Commonwealth of Virginia

Text to 9-1-1 White Paper

Detailing the Goal of Establishing Ubiquitous
Text to 9-1-1 Service in Virginia

Developed by the

Virginia E-911 Services Board

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Introduction

Text-to-9-1-1 is no longer a capability that is on the horizon; it has become part of our 9-1-1 reality. At present, there have been only six deployments in Virginia, but many Public Safety Answering Points (PSAPs) have expressed a strong interest in providing Text-to-9-1-1 service to their citizens and are moving forward to deploy this technology. Like the deployment of wireless E-911, the Commonwealth needs a comprehensive strategy for the deployment of Text-to-9-1-1 to ensure ubiquitous service. To this end, the E-911 Services Board (the "Board") established a Text-to-9-1-1 Subcommittee (the "Subcommittee") to evaluate the feasibility of texting to 9-1-1 as a statewide initiative. This white paper is the final report of that Subcommittee to the Board proposing the following goal and supporting recommendations.

Goal: Establish ubiquitous Text-to-9-1-1 service in the Commonwealth

The Subcommittee recommends that the Commonwealth take all steps necessary to ensure that Text-to-9-1-1 service is available universally to all citizens throughout the state. It will require strong centralized leadership and Board action to make this goal a reality. To achieve this, the Subcommittee is recommending the following:

- **Encourage the pursuit of web browser Text-to-9-1-1 solutions**

A base standard of service is needed as a foundation as the Commonwealth moves towards statewide deployment. The Subcommittee recommends that this baseline be a web browser Text-to-9-1-1 solution (described below). While this will just be an interim solution, it provides the best solution available to the Commonwealth at this time and the greatest flexibility to support future messaging capabilities. Basic web browser solutions are currently available to PSAPs at no cost; however, if any direct funding is provided by the Board for enhanced solutions (such as a text aggregator, which is described below), it should be contingent upon a PSAP pursuing this base standard.

- **Leverage text aggregator solutions for statewide deployment**

The Subcommittee recommends that text aggregators be leveraged to speed statewide deployment and enhance operations. These solutions provide necessary enhanced capabilities such as a single web user interface and, more importantly, the ability to transfer text message sessions among PSAPs with diverse equipment. The ability to transfer text sessions among PSAPs is a key feature for larger metropolitan based PSAPs. Although texting is a service that is primarily offered by wireless service providers, a growing trend is for third party providers to offer texting as an "over the top" service to an existing internet connection. Aggregators will provide a clean interface point for incorporating these "over the top" texts.

However, aggregator solutions come with one-time and recurring costs. The Subcommittee is recommending that the PSAP Grant Program be the potential funding source for these costs and that a single aggregator be selected as the standard statewide service provider solution. Fortunately, it may not be necessary to negotiate a separate contract vehicle for an aggregator solution for a statewide

Text-to-9-1-1 solution. There are existing local contracts that must be evaluated to determine if one of these contracts may be appropriate for statewide use.

- **Integrate statewide deployment of Texting to 9-1-1 with NG9-1-1**

Real potential for texting to 9-1-1 will be realized when it is integrated into the PSAP's call handling equipment and not as an external interface. Unfortunately, this cannot be achieved with the current E-911 network and will require the deployment of the Next Generation 9-1-1 (NG9-1-1) network. The Subcommittee is recommending that texting to 9-1-1 be incorporated into NG9-1-1 planning to ensure that it is a basic feature of NG9-1-1 and addresses operational challenges of the interim solution. At this point, permanent standards have not yet been developed to support texting to 9-1-1 in an NG9-1-1 environment.

Current Text-to-9-1-1 Solutions

At present, there are three primary interim solutions for Texting to 9-1-1. These solutions use native wireless operator texting capabilities, known as Short Message Service (SMS) and are as follows:

- **Direct IP**
- **Web browser based with Internet access**
- **TTY over standard PSAP trunks**

These solutions are considered interim because they are based on a transitional Text-to-9-1-1 standard, J-STD-110. This standard will remain in place pending a long-term solution for Internet Protocol (IP) based NG9-1-1 systems.

Direct IP - Direct IP delivery of Text-to-9-1-1 messages requires an IP based PSAP with IP connectivity to an Emergency Services IP Network (ESInet). This method most resembles the NENA i3 NG 9-1-1 solution, but it requires that a PSAP have connection to an IP network, as well as 9-1-1 equipment capable of receiving IP messages. Currently, there are no industry adopted standards for i3 NG9-1-1 Text to 9-1-1. As a result, any Direct IP solutions deployed today would need to be reworked once a statewide ESInet is deployed in Virginia. As a result, since Virginia PSAPs do not meet the requirements for Direct IP Text to 9-1-1, this is not an available option.

Web browser based with Internet access - Virginia PSAPs have instead focused on the web browser solution. This solution requires that a PSAP have a dedicated computer with Internet access. The telephone number associated with the device used for texting and the x/y coordinates of the cell sector centroid associated with the texting device are displayed on 9-1-1 equipment in the PSAP. Also, the web browser solution enables full duplex conversations. This will allow a PSAP call taker and a 9-1-1 caller to be texting simultaneously without fear of cutting off the other person's text.

Of the six deployments that have occurred thus far in the Commonwealth, five PSAPs have selected a basic web browser solution from a third party SMS delivery platform provider, commonly known as a Text Control Center (TCC) provider. The TCC is the interface between the texter and the PSAP. The TCC provider is responsible for routing 9-1-1 texts from the wireless carriers to the PSAPs.

To enhance functionality, the Subcommittee is recommending that a text aggregator be included in the web browser solution. This solution would aggregate all text-to-911 traffic from multiple wireless carriers and TCC vendors, allowing PSAPs to interact with a single service provider for text-to-911. It would also expand the capabilities of the basic web browser solution by including efficient two-way texting conversations and transferability among participating PSAPs. The current Alliance for Telecommunications Industry Solutions (ATIS) standard for texting does not include requirements for transferring so the enhanced capabilities offered by the text aggregator solution provide significant functional capabilities to PSAPs that transfer calls on a frequent basis.

Nationwide, the web browser solution is the most widely used deployment method. Platform providers are focusing resources on this delivery method because it is the solution most requested by PSAPs. When the web browser solution was first deployed, the text message was not incorporated into PSAP first response systems, such as a computer aided dispatch system; however, interfaces have been developed and are now more readily available. Also, TCC providers have developed a unified interface for the delivery of web browser Text-to-9-1-1 traffic to avoid having a separate interface page for each deployed carrier.

Telecommunications Device for the Deaf (TDD)/Teletype (TTY) over standard PSAP trunks - This method of Text-to-9-1-1 delivery requires the least modification to the PSAP equipment. SMS calls are converted to TTY messages and relayed to the PSAP over the existing PSAP wireless 9-1-1 trunks. This process does not require any changes to the existing 9-1-1 call handling equipment or network, but it is the most limiting of the Text-to-9-1-1 deployment solutions. It cannot be upgraded to a web browser or direct IP solution and simultaneous voice and text communication is not available.

Deployment Process and Best Practices

In order to understand the Text-to-9-1-1 deployment process, the Subcommittee reviewed the implementation processes used by PSAPs in a number of Texts to 9-1-1 deployment scenarios. The following is a summary of the primary steps identified, which are recommended for Virginia PSAPs to use in future deployments:

- PSAPs submit a letter to a wireless carrier requesting Text-to-9-1-1 service.
- PSAPs complete and submit a wireless carrier Text to 911 questionnaire.
- The wireless carrier will hold a “kick-off” conference call with the PSAP requesting service and the TCC provider to review the deployment process. It is recommended that the PSAP’s Local Exchange Carrier (LEC) coordinate with the TCC provider on settings for the selective router.

- The wireless carrier and the TCC provider will work with the PSAP's LEC and advise the PSAP when the selective routers are ready to handle texting to 9-1-1. The parties then schedule a date for testing.
- The wireless carrier and the TCC provider route text messages to the appropriate PSAP over the selected interface based on the cell sector, and provide the PSAP with a latitude/longitude location of the calculated centroid of the cell sector using commercial location positioning service.
- If a PSAP CPE upgrade includes support for text messaging, the CPE upgrade should be scheduled in advance of the deployment. In consideration of the planned SMS text interface method, the PSAP will need to discuss, arrange, and schedule any equipment upgrades with their equipment vendor.
- Following the testing, the TCC provider trains PSAP staff on utilizing their system. It is important for PSAP personnel to understand that Text-to-9-1-1 is not limited to people who are deaf, hard of hearing, or have speech disabilities and that this technology functions differently than other 9-1-1 technologies. In conjunction with training, the PSAP should develop appropriate SOPs.
- Once the PSAP is satisfied with the entire process, a deployment date is scheduled and public education material is developed.

At a minimum, national guidelines recommend that Text-to-9-1-1 deployments should occur on a county-wide basis. In Virginia, this means that the minimum geographical boundary for Text-to-9-1-1 deployments will be at the PSAP level since individual PSAPs cover both cities and counties. And even though the unit of deployment for Text-to-9-1-1 is a single PSAP and a single wireless carrier at a time, current Text-to-9-1-1 solutions can also support regional and even state-wide deployments. However, in these types of expanded projects, governance is critical because they require strong coordination among the PSAPs involved, as well as funding for increased functionality to maintain effective PSAP operations.

Call volume impacts, based on current, limited trials and deployments of Text-to-9-1-1, have shown that concerns about PSAPs being overwhelmed by texts to 9-1-1 may be unfounded. A proactive public education campaign will make a difference in how the public perceives and utilizes Text-to-9-1-1. The public should be advised to utilize text only when a voice call is not possible or advisable. Furthermore, there is no indication that Text-to-9-1-1 causes significant numbers of text messaging for emergencies. In fact, the opposite is true. Reports from the states, regions, and localities that have already deployed Text-to-9-1-1, demonstrate that this technology is not a burden to PSAP operations.

Deaf and Hard of Hearing Community

It is highly recommended that planning for Text-to-9-1-1 include consultation and input from hearing and speech advocacy organizations. Getting their input and help in public education efforts and PSAP operations procedures will assist in a smooth implementation of the technology. To this end, the Subcommittee has reached out to the Virginia Department for the Deaf and Hard of Hearing (VDDHH) to

gain insight into the perceptions of Virginia's deaf, hard of hearing, and speech impaired community towards Text-to-9-1-1, as well as to understand how it will impact them.

Through outreach, the Subcommittee discovered that this community is in full support of Text-to-9-1-1 and has a high degree of anticipation for the deployment of this technology in the Commonwealth. The primary reason is Text-to-9-1-1 provides functional equivalency in accessing 9-1-1. Moving forward the Subcommittee has asked the Virginia Information Technologies (VITA) Integrated Services Program (ISP) staff to continue to work with the VDDHH on the following issues related to Text-to-9-1-1:

- Marketing and education
- PSAP staff training and awareness

Potential Costs

The handful of localities in the Commonwealth that have already deployed Text-to-9-1-1 have incurred little to no financial cost. When individual deployments have incurred costs, these costs have generally been associated with the integration of texting to 9-1-1 into PSAP operations. The most common operational costs inherent to this integration process are as follows:

- Redesigning current workstations to accommodate additional equipment
- Training PSAP personnel
- Developing interfaces to accommodate different PSAP first response systems, such as Computer Aided Dispatch (CAD), mapping, and logging

In addition to evaluating the cost of deploying Text-to-9-1-1 on an individual PSAP basis, it should be evaluated on a statewide level. The inability to transfer calls statewide has already been identified as a limitation in the current statewide 9-1-1 network. Text-to-9-1-1 can be leveraged as a first step in overcoming this limitation by providing PSAPs with a solution that would enable them to transfer texts. Currently, an aggregator solution is the only way to give PSAPs this capability, but it will require funding. The Subcommittee is recommending that the Board provide this funding.

A centralized billing approach with a single "billing party" could potentially reduce the cost for the text aggregator service. In Virginia, the process to get Text-to-9-1-1 up and running statewide will be slowed down as each jurisdiction sets up their own contract with a vendor. The preferred alternative is for jurisdictions to order through a statewide contract, allowing the Board to pay for the service directly on behalf of the PSAPs.

Until a statewide ESInet is in place, there will be a cost associated with maintaining Text-to-9-1-1 service in the Commonwealth. The desired end state for Text-to-9-1-1 is to transition to an i3 solution when the necessary standards are in place. In this environment, Text-to-9-1-1 will become an application on the ESInet and will no longer incur additional costs for third party support. To provide a three year transition period to build a statewide ESInet and for the 9-1-1 industry to develop appropriate

standards, the Subcommittee is recommending that the Board provide statewide funding to PSAPs to deploy and maintain Text-to-9-1-1 during the entire period.

A financial estimate for a statewide deployment of Text-to-9-1-1 using an aggregator in Virginia, based on the parameters discussed above, would include the following total non-recurring and recurring expenses for a three year period:

Three Year Period – Cost Estimates for Statewide Deployment – Text Aggregator Solution			
Type of Cost	Number of PSAP	Amount	Total
Non-Recurring Cost	121	$1,500	$181,500
Recurring Cost*	121	$6,300	$762,300

*Provide Text-to-9-1-1 capability for up to five seat licenses at each PSAP

A simplified grant program should be made available for Text-to-9-1-1 where a PSAP could "check the boxes" to identify the desired level of service and associated costs (non-recurring and recurring for seat licenses) to simplify the service request process. The funding would be transferred to a statewide solution vendor through a billing agreement with the Board. A simple and easy method of obtaining funding would encourage PSAPs to deploy Text-to-9-1-1 more quickly.

Next Steps

The Subcommittee is making three recommendations to the Board in response to their charge to evaluate the feasibility of texting to 9-1-1 as a statewide initiative. These recommendations focus on providing governance, funding, and an implementation guide to deploy this new technology.

Any new initiative needs to start with governance. The Subcommittee is recommending that the Board establish ubiquitous Text-to-9-1-1 service in the Commonwealth as one of their goals by encouraging PSAPs to pursue a web browser solution, which includes a text aggregator, to achieve statewide deployment. Since the Board does not have the authority to compel a PSAP to deploy Text-to-9-1-1 or to use a single, statewide text aggregator, funding should be used to encourage this behavior as it provides the best approach for achieving a universal, standard level of service across the Commonwealth.

To provide funding for Text-to-9-1-1, the Subcommittee is recommending that the Board establish a grant initiative as part of the PSAP Grant Program with dedicated funding for Text-to-9-1-1. The scope and guidelines for this specific granting opportunity will need time to be developed. As a result, the Subcommittee believes the earliest this grant funding could be available is July 1, 2015.

And finally, there are a number of deployment related issues that were beyond the scope of this white paper, but need to be examined in order to provide guidance to the PSAP community. To address these

issues, the Subcommittee is recommending that ISP staff develop a Text-to-9-1-1 implementation guide from current research. The guide should be available as a resource to the PSAPs at least 90 days in advance of when dedicated Text-to-9-1-1 funding is made available. Additionally, staff must ensure that ALL NG-911 planning include Text-to-9-1-1 service as a basic, standard feature by ensuring that it is addressed in all 9-1-1 planning documents. And finally, ISP should lead the effort in developing funding strategies to promote the adoption of web browser solutions that include the enhanced capability of an aggregator.