
Telecommunications for the Deaf and Hard of Hearing, Inc.

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<sup>21</sup> See, e.g., *DAC Recommendations: IP CTS Metrics* ¶ 1 (recommending that “before a full shift in IP CTS technology takes place, current IP CTS quality (as well as ASR quality) be measured and quality metrics established to create minimum performance standards for IP CTS, regardless of the platform or technology used”).

<sup>22</sup> See *NPRM*, 33 FCC Rcd at 5868 ¶ 155. This process was started nearly a year ago but is still in its early stages and is ongoing: The Commission has not yet moved to a notice of proposed rulemaking on the service quality issues.

<sup>23</sup> See *IP CTS Quality Metrics: Provider Recommendations* (Aug. 21, 2018) attachment to letter from CaptionCall, InnoCaption, ClearCaptions, Hamilton Relay, and Sprint, to Marlene Dortch, Secretary, FCC, CG Docket Nos. 13-24, 03-123 (Aug. 21, 2018).

United Spinal Association  
VetsFirst  
World Institute on Disability

# White Paper on IP CTS Performance Measures and ASR

## Executive Summary

The Federal Communications Commission (the “FCC” or “Commission”) recently launched a proceeding to update and modernize the provision of Internet Protocol Captioned Telephone Service (“IP CTS”).<sup>24</sup> To ensure that these efforts do not undermine service to consumers, this White Paper explains why the FCC must focus on the development of uniform service quality metrics, testing methodologies, and standards for all IP CTS providers. Automated Speech Recognition (“ASR”) is a technology that is used today by human communications assistants (“CAs”) to provide IP CTS. The question on the table is what it will take to introduce ASR-only services (*i.e.*, with no human CA) in a manner that preserves access to high-quality IP CTS. The short answer: Service quality standards should be in place before any provider is certified by the FCC to offer ASR-only captioning services.

## Background

IP CTS is a subset of telecommunications relay services (“TRS”)—services that provide the ability for individuals with hearing loss (or other hearing and speech-related disabilities) to communicate by telephone. Under the Americans with Disabilities Act (the “ADA”), the FCC is obligated to make TRS available that are “functionally equivalent” to the voice services used by individuals without hearing loss. IP CTS is a captioning service that allows individuals to use their residual hearing to communicate in their own voices over the telephone, while reading captions on an IP CTS telephone of what the other party on the call says.<sup>25</sup> IP CTS has been a life-changing technology for people who experience hearing loss, including our nation’s veterans, because it enables them to communicate by telephone with family, loved ones, friends, emergency responders, healthcare providers, business partners, and others.

## Analysis

### **I. Performance Standards for IP CTS Are Long Overdue.**

The development and adoption of service quality metrics, testing methodologies, and quantitative standards for IP CTS providers are long overdue. Although IP CTS has been authorized since 2007, the Commission has not yet adopted these common-sense tools.

The lack of such standards hampers the FCC’s ability to manage the IP CTS program effectively. As the Commission recently noted, the Government Accountability Office urged the Commission to adopt goals and specific performance measures for TRS four years ago.<sup>26</sup> The GAO explained that “[w]ithout goals related to important dimensions of service quality . . . , it

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<sup>24</sup> See *In re Misuse of Internet Protocol (IP) Captioned Telephone Service*, Report and Order, Declaratory Ruling, Further Notice of Proposed Rulemaking, and Notice of Inquiry, 33 FCC Rcd 5800 (2018) (“*Declaratory Ruling*” or “*Notice of Inquiry*”).

<sup>25</sup> See, e.g., YouTube, *What Is IP CTS?* (Dec. 20, 2017), <https://www.youtube.com/watch?v=am03ZKu85C0>.

<sup>26</sup> See *Notice of Inquiry*, 33 FCC Rcd at 5868 ¶ 155 n.399; see also U.S. Gov’t Accountability Office, GAO-15-409, *Report to Hon. Jeff Sessions, U.S. Senate, Telecommunications Relay Service: FCC Should Strengthen Its Management of Program to Assist Persons with Hearing or Speech Disabilities* (2015) (“*GAO Report*”).

becomes difficult to determine if this attribute of functional equivalence is being met and to identify whether programmatic changes need to be made.”<sup>27</sup>

The Hearing Loss Association of America, Telecommunications for the Deaf and Hard of Hearing, Inc., and the National Association of the Deaf (collectively the “Consumer Groups”) have also urged the adoption of service quality metrics, testing methodologies, and quantitative performance standards to “ensure that consumers receive robust service from all providers.”<sup>28</sup> And, as discussed at greater length below, a coalition of IP CTS providers has proposed a framework that would allow the FCC to adopt service quality standards through a methodical and transparent process of identifying metrics and regular, objective testing.<sup>29</sup>

In addition to facilitating oversight of the IP CTS program, service quality metrics and uniform standards would advance the FCC’s objective of promoting competition.<sup>30</sup> In the context of TRS, it is especially important for providers to compete in terms of service quality, because they cannot compete on price. The development of common performance metrics and standards will empower consumers to select providers based on objective, apples-to-apples performance characteristics, creating incentives for providers to continue to experiment with and invest in innovative IP CTS products and offerings.<sup>31</sup>

Finally, uniform metrics, testing methodologies, and standards would also provide the FCC with the necessary tools to confirm that new services will deliver quality commensurate with existing services before entering the market. Indeed, the FCC’s Disability Advisory Committee (“DAC”) has specifically recommended that the FCC “ensure that any prospective IP CTS provider meet . . . minimum performance standards of quality prior to approval of any application to provide service.”<sup>32</sup> As discussed in Part II, the potential introduction of ASR-only services makes the adoption of performance standards even more urgent to ensure that customers do not effectively lose service because they receive poor-quality service.

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<sup>27</sup> *GAO Report* at 18.

<sup>28</sup> Letter from Blake E. Reid, Counsel to Telecommunications for the Deaf and Hard of Hearing, Inc., to Marlene H. Dortch, Secretary, FCC, GC Docket Nos. 03-123 and 13-24, at 2 (July 26, 2018) (“*Consumer Groups Letter*”). The Consumer Groups is comprised of the Hearing Loss Association of America, Telecommunications for the Deaf and Hard of Hearing, Inc., and the National Association of the Deaf.

<sup>29</sup> *IP CTS Quality Metrics: Provider Recommendations* at 3 (Aug. 21, 2018) attachment to letter from CaptionCall, InnoCaption, ClearCaptions, Hamilton Relay, and Sprint, to Marlene Dortch, Secretary, FCC, CG Docket Nos. 13-24, 03-123 (Aug. 21, 2018) (“*Industry Proposal*”) (“[I]t is important to establish a common set of metrics that will allow IP CTS users, regulators and other stakeholders to set meaningful minimum standards by which new approaches to providing IP CTS captions can be measured.”).

<sup>30</sup> *Notice of Inquiry*, 33 FCC Rcd at 5870 ¶ 161 (stating that consumers must have enough information “to make informed choices in their selection of provider services”).

<sup>31</sup> See, e.g., *In re Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 5140, 5157 ¶ 36 (2000).

<sup>32</sup> *Recommendation of the FCC Disability Advisory Committee, Relay and Equipment Distribution Subcommittee: Internet Protocol Captioned Telephone Relay Service Metrics* ¶ 10 (adopted Oct. 3, 2018) (“*DAC Recommendations: IP CTS Metrics*”), <https://docs.fcc.gov/public/attachments/DOC-354522A1.pdf>.



## II. The FCC Should Adopt Uniform Service Quality Metrics, Measures, and Standards for IP CTS Before Certifying ASR-Only Providers.

The Commission should encourage IP CTS providers to innovate and improve services to consumers. By creating incentives for providers to continually invest in service quality and new offerings, the FCC can best achieve Congress’s mandate that functionally equivalent communications by telephone be available to individuals with hearing loss.

ASR, while promising, needs further testing to ensure that it is capable of meeting this standard. Such testing is especially critical to determine whether ASR-only services can be effective *at scale*, and/or whether there are *particular circumstances and types of calls* when ASR-only services are, or are not, capable of delivering functional equivalence. As the Commission has acknowledged, “there are various factors that may influence [ASR’s] effectiveness for different calls.”<sup>33</sup> “ASR may be more conducive to communication on certain categories of calls . . . where there is likely to be less background noise and clearer articulation by call takers, or calls to friends, relatives and colleagues, who may be more aware of and sensitive to the user’s hearing loss and the need to speak clearly.”<sup>34</sup> These hypotheses require testing.

For example, the Commission must subject ASR-only services to rigorous testing to ensure they can handle emergency calls. As the Consumer Groups have observed, “it is critical that all [IP CTS] applicants be capable of providing robust performance in case of emergency.”<sup>35</sup> Users must “be able to rely on the transcription of a 911 call-taker’s questions and instructions to make life-and-death decisions—and promptly intervene with an alternate approach if a human CA or ASR-based engine is not successfully conveying conversational content.”<sup>36</sup> Ensuring that ASR can perform during emergency calls—whether traditional 911 calls, calls to poison control centers, or calls regarding other life-threatening situations—will be critical to public safety.<sup>37</sup>

The FCC, however, has failed to conduct such testing and generally authorized the provision of ASR-only IP CTS in June 2018.<sup>38</sup> Moreover, the protections that the Commission adopted to ensure that ASR-only providers are capable of delivering functional equivalence are insufficient. Although the FCC stated that it would require prospective ASR providers to demonstrate the ability to provide service, across “all types of calls,”<sup>39</sup> it did not explain how providers would do so or what that means.

As the Consumer Groups have explained, the FCC should require “demonstrated proof from all [ASR] applicants of the ability to handle calls involving male and female speakers, children, speakers who heavily use industry-specific jargon, speakers with thick accents, and speakers who speak at different rates, volumes, and with varying reliance on colloquial and

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<sup>33</sup> *Notice of Inquiry*, 33 FCC Rcd at 5829 ¶ 52.

<sup>34</sup> *Id.*

<sup>35</sup> *Consumer Groups Letter* at 5.

<sup>36</sup> *Id.*

<sup>37</sup> *DAC Recommendations: IP CTS Metrics* ¶ 1 (emphasizing that adoption of IP CTS metrics is of “paramount importance” because IP CTS may be utilized “during situations in which [a user’s] personal safety may be at risk”).

<sup>38</sup> *Declaratory Ruling*, 33 FCC Rcd at 5827 ¶ 48.

<sup>39</sup> *Declaratory Ruling*, 33 FCC Rcd at 5832-33 ¶ 60.

idiomatic language.”<sup>40</sup> This testing is necessary to replicate actual IP CTS calls. ASR-only providers must be equipped to deal with “complex call scenarios, including callers who speak over each other, multiple callers and conference calls, calls involving speakers with speech disabilities or impediments, calls involving volume amplification, and calls made with significant background noise.”<sup>41</sup> ASR-only providers also should be required to “demonstrate approaches to dealing with bias . . . in algorithms used in ASR solutions.”<sup>42</sup>

Although the FCC did seek comment on setting performance metrics and standards for all captioning services,<sup>43</sup> it appears to be poised to certify an ASR-only provider before adopting the metrics and standards that are necessary to ensure that such providers deliver adequate service. This would be putting the “cart before the horse.”<sup>44</sup>

Instead, before certifying any ASR-only provider, the FCC should adopt performance standards. And it should not approve any particular ASR-only provider that cannot demonstrate that its offering “is at least as robust as current IP CTS offerings” along several critical performance measures.<sup>45</sup> The DAC and Consumer Groups have expressly recommended that performance standards be put in place before the FCC attempts to migrate services over to ASR technologies and have made specific, practical recommendations to expedite this process.<sup>46</sup> According to the DAC, this task is urgent: “[Q]uality metrics and measurements are needed to ensure all IP CTS providers, regardless of method or platform, reach a level of performance that can provide, to the extent possible, a functionally equivalent experience for users.”<sup>47</sup> Moreover, the industry has explained that these standards should apply to “all IP CTS providers, regardless of the technology used to create captions” to “help improve the quality of captions delivered to IP CTS users.”<sup>48</sup>

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<sup>40</sup> *Consumer Groups Letter* at 6.

<sup>41</sup> *Id.*

<sup>42</sup> *Id.* Such bias can develop because the accuracy of captions can be affected by familiarity or lack of familiarity with a particular speaker’s mode of speech. See, e.g., Will Knight, *AI Programs are Learning to Exclude Some African-American Voices*, MIT Tech. Rev. (Aug. 16, 2017), <https://www.technologyreview.com/s/608619/ai-programs-are-learning-to-exclude-some-africanamerican-voices/>.

<sup>43</sup> *Notice of Inquiry*, 33 FCC Rcd at 5868 ¶ 155.

<sup>44</sup> *Declaratory Ruling*, Statement of Commissioner Jessica Rosenworcel, 33 FCC Rcd at 5900; see also *Consumer Groups Letter* at 2.

<sup>45</sup> Sprint Petition for Clarification or, in the Alternative, Reconsideration, CG Docket Nos. 13-24, 03-123, at 2-3 (July 9, 2018); *DAC Recommendations: IP CTS Metrics* ¶ 7 (recommending that Commission “peg [performance standards] to current performance by [CA]-based IP CTS providers”).

<sup>46</sup> See *DAC Recommendations: IP CTS Metrics* ¶ 1 (recommending that “before a full shift in IP CTS technology takes place, current IP CTS quality (as well as ASR quality) be measured and quality metrics established to create minimum performance standards for IP CTS, regardless of the platform or technology used”); *Consumer Groups Letter* at 3 (noting that it is urgent for the FCC to “expedite the development of the performance goals and measures in the [Notice of Inquiry] and proceed as quickly as possible to final rules, as it cannot afford to wait multiple years and multiple comment cycles to put a workable framework in place”).

<sup>47</sup> *DAC Recommendations: IP CTS Metrics* ¶ 5.

<sup>48</sup> *Industry Proposal* at 3.

The Commission should move expeditiously and seek comment on specific metrics, testing methodologies, and standards. It is critical that these service quality measures be subject to notice and comment and be uniformly applied to all forms of IP CTS.<sup>49</sup>

### **III. The Testing of ASR to Date Suffered from Serious Flaws and Is Insufficient to Ensure Quality Service.**

The FCC has contracted with MITRE to evaluate the performance of ASR, but its testing and recommendations thus far are purely preliminary.<sup>50</sup> Concerns have been raised about limitations and flaws in MITRE’s testing for over a year—with critics noting, for instance, that its results have not been subjected to peer review.<sup>51</sup> There are also indications that the results are unreliable and/or unrepresentative.<sup>52</sup> The early phase assessments relied on calls involving limited subject matter, curated test conditions, and a small and unrepresentative sample of users.<sup>53</sup> MITRE did not test calls in real time, calls where the speakers were other than adult males, or calls where the audio signal quality was less than ideal.<sup>54</sup> In addition, MITRE “used only spelling of words and missing words” in making its error-rate calculations on test calls,<sup>55</sup> ignoring myriad ways errors can affect actual user understanding and comprehension. Further testing is necessary to understand how other errors, including punctuation and syntax errors, as well as errors related to dysfluencies (*e.g.*, “uhms” and “uhs”), affect the overall effectiveness of a captioning service.

The DAC has recommended that the FCC support additional testing to address specific issues and that the Commission work with IP CTS providers and other stakeholders to develop testing, measuring, and scoring procedures before establishing quantitative standards.<sup>56</sup> The industry agrees, emphasizing that all future testing “should incorporate a review of research plans by third parties who can make recommendations and assure integrity of these plans prior to the plans being carried out.”<sup>57</sup> This approach will lead to improved testing and more reliable results.

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<sup>49</sup> See *DAC Recommendations: IP CTS Metrics* ¶ 4 (recommending that FCC “give instructions on how [each] metric is to be measured and provide guidance on how testing for each metric should be undertaken”).

<sup>50</sup> Indeed, the recommendations based on MITRE’s Phase 1 and 2 testing was not that the FCC should move forward with ASR but rather that there should be research into the feasibility of using fully automated services—including, specifically, “further usability testing to determine if [ASR] system prototypes can provide (a) similar levels of usability and call effectiveness as experienced today by current IP CTS users.” CMS Alliance to Modernize Healthcare, *Internet Protocol Caption Telephone Service (IP CTS) – Summary of Phase 2 Usability Testing Results* 15 (Mar. 23, 2016), <https://ecfsapi.fcc.gov/file/10411287298464/MITRE%20Corporation%20Summary%20of%20Phase%202.pdf>.

<sup>51</sup> Letter from John T. Nakahata, counsel to CaptionCall, LLC, to David Schmidt, TRS Fund Program Coordinator, Office of Managing Director, FCC, CG Docket Nos. 03-123, 13-24 Attach. 1 (Dec. 21, 2017) (“*CaptionCall 12-21-17 Ex Parte*”).

<sup>52</sup> *Id.*; Letter from David A. O’Connor, Counsel for Hamilton Relay, Inc., to Marlene Dortch, Secretary, FCC, CG Docket Nos. 13-24, 03-123 at 2 (May 24, 2018).

<sup>53</sup> *CaptionCall 12-21-17 Ex Parte* at 1.

<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> *DAC Recommendations: IP CTS Metrics* ¶ 6 (citing *Industry Proposal*).

<sup>57</sup> *Industry Proposal* at 9.

#### IV. The Risk to Consumers Is Significant.

IP CTS users comprise a particularly vulnerable population. Congress has recognized that individuals with disabilities face an array of collateral consequences, including discrimination, stigmatization, underemployment, and isolation.<sup>58</sup> The ADA was enacted to counteract these effects. IP CTS users are a subset of the population of individuals with hearing disabilities: They are individuals who developed hearing loss later in life—for example, people who are older and have aged into hearing loss, as well as American Veterans.

People who are older have been a driving force in the growth of IP CTS in recent years,<sup>59</sup> as the percentage of the U.S. population over 65 increases from 15 percent in 2015 to 21 percent (projected) by 2030.<sup>60</sup> American Veterans are also driving increased demand for IP CTS. According to the VA, hearing problems are “by far the most prevalent service-connected disability among American Veterans.” As of 2014, “more than 933,000 Veterans were receiving disability benefits related to hearing loss.”<sup>61</sup> For many American Veterans, hearing loss is a residual effect of having suffered acoustical trauma during training and combat.

It would be contrary to our national commitment to individuals with disabilities under the ADA and to our service men and woman, to expose these individuals to an untested and unproven technology on which so much depends. IP CTS is a life-changing service for many of its users, allowing them to continue communicating freely and living independently. Individuals use IP CTS to speak with their grandchildren, who otherwise might be difficult to understand because of their higher-pitched voices; with their doctors, lawyers, and accountants, who may use unfamiliar words and phrases; and with emergency responders, who may speak quickly and need precise and prompt responses. Moreover, when asked to rank the importance of different real-world listening situations, individuals with hearing loss generally rank the telephone as

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<sup>58</sup> See, e.g., H.R. Rep. 101-485(II), at 28-29 (1990), as reprinted in 1990 U.S.C.C.A.N. 303, 310 (documenting conclusions that “historically, individuals with disabilities have been isolated and subjected to discrimination,” both of which are “still pervasive” including in “telecommunications”; and that “people with disabilities as a group occupy an inferior status socially, economically, vocationally, and educationally”); S. Rep. 111-386 at 2 (2010) (“Various studies have found that people with disabilities suffer disproportionately higher rates of unemployment and poverty than those without disabilities. . . . If certain current and emerging technologies are not accessible to the disabled community, this economic disparity may increase. Enhanced accessibility could help diminish the economic divide.”).

<sup>59</sup> *Notice of Inquiry*, 33 FCC Rcd at 5863 ¶ 139.

<sup>60</sup> U.S. Census Bureau, 2014 National Population Projection Tables, Table 3 (May 9, 2017), <https://census.gov/data/tables/2014/demo/popproj/2014-summary-tables.html>; see also Comments of Hamilton Relay Inc., GC Docket Nos. 03-123 and 13-24, at 16-17 (Sept. 17, 2018) (“IP CTS growth is being caused by recognizable demographic shifts related to an aging population. Notably, the over-65 population increased by 17.5% between 2008 and 2016.”); Comments of Sprint Corp., GC Docket Nos. 03-123 and 13-24, at 5-6 (Sept. 17, 2018) (“[L]egitimate demand for IP CTS . . . will continue to grow over time, and users will increasingly be elderly individuals who are unfamiliar with accessibility technologies.”); Letter from David O’Connor, Counsel for Hamilton Relay, Inc., to Marlene H. Dortch, Secretary, FCC, CG Docket Nos. 13-24, 03-123, Att. (Sept. 5, 2017), Coleman Bazelon & Brent Lutes, The Brattle Group, *Telecommunications Relay Services for Individuals Who Are Deaf or Hard of Hearing* 19-20 (Aug. 30, 2017).

<sup>61</sup> Office of Research & Dev., U.S. Dep’t of Veterans Affairs, *Hearing Loss*, <https://www.research.va.gov/topics/hearing.cfm> (last visited Mar. 28, 2019).

second, behind only one-on-one in-person interactions. And, for many users, CA-based IP CTS has come closest to enabling functionally equivalent communications while using it.

If IP CTS quality were to decline following the introduction of ASR, many might simply stop using the service. Switching providers involves transaction costs, and older users might not understand that higher quality CA-based services are still available on the market. Indeed, because IP CTS is a new technology to most of its users, they are unlikely to appreciate the distinction between an ASR-only service and a CA-based service, or that each user can choose the provider he or she prefers, without incurring any cost for higher-quality services. Trends from other product and service markets show that individuals who are older and vulnerable—precisely the demographics of the IP CTS user base—are less likely to change providers, even when they are unhappy with their current providers.<sup>62</sup> The Commission’s experience with closed captioning for television programs also demonstrates that relying on market forces to ensure captioning service quality is an ineffective strategy that will deprive individuals with disabilities of access to captions that satisfy the ADA’s mandate of functionally equivalent communications by telephone.<sup>63</sup>

For those users who simply stop using the service because of its lower quality, there could be significant health consequences. Studies confirm that hearing loss is associated with other health conditions, including dementia, isolation, depression, and hospitalizations,<sup>64</sup> as well as decreased wages and productivity and increased healthcare costs—*i.e.*, it results in significant economy-wide harms.<sup>65</sup> Studies have also shown that *effective* assistive technologies can help

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<sup>62</sup> For example, a network of charities in the United Kingdom reviewed data from more than 2000 clients and 5000 complaints and found that “customers in vulnerable positions are more likely than the average consumer to stay in their contracts and with their [broadband] providers” and that “[p]eople aged 65 and over are . . . more than twice as likely as those under 65 to have been in the same contract for more than 10 years.” Roberto Merola & Lizzie Greenhalgh, Citizens Advice, *Exploring the Loyalty Penalty in the Broadband Market* at 4, 12 (2017), <https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/CitizensAdvice-Exploringtheloyaltypenaltyinthebroadbandmarket.pdf>. And a survey of nearly 1100 U.S. consumers found that while 59 percent of millennials would be inclined to leave a credit card issuer based on false declines, only 21 percent of seniors would be inclined to do the same. Julie Conroy, Alite, *Combating False Declines Through Customer Engagement* 3-4 (May 2017), [https://content.iovation.com/reports/Combating\\_False\\_Declines\\_Through\\_Customer\\_Engagement\\_Report\\_iovation.pdf](https://content.iovation.com/reports/Combating_False_Declines_Through_Customer_Engagement_Report_iovation.pdf).

<sup>63</sup> See *In re Closed Captioning of Video Programming Telecommunications for the Deaf and Hard of Hearing, Inc. Petition for Rulemaking*, Report and Order, Declaratory Ruling, and Further Notice of Proposed Rulemaking, 29 FCC Rcd 2221, 2235 ¶ 19 (2014) (discussing initial conclusion that market forces alone would police service quality); *id.* at 2232-33 ¶¶ 15-16 (discussing widespread complaints by consumer groups about quality of captioning which were often severe enough to affect comprehensibility of a program); *id.* at 2236-38 ¶¶ 21-22 (recognizing that the “Commission’s original assumptions regarding the marketplace incentives for [quality] captioning [had] not been borne out”); *id.* at 2223-25 ¶ 3 (adopting quality assurance standards).

<sup>64</sup> See, e.g., Nicholas S. Reed et al., *Trends in Health Care Costs and Utilization Associated with Untreated Hearing Loss Over 10 Years*, 145 JAMA Otolaryngology – Head & Neck Surgery 27 (2019); Jennifer A. Deal et al., *Incident Hearing Loss and Comorbidity A Longitudinal Administrative Claims Study*, 145 JAMA Otolaryngology – Head & Neck Surgery 36 (2019).

<sup>65</sup> Elham Mahmoudi et al., *Association Between Hearing Aid Use and Health Care Use and Cost Among Older Adults with Hearing Loss*, 144 JAMA Otolaryngology Head Neck Surg. 498 (2018); Sue Archbold et al., The Ear Foundation, *The Real Cost of Adult Hearing Loss* (2014).

mitigate these effects,<sup>66</sup> for example by allowing an individual who might otherwise feel stigmatized and isolated to stay in touch with family and friends, or by allowing a motivated employee to stay engaged in work projects under a reasonable telecommuting accommodation. The Commission therefore must ensure that IP CTS users can continue to communicate effectively by telephone.

### **Conclusion**

In June 2018 the FCC put the cart before the horse by finding that an ASR-only provider could be certified before the agency establishes the performance-based tools that will be necessary to evaluate whether such services satisfy the ADA. The FCC still has the opportunity to heed the advice of the DAC, the Consumer Groups, and the providers to focus on developing and adopting performance metrics, methodologies, and standards, so that when any such application is filed, it can be evaluated meaningfully.<sup>67</sup> These tools will facilitate overall program management, protecting consumers and the TRS Fund from inferior services.

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<sup>66</sup> Janet S. Choi et al., *Associations of Using Hearing Aids or Cochlear Implants with Changes in Depressive Symptoms in Older Adults*, 142 *JAMA Otolaryngology Head Neck Surg.* 652 (2016); Sergei Kochkin, *MarkeTrak VIII: The Efficacy of Hearing Aids in Achieving Compensation Equity in the Workplace*, 63 *Hearing J.* 19 (2010).

<sup>67</sup> *DAC Recommendations: IP CTS Metrics* ¶ 10 (recommending that the FCC “ensure that [all] prospective IP CTS provider[s] meet the minimum performance standards of quality prior to approval . . . to provide service”); *see also Consumer Groups Letter* at 2 (urging the Commission to “reset the sequence of events . . . and reprioritize its efforts toward developing goals and measures to be applied to all IP CTS providers before opening the floodgates on new and unproven technology with no means for evaluating it”).