

November 7, 2006¹

**EXPECTATIONS OF THE DEAF AND HARD-OF-HEARING COMMUNITIES FOR
COMPREHENSIVE FEDERAL ACTION TO ACCELERATE EMERGENCY-9-1-1 ACCESS**

The E-9-1-1 Stakeholder Council, supported by Telecommunications for the Deaf and Hard of Hearing, Inc. ("TDI"), appreciates the opportunity to share its expectations of the deaf and hard of hearing communities for comprehensive federal action in support of consumer needs and requirements in regard to 9-1-1 services. TDI is deeply troubled by the fact that people with disabilities are moving to newer, more efficient Internet-based technologies for communication that cannot be received by 9-1-1 Public Safety Answering Points ("PSAPs") with or without enhanced identity and location information. As time passes, more and more consumers are dropping the older technologies, which have little purpose in their lives other than the ability to call 9-1-1. For VoIP consumers, the government acted to bridge the gap when access to 9-1-1 was threatened by technology migration. For deaf, hard of hearing, and speech disabled consumers, who are increasingly cut off from 9-1-1, there has not been comparable action.

All Americans need rapid action from first responders. Therefore, all stakeholders in the provision of emergency number services must be committed to define and implement short-term and long-term solutions to ensure that those who are deaf, hard of hearing, or with speech disabilities can summon critical emergency services when needed.

There are two basic approaches that need to be supported: *Direct* access to 9-1-1 and communication with the PSAP call-taker in text or a combination of text and voice; and *indirect* access via any approved form of telecommunications relay service ("TRS"), where a communications assistant or interpreter is involved in the call and the PSAP call-taker experiences the call as a voice call. (Brief descriptions of current methods of direct as well as indirect/relayed communication services are included in the Appendix.)

I. Consumer Needs in Relation to 9-1-1 Accessibility

PSAPs, which now accept only telephone calls and TTY calls, are only beginning the process of transition needed to accommodate newer network technologies. Consumers with disabilities see a need for adequate funding to allow PSAPs to upgrade to an Internet Protocol ("IP") environment that is compatible with disabled-consumer advanced technologies such as those listed in the Appendix. Unfortunately, at this point, preparations for disability accessibility

¹ As new ideas and technologies develop, the thinking and recommendations contained in this paper will evolve to remain current. As a result, this paper will always be a work in progress.

have not yet been specified, nor have existing regulations mandating 9-1-1 accessibility been revised since their creation more than fifteen years ago.²

To illustrate the real impact of this dangerous technological gap on users, we repeat the stories of two deaf students from Gallaudet University as initially told in comments recently filed at the FCC:

The first involved a student who has a TTY but was paged by her friend who did not have phone service, requesting that she make a 9-1-1 call for him—which she did. In the second situation, the student was injured but did not have a TTY. Her roommate tried to use IP relay to reach 9-1-1 and saw that 9-1-1 calls were not possible; she then looked up the DC government main number, called that number through the IP relay service and was routed to a responder. In both situations, considerable time was spent in summoning agency assistance because both individuals had to get the help of another individual before being able to access 9-1-1.³

Another story forwarded to us involved a deaf resident who, upon smelling the strong smell of natural gas, abandoned the resident's dwelling. Before leaving the house, the resident dialed 9-1-1 and left the receiver off the hook. The resident also took a laptop computer. After reaching a safe distance from the home, the resident attempted to reach a PSAP using both VRS and IP Relay from the laptop, still using the Wi-Fi network from the house, but could not access the PSAP successfully. Nor was there a response based on the silent 9-1-1 call made prior to leaving the home. The resident was finally able to reach the local fire department only after obtaining the department's ten-digit number.

Other stories point to untrained operators or non-working devices as the problem:

- One involved an operator calling back the caller of a TTY-initiated 9-1-1 call, but using a voice telephone rather than a TTY device.

² The rules implementing Title II of the Americans with Disabilities Act, 28 C.F.R. §§ 35.101-35.190 (2006), were first published by the Department of Justice in the Federal Register on July 26, 1991. Final Rule, 56 Fed. Reg. 35694 (July 26, 1991). The section of the rule encompassing 9-1-1 accessibility provisions, 28 C.F.R. § 35.162, has not been revised since that initial publication. The current state of affairs for 9-1-1 access is not consistent with the charge given to the FCC by Congress. 47 U.S.C. § 225(d)(2) ("ensure that regulations prescribed to implement this section encourage . . . the use of existing technology and do not discourage or impair the development of improved technology.").

³ *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket No. 03-123, Comments of the Rehabilitation Engineering Research Center on Telecommunications Access 2 (Feb. 22, 2006), at <http://tap.gallaudet.edu/FCC/RERC%20IPRVRS911Dkt03-123.doc>.

- In another situation, that involved a shooting, a TTY user called 9-1-1 and while the PSAP could read the TTY message, the caller could not read the PSAP's response due to technical difficulties.
- A third involved the Baudot tones from a CapTel device not automatically opening the TTY window at the PSAP. (The computers at that PSAP were set up so that as soon as they "hear" the Baudot tones from a TTY, they open up the TTY window so that the dispatchers can type back a response.)

The following list of consumer considerations is intended as a guide to discussions on accessibility issues surrounding next generation 9-1-1 and the associated PSAP technology. It includes both short-term and long-term considerations.

General Technological Considerations

- a. Access to 9-1-1 should be made available through as many of the communications technologies outlined in the Appendix as is technically feasible.
- b. Automatic location identification ("ALI") technologies should be employed on a basis that is functionally equivalent with those employed for voice calls. Among other benefits, such an automated system alleviates some of the disadvantages of some non-voice communications (*e.g.*, typing of responses is usually slower than voice communications).
- c. Relay call center personnel must be able to instantaneously route emergency communications to specific PSAPs through the 9-1-1 calling network. If not feasible to use selective routers in certain situations, then PSAPs must fully accommodate contacts through the "back door," that is, to have a method by which the relay center can transparently pass through location and other data made available from the user's equipment to a non-9-1-1 number associated with the PSAP.
- d. Automated and instantaneous "call backs" from the PSAP to the caller must be supported.
- e. PSAP technologies must accommodate direct text communications in all of a PSAP's operations: recording of conversations, queuing, etc.

General Procedural Considerations

- f. Operating procedures should be standardized nationwide at all levels: users, relay services, and PSAPs. There should be a centralized source of information on 9-1-1 access, such as an official webpage, with instructions in text, audio, and video (available in ASL).
- g. Protocols must be user-friendly and be conducive to easy familiarity. Special procedures or equipment necessary just for 9-1-1 calls must be avoided because

consumers should not need to figure out special procedures at the time of an emergency and may not have specialized 9-1-1 equipment available.

- h. Both direct and relayed methods of contacting 9-1-1 must be supported. The arrival of a text or relay call should be transparent to the PSAP call taker and not require any unusual procedures on behalf of the PSAP personnel.
- i. To the extent that specialized procedures for relaying emergency calls (indirect method) are needed (*e.g.*, specialist communication assistants or interpreters), minimum training standards need to be addressed on a nationwide scope. Any rulemaking on such minimum training standards must incorporate input from a broad constituency, including consumers, the relay industry, and the PSAP industry.
- j. Likewise, nationwide standards on periodic testing of 9-1-1 systems are needed to ensure that access via text and relay services is as reliable as access via voice services.

"Functionally Equivalent" Service Considerations

- k. Connection wait times should be comparable to what is in effect today for voice callers to 9-1-1. Many states have established a standard of the PSAP answering the call within ten seconds ninety percent of the time.⁴ The same should be the case when a relay service answers an emergency call. If necessary for some technologies, phase-in targets may be specified but must feature enforceable deadlines.
- l. Realistic expectations with respect to connection wait times must be communicated to users. If delays are present in the system, users must be informed of this in real-time by a method compatible with the user's own technology.

⁴ See, *e.g.*, **California**: State of California, *9-1-1 Operations Manual*, at I.2 (July 1997), available at <http://www.documents.dgs.ca.gov/td/911/Chapter1.pdf>; **District of Columbia**: United States' Memorandum of Points and Authorities in Opposition to Defendants' Motion to Amend Judgment and Vacate Injunctive Relief, in *Miller v. District of Columbia*, CA No. 96-CV02833 (SS) 18 (D.D.C. 1997), available at <http://www.ada.gov/briefs/millerbr.doc>; **Massachusetts**: Massachusetts Statewide Emergency Telecommunications Board, *Standards for Enhanced 9-1-1*, 560 MASS. CODE REGS. 2.00, App. A, ¶ (1)(a)(4)(b), at 14 (June 2002), available at <http://www.mass.gov/Eeops/docs/setb/standards.pdf>; **New Jersey**: N.J. ADMIN. CODE § 17:24-2.3(a), available at <http://www.nj.gov/911/regulations.html>; **New Mexico**: N.M. ADMIN. CODE § 10.6.2.11(C)(17), available at <http://www.nmcpr.state.nm.us/nmac/parts/title10/10.006.0002.htm>; **Pennsylvania**: 29 Pa. Bull. 1717 (to be codified at 4 PA. CODE § 120d.105(a)(5)), available at <http://www.pabulletin.com/secure/data/vol29/29-14/536.html>.

- m. Because of the delay inherent in sending 9-1-1 requests through a relay service (as compared to voice communications), such requests must be assigned top priority by the TRS facility. A method must be devised to immediately signal a 9-1-1 call request to the relay service. One suggested method is to allow the user to combine the 7-1-1 and the 9-1-1 codes in a way that immediately alerts the relay service to the critical nature of the incoming request.
- n. Requirements imposed on Internet-based relay users to register addresses (either physical locations or IP addresses) for authentication of contacts cannot be more burdensome than that required today of non-relay or voice callers.

II. Federal Regulatory Background

Title II of the Americans with Disabilities Act of 1990 ("ADA") mandates accessibility to state and local government services, including emergency number 9-1-1 services.⁵ Title IV mandates the provision of TRS for people with hearing or speech disabilities as a means of attaining functional equivalency to voice telephone service.⁶ Both the Department of Justice ("DOJ") Civil Rights Division and the Federal Communications Commission ("FCC") have promulgated rules to implement the ADA in the context of emergency telecommunications.⁷ The DOJ and the FCC continue to share responsibility for the implementation and enforcement of these provisions.⁸ The Telecommunications Act of 1996 added accessibility obligations on telecommunications equipment manufacturers and providers of telecommunications services.⁹

In the vast majority of locations, voice telephone customers (whether wireline or wireless), place emergency calls by dialing 9-1-1. The call is routed to a Public Safety Answering Point ("PSAP") through a selective routing system based upon the location of the caller.¹⁰ The PSAPs, which are generally operated by state and local governmental entities, are

⁵ The Attorney General possesses this power over public entities by virtue of Title II of the ADA. Americans with Disabilities Act of 1990, § 202, Pub. L. 101-336, 104 Stat. 327 (codified at 42 U.S.C. § 12132) ("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").

⁶ ADA § 401, Pub. L. 101-336, 104 Stat. 327 (codified at 47 U.S.C. § 225).

⁷ 28 C.F.R. §§ 35.160-35.164 & 47 C.F.R. §§ 64.601-64.605.

⁸ U.S. Department of Justice, Americans with Disabilities Act: Access for 9-1-1 and Telephone Emergency Services (July 1998) [hereinafter USDOJ ADA], *at* <http://www.usdoj.gov/crt/ada/911ta.pdf>; FCC Consumer & Governmental Affairs Bureau, What You Need To Know About TRS, *at* <http://www.fcc.gov/cgb/dro/trs.html>.

⁹ Telecommunications Act of 1996, § 101(a), Pub. L. 104-104, 110 Stat. 56 (1996); *see also* FCC, Section 255: Telecommunications Access For People with Disabilities (2005), *at* <http://www.fcc.gov/cgb/consumerfacts/section255.html>.

¹⁰ In the case of traditional wireline telephony, the call is routed to the PSAP based on the telephone number of the 9-1-1 caller. In the case of wireless telephony, the location of the cell site where the call originates is used to route the call to the appropriate PSAP.

in communication with the local first responders. There are currently about 7,650 registered PSAPs in the United States.¹¹ ADA requirements for telephone emergency services are imposed on these PSAPs through the broad reach of rules promulgated by the DOJ.¹² Indeed, the DOJ has taken enforcement action against localities that are not in compliance with the ADA requirements for 9-1-1 services.¹³

The reach of the FCC with respect to PSAPs, in contrast, extends to common carriers in their role as providers of network access to the 9-1-1 system and to TRS providers, but not to the state governments who fund and operate the PSAPs.¹⁴ The rules promulgated by the FCC that impose "mandatory minimum standards" for TRS can only be enforced against a "common carrier engaged in interstate communication."¹⁵ These minimum standards currently require only the provision of tele-typewriter (TTY) services.¹⁶ The FCC minimum standard on the handling of emergency TRS calls is:

Providers must use a system for incoming emergency calls that, at a minimum, automatically and immediately transfers the caller to an appropriate [PSAP]. An appropriate PSAP is either a PSAP that the caller would have reached if he had dialed 911 directly, or a PSAP that is capable of enabling the dispatch of emergency services to the caller in an expeditious manner.¹⁷

¹¹ FCC, PSAP Registry, at <http://www.fcc.gov/911/enhanced/reports/psapregistry.html>.

¹² 28 C.F.R. § 35.160 (applying ADA requirements to PSAPs) and 28 C.F.R. § 35.162 (requiring provision of "direct access to individuals who use TDD's and computer modems.").

¹³ See, e.g., Settlement Agreement Between the United States of America and the Communication District for the Parish of Washington, Louisiana (Aug. 11, 2004), at <http://www.usdoj.gov/crt/ada/waparish911.htm>.

¹⁴ *IP-Enabled Services; E911 Requirements for IP-Enabled Service Providers*, WC Docket No. 04-36, WC Docket No. 05-196, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd. 10245, at ¶ 7 (2005) [hereinafter *9-1-1 Technical and Operational Issues*] ("Responsibility for establishing and designating PSAPs or appropriate default answering points, . . . retaining and training PSAP personnel, purchasing 911 network services, and implementing a cost recovery mechanism to fund all of the foregoing, . . . falls squarely on the shoulders of states and localities."); GAO Report, at 2-3 ("The only federally mandated timeframes for installation of wireless E9-1-1 technologies are those placed on wireless carriers by FCC. FCC has no authority to place timeframes on PSAPs, which are under state and local jurisdiction.").

¹⁵ 47 C.F.R. § 64.602 ("Jurisdiction.").

¹⁶ 47 C.F.R. § 64.604(a)(3)(v). In this section, there is also a requirement that PSAPs support Voice-Carry Over ("VCO") and Hearing-Carry Over ("HCO"); these are modifications of the TTY scheme in which (a) the hearing caller can hear the speaker who is deaf or hard of hearing; or (b) the speech-impaired caller can hear the other speaking party, respectively. See USDOJ ADA, *supra* note 8, at 6-7.

¹⁷ 47 C.F.R. § 64.604(a)(4).

III. Regulations in the States

States and localities have addressed 9-1-1 requirements for PSAPs through varied regulatory frameworks. To the best of our knowledge, however, there are no state regulations that exceed the requirements of the Department of Justice for accessibility. In other words, no state has taken the regulatory action of requiring that modern alternatives to TTY and TTY relay service be provided for deaf or hard of hearing consumers.

IV. Proposed Future Legislative and Regulatory Directions

TDI urgently seeks to convince policymakers at all levels of the need to act swiftly to both implement nationwide technological improvements in 9-1-1 emergency services for people who are deaf and hard of hearing and to promote flexibility in the technologies used to provide those services. With the rising popularity of Internet-based communications services used by the deaf and hard of hearing communities, and the resultant reduction in Public Switched Telephone Network ("PSTN")-based TTY use, the current minimum federal standards—for TTY direct access imposed on state and local governments for 9-1-1 service—are not sufficient to meet either the needs or desires of the deaf and hard of hearing communities. In other words, the current minimum 9-1-1 standards for TTY do not address the 9-1-1 needs of Internet-based TRS users.

At this moment, a unique window of opportunity for comprehensively addressing access to 9-1-1 services for people who are deaf and people who are hard of hearing is presented by virtue of ongoing regulatory activities relating to the implementation of VoIP 9-1-1 emergency services. The solutions developed for VoIP 9-1-1 can be applied to many of the Internet-based communications technologies outlined in the Appendix of this paper. . Solutions for connecting Internet-based emergency calls to the PSAPs, as well as reliable methods of determining the geographic location of the caller, are necessary before truly accessible emergency communications can be realized for persons with hearing and speech disabilities. It is therefore critical to establish now the priority need of the deaf and hard of hearing communities for access to emergency services.

An example of the systemic approaches being currently developed is the "internetwork," proposed by the Seventh Council of the Network Reliability and Interoperability Council ("NRIC").¹⁸ Defined loosely as "a set of policies, tools, interfaces and standards that connect securely the multiplicity of local, regional and national wireline and wireless networks,"¹⁹ the

¹⁸ NRIC is a consortium of the FCC, telecommunications companies, trade organizations, and public safety agencies. A final report by Focus Group 1 on Enhanced 9-1-1 of the NRIC Seventh Council was issued in 2005 by its Subcommittee D on PSAP / Emergency Communications Beyond E911. NRIC, Communication Issues for Emergency Communications Beyond E911 (Dec. 2005) [hereinafter *Beyond E9-1-1*], at http://www.nric.org/meetings/docs/meeting_20051216/FG1D_Dec%2005_Final%20Report.pdf.

¹⁹ National Emergency Number Association, Next Generation 9-1-1: Responding to an Urgent Need for Change 10 (2005) [hereinafter *NG9-1-1*], at http://www.nena.org/media/files/ng_final_copy_lo-rez.pdf

internetwork would allow, for instance, not only for a VoIP 9-1-1 caller to automatically transmit precise geographic location data to PSAPs,²⁰ but would also allow emergency responders to gain access to, and view in real-time, a building's video monitoring system prior to entering.²¹ The vision of the internetwork outlined is very broad and could easily accommodate the needs of the disabled, yet the fifty-one page report does not mention the special needs of people who are disabled or people who are deaf and people who are hard of hearing.

The internetwork, while comprehensive and visionary in a number of ways, does not provide policymakers with a practical roadmap to the needs of the deaf and hard of hearing communities.²² The model for the more practical, near-term steps toward improved emergency service for the deaf and hard of hearing communities is to piggyback onto the efforts to integrate VoIP into the 9-1-1 emergency system.²³ Because so many of the technologies are based on IP protocol, advances in VoIP 9-1-1 connectivity have the potential to directly address the needs of people who are deaf and people who are hard of hearing. The Voice-on-the-Net ("VON") Coalition and the National Emergency Number Association ("NENA") have proposed a three-phase plan to attain the "I3 Solution," with "dynamic location records, the ability to handle nomadic and mobile customers and interoperability between PSAPs."²⁴

The major obstacle cited by the VON White Paper is that far too often, "emergency systems are still using a 1970s technology, known as CAMA trunks, which induces call setup delays and limits the amount of information that can be transferred to the caller's 10 digits."²⁵ The VON report concludes, as might we, that "transforming the traditional PSAPs into IP enabled PSAPs is likely to require a new forward-thinking funding model and national commitment."²⁶ Yet, funding and the political will required for funding remains a major problem. For example, many of the state and local agencies that administer the over 7,000 PSAPs nationwide have neither the budgetary resources nor the political incentives to upgrade their facilities to receive and handle the enhanced emergency capabilities required of wireless carriers by the FCC.²⁷ A program of federal grants, such as those provided for in the ENHANCE

²⁰ Beyond E9-1-1, *supra* note 18, at 62-67 ("Summary of Key Recommendations").

²¹ *Id.* at 36.

²² A wealth of information on issues associated with emergency communications accessibility, including presentations and papers given at national conferences, is available on the website of the Technology Access Program, in Gallaudet University's Department of Communication Studies <<http://tap.gallaudet.edu/EmergencyCommunications.htm>>.

²³ See, e.g., VON Coalition, Answering the Call for 9-1-1 Emergency Services in an Internet World 5-7 (Jan. 2005), at http://www.von.org/usr_files/911%20VON%20White%20Paper%201-12-05%20final.pdf.

²⁴ *Id.* at 8.

²⁵ *Id.* at 5.

²⁶ *Id.* at 11.

²⁷ Ginny LaRoe, *Lost in Wireless World*, CHATTANOOGA TIMES FREE PRESS (June 16, 2006) (stating that for more than forty percent of the county's 9-1-1 calls, the location information was not received due to technical issues), at <http://www.msnbc.msn.com/id/13354393/>;

9-1-1 Act of 2004,²⁸ combined with conditionality on the quality of service provided, is one feasible method of raising the technological minimum nationwide that would make it possible to implement effective 9-1-1 calling for Internet-based services. Also, when requesting proposals for either technological research or for the deployment of 9-1-1 equipment, agencies of the federal government should require that such proposals, as well as the terms of any grants, specifically address the incorporation of flexible telecommunications technology to improve access for persons with hearing and speech disabilities.

The advantage of early federal coordination in promoting flexible 9-1-1 communications technologies is emphasized in the observation of two experienced FCC officials:

It is critical for industry to consider how to make their products and networks accessible to people with disabilities in the design and development stage, rather than trying to retrofit a product with an accessibility solution after the product is on the market, when it is much more expensive to do so.²⁹

At a time when the "landscape of communications is changing dramatically"³⁰ nationwide coordination is needed to prevent an accumulation of intractable compatibility issues with associated prohibitive costs. Congress and the responsible federal agencies need to recognize that there is both a gap in the regulatory scheme as well as a need to fill that hole with decisive leadership. A former FCC commissioner, who was instinctively "reluctant to intervene in the marketplace," used the provision of services to the disabled as the prime illustration of "certain critical functions that regulators must perform, even in a competitive marketplace, in furtherance of the public interest."³¹ She concludes that, "while one could posit that market forces generally should determine the availability of such equipment and services to individuals with disabilities, Congress has determined that access for individuals with disabilities is too important to defer to the market."³²

Verizon Wireless, More Than 95 Percent of Verizon Wireless Customers Have Emergency Location Capability in the Palm of Their Hands (May 26, 2006) (stating that while Verizon Wireless is the "first national service provider to meet" the FCC's requirement of 95% deployment for Enhanced 9-1-1 handsets, fully half of PSAPs still do not have Phase I 9-1-1 capability and two-thirds do not have Phase II capability), *at* <http://news.vzw.com/news/2006/05/pr2006-05-26a.html>.

²⁸ Ensuring Needed Help Arrives Near Callers Employing (ENHANCE) 911 Act of 2004, § 158, Pub. L. 108-494, 118 Stat. 3986 (codified as 47 U.S.C. § 942(b)).

²⁹ William E. Kennard & Elizabeth Evans Lyle, *With Freedom Comes Responsibility: Ensuring That the Next Generation of Technologies Is Accessible, Usable and Affordable* 10 COMMLAW CONSPECTUS 5, 13 (2001) (Mr. Kennard was Chairman of the FCC from 1997-2001; Ms. Lyle was an attorney in the FCC's General Counsel's office until 2001).

³⁰ *Id.* at 5.

³¹ Kathleen Q. Abernathy, *My View from the Doorstep of FCC Change*, 54 FED. COMM. L.J. 199, 208 (2002) (Ms. Abernathy was a Commissioner from 2001-2005).

³² *Id.* at 210.

The federal role in both ensuring uniform standards while still encouraging innovation is indispensable. The success of the FCC in encouraging wireless carriers to field 9-1-1 technologies must be matched by an equally ambitious effort to address PSAP capabilities. Every PSAP nationwide must be able to receive and utilize the life-saving data that is transmitted with almost every 9-1-1 call, including the data transmitted by the variety of devices that are best adapted for use by the disabled community. While TDI heartily applauds the efforts of the FCC's Disability Rights Office in organizing the E9-1-1 Disability Rights Access Summit, scheduled for November 15, 2006,³³ it is still true that no one agency can do this alone. It will take a cooperative effort by the White House Domestic Policy Council, the Congress, the FCC, the Department of Justice, the Department of Homeland Security, the Department of Transportation, state and local governments, and industry and consumer groups to get the job done. TDI believes that a national summit conference, to include accountable representatives from all of these stakeholder entities and organized by the White House Domestic Policy Council, is the proper venue in which to forge the opportunities for coordination and political momentum necessary when many overlapping regulatory spheres are implicated. TDI looks forward to contributing its full resources in the support of this ambitious, pioneering, and timely effort.

The consumer groups recommend the following government actions:

- a. All government initiatives to study, model, test, and implement next generation 9-1-1 systems must include disability access – direct and indirect relayed – as an integral part of the effort. Consumers need to understand what tradeoffs are involved in various approaches that might be tried, and to have a voice in selection of solutions based on how well they perform.
- b. The FCC should address short-term and long-term solutions for both direct and indirect access to 9-1-1 by people with disabilities. The FCC should examine an array of possible solutions, with an eye to providing functional equivalency to 9-1-1 telecommunications.
- c. The FCC should require the interoperability of text communication to ensure a direct method of access to 9-1-1 using IP technology. Reliance on TTY over VoIP should not be the solution. International harmonization is needed.
- d. The FCC should address the numbering issue under IP. Unlike VoIP interconnected services, video and IP text communications are not part of the North American Numbering Plan and this factor carries over into 9-1-1 issues such as call-backs.
- e. The FCC should require funding through the state TRS funds and provide funding through Interstate TRS Fund to cover the costs of implementation of location identification, selective routing, and other features of future TRS to 9-1-1 communications.

³³ FCC, Public Notice, FCC Announces E9-1-1 Disability Access Summit, DA 06-1908 (released Sept. 21, 2006), at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-06-1908A1.pdf.

- f. The Department of Justice should initiate a proceeding for short-term updates to 9-1-1 requirements to allow for Internet-based direct and relayed access to PSAPs. This proceeding will need to be closely coordinated with the FCC.
- g. Congress should appropriate funding for upgrading of technology used at PSAPs to ensure nationwide equality in access to emergency number services, and protect the funds from being used for other purposes by state and local governments.

Appendix

Telecommunication Technologies Today

The methods by which the deaf and hard-of-hearing communities need to be able to call 9-1-1 emergency services have become more diverse as new relay services have been added in response to the ADA's requirement for functional equivalency.³⁴ The growth of the Internet and popular products such as instant messaging have shifted the focus of communications away from the PSTN and into the more visually effective methods of the Internet. A sampling of the available technologies, and the issues associated with each is provided below:

PSTN Technologies that Can be Used by People with Disabilities to Call 9-1-1:

1. TTY.³⁵

a. **Direct Landline Calling.** As mentioned earlier, federal regulation requires PSAPs to provide direct access to individuals who use TDDs/TTYs.³⁶ PSAPs must equip all call-taker stations with TTY capability. On silent calls (that may or may not be from a TTY user), they are required to probe for TTY. People who can speak but who cannot hear can use "voice carry-over" to communicate with the PSAP; they speak and the PSAP call-taker types back. Because TTY calls are infrequent relative to voice calls, call-takers sometimes erroneously hang up on TTY callers; however many PSAPs handle 9-1-1 TTY calls well.

b. **Direct Wireless Calling.** Since 2002, wireless networks have been able to handle TTY calls through cellular telephones. However, the size of the TTY relative to the wireless device is quite large and consumers find it too cumbersome for routine wireless use and particularly for emergency use. TTY functionality could be built into

³⁴ National Emergency Number Association, NG (Next Generation) E9-1-1 2004/2005 Program 1 (Oct. 14, 2004) (stating intention to "develop, coordinate, and integrate the foundation for an evolved, fully-functional 'Next Generation E9-1-1' system that responds anytime, anywhere, from any device . . ."), at <http://www.nena.org/Initiatives/website%20pkg.pdf>; Northern Virginia Resource Center, Emergency Preparedness and Emergency Communications Access: Lessons Learned Since 9/11 and Recommendations (Dec. 2004), at <http://www.nvrc.org/MediaLibrary/DHHCANEmergencyReport.pdf>. See generally NG9-1-1, *supra* note 19.

³⁵ *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Access to Emergency Services*, CC Docket No. 90-571, CC Docket No. 98-67, CG Docket No. 03-123, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, FCC 04-137, released June 30, 2004, at ¶ 3 n.18 [hereinafter *TRS Order*].

³⁶ 28 C.F.R. § 35.162 ("Telephone Emergency Services").

those handsets that have keyboards and screens, and then deaf callers could call 9-1-1 wirelessly.

c. **Indirect Calling.** TTY users may choose to call through a traditional relay service. The relay service has responsibility for identifying the most appropriate PSAP for the caller's address, and calling that PSAP on a ten-digit number. The call, from the PSAP perspective, is a voice call, and possible mishandling on the PSAP end is avoided by using TRS. The two-step calling process, however, introduces an unknown amount of delay.

2. **Captioned Telephone.** Ultratec CapTel[®] is a PSTN-based relay service currently supported in thirty-eight states.³⁷ This type of relay service allows the deaf or hard of hearing user to listen to the other party's speech while simultaneously viewing a transcription of the speech on a screen on the phone. The user speaks directly to the other party, and the CA is silent on the call. CapTel users can call directly into 9-1-1; the CapTel device automatically turns itself into a voice-carry-over TTY. An alternate form of CapTel, 2-line CapTel, allows the user to call to 9-1-1 and merge the relay service (on line 2) into the 9-1-1 call. Because CapTel calls are a direct landline call from the user's location, it goes into the selective routing system. The model of 2-line CapTel (one line direct to 9-1-1 and a second line used for relay) is a good one for future provision of other relay services.³⁸ Ultratec, Inc. has applied to make CapTel an Internet-based service, so that in the future it may not be limited to the PSTN.

Internet-Based Technologies

1. **IP-Relay.** Essentially, Internet-Protocol Relay (IP text relay) is text relay service using the internet instead of the PSTN.³⁹ There are currently two basic types of interfaces: Websites and instant-messaging platforms. By visiting the website of an IP text relay provider, the user may place calls from any computer attached to the Internet. The wireless form of this service currently makes use of commercial instant messaging for the text leg of the call. A phone number is provided to the user, so that incoming calls are also supported – a limitation of the web-based sites is that users cannot receive calls. The challenges presented by this method of relay service, in the 9-1-1 emergency context, are significant. For example, because of the portability of the wireless device, the CA obtains no location information without input from the user; therefore, the CA must first ascertain location information from the user and determine the contact information for the

³⁷ Ultratec, Inc., States That Currently Offer 2-Line CapTel Service, at <http://www.captionedtelephone.com/states2line.phtml>.

³⁸ Ultratec, Inc., Dialing 911 in an Emergency, at <http://www.captionedtelephone.com/911.phtml>.

³⁹ E.g., MCI's IP-RELAY service requires the user to sign up for either AOL Instant Messenger or Yahoo! Messenger. IP-RELAY.com, News and Events, at <http://www.ip-relay.com/news.html>. See also FCC, at <http://www.fcc.gov/cgb/consumerfacts/iprelay.html>.

appropriate PSAP, before the call can be connected to the PSAP to report the emergency.⁴⁰

2. **Video Relay Services.** Video Relay Service ("VRS") uses Internet Protocol to send a video image so that the person who is deaf or hard of hearing can speak with a video interpreter using American Sign Language ("ASL"). The video interpreter uses voice to communicate with the hearing person on the other end of the call. The same issues associated with ascertaining the location of the 9-1-1 caller associated with IP-Relay are also associated with VRS, except that VRS is currently fairly stationary. (Webcams and videophones are not available everywhere, and there is no cellular form of VRS at this time).

3. **VoIP.** Voice-over-Internet Protocol ("VoIP") telephony is a rapidly expanding technology and, for some people who are deaf or hard of hearing, has many of the same attractions as for the hearing consumer such as low cost and advanced features. On the other hand, many people who are deaf and who do not have hearing family members or roommates do not subscribe to VoIP as they do not have a need for it. Some VoIP services are incompatible with TTY, so even if they can route a call to 9-1-1, they would not be accessible given the current limitation to calling via TTY. VoIP's 9-1-1 routing problems have been addressed by the FCC in a sweeping 2005 FCC Report and Order.⁴¹ The problem of interfacing VoIP with TTY has not been resolved by the FCC. Annually, 200 million 9-1-1 calls are placed nationwide.⁴² In 2004, two percent, or 370,000, were from Voice over Internet Protocol ("VoIP") equipment; this number, however, is expected to grow to 3.5 million VoIP-initiated 9-1-1 calls this year.⁴³ In 2005, the FCC sought comment on how an anticipated trend toward broader use of VoIP and other IP-enabled services might adversely affect 9-1-1 availability for people who are deaf or hard of hearing.⁴⁴ Nevertheless, the opportunity exists to apply those solutions developed for VoIP 9-1-1 services to other Internet-based services used by the deaf and hard of hearing communities.

4. **Instant Messaging.** Instant messaging is a form of text communication in which short messages are sent among parties on the Internet. IM is popular with deaf and hard

⁴⁰ See, e.g., *9-1-1 Technical and Operational Issues*, *supra* note 14, at ¶¶ 11-17 (describing problems associated with routing 9-1-1 calls from other than fixed locations). The FCC is currently considering these issues in connection with its recent NPRM. See *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Access to Emergency Services*, CG Docket No. 03-123, Notice of Proposed Rulemaking, FCC 05-196, released, November 30, 2005, at ¶¶ 2, 8, & 18-21 [hereinafter *VRS/IP-Relay 9-1-1 NPRM*].

⁴¹ *9-1-1 Technical and Operational Issues*, *supra* note 14.

⁴² *Id.* at ¶ 6.

⁴³ *Id.* at ¶ 10.

⁴⁴ *Id.* at ¶ 63; see also *VRS/IP-Relay 9-1-1 NPRM*, *supra* note 40, at ¶¶ 15-16.

of hearing people as well as the hearing population. However, IM is not standardized and is not interoperable between competing companies. Although a standardized form of IM has been described in industry standards, it is not clear whether one interoperable form of IM will actually ever develop. In the meantime, PSAPs do not accept instant messages, and there is not yet any technical capability for a PSAP to determine the location of an incoming IM, or to determine whether the contact is from someone with a legitimate emergency.

5. **SMS Text Messaging.** SMS is a form of messaging that operates in the wireless networks. Use of Short Message Service (SMS) text messaging, via cellular telephones or devices such as the BlackBerry[®], is a potential alternative for a person who is deaf or hard of hearing to contact emergency services while on the road.⁴⁵ The urgency of being able to contact emergency services while away from home without a cumbersome TTY is illustrated by the fact that, in a typical city, about 60% of all 9-1-1 calls received are placed from cellular telephones.⁴⁶ However there are problems associated with the use of SMS for 9-1-1 calling. First, unlike standard "real time" voice calls, SMS operates as a "store and forward" service. Therefore, any number of variables can delay the delivery of an SMS message, anywhere from ten seconds to ten minutes or longer, and there is no guarantee of delivery. Moreover, a 9-1-1 caller will not even know whether the message is received, unless the PSAP sends a return message. Lastly, if further details from the caller such as location or the nature of emergency are needed, SMS does not allow for the PSAP to obtain the information in "real time."⁴⁷ Finally, and most significantly, PSAPs do not accept short messages in this country. SMS is used in some locations in other countries.

6. **E-mail.** E-mail has many obvious benefits for people who are deaf or hard of hearing.⁴⁸ Yet, it also has many of the same problems as with other messaging

⁴⁵ Police in West Midlands, England, employ just such a system. West Midlands Police Department, Text Messaging for the Deaf, Hard-of-Hearing and Speech Impaired, at <http://www.west-midlands.police.uk/general/text-messaging.asp>. See also *When 999 Don't Work, Get Texting*, COMP. WEEKLY, Sept. 5, 2002 (citing study "in which 98% of the hearing-impaired people surveyed said they used SMS and 85% said they would like to use the service to contact the emergency services."), at <http://www.computerweekly.com/Articles/2002/09/05/189393/When+999+won't+work,+get+texting.htm>. Other police departments in Northern Ireland and Australia have also employed such SMS methods to accommodate people who are deaf or hard of hearing.

⁴⁶ LaRoe, *supra* note 27 (stating that sixty percent of all 9-1-1 calls made in Hamilton County were made via wireless phones).

⁴⁷ Department of Communications, Information Technology and the Arts (Australia), Frequently Asked Questions, at http://www.dcita.gov.au/tel/faqs/telecommunications_services/faq_-_emergency_needs_and_situations.

⁴⁸ Edie Herman, *Advocates Call for Improvements in Telecommunications*, COMM. DAILY, Apr. 18, 2006 ("We need a quick, feasible solution for passing calls to emergency centers using

technologies, including ascertaining location information, dependence on a server, and delay as messages are sent back and forth.

7. Interactive Text/Total Conversation. Currently there is no standardized form of text by which people can "call" or contact each other and be assured of a connection. The absence of such a form of communication in multi-media telecommunications has led to the fragmentation of text services as "features" rather than fundamental forms of communication over the Internet. Standards have been written for interactive text communication, but the industry has declined to implement these standard forms.

technology such as video relay, pagers, e-mail and other communications services used by the deaf [and hard of hearing communities] . . .").