



METROPOLITAN EMERGENCY SERVICES BOARD 9-1-1 TECHNICAL OPERATIONS COMMITTEE AGENDA

February 21, 2019, 10:00 a.m.

1. **Call to Order** – Committee Chair, Christine McPherson
2. **Approval of Agenda** – McPherson
3. **Approval of Minutes of November 15, 2018 Meeting** – McPherson
4. **Action Items**
 - A. Outstanding Leadership Award Nominations – Eggimann
 - B. Metro Area Text Message Routing for State Patrol
5. **Discussion Items**
 - A. Winter Storm-Related Incident Coordination with State Patrol – Tabled
 - B. Telecommunicator Resiliency Training / Support Grant – Morrissey
 - C. Supplemental Location Data - Eggimann
 1. Text Message Location – What Are PSAPs Seeing Today?
 2. Best Practices Document – (attached)
 - D. Review the Unassigned Future Issue list - Eggimann
6. **Reports**
 - A. PSAP Operations Round Table Work Group – Morrissey
 - B. SECB NG9-1-1 Committee Report – Pass/Scanlon/Pankonie
 - C. Legislation – Eggimann/Rohret
 - D. 9-1-1 Network Report – Eggimann
 - E. 9-1-1 Data Report – Broman
7. **Adjourn**

Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
Draft Meeting Minutes
January 17, 2019

Members Present:

Laura Anderson, Sherburne County
Carrie Bauer, Scott County
Bob Dowd, Isanti County
Jon Eckel, Chisago County
Heidi Hieserich, MAC
Christine McPherson, Minneapolis
Darlene Pankonie, Washington County

Nancie Pass, Ramsey County
Cheryl Pritzlaff, Dakota County
Jim Scanlon, City of Bloomington
Kevin Schwartz, Hennepin County
Val Sprynczynatyk, Anoka County
Victoria Vadnais, Allina Health EMS
Tim Walsh, Carver County

Guests Present:

Marcia Broman, MESB
Dan Craigie, ECN
Pete Eggimann, MESB
Mary Ehram, Solacom
Matthew Hoffer, CenturyLink
Jake Jacobsen, CenturyLink

Chad Loeffler, Metro Transit
Kari Morrissey, Anoka County
Jon Rasch, Ramsey County
Jill Rohret, MESB
Martha Ziese, MESB

1. Call to Order:

Christine McPherson called the meeting to order at 10:03 a.m.

2. Approval of Agenda:

M/S/C – Darlene Pankonie moved to approve the January 17, 2019 agenda. Bob Dowd seconded. Motion carried.

3. Approval of Minutes

M/S/C – Val Sprynczynatyk moved to approve November 15, 2018 minutes. Jeff Lessard seconded. Motion carried.

4. Action Items – None

5. Discussion Items

5A. Winter Storm – Related Incident Coordination with State Patrol

Darlene Pankonie reported that she had been unable to get together with the State Patrol and didn't have any draft language for a winter storm coordination policy the metro area PSAPs could use with State Patrol.

M/S/C - Pankonie moved to table the draft report to the committee until she can meet with State Patrol. Jon Eckel seconded. Motion carried.

5.B. Review the Unassigned Future Issue List

Pete Eggimann said there was a discussion at the November meeting on what operational issues should the 9-1-1 TOC get involved in. He included the list of topics suggested at the meeting as "unassigned future issue list" at the end of the draft meeting minutes.

Val Sprynczynatyk said she is waiting to hear back from the Sheriff and the Anoka County attorney regarding identity theft and fraud jurisdiction issues.

McPherson said there is some work being done by Hennepin County law enforcement to standardize the mental health form that would require notifying the agency that put the person on hold before they are released.

McPherson said the cell phone location ping process is very time consuming for dispatchers. She did get access to the RapidSOS after the last APCO meeting. It is working very well for the Minneapolis PSAP. It does work for text-to-9-11. Pankonie said it could be a good tool for sergeants.

Heidi Hieserich asked if training certification could be added to the list. McPherson said the PSAP Roundtable is working on it, so therefore it is not on this new unassigned project list. Hieserich asked if there was any work being done on the next level of telecommunicator licensing. McPherson will add telecommunicator licensing to the unassigned project list.

Pankonie said that she had posed the telecommunicator licensing question to the MSA because she had heard at the APCO NENA Chapter meeting that Al Fjerstad was working on that and is waiting for confirmation.

Dan Craigie said ECN support was requested and he too is waiting to hear back on this licensing issue.

Hieserich offered her assistance in supporting a licensing initiative.

Pankonie asked if the 9-1-1 standards could be available on the MESB website. Rohret said she is working on some changes to the website that include handling the 9-1-1 standards similarly to how the radio standards are listed, however the metro 9-1-1 standards are on the site. Pankonie also asked about whether the training curriculum was available on the MESB website. The curriculum is currently on the site in the password protected area for PSAP Managers under the Online PSAP Manual tab.

6. Reports

6A. PSAP Operations Round Table Work Group

Kari Morrissey said there are courses at Hennepin and Anoka Tech schools currently offering entry level, grant-funded telecommunicator training. Morrissey also reported that the recent CTO training was well received.

6B. SECB NG9-1-1 Committee Report

Pankonie said the SECB is undergoing a standard development process. ARMER standards are going to move to overall SECB standards to include NG9-1-1. They are suggesting a draft modification of the ARMER variance-waiver request form. This form would be used by all SECB Committees if PSAPs or users wanted a variance or waiver from a state standard.

Rohret said the metro has a variance standard related to ARMER as well. Whether it is a metro or state standard, this TOC would review first before passing on.

Eggimann said this is the form a county would use if they wanted to make a change in a state standard. Pankonie said that a letter was used in the past to request a variance or waiver but that this form would be used going forward.

Eckel clarified this it is for deviating from a standard, not changing a standard.

Rohret said that all the standard numbers will be changing at the state level. Dan Craigie said that there will be a search function in the Governance area of the SECB website to search for any standard. Pankonie said complying with ADA is a part of this process as well.

M/S/C-Pankonie moved to accept the form change and move to the Governance section of the standard index. Eckel seconded. Motion carried.

Dan Craigie announced that the MESB and ECN are working on preparing an RFP for 9-1-1 services or a portion of 9-1-1 services. It is intended the RFP will be released by spring. It was requested that a member of the NG9-1-1 committee participate in the RFP preparation. Craigie said the state and the MESB are the two signatories on the NG9-1-1 contract with CenturyLink.

Craigie said that text to 9-1-1 deployments in Chisago and Eden Prairie are complete. Bloomington is next. Carver County is still experiencing problems, and depending on the tests this afternoon, may move their text service back to Hennepin County while work continues to try to identify what is causing the intermittent reception of text messages on the VESTA answering application. Tim Walsh said that in December some of the tests the dispatchers did, did not go through. Two of the calls showed up on the screen as abandoned.

Eggimann said it appears that the problem reported in Chisago was limited to an issue on Verizon's network. Other greater MN PSAPs reported the same problem as well. Pankonie reminded committee members that it is important to open tickets with 9-1-1 Repair and send a copy of the ticket number to the MESB, so they can monitor the progress on resolving the issue. This can also alert both CenturyLink and the MESB that a problem may be affecting more than one PSAP.

Pankonie said if there are any agenda items members would like to see for the April 29-May 1 Public Safety Communications Conference they should contact Dan Craigie. Pankonie also reminded the committee members that the MSA/MN NENA/MN APCO 9-1-1 Conference is March 12-14 in Alexandria.

6C. Legislation

Eggimann said new language in the Heart Association telephone CPR bill is being reviewed by ECN and the MESB. Rohret said the Heart Association is meeting with the MSA regarding their proposed requirements for PSAPs and telecommunicators. Funding for the required training is currently not included in the language. The bill has not been introduced in session yet.

In a separate action, ECN is going to be introducing a bill to amend MS 403 to change the SECB composition to include the Department of Corrections and redefine the ARMER metro region to include Chisago, Isanti, and Sherburne Counties.

6D. 9-1-1 Network Report

Eggimann encouraged committee members to have their staff make some test text message calls in light of the issues reported at Carver and Chisago. The volume of actual text messages is so low that without some additional testing some issues may not be identified.

A meeting is scheduled for January 30 with the MESB, ECN, and CenturyLink to discuss the automated PSAP notification process and message content. The goal is to make the messaging content more relevant and useful for the PSAPs.

Matthew Hoffer, 9-1-1 Service Manager for CenturyLink, provided a brief summary of the December 2 outage that affected primarily VoIP services on the CenturyLink system. Some of the admin line service was lost at PSAPs that are connected to their city or county enterprise MLTS phone systems, but the 9-1-1 system itself was not impacted by the outage and 9-1-1 calls continued to be delivered throughout the event.

6E. 9-1-1 Data Report

Marcia Broman highlighted some items contained in her written report to the committee. Broman said work is continuing to reach agreement on the proposed Minnesota Road Centerline Standard schema. Work has also started to begin bringing their address points into the regional dataset. Broman told the committee members that implementing wireless call routing based on the caller's location remains the highest priority for the MESB, and possible solutions are being investigated.

7. Adjourn

Unassigned Future Issue List (not prioritized):

- Working with the MN Sheriff's Association to reach consensus on identity theft / fraud jurisdiction issues
- Leadership mentoring for staff
- Backup and work load sharing options for PSAPs
- Mental health call processing standard
- Cell phone location ping process standard
- 9-1-1 call routing and ALI data error reporting standard
- Telecommunicator licensing

**Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
Action Sheet
February 21, 2019**

Agenda Number 4.A. – Outstanding Leadership Awards Nominations

Recommendation:

The committee members select a 9-1-1 TOC representative to assist in reviewing the award nominations and choosing an elected-official recipient and a non-elected recipient for the metro region.

Background:

ECN has created a new Outstanding Leadership Award program to recognize people from each region who have made outstanding contributions to public safety communications. They want to recognize one elected-official recipient and one non-elected recipient from each region. The awards will be distributed at the Public Safety Communications Conference in St. Cloud at the end of April. The award nomination announcement was sent out on February 14 to the MESB board members and both the 9-1-1 and radio TOCs. A small team is needed to assist in the review of the nominations received for the metro region and select the metro region award recipients.

Issues and Concerns:

None identified.

Financial Impact:

None identified.

Motion:

2019 Public Safety Communication Conference Outstanding Leadership Nomination Form

At the 2019 Public Safety Communication Conference, hosted by the Minnesota Department of Public Safety, Division of Emergency Communications Networks, there will be a presentation of Outstanding Leadership awards. Each administrative region is encouraged to identify one elected official and one non-elected individual to each receive this award.

The Metropolitan Emergency Services Board is seeking nominations for both an elected official and non-elected individual to receive these awards for the Metro Region. The awards will be presented on the first day of the conference.

MESB nominations can be from the public safety communications disciplines and the elected officials responsible for the agencies utilizing public safety communications. Metro region criteria for the awards are as follows:

- To recognize an individual who has made a substantial commitment to public safety communications in the ten-county metropolitan area (elected, non-elected, or both).
- To recognize an individual who has made a significant impact or outstanding contribution to public safety communications networks or operations.
- To recognize an individual's exemplary service which supports the MESB Mission and Values to provide reliable, resilient public safety communications systems for the timely and efficient coordination of emergency services throughout the 10-county metro area. (<http://www.mn-mesb.org/about-us/>)

To nominate an individual for this award, please provide the individual's name and agency, and a brief description of the work he or she has done demonstrating exemplary service and leadership in public safety communications. (Examples may include, but are not limited to: other awards or commendations received, being a pioneer of public safety communications work, show of support to the public safety communications discipline, etc.)

Nominations are due no later than **FRIDAY, MARCH 15**. Please send nominations to:

9-1-1 Program

Pete Eggimann – 9-1-1 Coordinator

peggimann@mn-mesb.org

Radio Program

Tracey Fredrick – Radio Services Coordinator

tfredrick@mn-mesb.org

**Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
Action Sheet
February 21, 2019**

Agenda Number 4B. – Metro Area Text Message Routing for State Patrol

Recommendation:

The committee members reach consensus on whether text messages in the metro area are:

1. First routed to the 18 primary PSAPs, and transferred as necessary to State Patrol, or
2. Carve out polygons along the Interstates and some state highways in the metro area and first route text messages identified as coming from within those polygons to the State Patrol.

Background:

State Patrol is in the process of implementing text capability on their VIPER answering applications at their PSAPs at Water's Edge and in Rochester. Their intent is to take some first route text messages in greater MN and are working with MN GEO in defining the greater MN response polygons. When text messaging was implemented in the metro area last year, the MESB created very narrow (pavement only) polygons for some Interstate and state highways in the metro and identified them as State Patrol response areas. Airport has been taking the text messages that have been associated with those areas. The location information associated with text messages is very coarse, which complicates this issue. Unlike the original wireless implementation, it would be difficult to design a solution permitting each individual metro PSAP to decide if they want the messages or want State Patrol polygons created. Therefore, the MESB is asking the committee to try to come to consensus on a metro-wide implementation plan. Regardless of which first route solution is chosen, the ability to transfer text messages between the State Patrol and the metro PSAPs should work.

Issues and Concerns:

None identified.

Financial Impact:

None identified.

Motion:

Recommended Best Practices for Supplemental 9-1-1 Location Data

I. Introduction

This document was developed by the National Emergency Number Association (NENA),¹ the National Association of State 911 Administrators (NASNA),² and the Industry Council for Emergency Response Technologies (iCERT),³ in cooperation with the National 9-1-1 Program.⁴ It is designed to establish guidance on the potential use by the nation's Public Safety Answering Points (PSAPs) of 9-1-1 location data provided outside of the traditional process used by wireless carriers. The potential use of such "supplemental 9-1-1 location data" in addition to data provided by the carriers may assist in locating 9-1-1 callers quickly and accurately. This document describes recommended best practices for how such data should be provided to and used by PSAPs.

II. Background

The nation's 9-1-1 emergency communications services and systems are critical to promoting public safety and for enabling first responders to effectively respond to requests for emergency assistance. Originally developed to enable voice calls from traditional landline telephone networks, 9-1-1 services and systems continue to evolve to accommodate the ever-changing communications preferences and safety needs of the American public. Today, more than 70% of all 9-1-1 calls originate on wireless networks. While wireless access provides 9-1-1 authorities with a greater ability to aid those in need, the challenges associated with locating a wireless caller are not trivial, especially for calls made from indoor locations.

A 9-1-1 caller's location is generally considered to be the most critical piece of information required to dispatch emergency responders in a timely fashion, and various technological solutions have been developed over the years to aid wireless carriers in meeting this critical need. Initially, location solutions focused on 9-1-1 calls made from outdoor locations and utilized the carriers' own wireless networks as well as satellite networks available to the public (i.e., GPS) to locate callers. As wireless 9-1-1 calling has increased, attention has shifted to developing

¹ NENA: The 9-1-1 Association serves the public safety community as the only professional organization solely focused on 9-1-1 policy, technology, operations, and education issues; see www.nena.org.

² NASNA is comprised of State 9-1-1 program administrators and is the voice of states on public policy issues impacting 9-1-1; see www.nasna.org.

³ iCERT is the trade association representing the emergency response sector; see www.theindustrycouncil.org.

⁴ The National 9-1-1 Program's mission is to provide federal leadership and coordination in supporting and promoting optimal 9-1-1 services. This Federal "home" for 9-1-1 plays a critical role by coordinating efforts that support 9-1-1 services across the nation. See <https://www.9-1-1.gov/> for more information.

solutions that also allow carriers to locate callers indoors. Many of these solutions are designed to leverage the increasing proliferation of Wi-Fi networks deployed across the country, while also enhancing traditional location methods (e.g., improved satellite-based location systems).

One example of a new location technology being developed by device manufacturers and deployed by wireless carriers is Device-Based Hybrid (DBH); a technology that uses a mix of location methods available to the calling device including crowd-sourced Wi-Fi, Assisted Global Navigation Satellite System (A-GNSS)⁵, and handset-based sensors. Two important examples of DBH location technology are Hybridized Emergency Location (HELO) developed by Apple for its iOS and watchOS devices and Emergency Location Service (ELS) developed by Google for its Android operating system. Implementation of these technologies by some wireless carriers has already begun; more carriers are expected to utilize DBH in the future.

More recently, DBH-based solutions are being used by location service providers to provide PSAPs with 9-1-1 location information without the direct involvement of a wireless carrier, i.e., location data that is “supplemental” to the data that the wireless carrier already provides. The availability of supplemental data, if provided and used effectively, may provide PSAPs and first responders with additional information that allows them to determine the caller’s location more quickly and accurately and potentially save lives. The degree to which this supplemental data meets their needs, however, will depend on how the location is determined, how the information is conveyed to the PSAP, and how the Telecommunicator uses the information as part of any emergency response effort.

This document describes how supplemental 9-1-1 location data is provided to PSAPs, compares and contrasts those processes to the way location information is provided in conjunction with traditional 9-1-1 call processes, and recommends a set of best practices that are designed to guide the development, delivery, and use of such data.

III. Using Supplemental Location Data to Enhance 9-1-1 Services

a. Description of Supplemental 9-1-1 Location Data

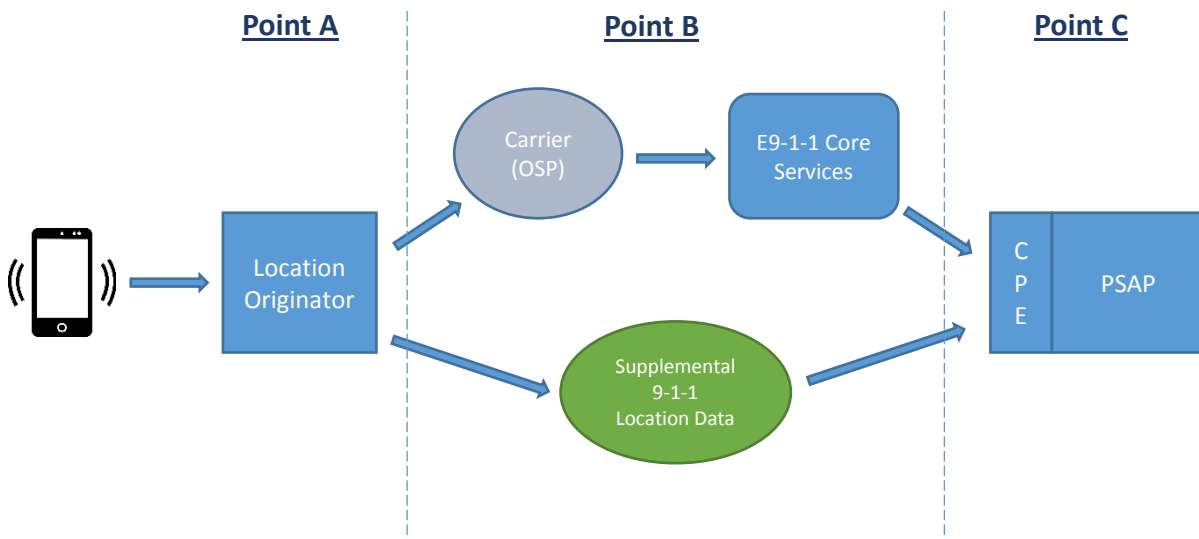
Supplemental 9-1-1 location data can be defined as *“any location data associated with a 9-1-1 call that is provided to a PSAP without the involvement of the originating carrier.”* As already noted, supplemental 9-1-1 location data is typically determined today using DBH-based technologies. In the future, however, such data may be determined using other technologies, and the best practices included within this document are designed to be technology-agnostic and

⁵ GNSS, or Global Navigation Satellite System, is the generic term that refers to satellite systems used for global navigation and includes the Global Positioning System (GPS) operated by the United States, the Galileo system operated by the European Union, the GLONASS system operated by the Russian Federation, and the BeiDou system operated by the People’s Republic of China.

equally applicable to any 9-1-1 location data provided outside of the process employed by wireless carriers, regardless of technology.

To understand how supplemental 9-1-1 location data might be used most effectively by PSAPs, it's important to understand the processes typically used for providing such data and how those processes compare to traditional 9-1-1 call processes used by the wireless carriers. Figure 1 provides a simplified diagram for collecting, delivering, and using 9-1-1 location information. These processes may be performed by an entity responsible for deriving the location information (Point A), an entity responsible for conveying that information to the PSAP (Point B), and the PSAP itself (Point C). The process may also include various third-party service providers and/or software and hardware vendors working for, or under contract to, the PSAP.

Figure 1: Generic 9-1-1 Location Data Delivery Process



As mentioned above, certain wireless carriers are already using DBH-derived information in the location data they pass to the PSAP. In this context, Point A might represent Apple's HELO or Google's ELS, Point B represents the wireless carrier (together with the entity under contract to provide Mobile Positioning Center [MPC]/Gateway Mobile Location Center [GMLC] functionality), and Point C is the PSAP. Point C would include 9-1-1 call handling, Computer Aided Dispatch (CAD), and other systems used by the PSAP to process, analyze, and archive 9-1-1 calls and associated location information. Prior to delivering the 9-1-1 location information to the PSAP, the wireless carrier or supplemental 9-1-1 location data provider may perform a validation process to provide a sanity check on the accuracy of the location information. Carriers may also utilize multiple location techniques to estimate the location, and if such location is believed to be better, it may provide that location to the PSAP in place of a DBH-based location.

The process for providing supplemental 9-1-1 location data to the PSAP can vary from the traditional wireless carrier process in several ways:

- 1) The 9-1-1 location provider (Point B) would be some entity other than the wireless carrier.
- 2) Today, the supplemental 9-1-1 location data providers deliver the location information directly to PSAP systems.
- 3) The 9-1-1 location data originator (Point A) for each process may be the same, e.g., Apple's HELO or Google's ELS, but the method for delivering the location information to the supplemental 9-1-1 location data provider would be different.

Wireless carriers provide PSAPs with 9-1-1 call location information that includes three types of information: (a) the estimated location of the caller; (b) confidence level; and (c) an uncertainty value. Uncertainty values are represented as a search area around the estimated location (e.g., a circle of radius x) based on a defined level of confidence. In accordance with FCC Rules, wireless carriers always provide 9-1-1 location information to PSAPs with a radius of uncertainty that is based on a confidence level of 90%. This standardization enables 9-1-1 Telecommunicators to consistently evaluate location information regardless of the wireless carrier serving the 9-1-1 caller. Confidence levels and uncertainty values employed by supplemental 9-1-1 location data providers may be different. As a result, when comparing 9-1-1 location information provided by different sources, PSAPs must take into account the confidence levels and uncertainty values provided by each.

b. Potential Benefits of Supplemental 9-1-1 Location Data

Regardless of how it's provided, the benefits of accurate and timely location information to a PSAP's emergency response efforts are numerous. It allows 9-1-1 Telecommunicators to spend less time determining and validating location information and allows first responders to get to those in need more quickly. Supplemental 9-1-1 location data may be helpful at any time, but it might be especially helpful when traditional methods for determining location don't provide a location that is sufficiently accurate based on estimated uncertainty or if traditional location methods don't provide an accurate location fix in a timely manner. With supplemental 9-1-1 location data available as an option, PSAPs and 9-1-1 authorities would be empowered to make their own choices about which technological solutions fit their specific needs.

Fortunately, location technologies available on smartphone devices and operating systems have improved greatly in recent years and continue to improve. While these technologies may be leveraged by carrier-based solutions, the availability of supplemental 9-1-1 location solutions may accelerate their adoption by PSAPs. Moreover, as PSAPs transition to NG9-1-1, the use of supplemental 9-1-1 location data may provide PSAPs with another tangible benefit of deploying IP-based systems that can receive location data beyond the traditional E9-1-1 ANI and ALI. The

benefits associated with the availability of supplemental 9-1-1 location data may be a key reason to upgrade outdated 9-1-1 call-handling applications, mapping products, or computer-aided dispatch software.

c. Potential Challenges of Supplemental 9-1-1 Location Data

As with any innovation, supplemental 9-1-1 location data is not without its challenges. While the majority of mobile devices are capable of sending supplemental 9-1-1 device location data, not every mobile device is currently enabled to do this (e.g., devices without a data connection or SMS), and some device manufacturers, networks, and/or operating system developers may not choose to support it. Even when a device is enabled, there is no assurance that the supplemental location data will be available for every 9-1-1 call sent to the PSAP. Moreover, not every PSAP is currently equipped to receive and use supplemental 9-1-1 location data if it were available. As with traditional Phase I and Phase II wireless location services, PSAPs must take steps to make use of available 9-1-1 location information. In order to take advantage of supplemental 9-1-1 location data, PSAPs must opt in to the service.

These issues should not be viewed as impediments. However, they are issues that should be recognized by PSAPs as they consider whether or not to make use of supplemental 9-1-1 location data.

d. Relationship to Next Generation 9-1-1

Next Generation 9-1-1 systems are designed to both deliver caller location information to the PSAP with the 9-1-1 call and use the location information for call routing control. While the latter is not yet available, the features of the NG9-1-1 Core can be used to access supplemental location information, process it, and deliver it to PSAPs through standard NG9-1-1 connections.⁶ This should be supported regardless of whether that location data is acquired from originating carriers or from supplemental 9-1-1 location data providers, using the Additional Data access feature or other points within the NG9-1-1 Core system. However, there must be a mechanism to distinguish carrier-provided 9-1-1 location data from supplemental 9-1-1 location data.

IV. Best Practices for Supplemental 9-1-1 Location Data Providers

This section describes recommended best practices for those entities that provide supplemental 9-1-1 location data to PSAPs. It includes guidelines affecting the accuracy of supplemental data, how such data is determined and conveyed to PSAPs, and what policies, procedures, and processes should be implemented by location service providers to address cybersecurity, privacy, and other important issues.

a. Location Information

Locations should be reported to the PSAP in a geodetic profile (latitude/longitude with altitude when possible, along with uncertainty radius and confidence) along with a reliable time stamp of

⁶ NENA Standard for NG9-1-1 Additional Data NENA-STA-012.2-2017

when the location was determined. The recommended confidence for geodetic locations is 90% to facilitate direct comparison with traditional wireless carrier location mechanisms. Any deviations from 90% should be clearly communicated to the PSAP.

If a reverse-geocoded address is provided, it should be labeled as “Estimated Address” to indicate that the address might be imprecise. The process of reverse-geocoding a geodetic address should ideally use the best available high-integrity data (e.g., site/structure address points, road centerlines, or site/structure parcel polygons). If possible, the civic address portion of the estimated address should be validated against MSAG or another validation function (e.g., an NG9-1-1 validation function such as LVF).

b. Caller Interaction

Location should be automatically conveyed to the PSAP without requiring 9-1-1 callers to go through manual steps to send location that could distract callers from the conversation with the 9-1-1 Telecommunicator or delay the call itself.

c. Timing

Location should be sent as soon as a position is acquired that satisfies the uncertainty and confidence outlined in this document, and location updates should be sent periodically throughout the call without requiring a rebid, and especially whenever the caller is in motion. Location should be sent with reliable time stamps to alert users of potentially stale locations.

d. Cybersecurity

Providers should follow common cybersecurity best practices such as end-to-end encryption, strong authentication schemes, and secure transport mechanisms. Mechanisms should be in place to identify and prevent spoofing of location data.

e. Privacy

Providers should ensure that 9-1-1 location information can be universally obtained only in association with an active 9-1-1 call. Locations obtained outside of a 9-1-1 call should require explicit user consent.

f. Stakeholder Notification

Providers of supplemental 9-1-1 location data should voluntarily notify stakeholders such as federal regulators, industry organizations, 9-1-1 authorities, and wireless carriers, as appropriate, when conducting tests, implementing significant software changes, and/or implementing any supplemental location solution. Stakeholders should be provided with any relevant information about their solutions, including any operational limitations associated with their location data.

g. NG9-1-1 Standards

Providers should design their services to support NG9-1-1 standards by supporting NENA i3 procedures, data flow, data structures, interfaces, functional elements, and services, such as Location Information Service (LIS), HTTP Enabled Location Delivery (HELD) and Presence Information Data Format – Location Object (PIDF-LO) when transmitting supplemental location data to PSAPs.⁷ The implementation of a specific standard or communications mechanism should be sought with industry interoperability in mind, though standards compliance is ultimately at the discretion of the PSAP for the delivery of emergency calls and data.

h. Terms of Use

Providers should provide clear, written “terms of use” to their Public Safety customers or contracted entity to clarify how supplemental location data can or cannot be used. Providers should be able to explain to their Public Safety customers how the location data provided is acquired and conveyed to PSAPs, as well as any limitations on the availability of supplemental 9-1-1 location data (e.g., if the subscriber is not subscribed to data services, if the call is from a non-service initialized device, if the supplemental information is determined with a non-standard confidence level).

V. Best Practices for PSAPs

This section describes recommended best practices for use by PSAPs that choose to use supplemental 9-1-1 location data in conjunction with their traditional 9-1-1 call-handling processes. It includes guidelines for using supplemental 9-1-1 location data in conjunction with location data received through traditional mechanisms, as well as best practices affecting location data display, workflow integration, and training. PSAPs will also likely need to incorporate the use of supplemental 9-1-1 location data into their standard operating procedures, and new policies and procedures may need to be developed.

⁷ See <https://www.nena.org/page/Standards>

a. Administrative Issues

i. Supplemental 9-1-1 Location Data Provider Qualifications

PSAPs and 9-1-1 Authorities should ensure that any entities providing supplemental 9-1-1 location data are able to meet several basic qualifications. They should be able to demonstrate that they are reputable, financially stable and meet all applicable legal and regulatory requirements. They should also be able to demonstrate that they meet i3 and other applicable industry standards and should demonstrate an understanding of how NG9-1-1 implementation will change the delivery of location information in the future. Because the use of supplemental 9-1-1 location data may require changes to CPE, PSAPs and 9-1-1 Authorities should be cognizant about how their decision to use such data will impact their long-term CPE plans.

ii. Legal/Liability Risks

PSAPs should evaluate potential legal/liability risks that may arise because of using supplemental 9-1-1 location data technology and services.

iii. Regulatory Requirements

PSAPs should ensure their supplemental 9-1-1 location data provider meets all applicable regulatory requirements at the federal, state and local levels.

iv. Contracts, Terms of Use, and NDAs

It is important to align expectations between the PSAP and supplemental 9-1-1 location data provider. These expectations should be documented and should include how the supplemental 9-1-1 location is identified, what notifications are given when supplemental data is not available, and a clear designation of responsibilities between the PSAP, supplemental 9-1-1 location data provider, and any other entities in the delivery chain. Service level agreements, assignment of liability, recordkeeping and data retention, data ownership and evidence production policies, and other related issues should be enumerated in any contracts or agreements. Any third party and sub-contractor relationships should be transparent and identified in the contract or agreement.

A supplemental 9-1-1 location data provider may require that a PSAP or 9-1-1 Authority enter into a Terms of Use or End User License Agreement (EULA). A EULA might specify the authorized use of the data and any limitations to the information provided. Such agreements should be clearly understood and should be evaluated to assess legal/liability risk.

Because of the proprietary nature surrounding the supplemental location technology or service employed, the PSAP may have to enter into a Non-Disclosure Agreement (NDA) with the vendor providing the service. It is important that an NDA does not unnecessarily limit the PSAP's

operations and that issues of indemnity and public and legal release of information are clearly addressed.

b. Technical Issues

The NENA i3 architecture for NG9-1-1 provides for a LIS to hold and provide caller location data.⁸ It also includes an Additional Data Repository (ADR) associated with an Additional Data query process for acquiring various data relevant to a 9-1-1 call or message. Either of these mechanisms could be employed to access supplemental 9-1-1 location data as available at the beginning or during a call, and from more than one point in the overall NG9-1-1 process for either routing control, delivery to PSAPs, or both.

If IP is available from the NG9-1-1 Core to the PSAP, the ability to access 9-1-1 location data from any server acting as a LIS or through the NG9-1-1 ADR feature would allow delivery of all location information via the IP links to all connected PSAPs, rather than requiring a separate data path into each PSAP.

If a supplemental 9-1-1 location data provider employs a separate data path (such as to the call handling system, the CAD, or a mapping system), that path might contain specific (non-NG9-1-1) access points and software to accept and process the additional location data. The public safety planner/decision maker should consider that, with NG9-1-1, there is no need for these separate arrangements. The public safety planner / decision maker must balance the immediate and timely availability of supplemental data through such integrations against the cost and potential schedule of the NG9-1-1 transition.

The NG9-1-1 common path from originator to PSAP contains numerous designed capabilities for Privacy and Security, Quality Control, and High-availability. Supplemental data providers should ensure acceptable capabilities for the same.

c. Operational Issues

i. Standard Operating Procedures (SOPs)

The use of supplemental 9-1-1 location data by a PSAP will likely require changes to the SOPs employed by the center in receiving, handling, and processing 9-1-1 calls. Potential changes should be considered well in advance of employing a supplemental 9-1-1 location service.

ii. Software Systems and Workflow Integration

⁸ See NENA Detailed Functional and Interface Standards for the NENA i3 Solution
https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-STA-010.2_i3_Architectu.pdf

PSAPs should ensure that software systems and applications integrate supplemental 9-1-1 location data into existing workflows and displays, such as 9-1-1 call handling systems, mapping solutions, CAD, or other PSAP systems. The addition of supplemental 9-1-1 location information should not impair the Telecommunicator's ability to view and process 9-1-1 location information in a timely manner.

Supplemental 9-1-1 location data should be queried automatically rather than requiring a manual request by the Telecommunicator. Where direct integrations are not immediately available, PSAPs should evaluate the benefit to public safety in adopting manual query mechanisms until such integrations are implemented.

PSAPs should collaborate with their software systems providers to ensure their applications display supplemental 9-1-1 location data in a manner that enables the Telecommunicator to make an efficient and informed dispatch decision based on all sources of location information provided including traditional 9-1-1 location data and supplemental 9-1-1 location data.

The User Interface should be designed to place displayed supplemental location in full context (e.g., indicating the relative age or time stamp of the location and whether the user is viewing the most recent location information). If multiple locations associated with the same call but from different sources (e.g., carrier and supplemental 9-1-1 location data provider) are present, these should be presented to the Telecommunicator together with each location clearly differentiated (e.g., one not overwriting the other). If presented graphically, the locations should be overlaid with clear and complete information about the source of the location data, time of delivery, and associated uncertainty (or "search area") at the same level of confidence for each.

Regarding confidence values, PSAPs should ensure that their software systems and applications display supplemental 9-1-1 location data with horizontal uncertainty measured as a search area around a reported point. All supplemental location information delivered as a position should convey confidence at 90%. If a confidence value other than 90% is conveyed by the provider of supplemental 9-1-1 location services, the confidence value should be displayed as well. PSAPs should exercise caution in making judgments about the accuracy of supplemental 9-1-1 location data that may utilize different confidence levels, and should require location data be displayed at a 90% confidence level for ease of comparison. In any event, Telecommunicators are advised to continue to rely on their training and their ability to question the caller regarding his/her location.

Notably, no location estimation technique is perfect, and any technique may result in significant errors (e.g., a call made from Idaho with a location given in Colorado). Even if such instances are rare, reliance on locations with significant errors could have drastic impacts on emergency response efforts. Therefore, PSAPs should compare any estimated location data to Phase I location data (cell site location), as this is a known location.

It is recommended that reverse geo-coding of a coordinate-based position into a civic address only be done using the best-available high-integrity data (e.g., site/structure address points, road centerlines, or site/structure parcel polygons). If a supplemental location is being displayed as a reverse-geocoded address, it should be labeled as an “estimated address” to encourage Telecommunicators not to immediately trust the address, and to verify the address information.

iii. Call Logging and Records Management

Supplemental 9-1-1 location data received by the PSAP should be associated with the call or incident record in all call and incident handling systems and logged by the PSAP’s logging recorder(s) and service(s). Supplemental 9-1-1 location data should be clearly distinguishable from ALI Location by using different symbology.

iv. Trouble Reporting

Trouble reporting procedures should be discussed, agreed upon, and documented in the service agreement between the PSAP/9-1-1 Authority, the supplemental 9-1-1 location data provider, and any associated PSAP system vendor. For integrated solutions, PSAPs/9-1-1 Authorities should contact their vendors in line with their existing support arrangements for trouble reporting. As an integrated solution, the supplemental location data is just a feature inside of a product that PSAPs/9-1-1 Authorities purchased (e.g., 9-1-1 call handling, CAD, mapping), and it is covered by existing trouble reporting procedures. It would be up to the 9-1-1 Authority and the vendor to engage the supplemental 9-1-1 location data provider for assistance in trouble shooting a problem. PSAPs should not contact a wireless service provider for issues related to supplemental location data that is provided separately from the traditional wireless location data.

For non-integrated solutions such as those provided by a web browser, PSAPs should contact the supplemental 9-1-1 location data provider for support.

v. Training

PSAPs should train staff and update SOPs to provide guidance on topics related to the use of supplemental 9-1-1 location data including:

- Basic concepts of caller location (e.g., civic address vs. lat/lon, uncertainty, confidence);
- Differences between supplemental 9-1-1 location data and location data from other sources (e.g., civic addresses, wireless Phase 1 and Phase 2, NEAD-based location, etc.);
- When and how to use supplemental 9-1-1 location data (e.g., when carrier-provided data is not sufficient to locate the caller);

- How to validate location if different sources yield inconsistent results; and
- How to properly report location discrepancies.

vi. Quality Assurance

PSAPs should periodically analyze and audit the locations of wireless 9-1-1 calls over periods of time to compare the speed and accuracy of traditional wireless locations to supplemental locations, to determine patterns, update training, and to work with traditional and supplemental 9-1-1 location data providers to correct problems to improve the accuracy and performance of traditional and supplemental location solutions.

February 2019

**Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
Network Report
February 21, 2019**

Agenda Number 6D.

1. Text-to-9-1-1:

Bloomington went live taking their own text messages on January 29. Sherburne Co. is now tentatively scheduled to turn-up text messaging for March 6. In greater MN three counties are currently on hold until firewalls get installed in front of their Solacom equipment.

Work continues in Carver Co., but they have resumed taking their text messages again as of February 5th. Following the third conference call involving technical staff from CenturyLink, West, IES, and Element, the ESInet firewalls were temporarily disconnected from the network. The message routing in the CHS-2 system is complex and message receipts and message replies frequently do not follow the same path. Element and WatchGuard, the firewall manufacturer, are now testing possible firewall configurations to deal with the unexpected routing.

2. Firewall Implementation:

The team working on the ESInet firewall implementation project turned up the ESInet firewalls at Dakota Communications Center for the ESInet connections to their VESTA application on January 30. That implementation has been working without any of the issues identified at Carver (see above). The MESB will pass on additional firewall implementation dates as they become available.

3. Device-based Hybrid Location (DBH location):

(see the NENA Supplemental 9-1-1 Location Data announcement included in the meeting packet)

4. August 1 9-1-1 Service Disruption:

A meeting was held on January 30th with representatives from the MESB, ECN, and CenturyLink to discuss the PSAP notification system that CenturyLink uses to pass on information related to issues on the 9-1-1 system. The discussion revolved around improving the message content to provide PSAP Managers with actionable information. CenturyLink pointed out that the system supports 9-1-1 services in 30+ states and cannot be customized just for the MN PSAPs, but indicated they were open to making changes that could be implemented system-wide. The group agreed to set up a table top exercise to follow the messaging process from the time an issue is identified through until the PSAPs are notified the issue has been resolved. The exercise should help identify ways to streamline message delivery, as well as message content.

5. Homeland Security Audits:

The Department of Homeland Security offered to conduct 9-1-1 PSAP Cyber Security Audits at three MN PSAPs, two in the metro and one in greater MN (large, medium, and small PSAP representation). ECN and the MESB attended the audits which were done at Chisago Co. (medium) and Allina Medical (large) here in the metro area. The Homeland Security representatives reviewed a check list of cyber security related issues with the IT and PSAP representatives at each of the PSAPs to document what the PSAPs were currently doing. The

final report and recommendations have not come back yet but may provide the baseline for the 9-1-1 TOC to create a cyber security standard or guideline for the metro area PSAPs.

6. NG9-1-1 ESInet:

In April 2018, NENA published a new NG9-1-1 ESInet Design document that outlines new modifications to the existing ESInets in use today. The new design focuses on increasing reliability and resiliency by incorporating multiple network service providers using different network protocols (e.g. MPLS, Ethernet, cable broadband Internet, wireless carrier broadband Internet). The NG9-1-1 ESInet would support multiple public safety applications (e.g. CAD, logging, CAD-to-CAD interoperability, cloud-based applications, shared/hosted applications, etc.) in addition to supporting 9-1-1. The MESB believes the NG9-1-1 ESInet configuration will offer valuable new COOP options for our PSAPs that today's ESInet cannot support. The MESB is working with ECN to incorporate the NG9-1-1 ESInet design into the current 9-1-1 services RFP.

Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
9-1-1 Data Report
February 12, 2019

1. Statewide GIS Data Standards:

- a. The Minnesota Geospatial Advisory Council (GAC) Standards Committee released a new version of the proposed **Minnesota Road Centerline Standard (MRCS)** schema for public review. The standard is intended to serve multi-uses, including NG9-1-1. Comments are due back to the Standards Committee by Wednesday, March 13, 2019. County GIS managers have been included in the public review distribution. County GIS, as well as PSAP staff working with centerline datasets, are encouraged to review and respond to the proposed standard.
- b. MESB staff has met with MnGeo staff on a state **PSAP/Emergency Service Zone Polygon Standard** that would be proposed through the GAC standards process. MESB has shared with MnGeo its experience with maintaining this polygon layer on behalf of its member PSAPs. MnGeo has committed to sharing any preliminary standard with the MESB and the SECB GIS Standards workgroup prior to proposing it through the GAC process.

2. Regional GIS Data Aggregation:

- a. **Centerline:** The MetroGIS/Met Council continues to process updates of the MRCC nightly to the MN Geospatial Commons website. Each metro county's most recent centerline data that has been uploaded to the portal and passed validations is included in the regional dataset. Eight of the ten metro counties are using this process for MRCC updates. Isanti County is resolving the last few errors found using the centerline validation tool and then will join the regional dataset aggregation process. Sherburne County has formatted to the MRCC schema and is working to fill in data content that it did not previously maintain.
- b. **Address Points:** The MetroGIS/Met Council continues to process updates of the Regional Address Point dataset (in the statewide schema) nightly to the MN Geospatial Commons website. Each metro county's most recent address points that have been uploaded to the portal and passed validations are included in the regional dataset. Nine of the ten metro counties are using this process for submitting address point dataset updates. Sherburne County is aware of the standard schema used by the metro area and will be updating their distribution as they are able to do so.

3. Regional PSAP/ESZ Boundaries:

- a. **Recent changes to regional PSAP/ESZ boundary polygons:**
 - i. Updates were made to reflect the recent change of Bloomington PSAP taking its own text-to-911 calls.
 - ii. MESB also worked with Sherburne County PSAP to identify some issues with the state's Mille Lacs/Sherburne PSAP boundary. The State needs to update that boundary in their polygon distribution so the MESB can start including the correct Sherburne County PSAP and ESZ boundaries as part of the metro area polygon layer.
- b. MESB will be publishing the **metro Regional PSAP/ESZ polygon dataset** to MetroGIS/Met Council and the State Geospatial Commons as part of the Regional Data Viewer project. This dataset was deemed public by the Minnesota Data Practices Office.

- c. Interim **standard responder agency names for use in the GIS data** have been defined. They will be used in the PSAP/ESZ boundary layer to create consistency across the region and allow for the creation of individual law enforcement, fire, and EMS ground transport polygon layers. These standard names will not affect abbreviations and naming conventions used by PSAPs in current ALI displays, but will be used in the Regional GIS Data Viewer when displaying responder agency service areas. The standard names will be able to be easily updated when statewide standard names are defined and agreed upon.

4. **Regional Data Viewer:**

- a. MESB has provided feedback to MetroGIS on the first draft of the **Regional Data Viewer project plan**. The Regional Data Viewer will provide visibility to the most current versions of the regional geospatial datasets central to the business needs of E9-1-1 and NG9-1-1. The application would be used for viewing the data and enhancing communications and interactions between the GIS-enabled and non-GIS enabled professionals engaged in the work of validating and maintaining 911 related data. User testing with PSAP/public safety is anticipated.

5. **Verizon Data Transition from West Mobility to Comtech**

- a. The Minnesota cutover of **Verizon CDMA** wireless 9-1-1 calls from West Mobility to Comtech completed at the beginning of February. All Verizon wireless ALI data (LTE and CDMA) has been confirmed to reflect the new standardized wireless data format. Sherburne County Verizon data has also been updated at Comtech to reflect the new format.

6. **Wireless Cell Sector/Routing Data:**

- a. Sprint is actively preparing for their **SPPCS VoLTE deployment** in Minnesota. ECN was not able to obtain an official schedule for the VoLTE deployment from Sprint, however, MESB has heard from Sprint's wireless data vendor that this may be as soon as the end of March. MESB has been actively working with West Mobility to provide routing and standardized cell sector ALI information for the Sprint VoLTE data. Existing Sprint CDMA data has already been updated to reflect the new standardized wireless data format and MESB is returning the VoLTE sectors to West in that manner as well. Once MESB is aware of Sprint's VoLTE testing plans, Pete will be sharing the schedule with metro PSAPs.
- b. **Wireless routing updates** for all carriers are being handled between Comtech (VZW), West Mobility (ATTMO, SPPCS), T-Mobile and the MESB (on behalf of all metro PSAPs) using routing spreadsheets exchanged via email. MESB is sending routing directly back, rather than sending it through the PSAP for final review. MESB PSAPs can always email mesbgis@mn-mesb.org and request that MESB review the routing for a specific sector or call.
- c. The effort to **clean up wireless ALI data screen content** and **streamline wireless data maintenance processes** is progressing and continues to be multi-staged. The targeted simplified wireless ALI screen display has been shared with PSAPs at past TOC meetings and via email.
- d. MESB is continuing to build out a **geospatial dataset of cell towers** across all carriers that will be used in the next phases of wireless ALI clean-up.

7. IPAWS and 911:

- a. On behalf of its PSAPs, MESB expressed concern to ECN about making PSAPs, rather than wireless carriers, responsible for interpreting wireless cell tower coverage when initiating **geo-targeted WEAs**. ECN (Dan Craigie) has communicated to MESB that he will recommend to the IPAWS committee that the language in the SECB IPAWS standard stating that PSAPs are responsible to identify cell tower/antenna locations in and around their serving area to create satisfactory geo-targeted WEAs be edited or even taken out.

8. Quarterly MSAGs:

- a. MESB distributed Q1 2019 MSAGs to PSAP Data Coordinators and County GIS reps in January.



MESB NG9-1-1 Transition 2019-2020 Strategic Plan

Executive Summary:

MESB staff has been actively engaged for several years in transitioning the metro area 9-1-1 system from the analog-based Enhanced 9-1-1 (E9-1-1) system, which has served the metro area since 1982, toward standards compliant digital Next Generation 9-1-1 (NG9-1-1) system). The NG9-1-1 system is being designed to meet the needs of a mobile society where the communications technology moves with the members wherever they go. This plan will document the progress that has been made in the transition to NG9-1-1 and the implementation milestones currently planned for 2019 and 2020.

The metro area NG9-1-1 system will be composed of several components:

1. Regional GIS data used for:
 - a. 9-1-1 call routing
 - b. Caller location validation
 - c. Emergency response coordination
2. Enhanced PSAP Connectivity to support:
 - a. Digital voice and text communication
 - b. The exchange of additional information relative to the event in progress (e.g. images, video, etc.)
3. NENA i3 Architectural Standard
 - a. Defines the core functions necessary to identify caller location, provided 9-1-1 call routing, define standardized data protocols, and the transport mechanisms to ensure NG9-1-1 system interoperability.
4. Multimedia Features Support
 - a. Provide the protocols and interfaces necessary to allow 9-1-1 callers to send images and video to 9-1-1 simultaneously while they are talking to the 9-1-1 telecommunicator.

Current Status and Planning:

The MESB, in cooperation with the State 9-1-1 Program, and the metro area Public Safety Answering Points (PSAPs), has made significant progress in preparing the foundation for the implementation of the metro area NG9-1-1 system. Each of the major NG9-1-1 components are listed below with a summary of the current status and plans for the next two years in the transition to NG9-1-1:



1. **Regional GIS** – This effort has been underway for several years. All 9-1-1 call routing in an NG9-1-1 environment will be based on geospatial data. In preparation for this transition, the following efforts have been undertaken by the metro PSAPs, counties, MetroGIS, and MESB:
 - PSAP and emergency service area polygons have been created and are distributed on a regular basis.
 - Regional schema standards for road centerline line and address point datasets have been defined and agreed to by the metro counties.
 - Aggregated regional road centerline (eight counties) and address point (nine counties) datasets have been created. The remaining counties are in the process of transitioning to the regional aggregation processes. Completion is currently anticipated by early 2020.
 - Synchronization is underway between the legacy Master Street Address Guide (MSAG) and Automatic Location Identification (ALI) data (which is the basis for 9-1-1 call routing in E9-1-1) and county geospatial data (which will be used in NG9-1-1). Data synchronization will allow for the transition from MSAG-based routing to geo-based routing without any major disruptions in call routing accuracy.
 - NG9-1-1 GIS data preparation and validation is nearing completion for nine of the ten counties in the metro area, with completion of the tenth county anticipated by end-of-year 2019. Until the State defines its NG9-1-1 data completion requirements, the MESB is using a benchmark of no more than two percent of ALI addresses not being able to geocode to road centerline and/or address points (based on NENA guidelines.)
 - Work is underway at the State (DPS-ECN and MnGeo) to define statewide geospatial data standards and aggregation/validation processes that will allow for aggregation of the metro area's regional data with that of greater Minnesota. The Minnesota Geospatial Advisory Council has approved a Minnesota address point schema and a road centerline schema is out for public review. Further work is needed at MnGeo to clarify the State's ongoing aggregation and maintenance processes and their implications on counties and regions. The State has not yet defined when those maintenance processes will be completed. Processes may also be affected by the vendor chosen for statewide NG9-1-1 core services.
 - Discussions have begun regarding the creation of a regional GIS-based MSAG to be used by telecom service providers that are not ready to transition their subscriber location data to NG9-1-1 processes by the time the State transitions to NG9-1-1 core services.

2. **Enhanced PSAP Connectivity** – The State 9-1-1 Program took the initiative in 2011-2012 to move the 9-1-1 system connectivity, including the metro area system, to



digital, IP-based connectivity between the 9-1-1 Service Provider and the PSAPs. The 9-1-1 system currently transports 9-1-1 calls in a digital format. This digital 9-1-1 network is referred to as an Emergency Services IP Network (ESInet). Currently, all but three of the 18 primary metro PSAPs accept calls directly in that digital format. The remaining three primary PSAPs in the metro area utilize a gateway between the 9-1-1 system and the PSAP 9-1-1 call answering application to convert from the digital format to the analog signaling used by the PSAP 9-1-1 answering application. While outside the MESB's area of responsibility, it is expected that all metro PSAPs will complete the transition from analog to digital when they replace or upgrade their 9-1-1 call answering applications by fourth quarter 2019.

The next phase of enhancing the ESInet connectivity to the PSAPs will involve re-homing the PSAP ESInet connections to redundant common meet points (e.g. a vendor-neutral data center, such as the 511 Building) where the 9-1-1 connections from the telephone companies and wireless carriers, as well as the 9-1-1 service provider connections can all come together in a secure facility. In addition to re-homing the PSAP connections, we expect to add additional redundancy and resilience to the meet-point-to-PSAP ESInet connections by using software-defined wide area network (SD-WAN) technology. The SD-WAN will manage multiple network connections using multiple service providers, transport protocols, and facilities. This will require cooperation with the State 9-1-1 Program. If the details can be worked out, this work should be completed by the end of first quarter 2020. The SD-WAN and re-homing will enable:

- Increased diversity/redundancy/reliability in the public safety side of the ESInet
- More flexibility in continuity of operations planning (COOP) options for large PSAPs
- Stability for telecommunications service providers and PSAP ESInet connections, even if the selected 9-1-1 service provider changes
- PSAPs sharing applications without the politics of where the application servers are located
- Vendors to have access to any PSAPs without requiring new network facilities
- Robust, secure, redundant, and reliable connectivity for cloud-based (e.g. Amazon Web Service - AWS) applications to PSAPs
- The use of cloud-based 9-1-1 core services in the future

3. **NENA i3 Architectural Standard** – NENA has several standard development work groups currently defining design and operating standards for NG9-1-1 components. As with most software-driven applications, the NG9-1-1 standards are expected to regularly evolve to remain consistent with the current trends in how



telecommunications services are being used by the general public. This need for the 9-1-1 system to continue to evolve was recognized as the use of wireless communications began to rapidly replace the use of the wireline telephone system on which 9-1-1 was originally designed. The current 9-1-1 system in Minnesota and 9-1-1 systems throughout most of the country do not yet utilize NG9-1-1 system core functions that are compliant with the NENA i3 NG9-1-1 standard. The telecommunications service providers serving the metro area are also not yet operating in compliance with the NENA i3 NG9-1-1 standard. The metro 9-1-1 system currently utilizes E9-1-1 call routing and location technology and delivers calls on a first generation digital ESInet. The metro/state 9-1-1 system relies on a shared 9-1-1 service provider that supports 9-1-1 call delivery in all or portions of 30+ other states.

In cooperation with the State 9-1-1 Program, the transition to a NENA i3 standard-based 9-1-1 system will involve releasing a request for proposal (RFP) for NG9-1-1 core services currently anticipated in early 2020. Core services handle caller location-based call routing, location validation, and caller location delivery. The GIS data work described in section 1 will be the basis on which the location services depend.

4. **Multi-media Features** – A fully compliant NENA i3 standard-based NG9-1-1 system will support the delivery of emergency calls for service using different communications mediums, including voice, real-time text, images, and streaming video. Most of the PSAP answering applications currently in use in the metro area would be capable of handling these different call formats, although a software upgrade may be required for PSAPs to receive multimedia. Currently, the 9-1-1 system and the telecommunications service providers are unable to support the delivery of anything but 9-1-1 voice and text calls.

The delivery of images and streaming video to 9-1-1 simultaneously with an on-going voice call to 9-1-1 is not yet technically possible. The wireless carriers do not support simultaneous data and voice in the same call currently. There are app developers working on the design of multimedia 9-1-1 apps for smart phones and it is possible app-based simultaneous data and voice could be available within the next two years. The NENA i3-based core services described in section 3 will support the delivery of simultaneous data and voice to the PSAP if the NENA i3-defined standard protocols are used, and most of the currently deployed 9-1-1 answering applications at the PSAPs should be capable of handling NENA i3 standard-based simultaneous data and voice calls but may require a software upgrade to do so. Multimedia support in the metro 9-1-1 system is anticipated in the fourth quarter of 2020 or early in 2021 provided the NENA i3 core services are procured by the RFP described in section 3. It is not clear that the wireless carriers will be able to support simultaneous data and



voice calls in their native networks by fourth quarter 2020, so multimedia to 9-1-1 during the next two years may be limited to phones equipped with a multimedia 9-1-1 app.

Strategic Initiatives Planned for 2019 and 2020:

Based on the MESB's ongoing work with the PSAPs, the State of Minnesota, and other MESB member agencies and departments (e.g. IT departments, GIS departments, etc.) which support the PSAPs and the 9-1-1 system, the MESB staff have identified eight high-priority projects as part of the NG9-1-1 transition process for completion in the next two years.

1. Complete the synchronization of metro legacy and NG9-1-1 data. **(Regional GIS)**
2. Implement an NG9-1-1 standard compliant ESInet that meets the goals and objectives outlined in section 2 above covering ingress to, egress from, and central to the NG9-1-1 core services. **(NENA i3 Architectural Standard and Enhanced PSAP Connectivity)**
3. Identify the GIS data requirements needed to support routing of wireless caller-based device location. **(Regional GIS)**
4. Engage with wireless carriers to establish direct i3 compliant ESInet interconnections to support sending the device location to the 9-1-1 system core services in time to route the call. **(NENA i3 Architectural Standard)**
5. Continue to evaluate the current 9-1-1 system and identify issues that could be improved within the metro area, considering PSAP needs and the 9-1-1 Service Provider capabilities. This initiative will include support for the increased use of shared/hosted or cloud-based public safety applications including, but not limited to, the 9-1-1 system i3-based core services. **(Enhanced PSAP Connectivity and NENA i3 Architectural Standard)**
6. Explore deployed NG9-1-1 systems which serve areas that mirror the Twin Cities region to identify what options are working well and which options have caused problems. Use that information to further develop and refine the metro area transition plan. **(Enhanced PSAP Connectivity and NENA i3 Architectural Standard)**
7. Coordinate the MESB NG9-1-1 transition planning with the State 9-1-1 Program, while maintaining the option to permit the metro area to move quicker, or specify a higher level of service, in the transition process if it is in the best interest of the metro



area PSAPs and residents (e.g. implement additional ESInet redundancy and diversity than is practically available in greater Minnesota, implement i3-based core services to support caller location-based call routing in the metro area, etc.).

(Enhanced PSAP Connectivity and NENA i3 Architectural Standard)

8. Monitor and assess perceived added value and security risks associated with the continued emergence of over-the-top services targeted at public safety agencies and PSAPs, which potentially offer more accurate location information and/or supplemental data related to in-progress 9-1-1 calls, but that are not part of or delivered over the 9-1-1 system. **(Enhanced PSAP Connectivity and NENA i3 Architectural Standard)**

Conclusion:

The transition from the legacy E9-1-1 system to a standards compliant NG9-1-1 system will continue over the next several years for both the telecommunications service providers and for public safety. The 9-1-1 system will also continue to evolve over time to remain compatible with the current trends in technology and how people routinely communicate. This will be challenging, but not insurmountable. It will, however, require an awareness that the system will always be evolving and not a one-time project which can be completed and not need to be addressed again for several years. This continual evolution may also require additional funding for the 9-1-1 system, communications, and PSAP operations as fire/EMS/law enforcement agencies become increasingly dependent on the PSAPs for response determination and coordination of response resources.

Minnesota, particularly the metro area, is well-positioned in this transition process. Minnesota is moving forward as one of the leaders in the process, without the risk of being too far out in front of the technology or the standards. 9-1-1 staff leverages the experience of early NG9-1-1 adopters and uses that experience to make sure the metro area's level of 9-1-1 service is not compromised during the transition. The MESB's goal is to continue to provide the most reliable and accurate 9-1-1 system possible with the resources available.