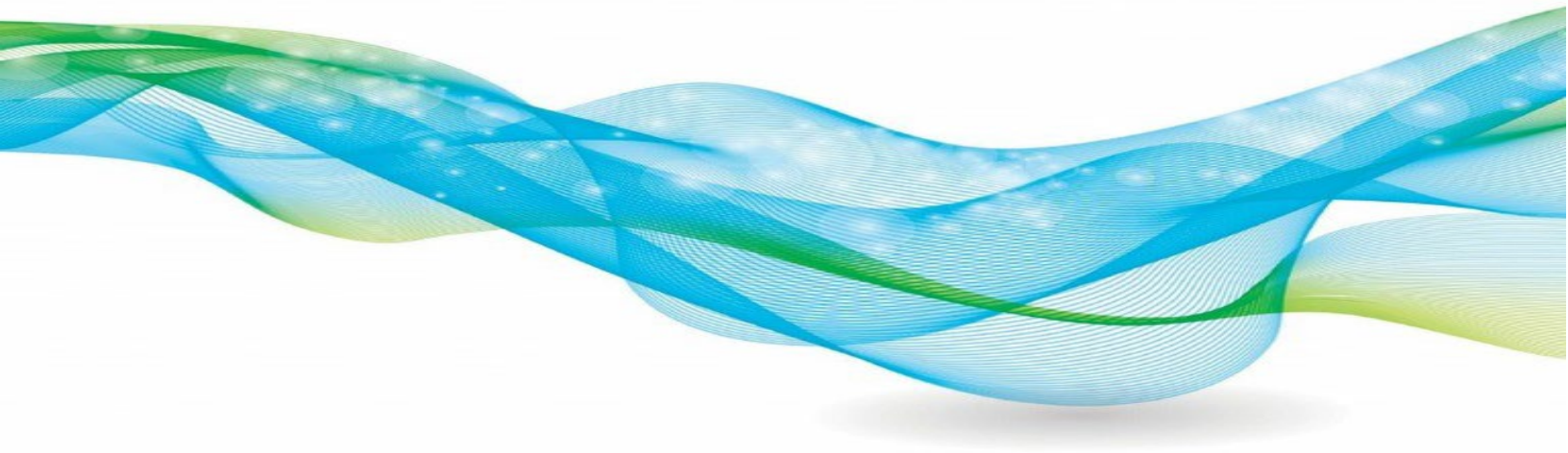

TRANSITION OF LEGACY RELAY USERS RELIANT ON ANALOG TO IP-BASED TELEPHONY RELAY SOLUTIONS

A White Paper

August 12, 2024

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Transition of Legacy Relay Users Reliant on Analog to IP-Based Telephony Relay Solutions

August 12, 2024

Introduction

For more than 35 years, Federal and State governments, have administered programs that enable individuals with hearing and speech disabilities to communicate with their hearing counterparts in a functionally equivalent manner. These programs were developed to satisfy core obligations under the Americans with Disabilities Act of 1990 ("ADA") as well Section 225 of the Communications Act of 1934. For that purpose, the Federal Communications Commission ("FCC") established the Telecommunications Relay Service ("TRS") program initially in 1991 to ensure that TRS providers offer telephone services for persons who are deaf, deafblind, hard-of-hearing or who have speech disabilities that are functionally equivalent to voice communications services.

Since the initiation of these service obligations, the telecommunications industry has undergone transformative innovations in network, user equipment and applications technologies. This period saw the advent of the internet and IP-based technologies, the proliferation of mobile and fixed wireless technologies, the development of Wi-Fi, the evolution of video services, as well as the introduction of social media, texting and other methods of communication that continue to emerge. Today, these technology advancements are essential to the way Americans commonly access information and interact.

From time to time, Federal and state policymakers rightfully have reassessed the TRS requirements to adapt to advances in technology and adjusted the TRS rules in order to achieve the core mission of ensuring that individuals with hearing and speech disabilities have access to functionally equivalent communication services.

This White Paper explores the current compelling need for Federal and state policymakers to proactively adapt TRS obligations and programs to reflect the evolution of the country's analog telecommunications networks to IP-based networks. These network changes have reshaped the use and demand for updated TRS solutions rendering some solutions increasingly obsolete for many but still the solutions of choice for important parts of the affected community. This Paper discusses trends in technology usage and alternative strategies, such as Real-Time Text (RTT), that could serve as a transitional solution in an IP-based network environment. The transition from traditional analog communication systems to more advanced digital and IP-based networks is accelerating. Government entities are urged to analyze and actively manage this transition. Close coordination between Federal and state government entities and public outreach through multiple channels will be important to educate and guide the diverse populations that are affected through this transition. Attention also must be paid to the impact of the technology transition on emergency services. The FCC is uniquely positioned to facilitate the evaluation of replacement TRS solutions, such as wireline RTT, and will need to initiate proceedings to consider appropriate rule changes to implement any update.

I. Background

The Federal Communication Commission (FCC) established the national Telecommunications Relay Service (TRS) Fund to ensure that individuals who are deaf, deafblind, hard-of-hearing, or who have speech disabilities can communicate with their hearing counterparts in a functionally equivalent manner. In 2011, Consumer Groups released their *TRS Policy Statement* with recommendations to ensure that these populations have access to functionally equivalent telecommunications, as mandated by the Americans with Disabilities Act (ADA). The *TRS Policy Statement* urged the FCC to "make proactive assessments to determine whether the TRS Fund continues to provide functional equivalency."[1] Although the TRS Fund currently supports multiple relay service operations, certain legacy relay options, Teletypewriter (TTY) and Captioned Telephone Service (CTS), are becoming obsolete without suitable replacements. As networks continue to transition from analog to Internet Protocol (IP), the FCC and Department of Justice (DOJ) should be proactive in updating rules and regulations, and directing public outreach, to ensure that individuals who are deaf, deafblind, hard-of-hearing, and who have speech disabilities can transition from legacy TTY services to Real-Time Text (RTT) and IP-based relay services to fulfill the ADA's mandate of functionally equivalent communications.

TTY is a device that allows people who are deaf, deafblind, hard-of-hearing, or who have speech disabilities to communicate over the phone. TTYs use a text-based interface to send and receive messages, and are connected to the phone network using an analog modem. CTS, which can be analog or Internet Protocol (IP) based, uses captioned phones with built-in screens and applications that display real-time text captions for people with hearing loss who have some residual hearing.

In recent years, there has been a growing trend towards IP-based telephony solutions, which are incompatible with TTY and analog CTS, and in some rare cases, also with IP CTS. As the North American telephony infrastructure transitions to IP-based solutions, legacy relay users will need to find new ways to communicate over the phone. This White Paper explores the transition of legacy relay users to IP-based telephony relay solutions, and addresses the following questions:

- What is the statutory and regulatory landscape?
- How many legacy TTY and CTS relay users remain across the United States?
- What alternatives are available to TTY and CTS legacy relay users as analog networks are decommissioned?
- What role does RTT play in providing a solution for legacy TTY and CTS relay users as they transition to IP-based solutions?
- What is the time horizon for the North American Telephony infrastructure to be completely transitioned away from analog to digital and IP-based solutions?
- What methods are available for government entities to notify legacy relay users of the transitions underway and the impact on their future use of analog relay services?

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[1] Consumer Groups' TRS Policy Statement - Functional Equivalency of Telecommunications Relay Services: Meeting the Mandate of the Americans with Disabilities Act, FCC (Apr. 12, 2011), available at: https://www.fcc.gov/ecfs/document/6016375700/1 (*TRS Policy Statement*).

- How does the transition to IP networks impact emergency communications by legacy TTY and CTS relay users?
- What steps should policymakers take to ensure continued access to functionally equivalent communications for legacy relay users?

II. What is the statutory and regulatory landscape?

Title II of the ADA provides that "no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity," and requires that the DOJ promulgate regulations to implement this provision.[2] Pursuant to this mandate, in 1991, DOJ promulgated its "effective communication" regulations, which require public entities to take appropriate steps to ensure that communications with individuals with disabilities are as effective as communications with others.[3] DOJ regulations also require public entities to provide appropriate auxiliary aids and services where necessary to allow individuals with disabilities an equal opportunity to participate in, and enjoy the benefits of, a public service, program, or activity.[4] Appropriate auxiliary aids include voice, text, and video-based telecommunications products and systems, including TTYs "or equally effective telecommunications devices."[5]

The Communications Act of 1934, as amended (Communications Act) requires the FCC to adopt rules to ensure that certain communications services and equipment are accessible to persons with disabilities.[6] In accordance with this directive, FCC rules require common carriers as well as VoIP providers, to offer 711 abbreviated dialing access to TRS via a voice telephone or TTY.[7] Additionally, FCC rules require that telecommunications services and equipment and advanced communication services and equipment be accessible and usable by individuals with disabilities,

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2 42 U.S.C. §§ 12132, 12134.

3 *See* 28 C.F.R. § 35.160(a). *See also* Order No. 1512–91, 56 FR 35716, July 26, 1991, *as amended by* AG Order No. 3180–2010, 75 FR 56183, Sept. 15, 2010.

4 *See* 28 CFR 35.160(b)(1).

5 *See* 28 C.F.R. § 35.104. *See generally* Public Law 101–336, 104 Stat. 327 (1990) (codified as amended at 42 U.S.C. 12101, *et seq*.).

6 *See* 47 U.S.C. §§ 225, 255, 617.

7 *See* 47 C.F.R. § 64.603; *Use of N11 Codes and Other Abbreviated Dialing Arrangements*, CC Docket No. 92- 105, Second Report and Order, 15 FCC Rcd 15188, 15191, para. 3 (2000) (*711 Order*).

subject to "achievability" conditions.[8] Among the specific requirements of these rules are requirements for TTY connectability and TTY signal compatibility.[9]

The Communications Act also directs the FCC to adopt, administer, and enforce regulations governing the provision of interstate and intrastate TRS, including rules on cost separation, which "shall generally provide" that interstate TRS costs are recovered from all subscribers for every interstate service and intrastate TRS costs are recovered from the intrastate jurisdiction.[10] Although the FCC has jurisdiction over both intrastate and interstate TRS, states have the option to exercise primary jurisdiction over the provision of intrastate TRS, with the FCC reviewing and approving individual state TRS programs.[11] If a type of TRS is not made available through a state program, the FCC retains authority to enable cost recovery, including TRS Fund contributions based on the intrastate revenues of telecommunications and VoIP service providers.[12]

The interstate TRS Fund provides for the recovery of TRS costs from shared funds contributed by telecommunications carriers and providers of interconnected and non-interconnected VoIP service.[13] Although initially limited to supporting interstate TRS, the FCC expanded the scope of the Fund to include both interstate and intrastate Internet-based forms of TRS,[14] and subsequently expanded the TRS Fund contribution base to include intrastate as well as interstate end-user

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8 *See* 47 C.F.R. §§ 6.5, 7.5; 14.20(a).

9 *See id*. §§ 6.3(b)(3), (4), 7.3(b)(3), (4), 14.21(d)(3), (4). *See also Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Report & Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, CC Docket Nos. 90-571, 98-67; CG Docket No. 03-123, 19 FCC Rcd 12475, 12481, para. 6 (2004) ("Congress structured section 225 in such a way that although the Commission has jurisdiction over both *intra*state and *inter*state TRS, the states have the option to exercise primary jurisdiction over the provision of *intra*state TRS[.]") (emphasis in original).

10 47 U.S.C. § 225(d)(3).

11 *See* 47 U.S.C. § 225(c), (d)(3)(B), (f); 47 C.F.R. § 64.605.

12 *See* 47 U.S.C. § 225(b), (d)(3).

13 *See* 47 C.F.R. § 64.604(c)(5)(iii); T*elecommunications Relay Services, and the Americans with Disabilities Act of 1990*, CC Docket No. 90-571, Third Report and Order, 8 FCC Rcd 5300 (1993) (*1993 TRS Third Report and Order*).

14 *See Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 98- 67, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 5140, 5152-54, paras. 22-27 (2000) (*2000 TRS Order*); *Provision of Improved Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Petition for Clarification of WorldCom, Inc*., CC Docket No. 98-67, Declaratory Ruling and Second Further Notice of Proposed Rulemaking, 17 FCC Rcd 7779, 7784-87, paras. 15-26 (2002) (*2002 IP Relay Declaratory Ruling*); *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Internet-based Captioned Telephone Service*, CG Docket No. 03-123, Declaratory Ruling, 22 FCC Rcd 379, 390, para. 25 (2007) (*2007 IP CTS Declaratory Ruling*).

revenues to fund Internet Protocol Captioned Telephone Service (IP CTS), Video Relay Services (VRS) and Internet Protocol Relay (IP Relay) services.[15]

III. How many legacy TTY and CTS relay users remain across the United States?

Although no clear statistics exist regarding the number of TTY and CTS relay users that remain across the United States, according to a paper published by the Technology Access Program of Gallaudet University, there were 200,000 to 700,000 TTY users prior to the adoption of current IP based options as of May 2000, based on information gathered at the time from the largest manufacturer of TTYs, Ultratec.[16]

The number of legacy relay users continues to decline as more and more people switch to IP-based solutions. In 2012 there were a total of 4,345,363 interstate TTY TRS minutes of use.[17] In 2012, there were approximately 100,000 TTY users.[18] If the number of interstate TTY TRS minutes of use is divided by the number of users, then on average each TTY user used TTY for 43 minutes in 2012. Fast forward ten years to 2022 and there was a total of 2,662,487 TTY interstate TRS minutes of use.[19] If we assume annual TTY minutes of use per user remained consistent from 2012 (i.e., 43 minutes of annual use per user) then there should have been approximately 61,918 TTY users in 2022.

The minutes for analog-based relay solutions billed to state governed relay programs is evidence of this decline. The graph below represents the decline in aggregated TTY intrastate minutes of use from 2017 (3,062,333) to 2023 (1,286,426) in the following ten (10) states: (1) California, (2) Colorado, (3) Iowa, (4) Maryland, (5) Minnesota, (6) Missouri, (7) North Carolina, (8) Oregon, (9) Virginia, and (10) Wyoming.[20]

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[15] *See Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Structure and Practices of the Video Relay Service Program; Misuse of Internet Protocol Relay Service*, CG Docket Nos. 03-123, 10-51, 12-38, Report and Order, 37 FCC Rcd 8037 (2022) (*2022 VRS & IP Relay Contributions Order*); *Misuse of Internet Protocol (IP) Captioned Telephone Service; Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket Nos. 13-24 and 03-123, Report and Order, 34 FCC Rcd 11265 (2019) (*2019 IP CTS Contributions Order*).

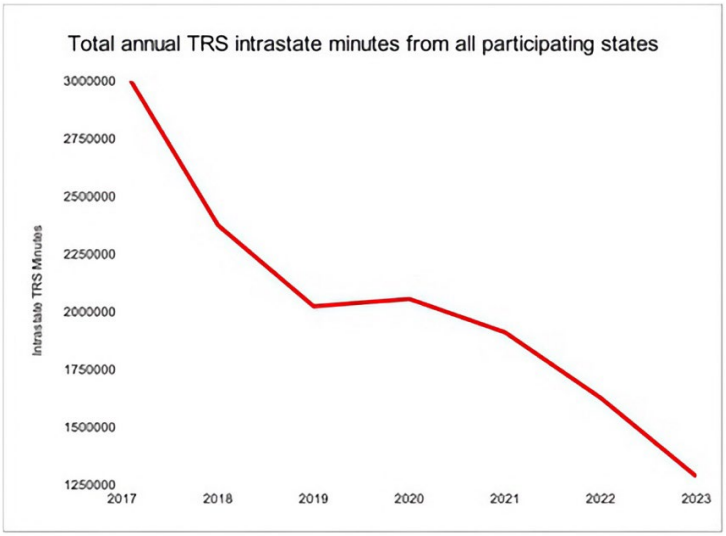
[16] *See* J. Tobias, Gallaudet University Technology Access Program, TTY Access to Voice Services (May 9, 2000).

[17] Rolka Loube 2012 TRS Data, at 82-89.

[18] Emergency Access Advisory Committee (EAAC) Report on TTY Transition, FCC, page 12 (rel. Mar. 2013), available at: https://docs.fcc.gov/public/attachments/DOC-319386A1.pdf.

[19] *See Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Structure and Practices of the Video Relay Service Program*, CG Docket Nos. 03-123 & 10-51, Interstate Telecommunications Relay Service Fund Payment Formula and Fund Size Estimate, Exhibit 1-1 (rel. May 1, 2023) (using conversation minutes).

[20] 2024 Survey of State Relay Administrators Conducted by NASRA National Association for State Relay Administration, The numbers provided by the eight states are aggregated because individual state/provider numbers are not publicly available.



To determine the approximate number of legacy relay customers nationwide, one would have to request reports from each respective state relay program (and their designated/contracted provider) that include the unique number of TTY NPA-NXXs that continue to access their respective relay services for analog TRS, Voice Carry Over and Hearing Carry Over. In a recent Memorandum from Missouri Public Service Commission staff, staff stated that monthly averages for the calendar year 2023 for intrastate analog relay service placed through Relay Missouri included 2,803 minutes and 469 calls.[21] The data indicates 54 Missourians with hearing and/or speech disabilities use analog relay services.[22] Aggregating such data nationwide would yield a very accurate picture of the number of legacy relay users at any given point in time. Such an estimate could be facilitated by the National Association for State Relay Administration (NASRA).

IV. What alternatives are available to legacy TTY and CTS relay users as analog networks are decommissioned?

IP telephony uses the internet to transmit voice and data. This is problematic for individuals who are deaf, deafblind, hard-of-hearing, or who have speech disabilities who only use the Public Switched Telephone Network (PSTN) landlines to communicate. Because TTYs use the Baudot format which is designed for analog voice phone landlines to communicate with other TTYs, these devices do not work reliably on IP networks.[23]

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[21] In the Matter of the Consolidation of The Relay Missouri Fund, Missouri Public Service Commission, File No. TO-2024-0033 (March 1, 2024) ("Missouri PSC Memorandum").

[22] *Id.*

[23] *See e.g.* the AT&T petition for rulemaking, GN Docket 15-178, https://www.fcc.gov/ecfs/search/search-filings/filing/60001095132.

As analog networks are decommissioned, legacy relay users must be educated about and have access to alternative communications solutions. The prominent options are: (1) IP Relay services; (2) IP CTS; (3) VRS; and (4) RTT services. However, the options differ from legacy relay services in important ways.

There are three IP-based TRS options available to legacy relay users. They include IP Relay, IP CTS, and VRS:

- **IP Relay**: IP Relay is a service that allows individuals who are deaf, deafblind, hard-of-hearing, or who have speech disabilities to communicate over the phone, with hearing people using a text-based interface on a computer or web-enabled device.[24] The call is transmitted through the caller's computer or other web-enabled device to an IP Relay communications assistant via the Internet and then the communications assistant relays the call to the receiving party via voice telephone. Currently, IP Relay is offered by T-Mobile.
- **IP CTS**: IP CTS is a service that allows people with varying degrees of hearing loss to communicate over the phone with hearing people utilizing a communications assistant or Automatic Speech Recognition (ASR) supported captioning displayed on the user's customer premise equipment or a web-enabled device connected to the Internet.[25] The communications assistant or ASR listens to the speaker and transcribes the telephone conversation so that the hard-of-hearing individual can read what is being said. IP CTS uses the Internet, rather than the telephone network, to provide the link and captions between the IP CTS user and the IP CTS service provider. IP CTS providers include CaptionCall, CaptionMate, ClearCaptions, Global Caption, Hamilton Relay, InnoCaption, Nagish, NexTalk, and Rogervoice. It should be noted that in some instances, some IP CTS users may experience challenges when attempting to connect RJ-11 plugs to IP phone networks. Some work and some fail due to incompatibilities with ATA adapters.
- **VRS**: VRS is a service that allows individuals who use American Sign Language (ASL) to communicate with hearing voice telephone users using a video interpreter.[26] A video link using the internet allows a communications assistant and the VRS user to view and sign with each other. The communications assistant is also connected to a user on the voice side of the call through telephone and interprets and relays the conversation between the parties to the call. VRS is available through a variety of providers, including Convo Communications, Sorenson Communications, Tive, and ZP Better Together.

While IP-based TRS options are an alternative for legacy relay users, there are some distinct differences between the technologies. For instance:

- IP Relay calls are initiated through a computer or other web-enabled device rather than a traditional landline. This requires the legacy relay user to own and know how to use digital

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[24] Internet Protocol Relay Service (IP Relay), FCC, available at: https://www.fcc.gov/ip-relay.

[25] Internet Protocol Captioned Telephone Service (IP CTS), FCC, available at: https://www.fcc.gov/ipcts.

[26] Video Relay Service (VRS), FCC, available at: https://www.fcc.gov/vrs.

technology, which could be a barrier for senior legacy relay users, those who lack access to high-speed broadband and those who cannot afford broadband. In addition, an IP Relay user would not be able to use voice carry over (VCO) unless the user has a second line to connect to audio.

- IP CTS calls require legacy relay users to speak to the other party on the call rather than communicate via text. Individuals with hearing loss who do not use their voice therefore could not switch to IP CTS. Additionally, IP CTS phones are not always a seamless replacement for analog CTS phones. Some standalone IP CTS phones connect voice through an RJ-11 cable, which in the case of VoIP must be routed through an ATA adapter to convert the analog voice signals to the digital format that VoIP providers use. Gallaudet University has conducted internal testing, and there are known instances of incompatibilities between some IP CTS phones with an RJ-11 cable and specific ATA adapters that result in voice becoming unintelligible.
- VRS calls require users to know ASL and rely on video calls rather than typing text. While much of the deaf and hard of hearing population knows ASL, some do not or might not use it as their primary mode of communication.

Although IP-based TRS services are options for some legacy relay users, they do not fulfil all the needs of individuals who are deaf, deafblind, hard-of-hearing, or who have speech disabilities.

RTT: RTT is the closest substitute for TTY. RTT allows conversations to take place in real-time without having to press "enter" or send"; rather, like their TTY predecessor, messages are conveyed to the receiving party as they are typed or otherwise generated, in the same manner as voice communications. A vast improvement over TTY, however, RTT is an IP-based technology that can be used over a variety of wireless platforms, including computers, smartphones, and tablets. In addition, unlike TTYs, RTT includes the following features: full duplex operation, seamless integration of voice and text, a full international character set, and latency functionally equivalent to real-time voice communications. This makes RTT a versatile and accessible solution for legacy TTY users, but only if they have access to wireless platforms because RTT is not yet a required accessibility solution for wireline telephone communications.

V. What role does Real Time Text (RTT) play in providing a solution for legacy TTY and CTS relay users as they transition to IP-based solutions?

RTT is not currently available natively on wireline voice networks, which limits its utility as a substitute for legacy TTY users. As Consumer Groups noted in the *TRS Policy Statement*, TRS must provide full benefits to all parties on a call, regardless of the complexity and/or cost,[27] which includes providing wireline RTT. Because RTT works only on IP-based networks, and wireless

[27] TRS Policy Statement, at 2.

providers have a small percentage of non-IP (3G) networks remaining, RTT has largely replaced TTY on wireless networks.[28]

In 2016, the FCC adopted a Report and Order amending its rules to relieve wireless service providers and equipment manufacturers of their TTY support obligations, including TTY support on legacy wireless networks, to the extent they support RTT on IP facilities in accordance with the FCC's rules.[29] The Report and Order concluded that it was premature at that time to address RTT in the wireline environment.[30] However, RTT support by wireline providers is desperately needed, as wireline service remains an important source of connection for legacy TTY users. Although an estimated 71.7% of American adults rely on wireless service as their sole telephone service, 28.3% of American adults still retain wireline voice service alongside wireless service.[31] The FCC should follow through on its commitment to "continue exploration on the appropriateness" of using wireline RTT as an alternative to TTY technology to "achieve a universal, integrated text solution for voice services accessibility on wireline IP-based services and end users."[32] It also should implement the recommendation of the FCC Disability Advisory Committee in its Report Prepared by the Real-Time Text Deployment in Wireline Networks Working Group, adopted February 24, 2022. The RTT Report encourages the FCC to issue a Notice of Inquiry considering ways to expand RTT availability, and recommends that any further FCC exploration of wireline RTT evaluate the benefits of RTT on wireline networks, the technical and practical challenges of implementing wireline RTT, and the issues for further consideration detailed in the RTT Report.[33]

Wireline RTT has a number of baseline requirements that the FCC should consider:

- RTT requires an end-to-end IP call path. This means the entire call must be IP based and cannot use analog wireline voice networks. Many parts of the wireline call path, whether the providers' networks or users' terminal equipment, continue to rely on analog infrastructure.

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[28] RTT DAC Recommendation, page 2, fn. 6.

[29] *Transition from TTY to Real-Time Text Technology; Petition for Rulemaking to Update the Commission's Rules for Access to Support the Transition from TTY to Real-Time Text Technology and Petition for Waiver of the Rules Requiring Support for TTY Technology*, 31 FCC Rcd 13568, 13605, para. 71 (Dec. 16, 2016) (*"2016 TTY Order")*.

[30] *See id.* at 31 FCC Rcd 13578, para. 13.

[31] Wireless Substitution Report, data as of December 2022, available at https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202305.pdf.

[32] 2016 TTY Order, 31 FCC Rcd 13578, para. 13.

[33] Recommendation of the FCC Disability Advisory Committee on the Report Prepared by the Real-Time Text Deployment in Wireline Networks Working Group, FCC (Feb. 24, 2022), available at: https://www.fcc.gov/file/22907/download ("*RTT DAC Recommendation*").

- Session Initiation Protocol (SIP) standard must be used for signaling. SIP signaling must follow telephony standards such as using telephone numbers for addressing.
- Supporting interoperation (Interop) is a requirement to pass RTT calls between providers. The Interop connection must be IP, engineered to support audio and text simultaneously, and support SIP signaling standard, with the providers agreeing on interoperability configurations.
- All media elements must adhere to RFC 4103 since the telephone service providers adopted the 4103 safe harbor.
- End-user terminal equipment must support RTT protocols and user interface requirements.

There are over-the-top (OTT) RTT wireline solutions that work for text-to-text communications. These solutions include:

- Hamilton Relay – Conducting user trials for OTT RTT services that would connect its relay services. Hamilton Relay provides the end user an RTT capable phone that contains a large screen and an attached keyboard, a ten-digit phone number, and the OTT VoIP connection.[34]
- nWise – Deploying OTT RTT services using applications on smartphones and internet-connected tables.[35]

As the transition to IP-based telephony continues, RTT is likely to become an increasingly important tool for individuals who are deaf, deafblind, hard-of-hearing, and who have speech disabilities. While other forms of text messaging technologies will continue to provide communication options — such as SMS, and other forms of text/video-based communications emerging on social media such as Instant Messaging, WhatsApp, Facebook, and Instagram and other forms of communication that have ASR built into their platforms — RTT remains unique as the sole means of enabling direct communication over the telephone in real-time without the need to press a button to take other action to send a message to the other party to the conversation.

The FCC should plan proactively for RTT to replace TTY on wireline networks. This effort should include obtaining input from state administrators of intrastate TTY TRS, to replace TTYs on wireline networks with RTT – as well as exploring other IP- and digital-based solutions for these users. Such a transition will require a coordinated effort with various government and public safety entities to develop, for example, pathways to IP based solutions and permission to contact TTY users to ensure continued access to the telephone network.

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[34] *See* RTT DAC Recommendation, at page 6. *See also PUC Approves Real Time Text Pilot under TRS Program to Better Connect Pennsylvanians with Communications Challenges*, PENNSYLVANIA PUBLIC UTILITY COMMISSION (Jun., 18, 2020), available at: https://www.puc.pa.gov/press-release/2020/puc-approves-real-time-text-pilot-under-trs-program-to-better-connect-pennsylvanians-with-communications-challenges.

[35] RTT DAC Recommendation, at page 6. *See also Accessible Emergency Calls with RTT*, NWISE, available at: https://nwise.se/solutions/accessible-emergency-calls-with-rtt/.

VI. What is the time horizon for the North American Telephony infrastructure to be completely transitioned away from analog to digital and IP-based solutions?

The North American Telephony infrastructure is currently in the process of transitioning from analog to digital and IP-based solutions. While previous migration from PSTN to IP-based options for legacy relay consumers have been mostly passive or reactive attempts that vary from state to state and carrier by carrier, in recent years, the FCC has engaged in an aggressive push for widespread broadband deployment.[36] This is accelerating the transition from traditional analog communication systems to more advanced digital and IP-based networks, hastening the phasing out of legacy systems like TTY. Many carriers including Windstream, Verizon, and AT&T have decommissioned copper services in many areas in the United States. In 2020 and 2022, residential connections to copper services fell from 17.9 million to 15.2 million, a reduction of almost 15%.[37] By spring of 2022, Verizon reported that it had transitioned 4.5 million of its circuits from copper to fiber and converted 36 central offices to all-fiber, retiring its copper plant entirely in those locations.[38] AT&T also projects it will have reduced its copper services by 50%, with 75% of its network served by fiber and 5G by 2025.[39]

Efforts to notify consumers of these changes vary. In 2015, the FCC began allowing providers to transition their networks from copper to fiber without FCC approval as long as the change did not "discontinue, reduce, or impair the services provided" and the provider gave 90 days' prior notice to residential customers and 180 days' notice to enterprise customers.[40] However, the FCC subsequently eliminated the requirement that retail customers be notified 90 days before their copper facilities were retired.[41] And, nothing in the FCC rules required carriers, the FCC, or states

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[36] *See, e.g., Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, WC Docket No. 17-84 , Report & Order, 33 FCC Rcd 5660, 5660, para. 1 ("Removing regulatory barriers causing unnecessary costs or delay when carriers seek to transition from legacy networks and services to broadband networks and services is an important piece of our work to encourage deployment of next-generation networks and to close the digital divide.")

[37] *See FCC Releases 2022 Communications Marketplace Report*, GN Docket No. 22-203, 37 FCC Rcd 15514, 15523, para. 19 (2022).

[38] *See* Statement of Kyle Malady, Executive VP & CTO, Verizon Communications Inc. on Verizon Communications Inc. Investor Day (Mar. 3, 2022).

[39] AT&T News Release, AT&T Lays Out Growth Strategy for Company Following Pending Close of WarnerMedia Transaction, (Mar. 11, 2022)

[40] *See Technology Transitions; Policies and Rules Governing Retirement Of Copper Loops by Incumbent Local Exchange Carriers*, GN Docket No. 13-5, RM-11358, WC Docket No. 05-25, RM-10593, Report & Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, 30 FCC Rcd 9372, 9375, para. 5 (2015).

[41] *See Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, WC Docket No. 17-84, Report & Order, Declaratory Ruling, and Further Notice of Proposed Rulemaking, 32 FCC Rcd 11128, 11147, para. 45 (2017).

to advise legacy TTY customers of the impact that copper retirements could have on legacy relay services.

VII. What methods are available for government entities to notify legacy TTY users of the transitions underway and the impact on their future use of analog relay services?

More attention, effort, and action should be brought to ensure legacy TTY consumers are not left behind. These legacy users are often Deaf Plus[42] aging populations that have relied upon analog technology for decades and are not familiar with IP options, or reside in rural areas where IP options are not well supported. These legacy TTY users are often unaware of the network changes that are causing their analog TTYs to no longer work.

The Consumer Groups' *TRS Policy Statement* proposed a goal for the FCC to educate and inform all Americans about the need for, benefits of, and types of TRS to meet the mandate of the ADA.[43] The FCC should plan proactively, including obtaining input from state administrators of intrastate TTY, to address the recommended transition of TTYs on wireline networks to RTT – as well as exploring other IP- and digital-based solutions for these users. Such a transition will require a coordinated effort with various government and public safety entities to develop, for example, pathways to IP based solutions and permission to contact TTY users to ensure continued access to the telephone network. To that end, Federal and State Government entities should notify legacy TTY users of the technology transitions underway and the impact on their future use of analog TTY in a number of ways, including:

- **Canned Messaging through Relay Providers**: State Relay Services could explore the possibility of directing their providers to include an introductory or closing message that would be generated automatically prior to or after conversational use, alerting TTY users of the pending phase out of the analog networks and the impact on legacy TTY users and encouraging users to contact a particular website or entity to obtain assistance migrating to IP solutions prior to the decommissioning of these analog networks. This may require approvals from the FCC prior to implementation to ensure that including such messaging in the Relay Process stream does not violate applicable rules or regulations. Similar messaging could be pushed out through legacy based Analog CTS solutions and would be impacted by the phase out of the analog networks.
- **NPA-NXX Reports**: Each State's TRS contractor provides monthly NPA-NXX reports that quantify the number of TTY users for each NPA-NXX. These reports could be more granular, facilitating a list of unique NPA-NXX-XXXXs still using TTY today. Such a list could then be cross referenced with the corresponding last mile local exchange carrier databases to identify the location information (registered physical address and potential

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[42] "Deaf Plus" refers to an individual who is deaf or hard of hearing in addition to having other medical, physical, emotional, cognitive, educational, or social challenges. *See Proposed Priority—Training of Interpreters for Individuals Who Are Deaf or Hard of Hearing and Individuals Who Are Deaf-Blind Program*, 81 Fed. Reg. 27375, 27377, n.2 (May 6, 2016).

[43] TRS Policy Statement, page 8.

email) for each TTY user. While this information is proprietary, special permissions could be sought from the FCC or appropriate governing agency to use this information to make direct contact with legacy TTY users. Prior to this happening, a formal request and formal approval would need to be secured. Once reports are generated or received, a designated entity could conduct targeted outreach to known legacy users of analog TTY to provide information on IP-based options and equipment available.

- **Direct mail**: The FCC could authorize government entities to send direct mail to legacy TTY users informing them of the transitions underway and the resources available to help them transition to IP-based solutions. Such mailing lists may be available through Equipment Distribution Programs (EDPs) where they exist or with state TRS contractors and last mile local exchange providers that deliver ANI/ALI and information digits to populate Call Detail Records. Government entities, including state relay providers, should be allowed access to such mailing lists through providers using the process listed under the "NPA-NXX Reports."
- **Email**: The FCC could authorize government entities to send emails to legacy TTY users informing them of the transitions underway and the resources available to help them transition to IP-based solutions. Such email lists may be available through EDPs where they exist or with state TRS contractors and last mile local exchange providers that deliver ANI/ALI and information digits to populate Call Detail Records. Government entities, including state relay providers, should be allowed access to such email lists through providers using the process listed under the "NPA-NXX Reports."
- **Website**: Government, not for profit, or for-profit entities (i.e., providers of equipment and relay services) could create coordinated/referrable websites that provide information about the transitions underway and the resources available to help legacy TTY users transition to IP-based solutions.
- **Social media**: Government entities can use social media to reach out to legacy TTY users and inform them of the transitions underway and the resources available to help them transition to IP-based solutions.

Because not all states have EDPs, additional direct mail and email options should also be explored.

VIII. How does the transition to IP networks impact Emergency Communications by Legacy TTY and CTS relay users?

Pursuant to its mandate under Title II of the ADA, DOJ requires Public Safety Answering Points (PSAPs) nationwide to provide direct, equal access to telephone emergency centers for individuals with disabilities who use analog TTYs.[44] "Direct" access means that PSAPs can directly receive TTY calls without relying on an outside relay service or third-party services and "equal" access

[44] *See* 28 CFR 35.162; 75 Fed. Reg. 43446 (Jul. 26 2010) ("The Department has interpreted title II so as to require that PSAPs provide 'direct, equal access' to 9-1-1 for individuals with disabilities who use TTYs.").

means that the telephone emergency services provided for TTY users are as effective as those provided for persons who make voice calls.[45]

Unlike DOJ, which continues to recognize TTY as the sole non-voice emergency access option mandated by the ADA, the FCC has initiated a series of proceedings to adapt its public safety regulations to the realities of an emerging IP-based telecommunications environment, including the gradual replacement of legacy circuit-switched 911 networks with IP-based networks as state and local 911 authorities transition to Next Generation 911 (NG911).[46] For example, as legacy users of analog TTY transition to IP Relay services, they face additional challenges of tethering the geolocation of the wireless device to the iTRS phone number attached to the Video Phone or IP Relay assigned phone number, and transmitting that location to the PSAP, which is not yet feasible through today's relay platforms. To address these issues, on June 8, 2023, the FCC adopted a Notice of Proposed Rulemaking (NPRM) seeking comment on a proposal to require wireline, interconnected VoIP, and IP-based TRS providers to deliver 911 calls, including associated location information, in the requested IP-based format, to the designated PSAP when notified that the PSAP is ready to receive NG911 calls.[47] It is anticipated that industry, consumer advocates, and government entities will explore some solutions to how the wireless assigned phone number used to host the Video Phone application will be able to tether the two numbers to create a one number solution and pass the geolocation onto the IP Relay provider.

The FCC also recently adopted rules to address misrouting of wireless 911 calls and RTT communications to 911, which have historically been directed to emergency call centers based on the location of the cell tower that handles the call rather than the call center that serves the caller's location. Re-routing these calls wastes valuable time and resources during emergencies. To address this issue, on January 25, 2024, the FCC issued an order requiring all wireless carriers to implement location-based routing nationwide for wireless calls and RTT communications to 911 call centers to allow these communications to be routed based on the location of the caller rather than the location of the cell tower that handles that call.[48] Using this precise location information to route 911 calls will result in millions more wireless 911 callers reaching emergency responders without the need for transfer or delay.

Efforts to address public safety issues impacting individuals with disabilities are undermined by the mismatch between the FCC's policies supporting rapid deployment and use of new NG911 technology and DOJ's outdated regulations that fail to account for evolving technologies. With the

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[45] *See* Department of Justice, 9-1-1 and Emergency Communications Services, ADA Best Practices Tool Kit for State and Local Governments (Feb. 27, 2007), *available at* https://archive.ada.gov/pcatoolkit/chap4toolkit.htm.

[46] *See, e.g., Facilitating Implementation of Next Generation 911 Services (NG911)*, PS Docket No. 21-479, Notice of Proposed Rulemaking, FCC 23-47 (2023).

[47] *See Facilitating Implementation of Next Generation 911 Services (NG911)*, PS Docket No. 21-479, Notice of Proposed Rulemaking, FCC 23-47 (2023).

[48] *See Location-Based Routing for Wireless 911 Calls Report and Order*, PS Docket No. 18-64, Report and Order, FCC 24-4 (2024).

nation increasingly operating on an IP-based telecommunications network that is incompatible with TTY technology, DOJ must update its Title II regulations to ensure that individuals who are deaf, deafblind, hard-of-hearing or who have speech disabilities have access to reliable emergency communications to the same extent as other populations. Conversely, the FCC must require carriers to provide reliable emergency communications for those individuals that still rely on TTY and have not adopted alternative relay services. As explained above, TTY does not work on IP-based networks – it works on analog. DOJ and FCC must coordinate to develop a comprehensive regulatory framework that supports accessible emergency communication services for *all* individuals with disabilities.

IX. What steps should policymakers take to ensure continued access to functionally equivalent communications for legacy TTY and CTS relay users?

Given that there is no alternative relay option available that provides an identical service for legacy TTY users, this Paper makes the following recommendations regarding wireline RTT, which is the closest substitute:

1. ***In accordance with the RTT DAC Recommendation, issue a Notice of Inquiry to evaluate expanding RTT availability and challenges associated with wireline RTT***. FCC guidance is needed on the phasing-out of TTY and expansion of RTT availability.[49] State relay programs are struggling with the transition. For instance, some states are considering eliminating their legacy TTY programs as well as the relay funds required to support them,[50] while other states have already eliminated their CTS programs. State relay programs need the FCC's guidance on the appropriate steps and processes for these drastic changes because the elimination of such programs will put the burden of providing services on either the FCC or local telecommunications companies, which would have a ripple effect if fees are no longer collected.

   History shows that when the FCC becomes involved in potential discontinuances of service to customers, companies find ways to meet consumers' needs. For example, in the case of Barrier/Fire Island, in 2013, Verizon entities located in New York and New Jersey filed applications requesting authority[51] to discontinue interstate wireline telecommunication services in certain parts of New Jersey and New York where copper facilities were destroyed and rendered inoperable by Hurricane Sandy.[52] Verizon proposed to offer

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[49] *See* Missouri PSC Memorandum, at 6 (stating even with low usage, "[a]bsent more FCC guidance, it seems premature for any state commission to consider phasing-out analog relay service because it will likely create a chaotic situation if common carriers must somehow take-over this responsibility.").

[50] *See* Missouri PSC Memorandum, at 4-6.

[51] 47 C.F.R. § 63.71

[52] Letter from Frederick E. Moacdieh, Executive Director – Federal Regulatory Affairs, Verizon, to Marlene H. Dortch, Secretary, FCC, Attach., WC Docket No. 13-150 (filed June 7, 2013).

Verizon Voice Link to customers – a wireless, rather than wireline, voice service. The FCC removed the application from streamlined processing as stakeholders raised concerns about Verizon's proposed discontinuances. In light of the FCC's response, Verizon decided to deploy fiber to the western portion of Fire Island, New York given the unique circumstances there, including the absence of another wireline provider, and withdrew its request for discontinuance for that portion.[53] The Barrier/Fire Island case demonstrates that when the FCC gets involved with the potential discontinuance of wireline options available to consumers, companies provide alternative, comparable options. Similar FCC involvement is necessary to ensure that legacy TTY and CTS users are not left behind during the transition to IP networks.

2. ***Update existing regulations to account for changes in relay technology to ensure individuals who are deaf, deafblind, hard-of-hearing, or who have speech disabilities can communicate to the same extent as a hearing individual***. Many government agencies continue to use wireline voice service, not wireless, to communicate with the public. With TTY becoming obsolete, the importance of wireline RTT is crucial, and regulations must be updated accordingly. For example, DOJ regulations regarding telecommunications currently require public entities to communicate by telephone with applicants and beneficiaries who are deaf, deafblind, hard-of-hearing, or who have speech disabilities with a TTY or equally effective telecommunications systems.[54] Public entities that use an automated-attendant system or an interactive voice response system must also provide effective real-time communication with individuals using auxiliary aids and services, including TTYs and all forms of FCC-approved telecommunications relay systems.[55] As TTY's are becoming obsolete, such regulations should be amended to require RTT – specifically, wireline RTT. In addition, DOJ's rules currently require telephone emergency services, including 911 services, to provide direct access to individuals who use TTYs and computer modems. [56] The rules should similarly be updated to require telephone emergency services, including 911 services, to provide direct access to individuals who use RTT and other IP options to ensure they have access to emergency services.

X. Conclusion

The transition of legacy TTY and CTS relay users to IP-based relay solutions is a complex process. However, there are a number of resources available to help legacy TTY users make the transition. Federal and State Government entities can play a significant role in this process by providing

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53 Letter from William H. Johnson, Verizon, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 13-150 (filed Sept. 11, 2013); Letter from Maggie McCassidy, Verizon, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 13-150 (filed Sept. 27, 2013).

54 28 C.F.R. § 35.161.

55 *Id.*

56 28 C.F.R. § 35.162.

information and resources to legacy TTY and CTS relay users, being actively involved in the transition to IP-based networks, and updating regulations. RTT is a versatile and accessible solution that can help legacy TTY users communicate in real time over a variety of platforms. As the transition to IP-based networks continues, the FCC and DOJ should be proactive in updating rules and regulations, and direct public outreach, to ensure that individuals who are deaf, deafblind, hard-of-hearing, and/or who have speech disabilities can transition from legacy TTY services to RTT and IP-based relay services to fulfill the ADA's mandate of functionally equivalent communications.