



Enhancing 9-1-1  
Communication Accessibility  
with Real-Time Text (RTT)  
July 27, 2018

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## ABSTRACT

The emergency services industry faces its largest challenge in decades—upgrading an outdated 9-1-1 system to accommodate the public’s growing reliance on mobile devices.

The decades old system is still operating on an infrastructure that is not equipped with the most up-to-date communication solutions. Thus, the best way to reach 9-1-1 is still through a landline-based voice call. Not only is this model limited today, it becomes increasingly more inadequate each year as the smartphone industry evolves and grows.

Real-Time Text (RTT) is a core feature to the Next Generation 9-1-1 (NG 9-1-1) model enabling text-based communication in a way that is superior to Text Telephone (TTY) communications. RTT allows text to be transmitted while it is being typed. NG 9-1-1 with RTT capability is a modern solution to provide the American public options for calling 9-1-1 and enabling Public Safety Answering Points (PSAPs) faster communication capabilities for emergency calls.

This groundbreaking technology not only unleashes greater potential for the public safety industry, but also for those who are deaf, hard of hearing, deaf-blind or have difficulty speaking as well as the greater population. This upgrade will allow emergency communication services to align with the most common communication methods through digital and mobile devices, and facilitate daily correspondence of text users.



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## INTRODUCTION

As technology and the population's reliance on such evolves, publicly provided communication services face the ever-growing challenge of staying current. The 9-1-1 industry and wireless carriers are at the forefront of a new wave of innovative technology solutions.

Real-Time Text (RTT) is a feature that allows users to see text as it is typed into a text interface.

This white paper asks and answers pressing questions regarding RTT as a new way for people to communicate; why it is important; how it works and its technological specifications; and the timeline of mandates within the public safety industry. Real-Time Text has potential to enhance safety and communication capabilities for the public.

Did you know?

- Over 240 million calls are made to 9-1-1 in the U.S. annually.<sup>1</sup>
- About 80% of those calls are made from cell phones.<sup>2</sup>
- Text messaging is the most used data service in the world.<sup>3</sup>
- Americans text twice as much as they call, on average.<sup>4</sup>
- 52% of U.S. households rely on wireless phones as primary communication.<sup>5</sup>
- For many Americans, ability to call 9-1-1 is the primary reason they own a cell phone.<sup>6</sup>

The FCC has designated RTT as a technical successor replacement to TTY. Wireless carriers, such as Verizon, T-Mobile and AT&T have introduced Real-Time Text service to the general public, opening up new communication options for all wireless users including individuals who are deaf, hard-of-hearing, deaf/blind, or who experience difficulties with traditional, voice-based communication.

Similar to advanced calling features, such as High-Definition Audio, and Video calling available on some phones, RTT is made possible through IP-based (Internet Protocol) technologies by mobile carriers for establishing calls between two parties. IP-based technology replaces the use of circuit-switched technology for establishing calls, which has previously been the norm for telecommunications delivery.

The use of IP-based technology is also a foundational part of Next Generation 9-1-1 systems as envisioned by the National Emergency Number Association (NENA). These NG-9-1-1 systems are designed to be compatible with the IP-based systems used by mobile carriers, and support the ability for consumers to use Voice, Video and RTT to communicate with 9-1-1.

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<sup>1</sup> NENA: <https://www.nena.org/?page=911Statistics>

<sup>2</sup> NENA: <https://www.nena.org/?page=911Statistics>

<sup>3</sup> Nielsen: <http://www.nielsen.com/us/en/insights/reports/2013/mobile-consumer-report-february-2013.html>

<sup>4</sup> Nielsen: <http://www.nielsen.com/us/en/insights.html>

<sup>5</sup> NCHS 2017 Survey: <https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201712.pdf>

<sup>6</sup> How Stuff Works: <https://people.howstuffworks.com/9-1-1.htm>

## WHY IS RTT SO IMPORTANT?

In a recent order from the Federal Communications Commission (FCC), RTT has been approved as an acceptable alternative to text telephone (TTY) technology for wireless carriers.<sup>7</sup> RTT technology allows consumers to simultaneously send and receive text characters as they are typed, even while they are using voice services. Wireless carriers began deploying RTT capabilities in certain devices on their networks in January 2018, changing the landscape 9-1-1 communication.

With RTT, text is transmitted instantly while being typed, character by character. The receiving party can immediately read the text as it is written, without waiting for the person to finish typing and press “send,” as in the case with SMS. If the sender is unable to complete their message, the receiving party will still be able to see the portion of the message the sender began. RTT does not replace SMS, but provides a way for consumers to incorporate conversational text within a phone call.

In an emergency, EVERY SECOND COUNTS! RTT capability provides Public Safety Answering Points (PSAPs) with text information in real-time, allowing emergency personnel issue appropriate, life-preserving responses faster than with other text technologies (i.e. TTY, SMS).

RTT can be used on its own to enable conversations using text. It can also be used where voice is impractical, or unsafe, and can be used as an adjunct to voice and video conversations. Real-time transcription of a video or audio conference is one example.

A fast and interactive means of conversing, RTT allows individuals to more effectively communicate with emergency responders. Furthermore, just like with speech, RTT users can immediately interrupt the conversation and ask for clarification.

Implementation of RTT will eliminate outdated technology.

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<sup>7</sup> FCC: <https://www.fcc.gov/consumers/guides/real-time-text-improving-accessible-telecommunications>

## HOW DOES RTT WORK?

Real-Time Text (RTT) begins with two parties engaging in a phone call to each other, with both parties using RTT-capable devices. Due to immediate transmission of typed characters, Real-Time Text has the same conversational directness and interactivity as voice.<sup>8</sup>

- RTT text transmission is silent so text and voice do not interfere with each other during a call as text follows the same path as the voice call.
- RTT can transmit and receive text at the same time, in lieu of forcing users to take turns.
- RTT can reliably transmit and receive any text character in any language.

### RTT to 9-1-1



Expected Hamilton Deployment

RTT calls directed to PSAPs that have not yet transitioned to Next Generation 9-1-1 systems will receive those calls as TTY calls, where the mobile carrier that originated the call to 9-1-1 has the responsibility of transcoding the text between RTT and TTY. PSAPs that have transitioned to Next Generation 9-1-1 have the foundations in place that will enable RTT calls to be delivered to 9-1-1 without being converted to TTY, preserving the end-to-end benefits of RTT communication.

In addition to having the foundations in place to support RTT, NG 9-1-1 PSAPs need to have their networks interconnected with wireless carriers so that calls to 9-1-1 are end-to-end IP-based.

### DIRECT RTT TO RTT MOBILE DEVICES

Voice + RTT calls between two parties can now be made. If a mobile phone subscriber, “A”, calls another mobile phone subscriber, “B”, a voice + RTT conversation can take place between the two as long as they are both operating on an RTT-capable mobile device, even if they are subscribers of different mobile carriers.

Having RTT-capable mobile devices is the key to making RTT effective in both daily communications and emergency situations. With the text arriving from a direct RTT line

<sup>8</sup> Real-Time Text: [http://www.realtimetext.org/rtt\\_in\\_detail](http://www.realtimetext.org/rtt_in_detail)

to a mobile-friendly RTT device in real-time (fractions of a second), the texting medium becomes much closer to a real conversation, increasing efficiency and saving time.

### **RTT TO TTY (BACKWARD COMPATIBILITY)**

Until a sunset date is established for Text Telephones (TTYs), backward compatibility is necessary. Mobile carriers are obligated to implement backward compatibility functionality within their networks, so that RTT callers can communicate with TTYs. Though the number of TTY users is not growing, the existing reliance on the established technology is still present.

The innovative RTT technology provides a more natural, bi-directional flow of communication that closely mimics the conversational nature of voice communication.<sup>9</sup> RTT allows text to be utilized in the same conversational method as voice.

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<sup>9</sup> Hamilton NG911: <http://hamiltonng911.com/rttvideo/>

## WHAT HARDWARE & INFRASTRUCTURE ARE NEEDED?

On October 23<sup>rd</sup>, 2017, the Federal Communications Commission (FCC) held an Accessibility Innovations Expo featuring private and public sector innovators, technology companies, organizations and academics that showcased their technology products and services impacting the lives of consumers with disabilities.<sup>10</sup> With the use of eTouch RTT handset client from Omnitor, Hamilton NG911<sup>®</sup> and INdigital demonstrated the new solution that provides RTT to 9-1-1 capability.

### **STATE LEVEL**

States that provide centralized funding or procurement for 9-1-1 services and equipment should ensure that RTT is supported by vendors.

### **PSAPs**

PSAPs need to have NG 9-1-1 equipment that is capable of receiving native RTT and establish connectivity with mobile carriers directly through a service provider.

### **CONSUMERS**

RTT is now available for consumers via certain mobile phone devices and service offered by national wireless carriers. Some carriers offer RTT as a downloadable app that can be installed on a smartphone, with other carriers offering certain mobile handsets supporting RTT. The availability of RTT-supported devices will increase over time.

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<sup>10</sup>FCC: <https://www.fcc.gov/news-events/events/2017/10/fcc-accessibility-innovations-expo>

## TIMELINE

The Federal Communications Commission (FCC) has allowed wireless carriers to support RTT on wireless IP networks in lieu of supporting TTY communication on wireless IP networks.<sup>11</sup>

- Tier 1 providers were required to support RTT on their networks by the end of 2017, and have all of their new authorized user devices support RTT by December 31, 2019.<sup>12</sup>
- Other providers have until June 30, 2020 to support RTT on their networks and June 30, 2021 to have their new devices support RTT.

“Supporting RTT” includes implementing backward compatibility from RTT to TTY for a period of time until the FCC determines that backwards compatibility is no longer needed. The “sunset date” for backward compatibility has not yet been determined.

“Supporting RTT” also includes delivering calls to 9-1-1 via RTT where the PSAP is capable of supporting RTT.

The FCC is proposing that wireless service providers support RTT on their networks as an eventual replacement of legacy TTY support. Simultaneously, there will be a need to communicate with individuals still using TTY devices. A call coming into a company’s network may be routed to many different places, for example, the call may end up with an agent working in a remote data center. If that call is a TTY call, it needs to be routed over a legacy phone network due to VoIP networks corrupting the TTY signal, making it difficult to achieve reliable communication.

The earlier the Real-Time Text adoption, the smoother the learning terrain and the sooner states, PSAPs and the public may benefit from this innovative technology.

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<sup>11</sup> FCC: <https://www.fcc.gov/real-time-text>

<sup>12</sup> Federal Register: <https://www.federalregister.gov/documents/2017/01/23/2017-01377/transition-from-tty-to-real-time-text-technology>

## WHY HAMILTON®

Since 1901, Hamilton Telecommunications has been meeting telecommunications and technology needs. As an established and trusted provider, we are committed to ensuring that we deliver the latest in technology with personalized customer service. Hamilton encompasses eight primary company divisions that allow Hamilton to operate on a local, regional and national basis.

Hamilton Relay, a division of Hamilton Telecommunications, has been providing telecommunications relay services for individuals who are deaf, hard of hearing, deaf-blind or have difficulty speaking since 1991. Hamilton Relay provides contracted Traditional Relay and Captioned Telephone services through 24 contracts to 18 states, the District of Columbia and the Island of Saipan, and is a provider of Internet-based Captioned Telephone services nationwide. Relay services available through Hamilton Relay include:

- Captioned Telephone (CapTel®)
- RTT
- Traditional Relay Services
- Speech-to-Speech
- Deaf-Blind Services
- Spanish

Hamilton brings experience in managing reliable networks for 116+ years and provides:

- RTT Technology
- SMS Text to 9-1-1
- Next Generation Core Services
- Wide range of regulatory experience.
- Robust Telecommunications Infrastructure.
- Broad understanding of accessibility components.
- 24x7x365 coverage with our in-house Data Center.
- Contracted telecommunications service experience on national, state, local levels.

Hamilton remains the leading organization for delivering these critical services. Continued focus on innovation and expansion will ensure Hamilton remains a cutting-edge leader in the telecommunication industry.

Hamilton NG911, Inc. is a division of Hamilton Telecommunications, a diversified telecommunications and technology services provider based in Aurora, Nebraska. Learn more at [www.HamiltonNG911.com](http://www.HamiltonNG911.com).

## CONCLUSION

Professional and public reliance on wireless and mobile devices are growing which clearly indicates the need for updated technological infrastructure in emergency services. In emergencies, every second counts, and accessibility is vital. Real-Time Text provides a timely and innovative solution for both the industry and citizens.

### **Interested in RTT and how to get it?**

#### **CITIZENS:**

Contact your local and/or state public safety office or representative. Inquire about the status of your PSAP's infrastructure, technological accommodations and updates in regards to Next Generation 9-1-1. Informing your local public safety office of your desire to see these services implemented may help bring about needed updates in a quick and efficient manner.

#### **PUBLIC SAFETY PROFESSIONALS:**

RTT is a fast, interactive means of communication that allows individuals to connect with emergency responders. With the government-mandated deadlines approaching, early integration of the Next Generation 9-1-1 service has not only been "green-lit", it grants your service area and civilians immediate access to emergency services through mobile and wireless means. Updating the decades-old system is in the best interest of all involved.

Hamilton NG911 meets the needs of modern day emergency technology with next generation focused innovations. Hamilton NG911 ensures: Experience, Trust and Commitment.

#### **WIRELESS CARRIERS:**

With a focus on next-generation innovations, the Hamilton RTT technology supports RTT providing a more natural, conversational text-based means of communication. Furthermore, just like with speech, RTT users can immediately interrupt the conversation and ask for clarification. This technology will, therefore, improve the communication experiences of customers and enhance telecommunications services.

Most importantly, RTT will help solve current communication issues for those with accessibility needs; specifically, this technology will be invaluable to individuals who are deaf, hard-of-hearing, deaf/blind or have difficulty speaking and for others who experience difficulty with voice-based communication.

## ADDITIONAL RESOURCES

- **FCC – Advantages to RTT**
  - <https://www.fcc.gov/consumers/guides/real-time-text-improving-accessible-telecommunications>
- **FCC – NG 911 for State and Local Governments**
  - <https://transition.fcc.gov/statelocal/NG911-presentation-4-22-2014.pdf>
- **FCC – Real-Time Text Intro**
  - <https://www.fcc.gov/real-time-text>
- **FCC – Accessibility Innovations Expo**
  - <https://www.fcc.gov/news-events/events/2017/10/fcc-accessibility-innovations-expo>
- **FCC – Real-Time Text Report and Notice of Proposed Rulemaking**
  - <https://www.fcc.gov/fcc-adopts-real-time-text-report-and-order-and-further-notice-proposed-rulemaking>
- **Hamilton NG911 – RTT Features Video**
  - <http://hamiltonng911.com/rttvideo/>
- **Nielsen – The Mobile Consumer, A Global Snapshot – PDF Download**
  - <http://www.nielsen.com/us/en/insights/reports/2013/mobile-consumer-report-february-2013.html>
- **Real-Time Text . org – Detailed Overview**
  - [http://www.realtimetext.org/rtt\\_in\\_detail](http://www.realtimetext.org/rtt_in_detail)
- **Real-Time Text . org – RTT Interoperability**
  - <http://www.realtimetext.org/interoperability>
- **Federal Register – Transition from TTY to Real-Time Text Technology**
  - <https://www.federalregister.gov/documents/2017/01/23/2017-01377/transition-from-tty-to-real-time-text-technology>
- **Department of Homeland Security – State Emergency Services**
  - <https://www.dhs.gov/state-homeland-security-and-emergency-services#>

## FOR MORE INFORMATION

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