Before the
Department of Justice
Washington, D.C. 20554

In the Matter of	)	
	)	
Nondiscrimination on the Basis of Disability in	)	CRT Docket No. 111; AG Order
State and Local Government Services;	)	RIN 1190-AA62
Accessibility of Next Generation 9-1-1	)	
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COMMENTS OF
THE ALLIANCE FOR TELECOMMUNICATIONS INDUSTRY SOLUTIONS

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Table of Contents

Summary

The Alliance of Telecommunications Industry Solutions (ATIS) recognizes the critical

role that emergency 9-1-1 call taking centers play in facilitating public safety and supports the

Department of Justice's examination and revision of its rules to ensure that direct, equal access to

9-1-1 centers is available for persons with disabilities using advanced communication

technologies such as text and video-based messaging. As more and more consumers utilize

wireless and other smart communication type devices, ATIS believes that it is paramount that

9-1-1 centers migrate to an Internet-enabled network, or Next Generation 9-1-1 network, in order

to deliver 9-1-1 emergency services to consumer irrespective of the communication technology

initiating a 9-1-1 call.

As a leading developer of technical standards pertaining to E9-1-1 and emergency

communications, ATIS encourages the Department of Justice not to impose new regulations

without due consideration of industry developed standards. As described in these comments

ATIS and other standard bodies are working separately as well as collaboratively on NG 9-1-1

technical specifications that could be used to inform the Department of Justice of key technical

considerations to take into account before implementing new regulations.

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COMMENTS

The Alliance for Telecommunications Industry Solutions (ATIS), on behalf of its

Wireless Technologies and Systems Committee (WTSC), hereby submits these comments in

response to the Department of Justice's (DOJ or Department) *Advanced Notice of Proposed*

Rulemaking (A*NPRM*) in the above referenced docket.[1] ATIS applauds the Department of

Justice for examining its regulations implementing Title II Americans with Disabilities Act

(ADA) to address how individuals with disabilities can have direct, equal access to 9-1-1 centers

using advanced communication technologies. ATIS' comments: (1) address several of the

specific questions raised in the *ANPRM* that should be considered as DOJ begins the process of

reviewing and revising regulations implementing Title II; and (2) encourages DOJ to carefully

considered industry developed technical standards before imposing new regulations.

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[1] *In the Matter of Nondiscrimination on the Basis of Disability in State and Local Government Services; Accessibility of Next Generation 9-1-1*, CRT Docket No. 111; AG Order, RIN 1190-AA62 (rel. July 26, 2010),

I.   Background

ATIS is a global standards development and technical planning organization that leads, develops and promotes worldwide technical and operations standards for information, entertainment and communications technologies. ATIS's diverse membership includes key stakeholders from the information and communications technologies industry, including wireless and wireline service providers, equipment manufacturers, providers of commercial mobile radio services, broadband providers, consumer electronics companies, public safety agencies, and internet service providers. Nearly 600 industry subject matter experts work collaboratively in ATIS's 17 open industry committees, which develop standards, specifications, best practices, and guidelines essential to communications networks' operation and continued evolution.

The ATIS WTSC is comprised of leading technologists who lead industry technical work on wireless issues, including next generation[2] 9-1-1 service (NG9-1-1). ATIS WTSC develops standards and technical reports related to 2G, 3G, and evolved 3G wireless services and systems, as well as those for Wireless Wideband Internet Access systems and for advancing NG9-1-1 communications services. The WTSC Lawful Intercept (LI) Subcommittee develops standards related to lawful intercept within the GSM family of technologies and coordinates activities relevant to U.S., regional, and international standards and specifications to ensure regulatory and commercial requirements are met.[3]

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[2] The term "next generation" as used here refers to Internet Protocol (IP) based communications, which are the next evolution (or next generation) in communication technology from the current circuit-switched technologies.

[3] ATIS WTSC, as well as the ATIS 3GPP Individual Members, provides North American input into 3GPP on LTE and other communication technologies, and ATIS believes that any NG 9-1-1 implementation should consider the deployment of LTE.

II.   Discussion

In the *ANPRM*, DOJ seeks comment on a series of specific technical and policy issues

regarding standards for accessibility of NG 9-1-1, and possible approaches to revising current

standards and regulations to ensure that as 9-1-1 call centers migrate to NG 9-1-1 they will be

able to directly receive messages from various kinds of advanced communication services, such

as text or video-based messaging by persons with disabilities.

A.   Direct, Equal Access to NG9-1-1 using Advanced Communication Services

Question 1 of the *ANPRM* seeks to understand what modes of communication (*e.g.,*

voice, text, video, or data) do or will individuals with disabilities use to make direct calls to a

PSAP, and from what types of devices would the calls be made.[4] The short answer is that voice,

text, and video are currently being used and will likely continue to be used.[5] However, ATIS

WTSC cautions DOJ that, if too many services are supported, end devices, networks and PSAPs

may choose to support different subsets of services, which potentially could lead to

interoperability problems. Additionally, many services can be direct or almost direct substitutes

for one another making it more efficient to focus on just one or two services of any given type –

e.g., one or two services supporting text based communication plus one or two supporting video,

etc.

Below, ATIS WTSC provides a list of services that are frequently considered for

communication by persons with disabilities, and provides specific comments on the suitability of

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[4] In responding to this question, ATIS WTSC assumes that "modes" as used in in the *ANPRM* refers to services as opposed to protocols (services are user-visible groups of functionality, while protocols are underlying technology enabling the services; any given service can often be implemented using a choice of protocols; careful service definition narrows the choices to guarantee interoperability). As services are visible to users, while protocols are not, it is critical to maintain a clear distinction so that users have access to the services they need but outdated protocols are not forced to be used in implementing these services.
[5] Data is not a communication mode in the sense that voice, text, and video are (indeed, voice, video, and text are transmitted as data, so in that sense all modes are inherently data); there are situations in which arbitrary data may be exchanged as part of communication, but this is not in itself a mode of communication.

each type of service (i.e., whether suitable, possibly suitable or unsuitable). The evaluation of

suitability is based on previous industry analysis and generally accepted criteria for emergency

communications (which include, among other factors, high reliability, low latency, priority,

location-based routing to select a PSAP, provision of location to the PSAP, simultaneous two-

way (i.e., full-duplex) communication, real-time communication, etc.).

Text:

- **Text Messaging** (a service allowing text messages to be sent to arbitrary destinations)
  - This service is suitable. Emergency text messaging is being studied by ATIS (via its role as the North American Organizational Partner in 3GPP[6]) and National Emergency Numbering Association (NENA) for wireless usage. We believe that a cost effective solution will be possible that is closely aligned with already defined solutions for emergency voice calls over IP.
- **Short Message Service (SMS)** (a specific protocol, despite the name, not a service)
  - This service is unsuitable. Various studies[7] have shown that this is highly unsuitable for generalized emergency usage due to potentially huge impacts to networks and end devices and significant problems concerning reliability, speed, and message ordering. However, the term "SMS" is often confused with a general text messaging service; when people say "SMS" they usually intend "text messaging". A service such as text messaging may be implemented with any of various protocols. The user interface of a service may remain unchanged even when different underlying protocols are used. Hence, a service that appears to a user identical to today's SMS may transmit and receive text messages using the protocols often used for IM (such as SIP or XMPP).
- **Real time text** (RTT, TTY emulation)
  - This service is suitable if supported as part of the solution for emergency text messaging.
- **Instant Messaging (IM)** (near time and real time) (a service allowing text messages to be exchanged bilaterally, often restricted to a defined set of contacts who have mutually granted permission)
  - This service is suitable if supported as part of the solution for emergency text messaging.
- **Teletypewriter (TTY)**
  - This service is potentially suitable, but edge gateways are likely to be needed to

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[6] 3GPP is a collaboration established in December 1998 that brings together a number of telecommunications standards bodies which are known as "Organizational Partners." ATIS is a founding and sole North American Organizational Partner of 3GPP. In addition to ATIS, the other current partners are the Association of Radio Industries and Businesses, China Communications Standards Association, European Telecommunications Standards Institute, Telecommunications Technology Association and Telecommunication Technology Committee.

[7] See, for example, 4G Americas, "Texting to 9-1-1: Examining the Design and Limitations of SMS", October 2010, www.4gamericas.org/documents/SMS%20to%20911%20White%20Paper%20Final%20October%202010.pdf

convert legacy analog to next-generation protocols. Thus, this should be viewed as a transitional service only, and not encouraged for long-term or all-IP use.

- **Text-conferencing** (a service allowing text messages to be exchanged with a group of people as a group)
  - This service is unsuitable initially due to complexity but might be supported in a longer timeframe.
- **Email**
  - This service is unsuitable for emergency use for the reasons discussed under SMS above. However, this service may possibly be suitable for non-emergency use, such as 511 services.

Video:

- **Multi-Media System (MMS)** (pictures, pre-recorded video)
  - This service is unsuitable for primary emergency use for reasons similar to those studied for SMS and email; it is possibly suitable for non-emergency use, such as 511 services. It is also possibly suitable for ancillary emergency use (e.g., transfer of pictures or prerecorded video in association with an existing voice or text session).
- **Real-time video**
  - This service is possibly suitable if it can be supported as a simple extension to the solutions now defined for emergency VoIP; this appears likely but further industry work is needed.
- **Video-conferencing** (deaf caller, interpreter and telecommunicator)
  - This service is unsuitable initially but with further development could become suitable as extensions to VoIP.
- **Video-conferencing with VCO and HCO capabilities** (caller with hearing loss or speech disabilities, interpreter and telecommunicator)
  - This service is unsuitable initially but with further development could become suitable as extensions to VoIP.
- **Three-way voice conferencing** (speech disabled caller, speech communication assistant and telecommunicator)
  - This service is unsuitable initially but with further development could become suitable as extensions to VoIP.

Web-Based:

- **Web-based TTY**
  - Web-based services have not been studied, but such services may possibly be supported through gateways on the web server side, however, the reliability, security, latency, and other suitability issues have not been analyzed by the industry and this would need to be carefully done before a determination could be made. The ability to use location (both for routing and provision to a PSAP) also needs to be analyzed. In general, the need for web-based and other external third-party server based services would seem to be obviated in a next-generation environment; they may be better suited as a short-term interim step.
- **Web-based text chat**
  - See Web-based TTY above.

- **Web-based captioned telephone (VCO)**
  - See Web-based TTY above.

Carry-Over:
- **Captioned telephone**
  - As an analog service this may not be suitable but see VCO/HCO using cell phone alone below.
- **Voice Carry Over (VCO)** using phone (cell or landline) and computer
  - Integrating streams from multiple independent sources into a common and coherent session is more complex, difficult, and costly than a service using next-generation functionality from a single source device; see VCO/HCO using cell phone alone below.
- **Hearing Carry Over (HCO)** using cell phone (cell or landline) and computer
  - Integrating streams from multiple independent sources into a common and coherent session is more complex, difficult, and costly than a service using next-generation functionality from a single source device; see VCO/HCO using cell phone alone below.
- **VCO using cell phone** that includes both voice & data network at the same time
  - See HCO using cell phone alone below
- **HCO using cell phone** that includes both voice & data network at the same time
  - This (and VCO above) appears to be suitable using next-generation technologies, which permit multiple media types to be transmitted with a single session. However, device and user interface considerations would need to be analyzed. This would likely be done as an extension to VoIP service definitions.

In-Vehicle:
- **Vehicle telemetric & communication** (text, video)
  - This appears to be suitable as a next-generation service and an extension to VoIP service definitions. However, it should be noted that in-vehicle services are not a primary means of communication.

Emerging technologies are expanding and continuously evolving and the services afforded to persons with disabilities should not be limited to the aforementioned communication modalities. ATIS WTSC notes a specific service may be offered via a number of different technologies, and that the capabilities, functionality, reliability, and suitability for various environments (such as emergency versus casual communication) may vary among different technologies. For example, a text messaging service might be implemented using SIP (including SIMPLE and MSRP), XMPP, or other protocols, and the user need not be aware (and likely would not be aware) of which protocol is being used. Therefore, care needs to be taken to

6

maintain a clear distinction between services and technologies.

Question 2 addresses whether DOJ should issue requirements for NG 9-1-1 technologies to support text communications along with analog based TTY communications and, if so, should NG 9-1-1 text technologies be backward compatible with analog-based TTYs or should the two communication methods be available side by side. ATIS WTSC advises that forcing backwards compatibility is likely to constrain the functionality and design of NG 9-1-1 services and technologies. Interoperability and edge gateways are likely a better choice in this instance, as these options allow analog TTY devices to communicate without limiting NG9-1-1 technologies. It also allows for a more rapid progression of underlying technologies, offering better functionality at lower cost to persons with disabilities.

ATIS suggests therefore that NG 9-1-1 text technologies be allowed an independent evolution path. Current evaluation and initial requirements in both NENA and ATIS are going in this direction already and any attempt to impose backward compatibility restrictions would most likely delay the availability of a solution (as well as increase its cost).

Question 3 of the *ANPRM* asks what text options should be designated as essential accessibility features of an NG 9-1-1system. ATIS WTSC recommends that DOJ should avoid designating particular technologies such as SMS or real-time text protocols as essential, and instead focus on identifying the services, such as text messaging or real-time text, that will be most helpful to assure equal access to emergency call-taking centers for individuals with disabilities.

Regarding the list of text options provided in the *ANPRM*:

- Text messaging and real-time text clearly seem to be useful services;
- SMS is a very specific protocol often used in implementing text messaging in legacy circuit-switched systems today, but one that suffers from a number of

limitations[8] and so should not be relied upon: Instead, the focus should be on the text messaging service as opposed to a particular underlying protocol. As previously mentioned, a text messaging service may, if desired, offer a look-and-feel which users associate with SMS today while using suitable protocols such as SIP (or XMPP) for communication with the PSAP;

- Commercial IM services generally require mutually authorized contacts and so do not seem obviously well-suited for emergency communications; however, generic IM services (such as those based on open standard protocols such as SIP (including SIMPLE and MSRP) or XMPP) may or may not require this, and may be suitable;
- E-Mail is a store-and-forward, non-real-time communication, and may be better suited for non-emergency uses (such as 511 services); and
- Analog gateways allow legacy TTY devices to communicate with newer systems and might be needed while TTY devices remain in use.

Question 4 solicits information about the interim plans that public safety answering points (PSAPs) should develop and implement to receive text messages. ATIS notes that the technical solutions currently being developed in ATIS 3GPP and NENA assume that originating networks will initiate text message sessions and deliver text messages directly to a PSAP (via a terminating Emergency Services Network, which is the normal direct path). Third party solutions (e.g., specialized text message centers to whom users send emergency related messages for forwarding in one way or another to a PSAP) are not being considered. It is expected that third party solutions will be more restrictive –e.g., require subscription and possibly monthly payments by users. However, if third party solutions can be developed to use existing non-emergency based text services, then they could have a short-term transitional role. ATIS WTSC does not encourage any special standardization for this because of the likely short-term applicability and more limited support of users.

B. Interoperability

Question 5 of the *ANPRM* seeks to understand the significant issues to the interoperability of messages sent by text that need to be addressed. There are many possible

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[8] See, for example, 4G Americas, "Texting to 9-1-1: Examining the Design and Limitations of SMS", October 2010, www.4gamericas.org/documents/SMS%20to%20911%20White%20Paper%20Final%20October%202010.pdf.

ways to send messages as text; some ways are inherently better-suited for emergency use than others. One important consideration is the reliability and timeliness of delivery; low-delay and high-reliability technologies are better suited for emergency use. Other important considerations include security, ability to use location for routing to a PSAP and for delivery to a PSAP, content length and character set limitations, and other factors considered in various industry studies. Another consideration is the concept of a "session," allowing multiple messages to be sent to the same PSAP and call-taker while maintaining message order, etc.

It is useful to distinguish between services which enable communication among arbitrary people, and those which allow communication among a specific set of people. For example, social networking sites, multi-player games, and proprietary IM services fall into the latter category, and thus seem an odd choice for emergency communication; however, text messaging, video calling, and other services which allow anyone to initiate communication with another are a natural extension of traditional voice calling, and hence better choices for emergency use.

C. Call Routing and Transfers

Question 7 of the *ANPRM* questions whether regulations should address call routing policies that restrict or prohibit transfers between 9-1-1 call centers from callers with speech impairments and requiring call takers to be fluent in oral/sign language interpreting services. ATIS WTSC believes that it is possible such transfers could be avoided if enough suitable information was provided to wireless network originators on routing requirements or if PSAPs themselves were provided with an emergency services network capable of performing the appropriate final routing as is being defined in NENA. However, some solutions (e.g., SIP-based ones) can accommodate a transfer as long as it is performed according to SIP protocol conventions. ATIS WTSC thus encourages DOJ to support transfer using any or all of these

9

solutions but also advises the Department not to impose rigid detailed requirements that may be unnecessarily difficult to support. In general, flexibility in this area is preferred over rigid nationwide rules.

D. Standardization

In Question 10 of the *ANPRM*, DOJ seeks comment on whether revised regulations on NG 9-1-1 requirements under Title II should be performance-based versus setting forth technical specifications for call-taking technology and equipment. Technical specifications carry a risk of forcing the use of technologies even after they have become obsolete that in turn could increase costs to all parties, including individuals with disabilities, and reduce functionality. ATIS WTSC thus recommends that specific technical specifications not be imposed and instead service requirements, including performance-based requirements, be defined. The industry is already collaborating on technical specifications and would be better positioned to react more efficiently to service and performance requirements as they would likely not require a complete redesign.

In Question 11, DOJ seeks comment on the technical issues that should be addressed in developing minimum standards. ATIS WTSC believes that DOJ should consider the following technical characteristics:

- High reliability
- Low delivery latency
- Ability to use the caller's location to route to an appropriate PSAP
- Ability to convey the caller's location to the PSAP
- Ability to maintain message order and coherence
- Ability to both provide identifying information (such as the originating user's name, address, location, phone number, etc.) and protect it from eavesdropping or alteration
- Ability to protect message content from eavesdropping or alteration
- Ability for all messages and any other associated information or media content (e.g., video, photographic, text, voice) to be routed to the same PSAP and call taker, maintaining arrival order
- Compatibility of solutions with existing solutions for voice (though not a visible benefit to users this will speed up deployment among all concerned parties)

- Avoid restrictions on content, including length and character set (obviously, services which do not impose limitations on length or on character sets are better suited)
- Compatibility with carrier networks (a more compatible solution is easier to deploy and at lower cost for all parties than a less compatible one)

Finally in Question 12, in the area of standardization, the *ANPRM* asks whether DOJ should adopt specific minimum standards. ATIS WTSC strongly urges DOJ to avoid mandating the use of particular standards and instead encourage the continued industry development of voluntary standards through open and consensus-based processes with widespread industry participation, such those developed by ATIS or the Telecommunications Industry Association (TIA.)

ATIS also notes that another of its industry committees is working on 9-1-1 standards that may be of interest to the DOJ. ATIS's Emergency Services Interconnection Forum (ESIF) serves as the primary forum for the telecommunications industry, public safety and other stakeholders to identify and resolve recognized technical and operational interconnection issues related to the delivery of E9-1-1 services. ATIS's ESIF has developed and published several industry-accepted standards related to E9-1-1 location accuracy and encourages the DOJ to take this work into account where relevant when determining new requirements for NG 9-1-1. These standards, which were created and adopted through a consensus-driven standards development process involving wireless carriers, public safety representatives, and other stakeholders, offer valuable insights and could serve as the basis for standards to be used in ensuring public safety agencies will be able to reliably and accurately locate consumer once 9-1-1 call is initiated whether through use of traditional or advanced communication services.

III. CONCLUSION

ATIS applauds the DOJ for examining its regulations to promote access to 9-1-1 services by individuals with disabilities. As ATIS' comments demonstrate, significant industry work has been completed and is underway to address: the use of advanced communications technologies to access 9-1-1 services. ATIS urges the DOJ to carefully consider this work and to avoid unnecessary technical mandates.

Respectfully submitted,

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