



May, 2014

WORKING GROUP 1
Next Generation 9-1-1
Task 1, Subtask 2

**Final Report – PSAP Requests for Service for
Interim SMS Text-to-9-1-1**

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1. Results in Brief

1.1 Executive Summary

The “Final Report - PSAP Requests for Service for Interim SMS Text-to-9-1-1” is a report to the Federal Communications Commission (FCC) on recommended best practices for 9-1-1 authorities to utilize when requesting the interim SMS text-to-9-1-1 service. Included in the report is information on how to request the service; how to test and deploy the service; operational considerations before, during and after the deployment; and finally considerations related to security.

During the period when the FCC was establishing the current CSRIC objectives, activities were taking place within other groups to establish much of this content. The CSRIC working group has attempted to incorporate other established work into this recommended best practice in order to ensure consistency within the industry.

2. Introduction

2.1 CSRIC Structure

Communications Security, Reliability, and Interoperability Council (CSRIC) IV									
CSRIC Steering Committee									
Chair or Co-Chairs: Working Group 1	Chair or Co-Chairs: Working Group 2	Chair or Co-Chairs: Working Group 3	Chair or Co-Chairs: Working Group 4	Chair or Co-Chairs: Working Group 5	Chair or Co-Chairs: Working Group 6	Chair or Co-Chairs: Working Group 7	Chair or Co-Chairs: Working Group 8	Chair or Co-Chairs: Working Group 9	Chair or Co-Chairs: Working Group 10
Working Group 1*: Next Generation 911	Working Group 2: Wireless Emergency Alerts	Working Group 3: EAS	Working Group 4: Cybersecurity Best Practices Working	Working Group 5: Server-Based DDoS Attacks	Working Group 6: Long-Term Core Internet Protocol Improvements	Working Group 7: Legacy Best Practice Updates	Working Group 8: Submarine Cable Landing Sites	Working Group 9: Infrastructure Sharing During Emergencies	Working Group 10: CPE Powering

*Working Group 1 was assigned responsibility for three tasks. Task 1 was further subdivided into two subtasks. This working group is responsible for Task 1 subtask 2.

2.2 Working Group 1 Task 1 subtask 2 Members

Name	Company	Status
Sherri Griffith Powell, Chair	L.R. Kimball	Active
Brent Burpee	Verizon Wireless	Active
Kimberly Burdick	Chouteau County MT - Sheriff's Office	Active
David Conner	US Cellular	Active
Terri Brooks	TruePosition	Active
Jeanna M Green	Sprint Corporation	Active
Matthew Gerst	CTIA-The Wireless Association®	Active
Eric Hagerson	T-mobile	Active
Roger Hixson	NENA	Active
Wink Infinger	Florida Department of Management Services	Active
Jay English	APCO	Active
Roger Marshall	Telecommunication Systems, Inc. (TCS)	Active
Kathy McMahon	Mission Critical Partners	Active
Christian Militeau	Intrado	Active
Martin Moody	Metropolitan Emergency Services Board	Active
Ganesh Pattabiraman	NextNav	Active
Gustavo Pavon	TruePosition	Active
Raghavendhra Rao	AT&T	Active
Cherie Lynn Rockwell	Butte County, CA	Active
Roderic Robinson	Telecommunication Systems, Inc. (TCS)	Active
Susan Sherwood	Verizon Wireless	Active
Chuck Ronshagen	Cassidian Communications	Active

Dorothy Spears-Dean	Virginia Information Technologies Agency	Active
Jerry Panagrossi	Invisitrack, Inc.	Active
Greg Turetzky	Intel Corporation	Active
Wayne Ballantyne	Motorola	Inactive
Kirk Burroughs	QualComm	Inactive
Bruce Cox	NextNav	Inactive
Kimberly Culp	Larimer County	Inactive
Gerald Jaskulaski	Department of Homeland Security	Active
Sandra Lott	Sprint	Inactive
Russ Markhovsky	Invisitrack	Inactive
Glenn Roach	Winbourne Consulting	Inactive
Ed Roth	LETA 9-1-1	Inactive
Kurt Schmidt	Intel Corporation	Inactive
Greg Schumaker	Sprint Corporation	Inactive
Kara Thielen	Viaero	Inactive
David Tucker	Vermont Enhanced 9-1-1 Board	Inactive
Jim Goerke	Texas 9-1-1 Alliance	Inactive
Kathy Whitbeck	Nsight	Inactive
Bruce Wilson	Qualcomm	Active
Steve Zweifach	Sprint	Inactive
Robert Ehrlich	Central Islip Hauppauge Volunteer Ambulance Corps	Inactive

3. Objective Scope and Methodology

3.1 Objective

In March 2013, ATIS and TIA jointly released the Native SMS Text-to-9-1-1 Requirements and Architecture Specification (ATIS/TIA J-STD-110). The standard assumes that a Public Safety

Answering Point (PSAP) will designate the type of standard SMS text-to-9-1-1 delivery method to the PSAP, or an alternate PSAP (and delivery method) that will accept SMS text-to-9-1-1 messages on behalf of the PSAP, or the PSAP will indicate that SMS text-to-9-1-1 is not supported at all. The ATIS/TIA Implementation Guidelines associated with ATIS/TIA J-STD-110 was released in November 2013 and contains guidance for Wireless Service Providers (WSPs), Text Control Center (TCCs) providers; and is also intended to support processes and procedures within PSAPs. In the May 2013 FCC Report & Order on Text-to-9-1-1 establishing bounce-back requirements for licensed wireless providers of text services, the FCC requires wireless carriers to provide a mechanism for 9-1-1 Authorities to notify the wireless carrier to temporarily suspend the SMS text-to-9-1-1 service and to restart the SMS text-to-9-1-1 service. The Working Group will recommend best practices “Final Report - PSAP Requests for Service for Interim SMS Text-to-9-1-1”, including testing and trialing of the service, operational procedures, and security requirements that WSPs, 9-1-1 Authorities, and third party service providers should follow in provisioning 9-1-1 Authority requests for the SMS text-to-9-1-1 service.

3.2 Scope

The “Final Report - PSAP Requests for Service for Interim SMS Text-to-9-1-1” is a report to the Federal Communications Commission (FCC) on recommended best practices for 9-1-1 authorities to utilize when requesting the interim SMS text-to-9-1-1 service. The information below details what was included within the scope of work for this document.

The scope of work for Task 1 Subtask 2 includes a review of the Public Safety Questionnaire and Request for Service documents recently published by ATIS/TIA. The questionnaire provides the WSP with a consistent method by which to determine the 9-1-1 Authority’s state of technical and operational readiness for the SMS text-to-9-1-1 service and preferred interface (delivery method).

The recommendations and best practices within this document provide insight on the three available delivery methods for the interim SMS text-to-9-1-1 solution; Web Service, TTY, and i3 ESInet/IP Interface. It is not the intent of this document to advise 9-1-1 Authorities as to which option is most appropriate or to identify when a region should implement. The intent is to assure that each delivery method is accurately described within this document, thereby empowering public safety with baseline knowledge by which to make implementation decisions.

This document also provides information on system testing to assure the integrity of SMS text-to-9-1-1 delivery. Test procedures are outlined for each of the three available delivery methods. The scope of work for this document does not include testing of calling device location or location accuracy.

Finally, this document provides operational considerations and information on available PSAP training materials for the 9-1-1 Authority to utilize when planning for the deployment of the Interim SMS text-to-9-1-1 service.

3.3 Operational Procedures

Working Group 1 Task 1 Subtask 2 met biweekly (every two weeks) via conference calls to explore appropriate administrative and technical best practices around Public Safety's formal Request for Service ("RFS") to Commercial Mobile Radio Service ("CMRS") providers of SMS text-to-9-1-1. The Subtask 2 group conducted review sessions and provided edited contributions of the existing RFS template documents to be shared for official service request. Supportive documents and training material from NENA were also highlighted, including a Standard Operating Procedure ("SOP") template for PSAP entities, and suggestions for predetermined messages for the PSAP CPE to respond to emergency text messages. SMS text-to-9-1-1 deployment test plans were also developed by members of the Subtask 2 group, which keyed on establishing testing guidelines to support the ATIS/TIA J-STD-110 architecture. All text contributions were reviewed, some edited, and those approved by all members were included into a final draft of the document.

This Subtask group conducted 12 meetings over teleconference calls spanning from November 8, 2013 through April 30, 2014. The sub-group relied upon members volunteering to embrace additional work in conjunction with participating in the responsibilities that each member faced in their public, private, or other profession.

4. Background

When the FCC's Emergency Access Advisory Committee (EAAC) was established, one of its missions was to recommend how to provide a national interim text-to-9-1-1 service¹. The EAAC recommended that SMS text-to-9-1-1 be used, largely because SMS was already in place in wireless carrier networks as a general use text service. ATIS/TIA developed a technical standard in March 2013 that defines the architecture of a Text Control Center (TCC), along with a basic implementation checklist. In December 2012, an agreement between the four largest wireless carriers (AT&T Mobility, Sprint, T-Mobile, and Verizon Wireless), NENA, and APCO was formalized and established May 15, 2014 as the "wireless carrier ready" date for offering the SMS text-to-9-1-1 service to the public. The FCC issued a ruling that a bounce-back message be in place to inform anyone who attempted to send an SMS text-to-9-1-1 that the service was unavailable. The bounce-back message had to be in place by all wireless carriers by September 30, 2013.

¹ The longer term solution for text to 9-1-1 was already being worked in standards groups, specifically MMES for use with NG9-1-1.

When the EAAC work ended, it was apparent that necessary detailed information to actually plan and implement the SMS text-to-9-1-1 service nationally was still needed, especially for use by Public Safety. An ad hoc Service Coordination Group (SCG), made up of the major stakeholders, was established to fill this gap. Several products resulted, including their published Information and Planning Guide, and a Public Safety Questionnaire and Request for Service letter. This information was posted for the use of Public Safety management in February 2014. The timeframe in which the SMS text-to-9-1-1 service is available to public end users is dependent on the readiness and request for service by Public Safety.

While this document is limited to the interim SMS text-to-9-1-1 service, the FCC continues to explore further expansion of text-to-9-1-1. In first quarter 2014, the FCC issued a FNPRM which proposed further wireless carrier requirements around SMS text-to-9-1-1, and in regard to Over The Top (OTT) text-to-9-1-1 service providers.

5. Best Practices

5.1 Requesting Text-to-9-1-1

During the period when the FCC was establishing the current CSRIC objectives, the above activities were taking place. As a result, a consensus baseline Request for Service letter process has been established by the SCG group². It is recognized that wireless service providers might need to insert carrier specific details into the baseline process.

After the planning process for each PSAP's selected delivery method (interface) is underway, the 9-1-1 Authority should prepare the service questionnaire(s) and the Request for Service letter, and send to each wireless carrier that operates within their jurisdiction. It is recommended that this be done via registered mail, in order to establish receipt date as a base for the implementation process.

² Information and Planning Guide - http://c.ymcdn.com/sites/www.nena.org/resource/resmgr/Docs/SMS_Text_Info_and_Planning.pdf.

Final Report

[May, 2014]

{9-1-1 Authority Letterhead}

Date:

[Wireless Service Provider Contact Name]
[Wireless Service Provider Contact Title]
[Wireless Service Provider Name]
[Wireless Service Provider Street Address]
[Wireless Service Provider City, State & Zip]

Re: Interim SMS Text-to-9-1-1 Request for Service

Dear _____:

The ___[Requesting Entity]___ hereby formally requests and authorizes [Wireless Service Provider Name] to provide SMS to 9-1-1 based on other emergency communications service as defined in 47 USC 615.b. (9)(B). The Public Safety Answering Point(s) to be deployed is/are:

___[PSAP Name] [FCC PSAP ID] [PSAP Location]___
___[PSAP Name] [FCC PSAP ID] [PSAP Location]___
___[PSAP Name] [FCC PSAP ID] [PSAP Location]___

Please begin deployment activities upon receipt of this letter. Your point of contact will be:

Mr./Ms. _____
Title: _____
Address: _____
Email: _____
Phone: _____

Regards,

NOTE: This service request letter was developed based on Annex B from ATIS/TIA J-STD-110.01, *Joint ATIS/TIA Implementation Guideline for J-STD-110, Joint ATIS/TIA Native SMS to 9-1-1 Requirements and Architecture Specification*; more information is available from the Alliance for Telecommunications Industry Solutions (ATIS)
<http://www.atis.org> .

To obtain the FCC PSAP ID, go to the FCC website - www.fcc.gov/encyclopedia/9-1-1-and-e9-1-1-services - in the middle of the page is a link to download the *FCC Master PSAP Registry File*. The file is in Excel and can be sorted by PSAP name, county, city or state. If corrections or changes are needed to the PSAP Registry, FCC contact information is provided on the web page.

SMS Text-to-9-1-1 PSAP Readiness Questionnaire Please fill out & return to: [Wireless Service Provider Contact Name] [Wireless Service Provider Contact Address]	
Name of PSAP	
PSAP FCC ID	
Contact info:	
Street	
Street	
City	
State	
ZIP	
PSAP Primary Point of Contact:	
First Name	
Last Name	
Desk Phone	
Cellular Phone	
Email address	
PSAP Admin Line for contact	
Existing SMS text-to-9-1-1 service today?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, please explain:
Will your PSAP be accepting SMS text-to-9-1-1 messages for other PSAP jurisdictions?	No <input type="checkbox"/> If Yes, list name & FCC ID (authorization letter from these PSAPs or 9-1-1 Authorities may be required):

Are there call taker workstations that can install Microsoft Internet Explorer version 8 or higher, Firefox latest version or Chrome latest version?	Yes <input type="checkbox"/>
	No <input type="checkbox"/>
If answered no above, can there be a special waiver to install one of the listed browsers?	Yes <input type="checkbox"/> Preferred Browser:
	No <input type="checkbox"/>
Are there workstations with a browser already installed?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, list browser and version:
Do the workstations have public internet access?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Does your PSAP have an ESInet or other IP network connectivity? <i>Please note: Support for IP networks that are not NENA i3 ESInet compliant are handled on a case-by-case basis</i>	Yes <input type="checkbox"/> No <input type="checkbox"/>
If yes:	
Are the IP links redundant?	
Where are the Points of Interconnection (POIs) located?	
Who is the ESInet facility vendor?	
If no:	
Who is the 9-1-1 Service Provider in your county?	
Do you have a point of contact for ordering and configuring circuits?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, Name: Contact Number:
How long does it take to complete a circuit order?	
Is there a firewall or internet proxy in place?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, firewall make & model:

Is there a firm that manages your workstations or firewall? If so please list firm and contact information.	Yes <input type="checkbox"/> Contact Name: Contact Number:
	No <input type="checkbox"/> (Please list primary in house IT department contact) Name: Contact Number:
Please list the number of workstations accessing the SMS text-to-9-1-1 service.	
How many dispatchers will be handling the service?	
Is the PSAP CPE equipped to handle TTY calls?	Yes <input type="checkbox"/> List CPE make and model:
	No <input type="checkbox"/> Can the CPE be upgraded?
Is the TTY workstation(s) connected via existing CAMA/SS7 trunk groups?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the TTY workstation(s) also connected to the ALI?	Yes <input type="checkbox"/> No <input type="checkbox"/>

5.2 Testing and Trialing Service

5.2.1 Web Services Interface

SMS Text-to-9-1-1 Web Services Option

Field Test Guidelines

Introduction

This document describes field test guidelines to demonstrate the functionality of SMS text-to-9-1-1 service utilizing the Web Services option.

Assumptions

- All connectivity between the TCC, the wireless carrier, and the PSAP have been established prior to field testing.
- Field testers should coordinate with requesting 9-1-1 Authority/PSAP for assistance with the PSAP personnel.
- Field tester(s) should utilize production wireless handset for field testing.
- Please note: accessibility of precise location updates may not be available. The initial location information sent to the PSAP is coarse location. Subsequent location rebids are not part of ATIS/TIA J-STD-110. Only coarse location is required, any rebid functionality is OPTIONAL.

Testing tools

- Activated wireless cell phones with the ability to send and receive SMS text messages.
- PSAP access to SMS to 9-1-1 interface.

Test Case no.	Test Case Description	Expected Result
1	SMS subscriber (tester) sends SMS to 9-1-1 request message from a mobile device	SMS request is sent from subscriber to the PSAP using the Web Services interface
2	PSAP TeleCommunicator receives SMS to 9-1-1 message	PSAP verifies MDN and the initially displayed coarse location information
3	PSAP sends a predefined canned response message to the subscriber	Pre-populated, pre-provisioned SMS message received by tester
4	Multiple SMS to 9-1-1 messages sent simultaneously to the PSAP from different mobile devices	Multiple SMS to 9-1-1 received and handled by different PSAP operators
5	SMS to 9-1-1 max active session limit verification using TCC Policy Routing Function (PRF)	Verify that SMS to 9-1-1 PRF max session limit rule successfully limits the delivery of SMS to 9-1-1 requests that would otherwise be received
6	SMS to 9-1-1 bounce back message when no telecommunicators are logged in to the Web Service at the PSAP	TCC successfully sends bounce back response when there is no PSAP telecommunicator available to receive SMS to 9-1-1 messages
7	PSAP inside boundary routing verification	The tester verifies that SMS to 9-1-1 requests successfully route to the expected PSAP, based on PSAP boundary definitions
8	PSAP outside boundary routing verification	The tester verifies that SMS to 9-1-1 requests do not route to the original PSAP, but successfully route to a different PSAP, based on outside PSAP boundary definitions

5.2.2 TTY Interface

SMS Text-to-9-1-1 TTY Option

Field Test Guidelines

Introduction

This document describes field test guidelines to demonstrate the functionality of SMS to 9-1-1 service utilizing the TTY option.

Assumptions

- All connectivity between the TCC, the wireless carrier, and the PSAP have been established prior to field testing. This also includes any fine tuning of the existing trunk group parameters between the Selective Router and the requesting 9-1-1 Authority/PSAP.
- Field testers should coordinate with requesting 9-1-1 Authority/PSAP for assistance with the PSAP personnel.
- Field tester(s) should utilize production wireless handset for field testing.
- Please note: accessibility of precise location updates may not be available. The initial location information sent to the PSAP is coarse location. Subsequent location rebids are not part of ATIS/TIA J-STD-110. **Only coarse location is required, any rebid functionality is OPTIONAL.**

Testing tools

- Activated wireless cell phones with the ability to send SMS messages.

- PSAP access to SMS to 9-1-1 interface.

Test Case Number	Test Case Description	Expected Result
1	SMS subscriber (tester) sends SMS to 9-1-1 request message from a mobile device	SMS request is sent from subscriber to the PSAP using the PSAP TTY interface
2	PSAP TeleCommunicator receives SMS to 9-1-1 message	PSAP verifies and records MDN and the initially displayed coarse location information
3	PSAP sends a reply message to the subscriber	PSAP typed message is received by subscriber and verbally verified as to content
4	Multiple SMS to 9-1-1 messages sent simultaneously to the same PSAP from different mobile devices	Multiple SMS to 9-1-1 messages received and handled by different PSAP operators
5	SMS to 9-1-1 max active session limit verification using TTY Admin Policy Routing Functionality (PRF)	Verify that SMS to 9-1-1 PRF max session limit rule set up successfully limits the delivery of SMS to 9-1-1 requests via TTY that would otherwise be received
6	SMS to 9-1-1 bounce back message when no TTY call takers are available at the PSAP to take the text call	TCC successfully sends an bounce back response when there is no PSAP operator available to receive SMS to 9-1-1 messages via TTY
7	PSAP inside boundary routing verification	The tester verifies that SMS to 9-1-1 requests successfully route to the expected PSAP, based on PSAP boundary definitions
8	PSAP outside boundary routing verification	The tester verifies that SMS to 9-1-1 requests do not route to the original PSAP, but successfully route to a different PSAP, based on outside PSAP boundary definitions

5.2.3 i3 ESInet/IP Network Interface

SMS Text-to-9-1-1 i3 ESInet/IP Network Service Interface

Field Test Guidelines

Introduction

This document describes field test guidelines to demonstrate the functionality of SMS text-to-9-1-1 service utilizing the ESInet Services option.

Assumptions

- All connectivity between the TCC, the wireless carrier, and the 9-1-1 Authority/PSAP have been established prior to field testing.
- Field testers should coordinate with requesting 9-1-1 Authority/PSAP for assistance with the PSAP personnel.
- Field tester(s) should utilize production wireless handset for field testing.
- Please note: accessibility of precise location updates may not be available. The initial location information sent to the PSAP is coarse location. Subsequent location rebids are not part of ATIS/TIA J-STD-110. **Only coarse location is required, any rebid functionality is OPTIONAL.**

Testing tools

- Activated wireless cell phones with the ability to send and receive SMS text messages.
- PSAP access to SMS to 9-1-1 interface.

Test Case no.	Test Case Description	Expected Result
1	SMS subscriber (tester) sends SMS to 9-1-1 request message from a mobile device	SMS request is sent from subscriber to the PSAP using the i3/ESInet (SIP/MSRP) interface
2	PSAP TeleCommunicator receives SMS to 9-1-1 message	PSAP verifies MDN and the initially displayed coarse location information
3	PSAP sends a text response message to the subscriber	PSAP originated SMS message response received by tester
5	Multiple SMS to 9-1-1 messages sent simultaneously to the PSAP from different mobile devices	Multiple SMS to 9-1-1 received and handled by the same PSAP telecommunicator
6	Multiple SMS to 9-1-1 messages sent simultaneously to the PSAP from different mobile devices	Multiple SMS to 9-1-1 received and handled by different PSAP telecommunicators
7	SMS to 9-1-1 bounce back message when no telecommunicators are logged in at the PSAP station	TCC successfully sends bounce back message when there is no PSAP operator available to receive SMS to 9-1-1 messages
8	PSAP inside boundary routing verification	The tester verifies that SMS to 9-1-1 requests successfully route to the expected PSAP, based on PSAP boundary definitions
9	PSAP outside boundary routing verification	The tester verifies that SMS to 9-1-1 requests do not route to the original PSAP, but successfully route to a different PSAP, based on outside PSAP boundary definitions

5.3 SMS Text-to-9-1-1 Operational Considerations

5.3.1. Planning Considerations and Resources

This working group recognizes that there are many decisions to be made by a 9-1-1 Authority prior to implementing an Interim SMS text-to-9-1-1 solution; and that documentation has been created by other groups to assist the 9-1-1 Authority in this area. Rather than providing a duplicate of that information in this document this section provides a summary of the resources available for consultation and consideration by 9-1-1 Authorities.

Public Safety must address a number of planning issues when preparing to accept SMS text-to-9-1-1 messages – from determining which PSAP(s) is going to receive the SMS text messages, and implementing the interim SMS text-to-9-1-1 solution, through the education of the public end user and the introduction of the service. Consultation with the local Deaf, hard of hearing, and speech disability communities to identify and address local concerns, and to ensure effective outreach is recommended. A coordinated education program to manage the expectations of the public end user is necessary.

County-wide (or regional or state-wide) service implementation is recommended. The PSAPs that will be accepting the SMS text to 9-1-1 messages must be defined. The choice of the SMS message delivery option to the PSAP defines the associated network elements, CPE upgrades, and/or ancillary workstations (and potential costs, both non-recurring and recurring) that are required for a complete service deployment. SMS message overflow and alternate routing schemes must be defined. The 9-1-1 Authority must prepare the service questionnaires and Request for Service letters and send to each involved wireless carrier. Associated equipment and

network elements must be installed and testing of the service must be scheduled. Training and standard operating procedures for handling SMS text-to-9-1-1 are similar to current procedures for handling TTY calls, but training must be completed. And finally the “rollout” of the SMS text-to-9-1-1 service takes place.

The working group recommends 9-1-1 Authorities reference the following resources for additional information. The Service Coordination Group as mentioned in section 5.1 above, has created the “Interim SMS Text-to-9-1-1 Information and Planning Guide³”. In addition the NENA NG9-1-1 Education and Training working group created a list of consideration points, “Is Text-to-9-1-1 Right for My PSAP”, for 9-1-1 Authorities to utilize in planning⁴.

5.3.2. Implementation Considerations

Section 5.1, Requesting SMS Text-to-9-1-1, and Section 5.2, Testing and Trialing Service, refer to the three delivery options available to Public Safety for interim SMS text-to-9-1-1. They are: Web Services; TTY; and an i3 ESnet/IP Network Interface. These text-to-9-1-1 delivery options are provided by a new functional element called a Text Control Center (TCC), which is defined in ATIS/TIA J-STD-110, Joint ATIS/TIA Native SMS to 9-1-1 Requirements and Architecture Specification and ATIS/TIA J-STD-110.a, Supplement A to J-STD-110. There is also an implementation guidelines document, J-STD-110.01, Joint ATIS/TIA Implementation Guidelines for J-STD-110, that provides the wireless carriers, vendor community, and Public Safety with information intended to set equivalent expectations and produce efficient deployments.

Based on the three delivery options defined in the referenced standards, Public Safety governing authorities must select a SMS text-to-9-1-1 delivery method that best fits their current needs and future plans. For each one of the delivery options chosen there are tradeoffs.

5.3.2.1 Web Services

One assumption that could likely be made from ATIS/TIA J-STD-110 is that each wireless carrier – at least for the major wireless carriers - will implement their own TCC. Another assumption is that there will be more than a single TCC vendor serving Tier 1, 2, and 3 wireless carriers. As wireless carriers select individual TCC solutions, the Web Services approach between TCC vendors will vary in implementation. This means that each TCC Web Services solution will present a unique user interface.

If all the wireless carriers providing a Web Service within the PSAP/9-1-1 Authority’s jurisdiction are served by the same TCC vendor solution, then it’s a straightforward implementation, having a single user interface to the PSAP. In the case where all wireless carriers serving a single jurisdiction are not served by the same TCC vendor solution, Public Safety must seek a favorable workaround that provides a single web service user interface. ATIS/TIA J-STD-110.a does not

³ Information and Planning Guide

http://c.ymcdn.com/sites/www.nena.org/resource/resmgr/Docs/SMS_Text_Info_and_Planning.pdf.

⁴ http://c.ymcdn.com/sites/www.nena.org/resource/resmgr/standards/is_text-to-9-1-1_right_for_m.pdf

explicitly address the provision of a single web service user interface at the PSAP, but does offer a solution.

ATIS/TIA J-STD-110.a defines a standard TCC-to-TCC SIP/MSRP interface to support interworking between what is characterized in this document as Originating and Terminating TCCs. The PSAP can choose a TCC Web Service vendor based on its preference for the web service user interface (Terminating TCC). That Terminating TCC can then serve as an aggregation point for any number of wireless carriers' individual Originating TCCs. This approach simplifies requests for service from each wireless carrier that provides service within the PSAP jurisdictional boundary, and provides a single, consistent interface to the PSAP Telecommunicator.

5.3.2.2 TTY Interface

Wireless carriers deploying TCC to Selective Router (SR) network links may choose to implement IP backhaul "tunneling" of digitized Baudot, or utilize existing SS7 links. Given the fairly large number of SRs currently deployed, consideration should be given to try to minimize the number of connections from each TCC to each SR. Using a Terminating TCC as an aggregation point for any number of wireless carriers' individual Originating TCCs, as defined in ATIS/TIA J-STD-110.a, is one approach.

9-1-1 authorities that select the TTY option must consider the challenges and limitations of TTY delivery, including the limitation of one TTY delivered SMS text-to-9-1-1 session per CAMA trunk. TTY trunk capacity may be exceeded as SMS text-to-9-1-1 requests become more prolific, requiring additional CAMA trunks and port capacity to be added at the SR and PSAP CPE.

5.3.2.3 i3 ESInet/IP Network Interface

9-1-1 authorities that request a Session Initiated Protocol (SIP)/Message Session Relay Protocol (MSRP) interface to support either an NG9-1-1 (i3) ESInet interconnection, or an optional SIP/MSRP conformant PSAP CPE implementation (not described in ATIS/TIA J-STD-110), will plan for network interconnections typically over a commercial MPLS service. This requires the i3 ESInet or PSAP demarcation point to have an MPLS service in place. Direct SIP/MSRP interconnections are managed at each wireless carrier Originating TCC, or optionally at a Terminating TCC aggregation function.

Conclusion

ATIS/TIA J-STD-110.a, a Supplement to ATIS/TIA J-STD-110, provides an architecture that can be advantageous to the PSAP and 9-1-1 Authority when there is more than one TCC involved in a deployment. If a PSAP/9-1-1 Authority is choosing TTY to a legacy network, or delivery to a NENA i3 ESInet, ATIS/TIA J-STD-110.a defines a TCC-to-TCC interworking interface that can be utilized as a method to minimize the number of circuit interconnections required. If a PSAP/9-1-1 Authority has a requirement for a single web service client supporting all SMS text to 9-1-1, regardless of wireless carrier,

that same method is applicable. The architecture defined in ATIS/TIA J-STD-110.a allows multiple wireless carriers' Originating TCCs to interconnect with a single Terminating TCC. The Terminating TCC:

- Serves as an aggregation point for multiple wireless carriers/Organizing TCCs;
- Provides three SMS text-to-9-1-1 message delivery methods into the PSAP/9-1-1 Authority;
- Defines the specific Web Service user interface that the PSAP can standardize on;
- Consolidates the number of network interfaces required;
- Provides centralized management and control for service availability
- Is a centralized management and reporting node

5.3.3 PSAP Training and Standard Operating Procedures

The NENA NG9-1-1 Education and Training working group has created PSAP training materials and a sample standard operating procedure as a starting point for 9-1-1 Authorities. The documents are located on the NENA web site⁵ in editable form in order to allow for customization by 9-1-1 authorities.

5.4 Security

As our technology changes, so do the threats we face. In order to ensure continuity of operations it is essential that we learn to protect and secure our networks and systems in both the public and private sectors. Our ability to secure our networks, and critical data, from cyber attack must be a primary consideration when designing and implementing any new solutions including the interim SMS text-to-9-1-1 solution.

There are several groups already working on security considerations and use cases for evaluation. They include the Alliance for Telecommunications Industry Solutions, the National Emergency Number Association and the Association of Public-Safety Communications Officials among others. These organizations are already working cooperatively between industry and public safety to arrive at suggested solutions for potential unwanted or unintended consequences when utilizing new systems and technologies. While the interim solution includes three primary delivery methods for SMS text-to-9-1-1, the introduction of web based options into this mix, and the need to have data networks available for the transport of this traffic, along with potential privacy, location, and continuity issues still present potential issues for both the carriers and public safety.

In addition, it is the recommendation of this working group that the Commission consider working with appropriate entities to adopt a common approach to Cybersecurity beyond the federal level. The Government Accountability Office (GAO⁶) is working on a similar approach which may be of use as a model.

Based on the Comprehensive National Cybersecurity Initiative (CNCI) several key points could be

⁵ PSAP Interim Text-to-9-1-1 Training Documents - http://www.nena.org/?text_training_docs

⁶ <http://www.gao.gov/products/GAO-14-125>

included in the security planning for this technology. Among these are several considerations that would be applicable to the SMS-to-9-1-1 arena, and would carry forward into other Next Generation technologies. At a high level they include:

- Inclusion of provisions for establishing Trusted Internet Connections for traffic destined for, and originating from, PSAP's.
- Deployment of intrusion prevention systems across the enterprise.
- Develop and implement a cyber counterintelligence (CI) plan.
- Expand cyber education.
- Define and develop enduring deterrence strategies and programs.

In considering the implementation of such programs, we need to understand not only the risk, but also what we can do to mitigate that risk. Waiting until the networks are built is too late. While we strive to combat the current cyber attacks, cyber criminals are already designing the next vector for attack, and they are constantly adapting.

We cannot for one minute allow the threat of cyber attack to deter us from progressing. This said, our resolve to deploy these new technologies must be matched by our resolve to create secure systems and solutions for both industry and public safety.

6. Recommendations

It is highly recommended that the FCC work with the National 9-1-1 office and the Department of Justice to take every possible opportunity to collaborate and assert directive influence with 9-1-1 governing authorities to implement the best practices within this document.

Regardless which one of the three available delivery methods for interim SMS text-to-9-1-1 is chosen by a 9-1-1 Authority, well executed coordination between the requesting 9-1-1 Authorities and the WSPs will be a key factor in successful deployments. Coordination should be centered on the most practical and effective unit of local government, which is often the county level or above. 9-1-1 governing authorities should provide status and a level of awareness to the 9-1-1 governance entity for the state,

This coordination should be established during the planning phase and continue through testing and establishing operational procedures. In counties where there are multiple PSAPs, coordinating the submission of Public Safety Questionnaires will enable the involved wireless carriers to have a complete picture of the county-wide state of technical and operational readiness for the implementation of the SMS text-to-9-1-1 service, allowing all parties to use resources more efficiently and effectively. Testing on a local, regional or statewide level will also generate positive results; it will facilitate the implementation of SMS text-to-9-1-1 in a robust and integrated manner, as well as provide a uniform set of expected results and limitations to all involved PSAPs. And finally, a coordinated approach to

the generation of operational procedures at the county and higher level will ensure that users, both 9-1-1 professionals and the public, are educated from a single source.

7. Conclusion

This working group reviewed published standards, established work, recommendations and documents from the various resources, detailed throughout this document, and have compiled the information in this report. This document will assist public safety with knowledge on delivery methods selection, service requests and submission, security needs, implementation and testing for a successful implementation of interim SMS text-to-9-1-1. Best practices provide insight on available wireless carrier delivery methods and service limitations. 9-1-1 Authority's completion of the Public Safety Questionnaire and Request for Service documents will stipulate the 9-1-1 Authority's technical and operational readiness and notify the wireless carriers of their preferred interface choice for deployment. Testing plans are included to assure the integrity of the SMS text-to-9-1-1 service delivery for each delivery method. Information on available PSAP training materials will assist with operations and planning and provided public education materials should reduce the impact of the deployment timeline for an effective rollout of the SMS text-to-9-1-1 service nationwide.

GLOSSARY

9-1-1 Authority - The organization having administrative jurisdiction over a particular 9-1-1 service system. This could be a county/parish or city government, a special 9-1-1 or Emergency Communications District, a Council of Governments or other similar body.

Course location – initial location based on cell antenna and sector centroid used to route SMS text-to-9-1-1 communications. Each sector has a terminating PSAP associated with it.

DDoS – distributed denial-of-service (DDoS) attack is an attempt by two or more parties or software applications to make a machine or network resource unavailable to its intended users, usually by disrupting its functions or access to it.

i3 – a short term referencing the NENA architecture design for NG9-1-1.

ESInet – a designed, managed IP network dedicated to support and transport of emergency services applications, including but not limited to NG9-1-1.

IP – Internet Protocol, the software language originally designed for the Internet, but used on other networks to support data transfer and provide IP based functionality.

OTT – Over The Top, is a term describing the provision of text or multimedia using smartphone software applications provided by companies other than the wireless operator providing connectivity.

PSAP – Public Safety Answering Point, a local government organization where 9-1-1 calls or texts are answered and processed.

SCG – Service Coordination Group, an Ad Hoc stakeholder group formed to document consensus planning and information to support national implementation of SMS text-to-9-1-1.

SMS – Short Message Service, a texting service currently implemented in all wireless carrier networks.