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

January 20, 2022 10:00 a.m.

WebEx Meeting: Meeting Link
Phone Number: (408) 418-9388
Access Code: 255 361 49084
Password: mUMg3KcNm35 (68643526 from phones and video systems)

1. **Call to Order**

2. **Approval of Agenda**

3. **Approval of Minutes –** November 18, 2021 Meeting

4. **Action Items**
   - A. ECN PSAP Cybersecurity Assessments

5. **Discussion Items**
   - A. RapidDeploy RadiusPlus Mapping Pilot Project from ECN.
   - B. 911 Authority NG9-1-1 System Assessment Report
   - C. Public Safety Telecommunicators Job Fair
   - D. Workload Sharing / CAD2CAD Workgroup Update
   - E. SECB Grant Dollars for Mental Health Response Training
   - F. Metro-Wide Peer Support Team
   - G. Mental Health Call Processing Standard
   - H. Potter Trial / Federal Trial Communications Plan
   - I. PSAP Roundtable Members List

6. **Reports**
   - A. PSAP Operations Round Table Workgroup
   - B. SECB NG9-1-1 Committee Report
   - C. 9-1-1 Network Report (Attached)
   - D. 9-1-1 Data Report (Attached)
   - E. MN Sheriff's Assoc. PSAP Subcommittee Report
   - F. IPAWS Report
   - G. SECB Pension Workgroup
   - H. SECB Classification/Training/Certification

7. **Announcements -** None

8. **Adjourn**

# Metropolitan Emergency Services Board
## 9-1-1 Technical Operations Committee
## Draft Meeting Minutes
## November 18, 2021

**Committee Members Present:**

Laura Anderson, Sherburne County
Carrie Bauer, Scott County
Susan Bowler, Carver County
Dan Klawitter, Hennepin EMS
Janelle Harris, City of Edina
Joni Hodne, City of Minneapolis
Chad Loeffler, Metro Transit
Tony Martin, Hennepin County
Darlene Pankonie, Washington County - **phone**
Lauren Petersen, Metro Airport
Cheryl Pritzlaff, Dakota County
LaVae Robinson, City of Bloomington
Jon Rasch, Ramsey County
Bob Shogren, Isanti County
Val Sprynczynatyk, Anoka County
Jake Thompson, Chisago County
Vicki Vadnais, Allina EMS
Greg Weigel, St. Louis Park

**Guests:** Laura Barton, 911 Authority – phone**;** Marcus Bruning, ECN; Scott Haas, Scott County; Matthew Hoffer, Lumen; Richard Jacobson, Lumen; Dawn Kenyon, Hennepin County; Joel McCamley, 911 Authority- phone; Robert Madich, IES; Kari Morrissey, Anoka County; Rod Olson, Minneapolis; Scott Petersen, Minneapolis PD; Dave Taylor, IES

MESB Staff: Marcia Broman, Jill Rohret

### 1. Call to Order
Susan Bowler called the meeting to order at 10:02.

### *2. Approval of November 18,2021 Agenda*
Added to the agenda are two Discussion Items. 5.F. Metcom and 5.G. Virtual meetings.

*Motion (Robinson/Martin) to approve the amended November 18,2021 Agenda. Approved.*

### 3. Approval of Minutes
*Motion (Sprynczynatyk/Pritzlaff) to approve the October 21,2021 TOC minutes. Approved.*

### 4. Action Items
**A. Nomination and Election of Chair and Vice-Chair of the 9-1-1 TOC for 2022**
Susan Bowler and Val Sprynczynatyk volunteered to remain Chair and Vice-Chair of the 9-1-1 TOC for 2022.

*Motion (Robinson/Sprynczynatyk) to elect Susan Bowler as 2022 9-1-1 TOC Chair. Approved.*

*Motion (Petersen/Robinson) to elect Val Sprynczynatyk as 2022 Vice-Chair. Approved.*

**B. 2022 Committee Appointments**

**1. NG9-1-1 Committee**

Chad Loeffler and Janelle Harris volunteered to remain representatives to the NG9-1-1 Committee.

*Motion (Martin/Hodne) to elect* Chad Loeffler and Janelle Harris as the 2022 NG9-1-1 Committee Representatives. Approved

**2. IPAWS**

Scott Haas volunteered to remain IPAWS representative for 2022. Val Sprynczynatyk nominated Kari Morrissey.

*Motion* (Sprynczynatyk/Hodne) to elect Scott Haas as primary and Kari Morrissey as alternate representatives to the 2022 IPAW Committee. Approved.

**C. Nomination and Election of MESB Representative to the NG9-1-1 Technical Group**

*Motion (Sprynccnatyk/Hodne) to elect Scott Peterson as the 2022 MESB Representative to the NG9-1-1 Technical Group. Approved.*

**5. Discussion Items**

**A. 9-1-1 Dispatch Career Fair**

Val Sprynczynatyk said Lisa Vik from Eden Prairie has been looking for venues for the next job fair. The Eden Prairie Community Center has several Saturdays in February open.

Members agreed on the date Saturday February 26, 2022. 10 a.m.–2 p.m. for the 9-1-1 dispatch job fair.

**B. 911 Authority PSAP Survey Recap/NG9-1-1 Strategy Document**

Mike Mihelich introduced Joel McCamley from 911 Authority to present the survey results from the metro PSAPs.

**C. RFP for Workload Sharing/CAD2CAD**

Mihelich said two RFPs were received. Winbourne was chosen as the consultant for the Workload Sharing/CAD2CAD RFP. There will be a kick-off meeting next Friday. There should be a working document ready in about six months. This is different from the 2018 Winbourne study.

**D. Mental Health Call Processing Standard**

Tony Martin said the group is meeting every two weeks, with the focus on best practices and a type of tiered level for mental health calls. Next meeting there will be a discussion on liability topics. A draft of work up to this point will be presented next month at the NG9-1-1.

**E. Upcoming Trial Planning**
Next Monday's meeting is an update for planning. There is no set location plan for this meeting, it will be more of a pop-up plan for the EMRG.

**F. Metcom**
Rod Olson said at the two previous Radio TOC's there has been discussions that BCA has been sitting on a console since the end of May. Jill Rohret has had a discussion with a representative and told them that it was against standard. They have since gotten off Metcom. There should be a discussion if Metcom is to be just for hailing.

Rohret said if Metcom is to be simply a hailing talk group there is no need to encrypt it. If Metcom is to be used for other than hailing encryption should be considered. If used for more than hailing whether it is encrypted or not, the standard should be adjusted.

Martin said according to the standard the Metcom talk group is intended for day-to-day urgent or emergent mutual aid situations. It is also a means for hailing another dispatch center to re-direct them to another talk group.

Martin said he felt it should not be used as a policing talk group but as an emerging situation resource.

Sprynczynatyk said she agreed that the use of Metcom should be overseen by the PSAP using it.

Dan Klawitter said State Patrol uses it a lot for PIs on the interstate. There have been instances where you can't get through to a center and use Metcom to do so.

Martin said it also creates situational awareness between centers.

Jon Rasch said the comment that it shouldn't be on the RF system because that is consoles only; we found in Ramsey that Metcom is on all of the backup radio systems, both consolettes and portables. Ramsey County has a waiver that the consolettes can be used by the ECC in case of an emergency.

Olson said the big discussion is do we really need encryption for the rare instances the back-ups will be used.

Martin said we are then reserving for the PSAP when we could be using Metcom.

Olson said when you encrypt a channel that uses more data putting more loading on the console.

Jake Thompson said there will also be an additional cost to encrypting all radios.

Klawitter and Vadnais support using encryption.

**G. Virtual Meeting**
Rohret said the topic is complex and the open meeting law is not black and white. The board chair and board counsel make the decision to go to virtual meetings. The legislature has made changes to the open meeting law, one of them being that as of July 1 of 2021, anyone participating in a virtual meeting needs to do so in an open and publicly accessible location. There is also the requirement that the public would need to be notified of all those locations. 10 days before the meeting those locations would need to be determined so that could be published. Potentially individual agencies would need to publish that as well.

Rohret said some state agencies continue to have some of their meeting virtually. The state is not subject to all the same open meeting law provisions as local government.

Martin said virtual meetings might lead to better attendance. Hybrid meetings as an option should still be considered.

Rohret said the AMC has chosen not to address the open meeting law at this legislative session, but it is hoped it will be in the future.

**6. Reports**
**A. PSAP Operations Roundtable Work Group- no report**

**B. NG9-1-1 Committee Report**
Chad Loeffler said the NG9-1-1 Committee met yesterday. Discussed and approved were the seven goals of the state-wide interoperability plan. Language for dispatcher re-classification was discussed. Status Board cheat sheet was discussed. Tactical mapping for a state-wide solution was discussed. 403 updates were discussed. Cyber Security and Mental Health Initiatives updates were given.

**C. 9-1-1 Network Report-attached**

**D. 9-1-1 Data Report-attached**

**E. MN Sheriff's Association**
Susan Bowler said the MN Sheriff's Association met on November 2nd. There was an update on the 9-1-1 Saves app talking points presentation. It has been circulated to the MSA PSAP Committee. The proposal is to send the message out in the committee's name.

Bowler said a couple of the counties that got an FSLA exemption were scheduling. Bowler said allowable uses of the 9-1-1 funds in 403 was discussed.

**F. IPAWS Report**
Scott Haas said at the last meeting this month, live site testing for emergency alerts was discussed. Overlap alerts from agencies was discussed. There were no action items.

**7. A. Announcements.**
Jonie Hodne said the Minneapolis back-up center is nearing completion. The 12 workstations will be able to take on additional or all of the main center's dispatchers.

Hodne said there is a small re-classification work group. Group meets on Monday and with the larger group on Tuesdays.

Rasch said he felt there should be some conversations between the smaller groups before this goes before the legislature.

Rohret said she will send out the proposed statute definition.

*Unknown* said it's important to have 9-1-1 in the definition.

*Unknown* said the national push is to rename the center as an Emergency Communications Center and the position to Public Safety Telecommunicator.

Darlene Pankonie said the pension group met on Tuesday. There was much discussion on position papers which did not leave time for dispatcher pension discussion. It will be discussed at the next meeting. A Doodle poll will be sent out. The work group has been re-framed to change the focus from moving the dispatchers to the corrections fund to do the dispatchers deserve enhanced benefits and if so, what are they?

Rasch said the RCECC phone refresh project is complete. The new Motorola VESTA enables inter-connection between the main and back-up center with GEO diverse back-up, servers in both locations and T1 lines.

Rasch said the Ramsey County Board approved funding for mental health initiatives.

**8. Adjournment 11:44 a.m.**
**(Rasch/Martin)**

# METROPOLITAN EMERGENCY SERVICES BOARD

**Meeting Date:** January 20, 2022
**Agenda Item:** 4.A ECN PSAP Cybersecurity Assessments
**Presenter:** Mihelich

## RECOMMENDATION

MESB region to participate in ECN PSAP Cybersecurity Assessments with each PSAP choosing individual participation. List of participating PSAPs will be provided to ECN.

## BACKGROUND

In the past, the metro region has tried to secure SECB grant funds for PSAP cybersecurity assessments of all PSAPs within our region. ECN has contracted with Federal Engineering to complete PSAP cybersecurity assessments for all participating PSAPs throughout Minnesota. Any PSAP connected to the ESInet are eligible for the ECN project. Each participating PSAP will fill out an assessment workbook and may receive a site visit from the FE project team for further assessment. With this contract, only cybersecurity assessments will occur, mitigation/correction of threats found may be included in a future contract.

## ISSUES & CONCERNS

Metro PSAPs would like to ensure that the ECN assessments meet the needs of the larger Emergency Communications Centers. Participation in the ECN project may preclude the MESB region from securing additional SECB grant money for a specific metro region PSAP cybersecurity project.

## FINANCIAL IMPACT

No financial impact to the MESB directly, but MESB staff would like the possible financial impacts to PSAPs defined in a written document between ECN and the participating PSAPs.

MOTION BY:
SECONDED BY:
MOTION:

PASS/FAIL


# NG9-1-1 System Assessment Report

DRAFT

1/14/2022

*submitted by*

911 Authority

Connecting Public Safety with Technology

# Executive Summary

The Metropolitan Emergency Services Board (MESB) supports public safety for the residents of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, and Washington Counties, and the City of Minneapolis. This support includes oversight and management of the metropolitan portion of the ARMER radio system; oversight and management of the regional 9-1-1 system; and coordination of the regional Emergency Medical Services (EMS) providers. This regional approach to planning and supporting Public Safety Answering Points (PSAPs), radio system users, and EMS providers ensures optimal response to emergencies and large-scale public safety events occurring within the metropolitan region. The MESB works closely with the Minnesota Department of Public Safety, Division of Emergency Communication Networks (ECN) to not only manage the current E9-1-1 system, but also plan and implement Next Generation 9-1-1 (NG9-1-1).

In preparation for the planned transition to NG9-1-1 in 2022 and beyond, the MESB commissioned this assessment report of the MESB regional PSAPs to provide a current analysis of 9-1-1 and PSAP operations across the MESB region. The crucial information collected and analyzed for this report is necessary for the MESB and the MESB PSAPs to make informed decisions related to the PSAP transition from legacy 9-1-1 technology to NG9-1-1 technology and operations.

A key objective of this report is to establish a 9-1-1 technology baseline to use for future plans and inform specific MESB NG9-1-1 RFP requirements. The survey data gathered here will also be used to guide the completion of the MESB NG9-1-1 Transition Plan.

Regional response to the survey was outstanding and the support of the PSAP personnel in collecting and submitting the survey data was met with enthusiasm. We would like to acknowledge the direct support of the MESB staff, the MESB 9-1-1 Technical Operations Committee and the MESB regional PSAPs for their contributions to this assessment report.

Highlights of the information collected from the MESB regional PSAPs includes:

| 9-1-1 in the MESB Region – Quick Facts | |
|---|---|
| **PSAPs of the MESB Region** | **19 Primary, 6 Secondary** |
| **Number of 9-1-1 Call Answering Positions** | **400** |
| **Number of Staff Supporting 9-1-1 across the region** | **940** |
| **First Responder Agencies served by the region (Fire, Police, EMS, includes some duplication)** | **261** |
| **Annual 9-1-1 Calls processed in the region (approximate as reported)** | **2.6M** |
| **Population served by MESB PSAPs (approximate)** | **3.7M** |

**Findings and Conclusions**

- The data collected for this report establishes an excellent foundation for the analysis presented in this report. While the data represent a snapshot in time and the accuracy of specific information will decline over time, the level of information is appropriate, valid, and necessary to inform an orderly transition to NG9-1-1 in the MESB region

- The anticipated level of upgrades to systems and equipment necessary for MESB PSAPs to transition to full NG9-1-1, i3 operating capability is low to moderate from a PSAP cost, training and major equipment change out perspective. Assuming a transition to full NG9-1-1 capability occurs within the next 12 to 24 months

- All MESB PSAPs will require some level of upgrade to transition away from the current 9-1-1 system provided under contract with Lumen to a system that fully supports the NENA NG9-1-1 i3 specification

- Staffing in a NG9-1-1 environment will require different skill sets like cybersecurity and networking or social media and texting. Personnel costs could be impacted by specialized skill sets or from the increased reliance on accurate data like GIS which will require an increase in maintenance activities.

- The MESB PSAPs are well prepared for the transition to NG9-1-1 as evidenced by the level of investment in technology, applications, resources and funding committed to public safety across the MESB region in addition to specific 9-1-1 funding from ECN

- As more integration occurs across the MESB region on applications like CAD and CHE the more efficient the MESB PSAPs become operating as one logical entity at the systems level. Examples include CAD to CAD interoperability, hosted Call Handling Equipment and alerting applications

- The MESB PSAPs will benefit from a diverse, scalable, redundant NG9-1-1 system that delivers data and information about and from emergency events (calls, data and supplemental information)
    - The NG9-1-1 system will allow for increased situational awareness and enhance the prioritization of events based upon the additional intelligence delivered with the call

- Once the NG9-1-1 system is operational, the MESB region will have the ability to prepare alternative arrangements, agreements including mutual aid for the PSAPs.
    - Arrangements may be developed that enhance the operational polices of the PSAPs to aid in how each PSAP interoperates and shares information and/or systems where appropriate

- The NG9-1-1 system will provide for a common approach for Cybersecurity across all MESB PSAPs in addition to the current local efforts. This will enhance the ability to recognize, divert or isolate DDoS, TDoS and intrusions that can compromise the entire operation.

- Establishment of a centralized monitoring and reporting capability that can manage all operational components within the Service Level Agreement (SLA) and maintain integrity across all MESB PSAPS.

- This capability will ensure consistent monitoring and management of the services provided (ESInet, Hosted Call Handling, GIS, Telecommunications, Radio, CAD, Recording, etc.) and quick resolution of any problem or trouble with the associated provider.

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# 1. 9-1-1 Assessment Objectives and Methodology

## 1.1 PSAP 9-1-1 System Assessment Objectives

NG9-1-1 refers to the ability to transmit, receive, process, transfer, dispatch, use, and store both voice and data (in the form of pictures, videos, text messages, and incident information) associated with a 9-1-1 call or request for emergency assistance. The NG9-1-1 system that will be implemented in the MESB region will contain the same functions of the current system, such as reliability, while providing for greater accessibility, interoperability, and a more efficient use of 9-1-1 resources. NG9-1-1 will enable the transfer of 9-1-1 calls between geographically dispersed PSAPs, will increase sharing of data and resources to improve emergency response, and improve coordination and partnerships within the 9-1-1 community.

The MESB considers the creation of a transition strategy and plan as critical to the success of its NG9-1-1 implementation. This strategy must recognize synergies, dependencies, and constraints of the metro regional 9-1-1 system's existence within the context of a statewide 9-1-1 system.

Along with this transition plan a documented assessment of the current 9-1-1 system for the ten-county metropolitan region was conducted. This assessment provides an in-depth analysis of 9-1-1 and PSAP operations across the MESB region. The crucial information collected and analyzed for this report is necessary for the MESB to make informed decisions related to the PSAP transition from legacy 9-1-1 technology to NG9-1-1 technology and operations.

The primary goals and objectives for conducting an MESB regional 9-1-1 System Assessment are as follows:

1. Survey both Primary and Secondary PSAPs and determine NG9-1-1 readiness
2. Analyze the current equipment and software, as well as changes needed for the transition to NG9-1-1 (including Call Handling Equipment (CHE), servers, workstations, Automatic Number Identification/Automatic Location Identification (ANI/ALI) controllers, Geographic Information Systems (GIS,) Computer Aided Dispatch (CAD), Records Management Systems (RMS), etc.)
3. Identify pending actions or projects that may impact the implementation of NG9-1-1
4. Deliver Final 9-1-1 System Assessment Report

## 1.2 Assessment Methodology

The methodology for conducting the MESB 9-1-1 System Assessment consisted of the 911 Authority team working in collaboration with MESB staff on the following:

1. Review of existing documentation related to the 9-1-1 operating environment in the MESB region

2. Develop a PSAP survey tool for data collection and report content
3. Manage the collection and distribution of PSAP related data for the report

### 1.2.1 Review of Existing Documentation

The 911 Authority team reviewed existing documentation and used these documents for comparison throughout the development of this report. Specific documentation included:

- MESB call statistics 2020
- MESB by laws and governance documents
- MESB TOC minutes and meeting packet reviews
- Current statewide NG9-1-1 system RFP

### 1.2.2 Online PSAP Survey

A PSAP Survey tool was developed and designed with input from the MESB staff. The questions contained in the survey tool primarily focused on PSAP specific information and topics or areas relevant to the assessment report, including:

**PSAP Information**

- Identify the current inventory of PSAP CHE, CAD, and other PSAP systems to determine NG9-1-1 readiness
- Determine the status of the MESB PSAPs relative to NG9-1-1 readiness and capability
- Identify any other issues related to the implementation of NG9-1-1 service
- Identify current and possible future end-user services and applications that will need to interface with both the current and future NG9-1-1 networks, such as CAD to CAD

**PSAP Readiness**

- Current status of the PSAPs in the MESB region relative to NG9-1-1 readiness/capability
- Catalog existing equipment and software (CHE, CAD, recorders, etc.)
    - Legacy
    - NG9-1-1 capable or enabled
- GIS capabilities
    - Current and possible future end-user services and applications

The PSAP Survey tool consisted of 45 questions. A draft of the survey was shared with the PSAPs in the MESB region. The final PSAP survey was distributed to the PSAPs on September 15, 2021, with a deadline of October 31, 2021. In total 24 PSAPs responded and provided information for this report. A copy of the survey can be found in **Appendix B** of the report.

# 2. Current 9-1-1 Infrastructure in the MESB Region

**Relevant Background**:
The PSAPs of the ten-county MESB region currently participate in a 9-1-1 system operated by Lumen as the 9-1-1 system integrator for the State of MN. The 9-1-1 call routing platform is an IP-selective router operated by Intrado, Inc., Lumen's vendor. The ingress network is currently transitioning to Time Division Multiplex (TDM) and Session Initiation Protocol (SIP) Points of Ingress/Interface (POIs) for Originating Service Provider (OSP) connections to the 9-1-1 network. The ingress network is operated by Inteliquent for aggregation and protocol conversion to support NG9-1-1 core services once they are in place (anticipated in late 2022 or early 2023).

The 9-1-1 traffic-only egress network currently consists of two physically diverse connections to each PSAP and all of the region's PSAPs are connected via Request For Assistance Interface (RFAI) SIP, a proprietary Intrado developed interim protocol (a transitionary protocol to NENA i3). The metro regional Automatic Location Identification (ALI) telephone number record data is currently hosted by Intrado.

The region's Master Street Address Guide (MSAG) is coordinated regionally by the MESB. MESB and its 9-1-1 and GIS partners have been collaboratively engaged in preparing the region's geospatial data for use in NG9-1-1. As a result, significant synchronization of legacy 9-1-1 and NG9-1-1 data has been completed, and regionally aggregated road centerline, address point, PSAP, and response boundary datasets are available for use in an NG9-1-1 data environment.

One of the main goals of the MESB 9-1-1 System Assessment report is to establish a baseline of the current 9-1-1 infrastructure in the MESB region. Using a combination of data collected by the PSAP survey tool, existing program documentation and interviews with various PSAPs, this section of the report provides the detailed analysis of our findings. This section examines the following areas:

1. MESB 9-1-1 System Scope and Size
2. Current 9-1-1 PSAP Operations
3. Current 9-1-1 Call Handling Equipment

## 2.1 MESB 9-1-1 System Scope and Size

A major component of the MESB 9-1-1 System Assessment is determining the size, scope and scale of 9-1-1 and PSAP operations across the MESB region. For the purposes of the assessment, an examination of the current system and its influence or impact on NG9-1-1 using the following metrics is relevant.

1. PSAPs of the MESB Region
2. Number of 9-1-1 call answering positions
3. Number of staff supporting 9-1-1

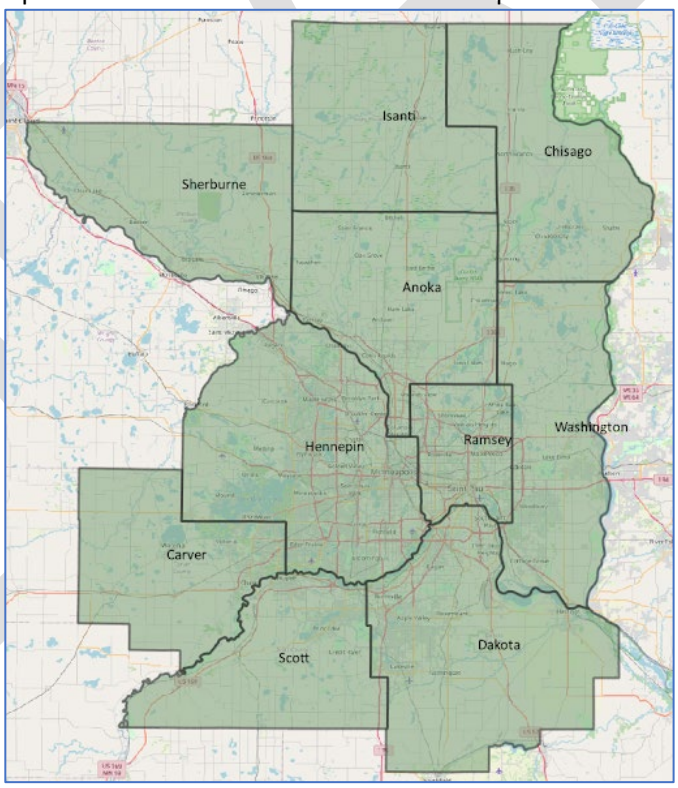
4. First Responder agencies served by PSAPs
5. Annual 9-1-1 call information

Each of these will be analyzed in the following sections using the PSAP survey data and experiences from other NG9-1-1 implementations. Here are some quick facts related to the scope and size of 9-1-1 in the MESB region as determined by the responses to the PSAP survey.

| 9-1-1 in the MESB Region – Quick Facts | |
|---|---|
| **PSAPs of the MESB Region** | **19 Primary, 6 Secondary** |
| **Number of 9-1-1 Call Answering Positions** | **400** |
| **Number of Staff Supporting 9-1-1 across the region** | **940** |
| **First Responder Agencies served by the region (Fire, Police, EMS, includes some duplication)** | **261** |
| **Annual 9-1-1 Calls processed in the region (approximate as reported)** | **2.6M** |

### 2.1.1 PSAPs of the MESB Region

A map displaying the geographic service areas of the MESB PSAPs is provided below.



The MESB supports public safety for the residents of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, and Washington Counties. There are 25 total PSAPs supporting the MESB Region, 19 Primary PSAPs and six Secondary PSAPs.

| PSAP Definitions from the NENA Master Glossary (*NENA-ADM-000.24-2021)* | |
|---|---|
| **PSAP (Public Safety Answering Point)** | An entity responsible for receiving 9-1-1 calls and processing those calls according to a specific operational policy. |
| **Primary PSAP:** | A PSAP to which 9-1-1 calls are **routed directly** from the 9-1-1 Control Office. |
| **Secondary PSAP:** | A PSAP to which 9-1-1 calls are **transferred from** a Primary PSAP. |
| **Wireline Primary / Wireless Secondary** | A PSAP which answers landline 9-1-1 calls directly from the CO but gets wireless 9-1-1 calls transferred in from another PSAP (ex. Department of Defense PSAPs are often configured this way) |
| **Wireless Primary / Wireline Secondary** | A PSAP which answers wireless 9-1-1 calls directly from the CO but gets wireline 9-1-1 calls transferred in from another PSAP (ex. State Police / Patrols generally operate in this capacity) |

From a NG9-1-1 perspective, a PSAP's classification can determine the level of NG9-1-1 services delivered to a specific location or the kind of ESInet connection. For example, in some jurisdictions, Secondary PSAPs are not eligible for direct connection to the ESInet and NG9-1-1 core services unless certain operational requirements are met. The table below identifies the PSAPs of the region.

| Primary PSAPs (Answers 9-1-1 calls directly) | Secondary PSAPs (9-1-1 calls are transferred here for further dispatch) |
|---|---|
| **Anoka County Emergency Communications** | **Allina EMS Communications** |
| **Bloomington Police Department** | **Hennepin EMS** |
| **Carver County Sheriff's Office Dispatch** | **Metro Transit Control Center** |
| **Chisago County Sheriff's Office Emergency Communication Center** | **M Health Fairview EMS** |
| **Dakota Communications Center** | **North Memorial Health Ambulance** |
| **Eden Prairie Police** | **Ridgeview Medical Center** |
| **Edina/Richfield Emergency Communications Center** | |
| **Hennepin County Sheriff's Office** | |
| **Isanti County Sheriff's Office** | |
| **Metropolitan Airports Commission Emergency Communications Center** | |
| **Minneapolis Emergency Communications Center** | |
| **Minnesota State Patrol *** | |

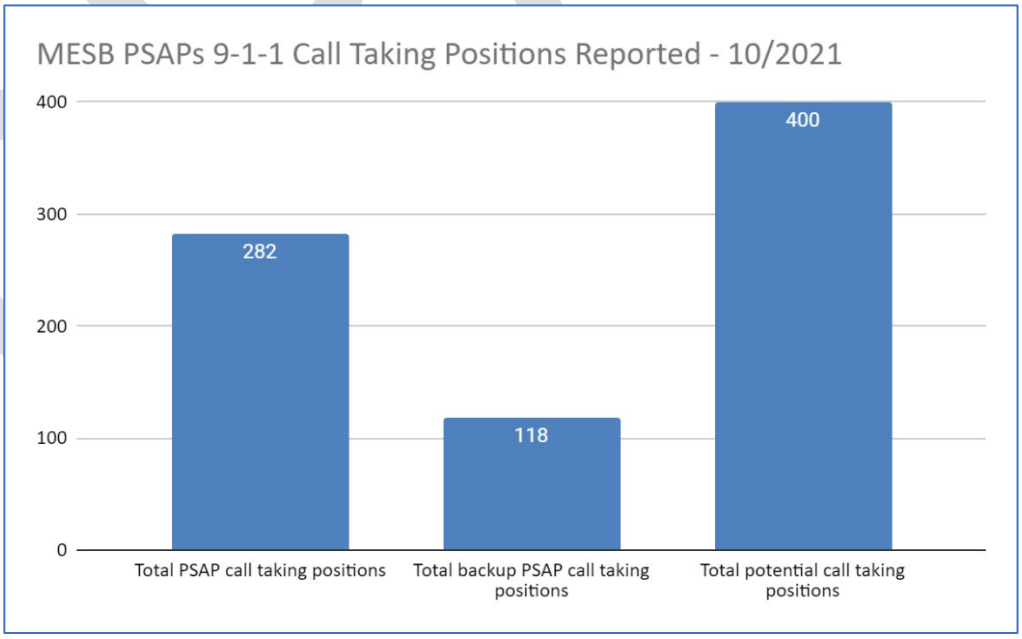
| | |
|---|---|
| **(*wireless primary, landline secondary)** | |
| **Ramsey County Emergency Communications Center** | |
| **Scott County Sheriff's Office** | |
| **Sherburne County 911 Communications Center** | |
| **St. Louis Park Police Department** | |
| **University of Minnesota** | |
| **Washington County Emergency Communications** | |
| **Fort Snelling (DOD PSAP) *<br>(*landline primary, wireless secondary)** | |

The identified Secondary PSAPs highlight the regional coordination for EMS services across the MESB. It also underscores the operational importance of taking these MESB Secondary PSAPs into consideration when planning for the transition to NG9-1-1, network endpoints and additional cost elements necessary to respond to certain 9-1-1 call types.

### 2.1.2 Number of 9-1-1 Call Answering Positions

The PSAPs answer 9-1-1 calls using call answering systems commonly referred to as call handling equipment (CHE) or customer premise equipment (CPE). Generally speaking, all PSAPs in the MESB region have the authority and autonomy to purchase and use any CHE system to answer and process 9-1-1 calls from the public to fulfill their statutory obligations related to 9-1-1.

The PSAP survey also sought to identify how many 9-1-1 call answering positions the PSAPs have in their 9-1-1 centers.

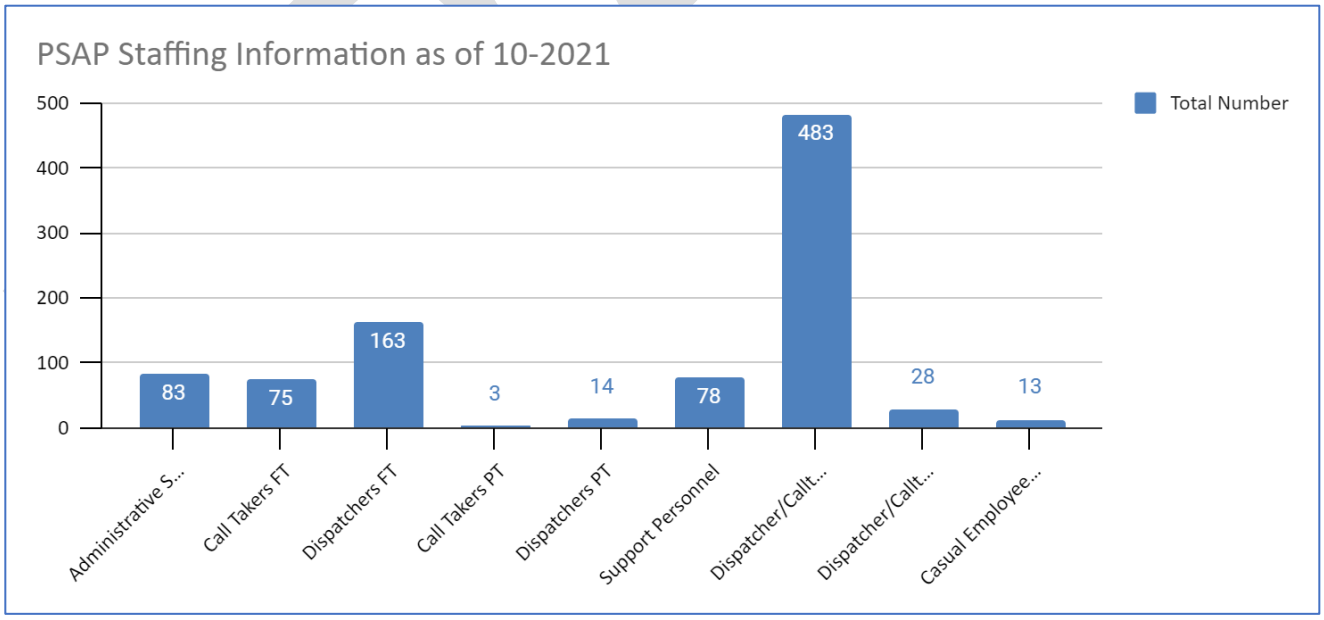


| How many 9-1-1 answering positions does your PSAP have? | | |
|---|---|---|
| **Location/Type** | **Total # Positions** | **Average # of Positions** |
| **Active / Primary** | **282** | **12** |
| **Backup** | **118** | **5** |
| **Total** | **400** | |

The distribution of 9-1-1 call answering positions across the region is consistent with other 9-1-1 environments across the country in that the number of positions at a PSAP is generally related to the population served by that PSAP. For example, a rural county with a population under 10,000 is likely to have a two position PSAP and lower 9-1-1 call volumes. Resulting in having one telecommunicator answering 9-1-1 calls at any given time. The larger PSAPs of the MESB region all handle larger call volumes and generally require higher levels of investment in 9-1-1 systems, training, staff and support required to handle the higher 9-1-1 call volumes.

### 2.1.3 Number of Staff Supporting 9-1-1

The PSAPs were asked to provide PSAP staffing information related to 9-1-1 operations as part of their submission. PSAP staffing is another area that can drive 9-1-1 costs, can be tied to system capacities, and corroborates other aspects of the data collected by the PSAP survey. The table below provides a breakdown of the information provided:

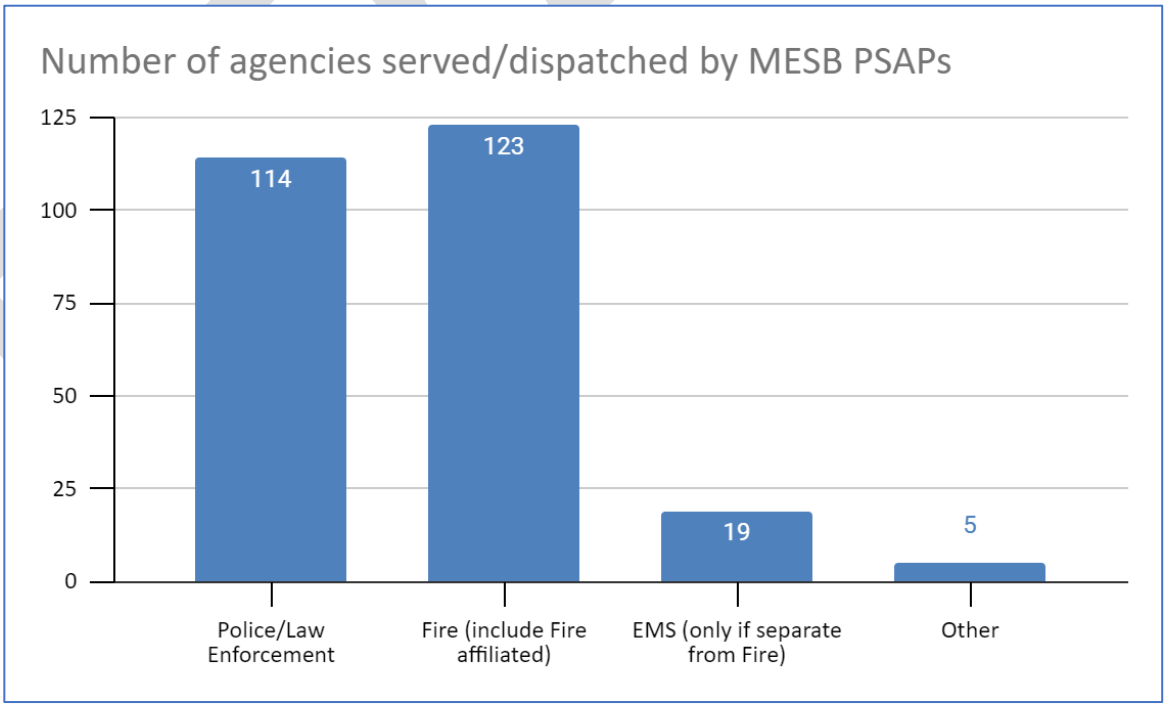


| PSAP Staffing Information | Total Number |
|---|---|
| **Administrative Staff** | 83 |
| **Call Taker Full Time** | 75 |
| **Dispatcher Full Time** | 163 |
| **Call Taker Part Time** | 3 |
| **Dispatcher Part Time** | 14 |
| **Support Personnel** | 78 |
| **Dispatcher/Call Taker FT** | 483 |
| **Dispatcher/Call Taker PT** | 28 |
| **Casual Employees (i.e Civilian Clerks)** | 13 |
| **Total PSAP Staffing 10-2021** | **940** |

Staffing in a NG9-1-1 environment will require some different skill sets like cybersecurity and networking or social media and texting. Personnel costs could be impacted by specialized skill sets or from the increased reliance on accurate data like GIS which will require an increase in maintenance activities.

### 2.1.4 First Responder Agencies Served by MESB PSAPs

The chart and table below summarize the number and types of first responder agencies served by the MESB PSAPs. According to the PSAPs that responded to this question, agencies are dispatched in the MESB region.



| Number of agencies served/dispatched by your PSAP | |
|---|---|
| | Total Number |
| **Police/Law Enforcement** | 114 |
| **Fire (include Fire affiliated)** | 123 |
| **EMS (only if separate from Fire)** | 19 |
| **Other** | 5 |
| **Total First Responder Agencies Served** | **261** |

It is important to note that operationally, it is common for some first responder agencies (typically Fire and EMS agencies) to be dispatched by more than one PSAP. This means there is likely some duplication and overlap between the numbers represented by the survey data above.

### 2.1.5 Annual 9-1-1 Call Information

Current PSAP call volumes are very valuable information to have and helps corelate many of the other data points collected for this report. The PSAP survey asked the PSAPs about their annual 9-1-1 call volumes.

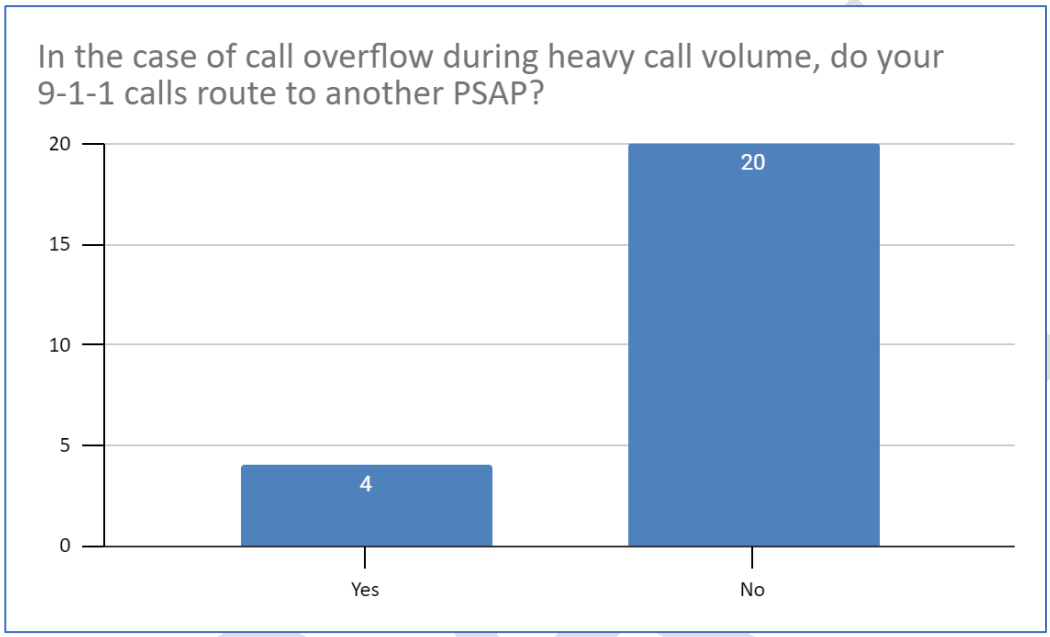
| Annual Number of 9-1-1 Calls by Call Type | Total | Average/PSAP |
|---|---|---|
| **Wireline/landline 9-1-1 Calls** | **419,227** | **17,468** |
| **Wireless 9-1-1 Calls** *(including non-service initialized phones)* | **1,831,527** | **76,314** |
| **VoIP 9-1-1 Calls** | **115,496** | **4,812** |
| **9-1-1 call transfers to other agencies** | **257,433** | **10,726** |
| **Total 9-1-1 Calls** | **2,623,683** | **109,320** |
| **Administrative (non-emergency) Calls** | **2,806,427** | **116,934** |
| **Total Calls Processed** | **5,430,110** | **226,255** |

The call volumes reported by the PSAPs reflect a level of activity across the region that is consistent with the population of the region and will inform future NG9-1-1 planning, procurement, and implementations. This information will be vital to sizing the NG9-1-1 system as it relates to expected call volumes any NG9-1-1 system will be required to accommodate.

### 2.1.6 Legacy 9-1-1 Call Flow Challenges

The PSAP survey asked PSAPs to identify what happens to their 9-1-1 calls when they are busy and cannot answer a 9-1-1 call because they are already working on other 9-1-1 calls, known as an overflow scenario. In a legacy 9-1-1 call flow environment and as seen in the MESB region, what happens to overflow 9-1-1 calls

depends on what capabilities a PSAP has to answer 9-1-1 calls presented on other systems, like the admin phone or 10-digit non-emergency number. Here is what the PSAPs reported regarding 9-1-1 call overflows in the MESB region:




Here are a sample of the responses from the survey for what happens today in a 9-1-1 call overflow in the MESB region:

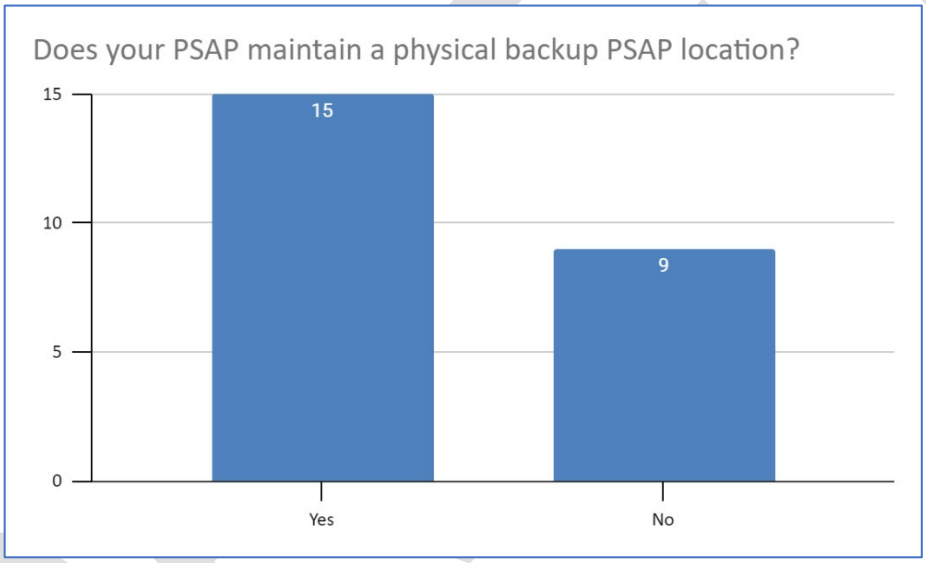
| PSAP Responses |
|---|
| Calls roll to Allina EMS |
| Hennepin EMS. It is handled by our phone system. Not at the phone company level. |
| Dakota County Communications |
| Carver County Sheriff's Office |
| Overflow 9-1-1 calls route to the non-emergency phone lines and the in-house extension lines. |
| Fast Busy when all lines are in use |
| overflow 911 when all lines busy roll to admin lines within center |

Generally, it is the intent of every PSAP to answer each and every call. The ability to do so can be limited by many things beyond the control of any one PSAP. What happens to an overflow 9-1-1 call may or may not be within the control of the PSAP.

In NG9-1-1, the ability for a call to go from one PSAP to another based on current network or operating conditions is part of the design and operational capabilities of NG9-1-1. In a NG9-1-1 environment 9-1-1 callers will no longer receive a fast busy, they will be rerouted to another PSAP.

Another similar and related PSAP issue created by legacy 9-1-1 call flow is the fact that some PSAPs have a physical backup facility that typically houses a backup CHE/CPE system and duplicate 9-1-1 connections to the 9-1-1 network for the purposes of remaining operational during times of trouble or outage.

The PSAP survey asked the PSAPs if they have a physical backup location for answering 9-1-1 calls. Here is what the PSAPs reported:



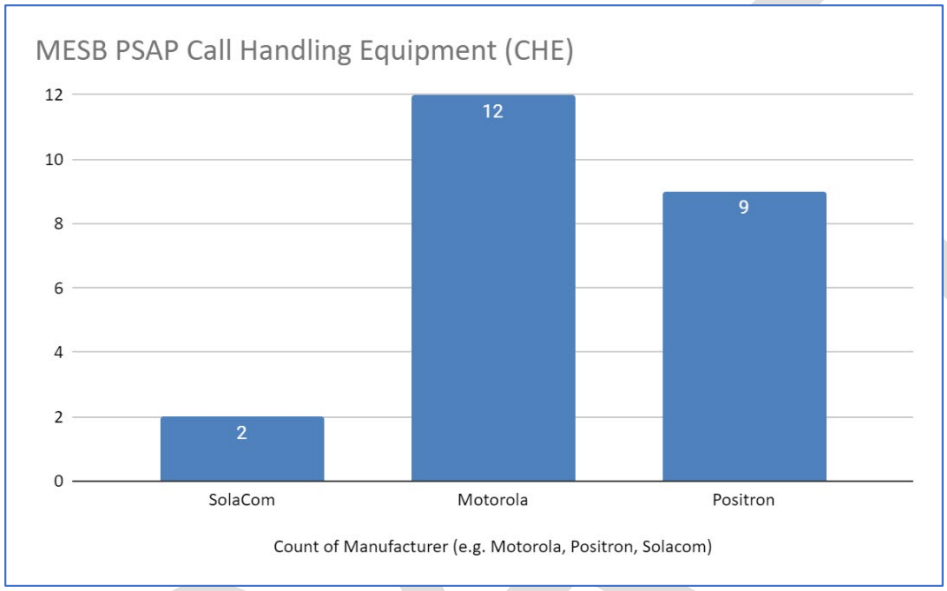

In NG9-1-1, physical backups are not required for most PSAPs to remain operational. With NG9-1-1 dynamic call routing, 9-1-1 calls destined for a particular PSAP can automatically be sent to a predetermined location if the intended PSAP is unavailable for any reason. Larger PSAPs will often maintain a physical backup even when they are part of a NG9-1-1 system given that few other PSAPs can successfully process a large PSAPs' 9-1-1 call volumes. Load balancing at the NGCS can be a mitigating factor in this potential overload the neighboring PSAP scenario.

## 2.2 Current 9-1-1 Call Handling Equipment (CHE)

An area of focus for this report is to understand the current CHE systems operating in the MESB region. The PSAP survey asked several questions related to a PSAPs CHE, with the intent of gathering enough information to make a determination of NG9-1-1 readiness of any particular PSAP in the region. While the information

provided is extremely valuable and informative, some errors or mislabeling of information from the PSAPs exists and it is possible that a PSAP could be identified as not ready when in fact they are and vice-versa.

The list of manufacturers reported by the PSAPs includes:



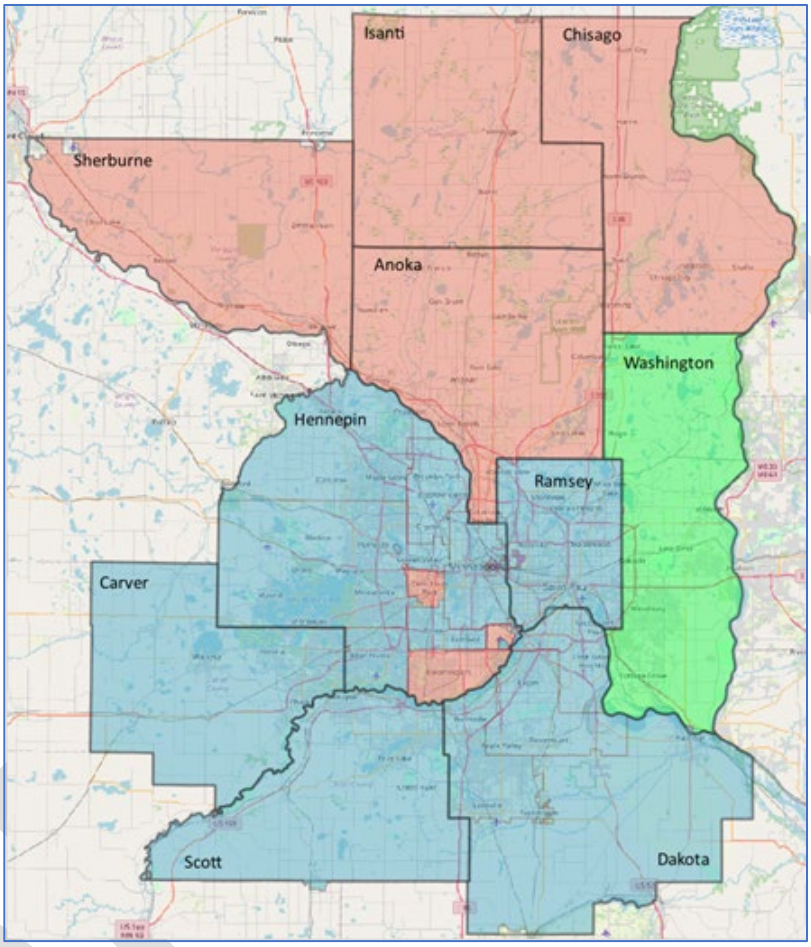

Each of these identified system vendors provide CHE systems that are NG9-1-1 capable to PSAPs across the country. Each of these vendors currently integrates to and operates with numerous NG9-1-1 system providers in other NG9-1-1 systems in other states and jurisdictions. Specific operational capabilities are often dependent on specific PSAP operational requirements and further information is required in order to determine if a specific installation of CHE is NG9-1-1 capable. For our analysis we focused on version numbers.

Where possible, the MESB PSAPs provided version or revision numbers associated with the CHE platforms. Examples include:

| Sample Reported CHE Manufacturer and Versions | |
|---|---|
| **Motorola** | Vesta 911 R7.2.737.673 |
| **Motorola** | VESTA 911 R7.1.621.568 |
| **Motorola** | Vesta 6.1.0 |
| **Positron** | Viper Power911 v 6.4 |
| **Positron** | VIPER Power 911, 5.1 |
| **Solacom** | Guardian V 21.3 |

By examining the version information in more detail, the differences in MESB PSAP CHE installations becomes

more evident. Below is the distribution of CHE by manufacturer across the region based on responses to the PSAP survey.




**CHE by County (Vesta, Viper, Solacom)**

**Are the PSAPs of the MESB region ready for NG9-1-1?**

> ***It must be pointed out that all MESB regional PSAPs are currently configured to operate with the network provided under contract with Lumen and the Intrado A911 system. As currently configured and connected, all MESB PSAPs would require configuration changes to their CHE platforms if/when the NG9-1-1 service provider changes as a result of the next NG9-1-1 contract signed by ECN, anticipated in 2022.***

Notwithstanding the note above, when analyzing the PSAP responses to the CHE system survey questions, attention was paid to the provided make, model, and version of the CHE system. Having all or some of this

information is useful in deciding a PSAPs NG9-1-1 CHE readiness. The primary data used for CHE NG9-1-1 readiness determination is the CHE application's software version number. Based upon our response analysis, the following information pertains to the CHE readiness of PSAPs in the MESB region:

| PSAP CHE NG9-1-1 Readiness Assessment | |
|---|---|
| **PSAPs Reporting NG9-1-1 Capable CHE** *(18 Primary and 2 Secondary PSAPs)* | 23 |
| **PSAPs Reporting Non-NG Ready CHE or Unknown** | 2 |
| **Totals** | 25 |

Based on the information provided from the PSAPs, 18 Primary and five Secondary PSAPs in the MESB region operate a CHE system that should require little modification when transitioned away from receiving 9-1-1 calls from the current 9-1-1 system to receiving calls from a NG9-1-1 system. That is not to say there will be no costs involved in the transition, it means that the CHE system itself will not require complete replacement when the PSAP is transitioned over to the new NG9-1-1 system. If the transition to a new NG9-1-1 system occurs in the next 12 – 24 months (by 2024) as anticipated, then a software upgrade to a newer revision is all that should be required at the majority of MESB PSAPs. The remaining CHE systems in question are operated at Secondary PSAPs and may require replacement if full capabilities are expected to be shared between Primary PSAPs and Secondary PSAPs across the region.

## 2.3 Findings and Conclusions

- The data collected for this report establishes an excellent foundation for the analysis presented in this report. While the data represent a snapshot in time and the accuracy of specific information will decline over time, the level of information is appropriate, valid, and necessary to inform an orderly transition to NG9-1-1 in the MESB region
- The anticipated level of upgrades to systems and equipment necessary for MESB PSAPs to transition to full NG9-1-1, i3 operating capability is low to moderate from a PSAP cost, training and major equipment change out perspective. Assuming a transition to full NG9-1-1 capability occurs within the next 12 to 24 months
- All MESB PSAPs will require some level of upgrade to transition away from the current 9-1-1 system provided under contract with Lumen to a system that fully supports the NENA NG9-1-1 i3 specification
- Staffing in a NG9-1-1 environment will require different skill sets like cybersecurity and networking or social media and texting. Personnel costs could be impacted by specialized skill sets or from the increased reliance on accurate data like GIS which will require an increase in maintenance activities.

# 3. NG9-1-1 Assessment

This section of the report will focus on the following areas relevant to NG9-1-1 in the MESB region and how these areas will change in this new 9-1-1 environment:

- NG9-1-1 and PSAP Operations
- GIS in NG9-1-1

## 3.1 NG9-1-1 and PSAP Operations

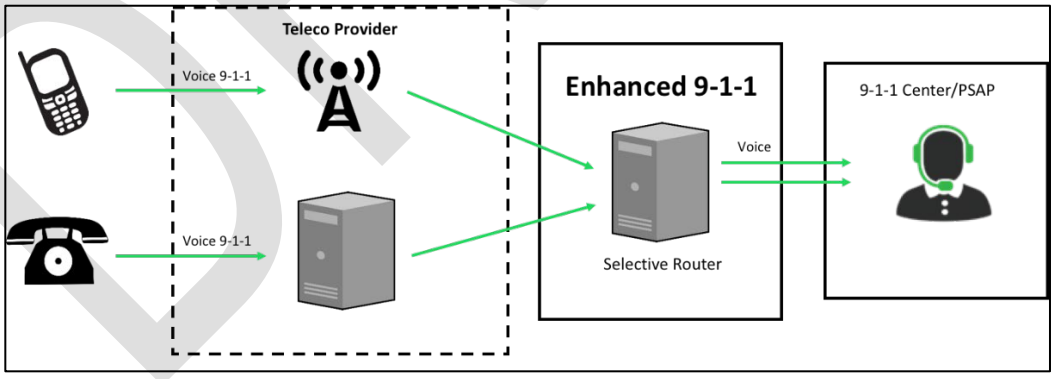
This section of the report will explore the various ways operating on a NG9-1-1 system will be different than the legacy 9-1-1 system and how those differences can affect PSAP operations in the MESB region, which includes the following areas:

- NG9-1-1 Call Flow
- Physical Backups and 9-1-1 Call Overflow
- 9-1-1 Call Transfers
- Training and Protocols

### 3.1.1 NG9-1-1 Call Flow

9-1-1 call flow in NG9-1-1 is different than the legacy 9-1-1 system. Understanding the differences is important to understanding how NG9-1-1 can address the challenges legacy 9-1-1 call flow creates in MESB.

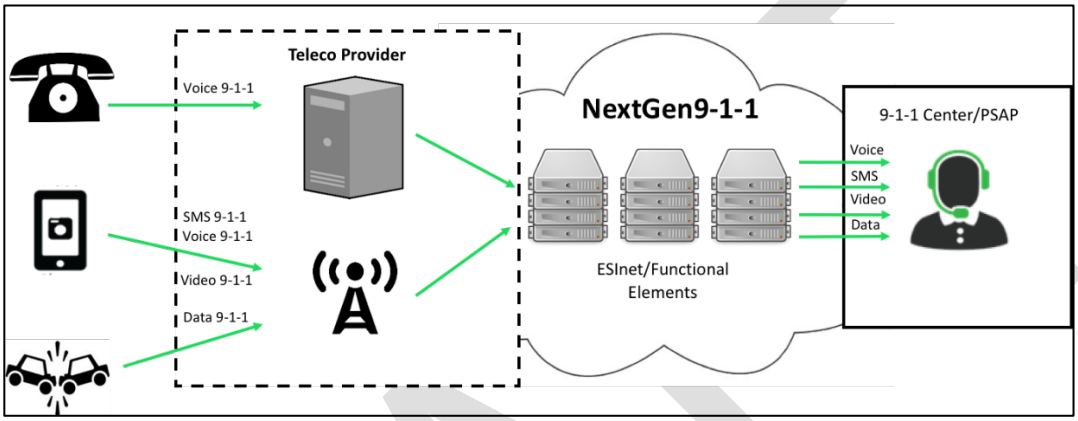
The diagram below shows a simplified legacy 9-1-1 system. 9-1-1 calls enter the system on the left of the diagram and progress through a series of analog connections and the legacy Selective Router (SR) to one of the PSAPs connected to that SR.




The diagram shows dedicated, point to point connections between legacy elements that are used to selectively route a 9-1-1 call to a PSAP. All 9-1-1 calls in the MESB region rely upon these kinds of dedicated connections built to specific PSAPs in order to process 9-1-1 calls. What SR a PSAP connects to is based largely on where the

PSAP is physically located and the evolution of the telephone networks over the 19th and 20th centuries.

The following diagram represents a simplified NG9-1-1 system. Here too, calls enter the diagram on the left and progress through a core routing function which then sends the 9-1-1 calls on to the PSAPs that are connected to the ESInet.




The NG9-1-1 diagram shows many more connections and functions involved in processing a 9-1-1 call. This visually demonstrates a major difference between how a 9-1-1 call gets received, processed, routed, and delivered in the legacy and NG9-1-1 environments.

In legacy 9-1-1, the 9-1-1 call relies on dedicated trunks connecting a SR to a PSAP. In NG9-1-1, the 9-1-1 call relies on a session being established between the 9-1-1 caller and the PSAP via SIP. The NG9-1-1 call session relies upon the ESInet, which relies on multiple paths and connections to connect to all PSAPs. This allows for the NG9-1-1 system to send 9-1-1 calls to any PSAP that is connected to the ESInet, regardless of where the 9-1-1 call came from or how it came into the system.

This basic difference, multiple paths and connections versus limited dedicated trunks delivering 9-1-1 calls to the PSAPs, begins to address the challenges identified and allows for planned operational change to occur in the MESB region.

### 3.1.2 Physical Backups and 9-1-1 Call Overflow

As noted previously, there are PSAPs in the MESB region that maintain physical backups as well as PSAPs whose 9-1-1 calls will ring to a “fast busy” if the PSAP is overloaded. These situations exist primarily as a result of the limitations inherent in the design of the legacy 9-1-1 system. Specifically, the challenges addressed by NG9-1-1 include:

- Physical PSAP Backups

- 9-1-1 Call Overflow

**Physical PSAP backups**

Based on the survey results, at least 15 PSAPs in the MESB region maintain a physical backup for their PSAP. This typically means there are duplicate 9-1-1 connections, systems, and costs associated with maintaining a physical PSAP backup. There are operational reasons for PSAPs to maintain physical backups, but NG9-1-1 makes every other PSAP in the region a virtual backup PSAP.

NG9-1-1 will make it possible for some PSAPs to decommission their backup PSAPs, eliminating the duplicate costs and systems, which could result in significant savings over the long term at the local level. The ability for a PSAP to back up another PSAP in NG9-1-1 will require an increase in cooperation, communication, and data sharing between agencies.

It may be necessary, from an operational standpoint, for larger PSAPs to maintain a physical backup when diverting their 9-1-1 call traffic would result in cascading overloads of smaller PSAPs across a region or the state. The inherently flexible location-based routing capabilities of a NG9-1-1 system will provide many alternative backup arrangements for PSAPs to consider as the transition to NG9-1-1 takes place.

**9-1-1 Call Overflow**

Another challenge identified in the survey data is what was referred to as 9-1-1 call overflow. According to the survey results, 20 PSAPs do not overflow their 9-1-1 calls to another PSAP if they are busy and cannot answer the call. These 9-1-1 calls could go unanswered or result in the caller hanging up and sending another 9-1-1 call into the system.

NG9-1-1 will make it possible for all 9-1-1 calls to be answered regardless of what is happening at any given PSAP in the region. The dynamic call routing design of the NG9-1-1 system will automatically overflow a 9-1-1 call to another, pre-designated PSAP or series of PSAPs until the call is answered. This is accomplished via a NG9-1-1 system function known as a Policy Routing Function (PRF).

Operationally, PSAPs will need to participate in the planning and configuration of the PRF in a NG9-1-1 system. Sending a 9-1-1 call to a PSAP is easy to do from a technical standpoint in NG9-1-1, but dispatching, paging first responders, activating warning sirens, and LMR communications for another PSAP is a different operational challenge not directly addressed by the NG9-1-1 system.

### 3.1.3 9-1-1 Call Transfers

Transferring a 9-1-1 caller is an operational reality for a PSAP, especially for certain types of 9-1-1 calls like wireless/cellular 9-1-1 calls. If a PSAP is a Secondary PSAP, one that does not directly get 9-1-1 calls. This often requires additional interrogation of the caller and a delayed dispatched response.

NG9-1-1 mitigates the challenges with 9-1-1 call transfers with the ability of the NG9-1-1 system to dynamically route and ultimately geo-route 9-1-1 calls based on location data. For the 25 PSAPs in the MESB region, the NG9-1-1 system will automatically route all calls, including wireless 9-1-1 calls, to that PSAP based on the location of the call and the caller will not be transferred between PSAPs as much as they are today.

An operational efficiency the region enjoys comes from the fact that all MESB PSAPs is that all PSAPs are served by and connected to the same routing cores and if a call is transferred from any PSAP to any other PSAP across the region or across the state, the location data is available for that call and will be provided to the transferred agency.

### 3.1.4 Training and Protocols

The transition to NG9-1-1 brings with it more than just changes in equipment at the PSAP. New systems, new tools, new processes all add to the demands placed upon telecommunicators when processing 9-1-1 calls. Given that NG9-1-1 primarily moves away from a system designed to handle landline 9-1-1 calls to a system that can process multiple types of calls, it is likely that lack of training could become an obstacle to the deployment of NG9-1-1 at the PSAP. Training will be necessary to operationalize many of the capabilities promised by NG9-1-1 service.

The PSAP survey asked PSAPs about training and protocols currently in place. The chart below provides the breakdown on PSAPs that require some type of formal 9-1-1 training for telecommunicators. Another question on the survey asked the PSAPs to report on any 9-1-1 protocols used in the PSAP for call interrogation. The chart below provides the results from the PSAPs.

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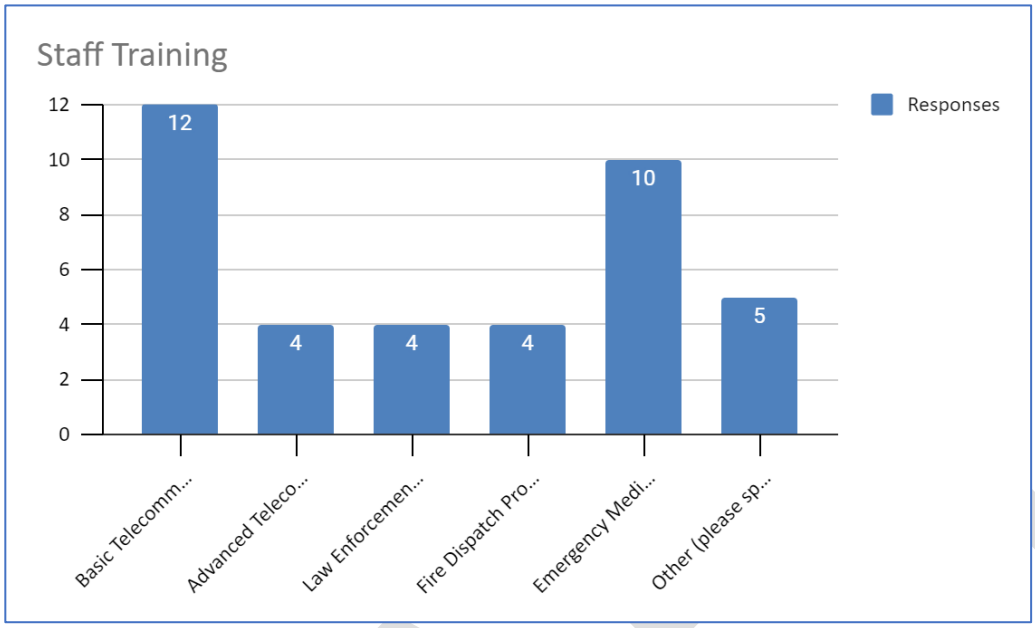



| Training Types | Required |
|---|---|
| **Basic Telecommunicator** | 12 |
| **Advanced Telecommunicator** | 4 |
| **Law Enforcement Protocols** | 4 |
| **Fire Dispatch Protocols** | 4 |
| **Emergency Medical Dispatch** | 10 |
| **Other (please specify)** | 5 |

Other training/protocols identified include:

- Telephony CPR
- Inhouse training specific to disciplines supported by the PSAP

The State of Minnesota has statewide minimal training protocols in place for telephone CPR. The Statewide Emergency Communications Board has established a minimum training standard, Standard 911-3 Telephone CPR Statewide Operational Standard, that establishes every PSAP must maintain a telephone cardiopulmonary resuscitation program in one of two ways. The first option is to provide each 9-1-1 telecommunicator with training in cardiopulmonary resuscitation. The second option is for the PSAP to have the ability to transfer callers to another PSAP in which the telecommunicators have been trained.

The MESB provides a minimum training requirement for telecommunicators in the region. The training contains specific topics which provide the basic foundational knowledge and skills necessary to fulfill the role of a telecommunicator. These topics include Roles and Responsibilities, Legal Concepts, Interpersonal

Communication, Emergency Communications Technology and Information Systems, Call Processing, Emergency Management, Radio Communications, Stress Management, and Quality Performance Standards Management.

The ease with which a NG9-1-1 system can dynamically route calls between PSAPs will quickly highlight differences in training and protocols across the region. Other jurisdictions, while implementing NG9-1-1 systems, have also encouraged and supported consistent service with programs like minimum training standards or the adoption of protocols like emergency medical dispatch (EMD). Given the existing level of support from the PSAPs for both basic telecommunicator and protocol specific training as reported on the survey, it could serve as a foundation for further standardizing PSAP training across the MESB region.

## 3.2 GIS in NG9-1-1

Historically, all 9-1-1 calls are delivered to a PSAP by a telecommunication OSP. The OSP is responsible for carriage and delivery of a call to the correct PSAP using a database that has been largely defined by the physical location of a device or agent capable of dialing 9-1-1.

This database (referred to as the Selective Router Database or SRDB) is a collection of data records that link a telephone number to a physical address. In 9-1-1 systems, this framework minimizes the variability of locations by defining exactly where a call goes based upon a fixed attribute in the database.

The SRDB functionality has worked well; however, new technology, user mobility and applications available to consumers are not as fixed as they were when the system was originally implemented.

Today, the devices and systems that can trigger an emergency call have caused the existing 9-1-1 systems to pursue several augmentations, patches, and significant system upgrades to meet the demand in attempts to increase the ability of the fixed location-based system to handle mobile (non-fixed location) devices.

The preferred method of routing calls in NG9-1-1 and in the future is geospatially. Using the spatial ability of Geographic Information Systems (GIS) that utilize attributes specifically structured for call routing offers a significant enhancement to 9-1-1. This configuration allows for call information systems to query the maps derived databases to identify the caller location and route a call to the correct PSAP.

PSAPs across the MESB region utilize GIS as a tool in many ways. Most utilize GIS to support the PSAP's CAD/mapping system and as a tool to manage the Master Street Address Guide (MSAG) which is developed by a PSAP to validate the records contained in the current ALI and SRDB. GIS developed geospatial datasets exist for all MESB counties and PSAPs. These authoritative GIS databases are locally developed and maintained, as well as aggregated into datasets that provide coverage for the 10-county MESB region.

Geolocating calls is a significant change to how 9-1-1 calls route. In E9-1-1 and legacy systems OSPs control the information and routing of a call. This can occasionally lead to incorrectly routing calls to the wrong PSAP. In addition, if a call must be transferred outside of an OSP service area a loss of data including the location may occur. This can result in PSAPs losing critical information about the caller as they are transferred from PSAP to PSAP.

The significance of routing based upon location cannot be overstated. The benefits of location-based routing in NG9-1-1 allows for 9-1-1 to operate as a seamless system rather than a series of siloes and individual platforms designed to support a single OSP or PSAP.

### 3.2.1 Address Databases

One of the primary components of a 9-1-1 call is the determination and conveyance of caller location. Within a legacy 9-1-1 call flow this is often done through using databases that contain a fixed address. Databases built from customer records of addresses are used during the Service Order Input (SOI) process to document the fixed location of the service address (sometimes billing address) of the OSP customer. The SOI process results in a database of customer locations based on their address at the time they connect the service from the OSP.

Legacy 9-1-1 databases (e.g. ALI) are often developed from OSP SOI records. The SOI record is a database record that contains a service order subscriber name and address where the telephone number is installed or assigned. Over time additional supplemental databases built with GIS have been created to enhance the baseline SOI data. The MSAG is used to define the address ranges and is often exported from a GIS tool to validate the SOI and establish an Emergency Service Number (ESN). The ESN is appended to the SOI information, and the result is the SRDB. The SRDB is the primary method for routing calls in E9-1-1 and legacy 9-1-1. If attributes are not present in the databases or is inconsistent, the call will still route to the PSAP because it uses the ESN contained in the SRDB that was defined through the SOI process. The SRDB has essentially reached obsolescence due to the increase of mobile communications.

The MSAG is developed and maintained by the local 9-1-1 authority and contains the address ranges and street names within a PSAP's serving area. The MSAG is used as a validation tool in legacy 9-1-1 systems to ensure that each ALI database record has a corresponding MSAG street and address range. This process ensures that a PSAP will receive validated ALI on the screen at the telecommunicator position for each call. In addition, the process also assigns each ALI telephone number record, based on its corresponding MSAG entry, an ESN that is used in the SRDB for PSAP routing, as well as with identification of emergency response agencies in the ALI display.

In NG9-1-1, emergency call routing and location validation occurs through the geolocation database system that utilizes aggregated and normalized geospatial data. These functions are defined in NENA i3 Standards as Emergency Call Routing Function (ECRF) and Location Validation Function (LVF). The ECRF and LVF transactions

utilize the spatial information provisioned by GIS to determine location of the caller and identify a route through the NG9-1-1 system to a PSAP.

### 3.2.2 GIS Normalization and GIS Synchronization

During transition to NG9-1-1 call routing, databases used in the legacy 9-1-1 system will serve as a baseline to ensure that migration operates in a consistent manner as the current 9-1-1 routing system. Over time, the manner which the 9-1-1 routing data is managed and maintained will change. Instead of the MSAG process, the data will be managed through GIS which will allow for a more effective and efficient update and correction method.

As transition occurs, there will be areas that may require attention including:

1) Disparate GIS management agencies and systems
2) Disparate GIS data layers
3) Sharing of GIS information
4) Inconsistent attribute data
5) Reconciliation of GIS data with MSAG
6) Normalization of GIS data
7) Existing ALI management tools and services

Through the GIS development process, two additional steps will be undertaken by the MESB region.

First, all GIS data will be "normalized" across the region. This entails:

- **Common regional data schemas**
  - Ensure a common structure and format for each data layer, with normalized attribution, that is compatible with NG9-1-1 data requirements
- **Common submission method**
  - For data sourced through MESB-member county GIS partners to be federated
- **Common process for regional data aggregation and publication**
  - Data merged and available on a greater coverage area than ever before
- **Edgematching of data between counties:**
  - All polygon boundary edges between county, PSAP, and response agencies are seamless, i.e. "matched"
  - Centerline segments that cross county boundaries align
  - Verified through Quality Assurance/Quality Control (QA/QC) steps
  - All gaps and overlaps have been corrected

The second step is GIS Synchronization. This step audits the NG9-1-1 geospatial data with the legacy ALI and

MSAG information to synchronize the data in support of the migration to NG9-1-1 call routing and location validation. Data synchronization helps to ensure the GIS data has reached a level of accuracy and completeness sufficient for NG9-1-1 use. This entails:

- GIS synchronization of attribute data may include many validation audits, such as:
  - ALI to Centerline audit
  - MSAG to Centerline audit
  - Address points to ALI audit
  - Boundary audit
  - Routing audit
  - NENA NG9-1-1 data model audit
- Alignment of MSAG validation with GIS validation during the transitionary period (e.g. GIS-derived MSAG)

Along with these two key steps for GIS development, data processes and workflows to support ongoing maintenance of the regional NG9-1-1 geospatial datasets, as well as integrating them into a statewide NG9-1-1 system deployment will be needed to support the metro area's NG9-1-1 transition.

### 3.2.3 Legacy 9-1-1 Call Routing

Existing legacy 9-1-1 systems utilize data that assists in determining the location of a call based on the service address. 9-1-1 calls are routed to a PSAP based upon the key database fields contained in the SRDB. This data has historically been tied directly to telephone company billing/service records that link a telephone number to the fixed address at which the service is installed. Based on legacy validation processes, each ALI telephone number record, based on its corresponding MSAG entry, is assigned an ESN that is used in the SRDB for PSAP routing. It is simply a tabular lookup in the database to find the ESN, which in turn identifies the PSAP, associated with a telephone number. Once that information is collected, the Selective Router sends the call on to the PSAP without any other location information; only the ANI is delivered at this stage in the call flow. Once a call is received at the PSAP the CHE will query the SRDB to gather the ALI and present it to the call taker. This means that the call is delivered to a PSAP before location. Another way to think of Legacy 9-1-1 call routing is the "PSAP finds the callers location. After the call is answered by the telecommunicator, a separate data query obtains the ALI location information to display on the CHE screen. The information displayed is the presumed location of the caller. The legacy 9-1-1 call routing method has worked very well for calls from "fixed" locations (e.g. wireline) and continues to be an efficient way of routing wireline traffic.

This method of call routing and location identification, however, has become obsolete with the introduction and proliferation of wireless and VoIP callers. Caller location is no longer directly tied to a physical location as it was when the legacy 9-1-1 selective routing platform was deployed.

### 3.2.4 NG9-1-1 Call Routing

NG9-1-1 call routing is designed to deliver location along with the call. This means the CHE operates slightly different since it does not rely on the ANI to ALI query the same as it has in Legacy 9-1-1. A simpler way to understand the difference between legacy 9-1-1 call routing and NG9-1-1 call routing is:

| | |
|---|---|
| **E9-1-1 (Legacy)** | PSAP "finds" the caller by asking for location |
| **NG9-1-1** | Caller "finds" the PSAP by looking for the PSAP location |

In NG9-1-1, civic addresses will utilize frameworks known as Civic Location Data Exchange Format (CLDXF) and the Presence Information Data Format Location Object (PIDF-LO) to replace ALI with location information that must match the data contained in a GIS layer. CLDXF and PIDF-LO usage is known in NG9-1-1 as "location-by-value" and offers the potential for more detailed location information than traditional ALI. In a transitional model, all ALI records must be modified to meet the CLDXF framework. GIS is the best option for a tool to do that.

NG9-1-1 can also route based upon geodetic coordinates, which typically are referred to as X,Y coordinates. Latitude and Longitude coordinates are known in NG9-1-1 as "location-by-reference". While the legacy 9-1-1 call routing platform is obsolete, a lot of the database information that is used currently is relevant for building the NG9-1-1 database used for NG9-1-1 call routing. Typically, this data is reflected as attribute information in a GIS to spatially link a GIS feature with the attribute data that can be used by the NG9-1-1 routing platform. The result is a fully capable and functional location-based system that can link a caller location to the attribute information in the GIS to determine a route.

Examples of the data that can be used to develop a GIS data management structure that are used in legacy 9-1-1 include but are not limited to:

1) Valid MSAG per PSAP
2) Selective Routing database information
3) County based Geo-files
4) Emergency Service Zones (ESZ) and Emergency Service Numbers (ESN)
5) Street Centerlines and Address ranges
6) Additional county and regional GIS layers

### 3.2.5 NG9-1-1 and GIS Strategy

One of the first steps in the development of an NG9-1-1 system is the process of getting the GIS information in order. The NENA NG Data Model has identified the primary (required) layers that are needed to route 9-1-1

calls. The remaining layers are useful primarily at a PSAP or jurisdiction to refine the knowledge about a call or situation. Therefore, from a strategic perspective, the layers are often defined in terms of Call Routing or Call Dispatch. This is an important designation to consider since many of the Call Dispatch layers may require additional effort to review, modify, and agree upon.

For the MESB region, a strategy to build the Call Routing GIS database with the minimal information to route traffic to a PSAP can allow rapid deployment of NG9-1-1.

#### 3.2.5.1 Call Routing

Call Routing does not technically require all the information that a Call Dispatch platform does. However, if the information is available and can be used, it is valuable to support and enhance the effectiveness of NG9-1-1.

In almost all cases, Call Routing via GIS can be introduced sooner in NG9-1-1 implementation and be functioning in a rapid manner. This is due to the Call Routing function only needing an X/Y derived location and a boundary to select where to route a call. The additional layers and information contained in the NENA Data Model are very important, but if they are not available initially, it does not need to hinder the advancement to NG9-1-1 GIS routing of 9-1-1 traffic.

It is also likely that the Call Routing GIS data required will require less initial effort than Call Dispatch to become deployable with NG9-1-1. Focusing on the Call Routing data first may accelerate the usage of the ESInet and NG Core Services for routing.

#### 3.2.5.2 Call Dispatch

Call Dispatch happens after the PSAP receives the call and uses the local tools to display and manage the response to the incident. Call Dispatch mapping information is normally used within a local CAD system and contains specific information that may be useful for a single PSAP. In addition, the Call Dispatch information contains additional layers that may be used after a call is answered – but will not be used to route a call to a PSAP.

The GIS data used for Call Dispatch is largely influenced by the PSAP. This can require substantial effort to adjust, modify, and match all of the variable data sets from the local level. Layers such as speed limits, road closures, or other specific files that are important when dispatching a call is not likely to impact routing a call to a PSAP. Feature sets for Call Dispatch can certainly aid the NG9-1-1 Call Routing function, but often require concurrence by all agencies. This factor increases the likelihood of substantial delays with strategically deploying a system that can route calls.

This is an important distinction because there are often Call Dispatch issues (first response boundaries for

instance) that while important – are not crucial to develop and implement a geolocation-based Call Routing platform.

**Recommendations**

This section has presented many common themes relating to GIS in NG9-1-1. While GIS itself is an integral part of an NG9-1-1 system it is primarily just a tool. The spatial data that is managed and maintained by a GIS tool is critical to geo-location for NG9-1-1. The recommendations that follow are primarily focused on the database and operations of the GIS as a tool to create, manage, and maintain the geo-location system.

- Ensure that the GIS normalization of the spatial data sets and geographic features meets the accuracy requirements of the selected NG9-1-1 vendor. The GIS normalization process will be necessary to identify and correct discrepancies that may cause the NG9-1-1 vendor to delay acceptance of the data

- Complete the GIS synchronization of ALI and MSAG information. The GIS synchronization has largely been completed but may require additional effort once the NG9-1-1 vendor is chosen

- Establish a process for how GIS data is replicated to the NG9-1-1 vendor either through a Spatial Interface (SI) provided by the NG9-1-1 vendor (or partner). The SI process may include new tasks for each PSAP regarding the upload and replication of data to the NG9-1-1 system

- Establish how the NG9-1-1 vendor is using the SI and spatial data as a validation with the telecommunication database records. Discrepancies are going to occur between the OSP records and the spatial data. A new process may be required by the NG9-1-1 vendor to ensure a prompt remediation of errors is completed by all PSAPs

# 4. Other Considerations

## 4.1 NG9-1-1 Costs

Costs in a NG9-1-1 operating environment are similar to and, in certain instances may replace the current costs MESB PSAPs pay related to 9-1-1 call delivery and processing. The costs for today's 9-1-1 network is based largely on regulated and tariffed services specific to wireline telephones as defined and provided by the legacy telephone companies. The transition to NG9-1-1 sets the stage to reduce or remove these costs, and the legacy regulated mechanisms in place to pay for them.

There are several strategies for mitigating the occurrence of overlapping PSAP costs while the transition to NG9-1-1 takes place. A successful strategy used in other states is to negotiate terms establishing that payment for any NG9-1-1 related services will only occur upon the successful cutover and testing of NG9-1-1 service to the PSAP. This approach creates a milestone event that can be used to determine when old costs end and new costs begin.

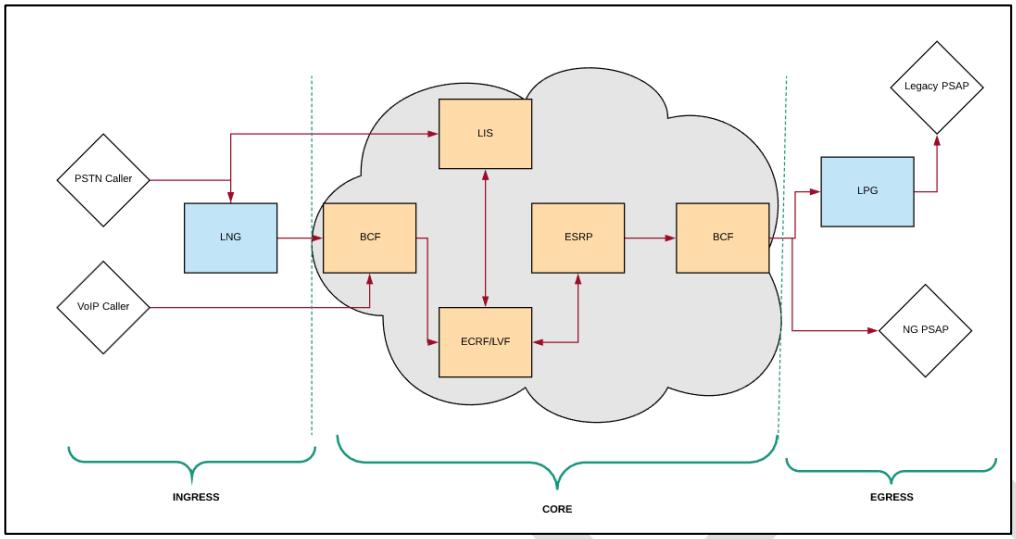
As the transition to NG9-1-1 begins, new and different cost elements will come into play. The factors that will impact, drive and influence costs for NG9-1-1 include:

1. NG9-1-1 ESInet and Network Costs
2. NG9-1-1 Core Services/i3 Standards Costs
3. NG9-1-1 Transition Costs
4. NG9-1-1 GIS Costs
5. NG9-1-1 Training/Support Costs

### 4.1.1 NG9-1-1 ESInet and Network Costs

The ESInet and network costs fall into three general areas:

1. **Ingress** – the network needed to get 9-1-1 calls from the OSPs to the Next Generation Core Services (NGCS) for processing and routing to a PSAP
2. **Core** – the network needed to process 9-1-1 calls between geo-diverse Next Generation Core Service nodes typical of most NG9-1-1 systems
3. **Egress** – the network needed to deliver 9-1-1 calls from the core to the PSAPs for processing and dispatch




All ESInet and network costs are generally driven by the number of connections and the bandwidth required for those connections. For example, if there are 25 MESB PSAPs and each PSAP requires a 10 mbps connection to the ESInet for 9-1-1 call processing, then a service provider can take that information, design the egress ESInet to the PSAPs and establish a cost for doing so.

Additionally, ESInets require hardware and specialized equipment in order to operate as expected. The type of hardware used, and the level of redundancy needed for 99.999% availability will drive the cost for the ESInet as well. The ESInet hardware components that will be required include:

- **Border control functions and Session Border Controllers** (**SBC**)– used for 9-1-1 call control and security in the ingress and egress sides of the ESInet
- **Core Routers** – to route traffic between the NGCS, typically high capacity and expensive
- **NGCS Application Stack x2** – used to process 9-1-1 calls and route to the PSAPs, typically two or more instances in geo-diverse locations
- **Edge Routers** – to route traffic between the NGCS and the PSAPs, typically a minimum of two per PSAP for proper redundant connectivity to the NGCS

These elements will be new costs and will be incurred in addition to the existing expenses at the state and local level for things like radio, CAD, or CHE.

The ESInet network connectivity components include some elements that require redundancy for network reliability, effectively doubling the costs. For example, each of these bullets represents a duplicated cost:

- Redundant connections OSP to NGCS
- Redundant connections NGCS to NGCS
- Redundant connections NGCS to PSAP

- Redundant connections NGCS to Interstate-NGCS

The ESInet portion will directly affect the costs of network connectivity at the PSAPs. Depending upon the transition and migration strategy employed for the ESInet, these costs may be phased in. In addition, the ESInet costs will offset other charges that are currently being paid like analog 9-1-1 trunks or ALI.

### 4.1.2 NG9-1-1 Core Services/i3 Standards Costs

The NGCS functional element stacks are implemented to process and route NG9-1-1 calls across the ESInet and the MESB region. These functional elements and service components are necessary for the transition into a fully functional NG9-1-1 network and will bring new service costs as a result.

NG9-1-1 functional elements and services will drive costs in the transition to and operation of the NG9-1-1 systems. The NG9-1-1 functional elements include:

- Emergency Services Routing Proxy (ESRP) – would be replicated across NGCS cores and used by PSAP CHE
- Location Information Server (LIS) / ALI and Database service – would be centralized and aggregated in the core and used by PSAP CHE
- Emergency Call Routing Function/Location Validation Function (ECRF/LVF) – would be replicated across NGCS cores and used by PSAP CHE
- Legacy Selective Router Gateway (LSRG) – needed for transition from legacy to NG9-1-1, cost will decrease over time
- Legacy Network Gateway (LNG) – needed on the ingress side for OSP transition, cost will decrease over time. LNG's will be required until all OSPs have transitioned to IP connectivity to the ESInet
- Legacy PSAP Gateway (LPG) – needed during the transition from legacy 9-1-1 to NG9-1-1, cost will decrease over time. LPG's will be required until all PSAPs have transitioned to "NG9-1-1 capable" CHE

### 4.1.3 NG9-1-1 Transition Costs

A transition from the legacy 9-1-1 system to a NG9-1-1 system will be necessary for all PSAPs and citizens to benefit from the increased capabilities NG9-1-1 will bring to the MESB region. While there are no standardized approaches or methodologies for going through the transition, there are identifiable phases or milestones that are necessary to complete in order to move from one environment to the other.

Each phase of the transition to NG9-1-1 has the potential to impact costs carried by the current system. The NG9-1-1 system deployment in the MESB region and in greater Minnestoa will essentially follow this progression and timeline until full NG9-1-1 deployment is established. The common timeline for completing this transition is 18 – 24 months from the time a NG9-1-1 services contract is signed. The figure below displays the typical NG9-1-1 transition milestones over time.

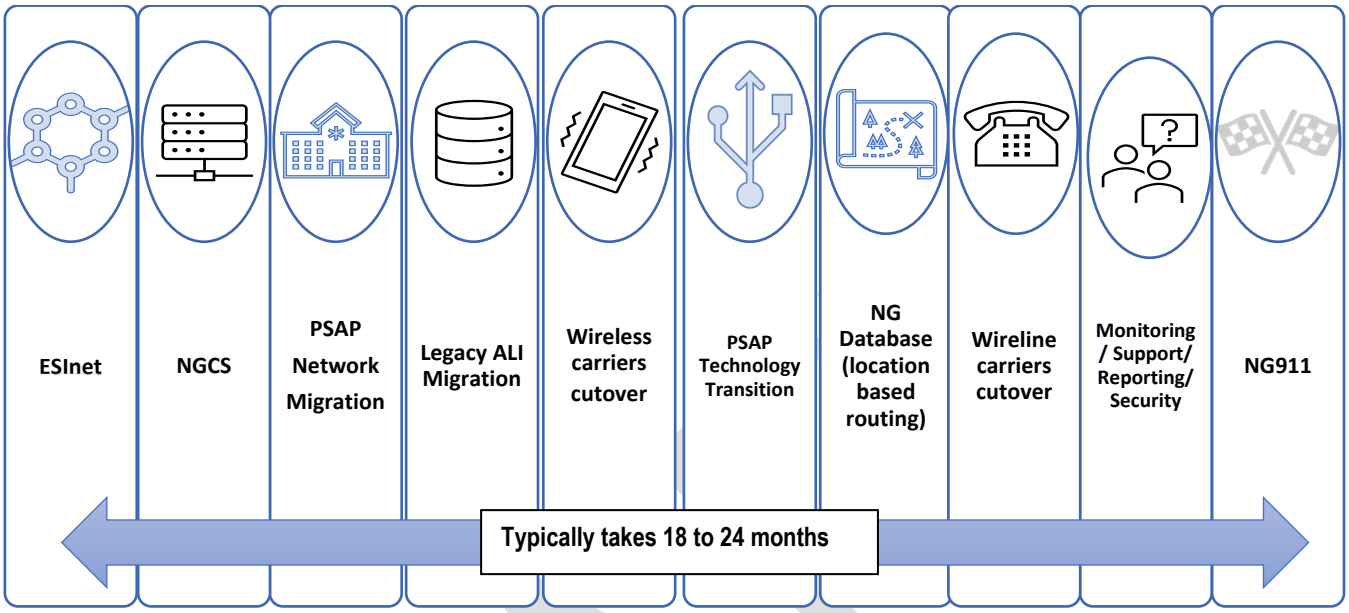



FIGURE 2 - NG9-1-1 TRANSITION MILESTONES

As the NG9-1-1 system deployment progresses through these transition milestones, economies of scale and consolidation of fragmented technical services like ALI should allow for cost savings in subsequent phases. Not all the phases are sequential, and some can begin in parallel.

PSAP costs associated with the transition to NG9-1-1 are controlled by the length of time both the legacy 9-1-1 and NG9-1-1 systems are required to operate together. As long as PSAPs are getting 9-1-1 calls routed to them from the legacy 9-1-1 system, they will be liable for those legacy costs. In other words, until all the PSAPs are cutover to and receiving all 9-1-1 calls from the NG9-1-1 system/ESInet, the legacy 9-1-1 system is still needed and legacy PSAP costs will be incurred in order to process 9-1-1 calls in the MESB region. When PSAPs are no longer using the legacy 9-1-1 system to process 9-1-1 calls, those legacy PSAP costs will cease.

Both the transition and NG9-1-1 costs created by these transition changes are traditionally not the responsibility of the PSAPs or the state program directly. Some legacy costs associated with legacy 9-1-1 service elements, like ALI, may still apply and would be the responsibility of the NG9-1-1 service provider.

### 4.1.4 NG9-1-1 Geographic Information System Costs

The importance of GIS in the NG9-1-1 operating environment will require an increase in costs associated with developing, maintaining and using GIS data at the state, MESB and PSAP levels. The GIS/Geo-based routing costs are influenced by the expected bandwidth required and ECRF / LVF requirements for all 9-1-1 call routing

in the region.

Additionally, GIS costs include a level of redundancy within the call routing framework to provide reliability and access to the NGCS functional elements using and accessing the GIS data. Typically, a vendor is required to supply reconciliation and synchronization services to maximize the readiness of data and GIS files for operation. Vendors have developed tools and systems to streamline the ongoing data update and QA/QC specifically for the NG9-1-1 market. The operational components (SI) and functions to manipulate the database once it is operational are much better served through a vendor and include:

- Data Normalization Services
- Back Office
- Hardware

Costs of completing GIS data readiness can be reduced marginally through the efforts of MnGeo, the State of Minnesota's GIS office, or other operational group that can assist in meeting the NENA NG9-1-1 GIS database requirements. Such costs are primarily in the equipment required to store and allow access to the location information. For instance, the State may create and own the GIS repository for the State but allow access to the vendor described above to embed their toolkit for data processes. This reduces the need for the GIS database to be shipped to the vendor and stored at their facility.

### 4.1.5 NG9-1-1 Training/Support Costs

NG9-1-1 by itself will not drive training costs at the PSAPs. There may be new ways of processing new types of 9-1-1 calls, but generally speaking, any training associated with that will be dependent on the system or application the PSAP chooses and purchases. CAD is a good example of a system where training related to NG9-1-1 capabilities may be needed but would be specific to the CAD application used. Text-to-9-1-1 and enhanced location services are additional examples of NG9-1-1 features that will require additional training. As technology changes and advances, new applications will be added to NG9-1-1 networks and will require separate training as well.

An area where NG9-1-1 may increase costs for PSAPs is in technical or specialized support related to NG9-1-1 technologies and functions. Any costs would largely depend on the PSAP in question as some PSAPs have extensive internal support staff while others rely on external parties for any technical support. NG9-1-1 brings an increased reliance on technologies like GIS, networking, and cybersecurity. GIS and cybersecurity are areas that PSAPs may not be prepared to support in a NG9-1-1 environment or have access to full time support staff necessary to operate and maintain NG9-1-1 systems related to GIS and cybersecurity.

## 4.2 Reported PSAP Cost and Funding Data

The PSAP survey asked respondents to provide cost and funding information related to the operation of the PSAP. 16 PSAPs provided operating budget information in response to the survey. While not intended to be an audited figure or represent all 9-1-1 costs across the region, the information does provide a measure of the scale of 9-1-1 services across the MESB region.

| What is your PSAP's annual operating budget? | |
|---|---|
| $6,820,000 | $18,105,790 |
| $1,814,548 | $2,400,000 |
| $2,146,000 | $1,780,437 |
| $10,084,639 | $967,000 |
| $1,288,837 | $3,500,000 |
| $1,500,000 | $2,500,000 |
| $8,351,053 | $6,476,450 |
| $1,657,063 | $934,936 |
| **Total Reported PSAP budgets** | **$70,326,753** |
| *(16 of 25 agencies provided budgetary estimates)* | |

Extrapolating from the numbers reported above, the estimated total operating budgets supporting 9-1-1 and PSAPs in the MESB region exceeds $100 million annually.

The information provided by the PSAPs identified funding sources related to local 9-1-1 operations. They include:

| How is your PSAP funded? | |
|---|---|
| County tax dollars/ ECN 911 funds | General Funds, Surcharge money |
| Tax Levy, General City Funding | State Legislature appropriation through the Dept. of Public Safety / Trunk Highway Funding |
| County Levy Dollars and ECN 911 Funds | 60% County tax levy, 40% cities covered by JPA split by call volume formula |
| Member agencies within Joint Powers | Property Tax/Levy/911 special revenue |
| via the PD's operational budget for staffing and equipment. MN Grant Funding is used to fund 911 systems. | county levy budget |
| PD General Operating Budget, ECN 911 Funds, Contract Fees | Annual budget |
| Departmental Budget & ECN 911 Fees | County levy and E911 revenue |
| MAC - MSP Airport Police Department Budget | Privately |
| Hennepin Healthcare System | Local Transit Dollars |

| | |
|---|---|
| **Annual Budget through our EMS dept.** | **Ridgeview Medical Center** |

Note the predominant combination of both local and state funds required to fund and operate MESB PSAPs. This is also the predominant funding model for 9-1-1 and Public Safety agencies across the rest of Minnesota and the country as well.

The survey asked the PSAPs to provide the amount of 9-1-1 Special Revenue Fund received in 2020. 14 of the 24 MESB PSAPs were able to provide data for the survey. While not all agencies responded with figures, the data does provide insight into the funding ratio between collected 9-1-1 surcharges and the operation of a PSAP.

| How much does your PSAP receive annually from the 9-1-1 Special Revenue Fund (i.e. 9-1-1 fees) | |
|---|---|
| **$494,481** | **$68,319** |
| **$111,688.92** | **$2,277,333.33** |
| **$185,591** | **$1,379,302** |
| **$581,696** | **$235,680.60** |
| **$82,000** | **$182,315.76** |
| **$226,300** | **$61,000** |
| **$670,645.32** | **$750,132** |
| **Total Reported 9-1-1 Fees Received** | **$7,306,484** |

## 4.3 Additional Tools and Capabilities in the Region

This section of the report analyzes the additional tools and capabilities reported by the MESB regional PSAPs. Topics include:

- Computer Aided Dispatch (CAD)
- Additional Data Repositories (ADR)
- 9-1-1 Call Recording
- Alerting

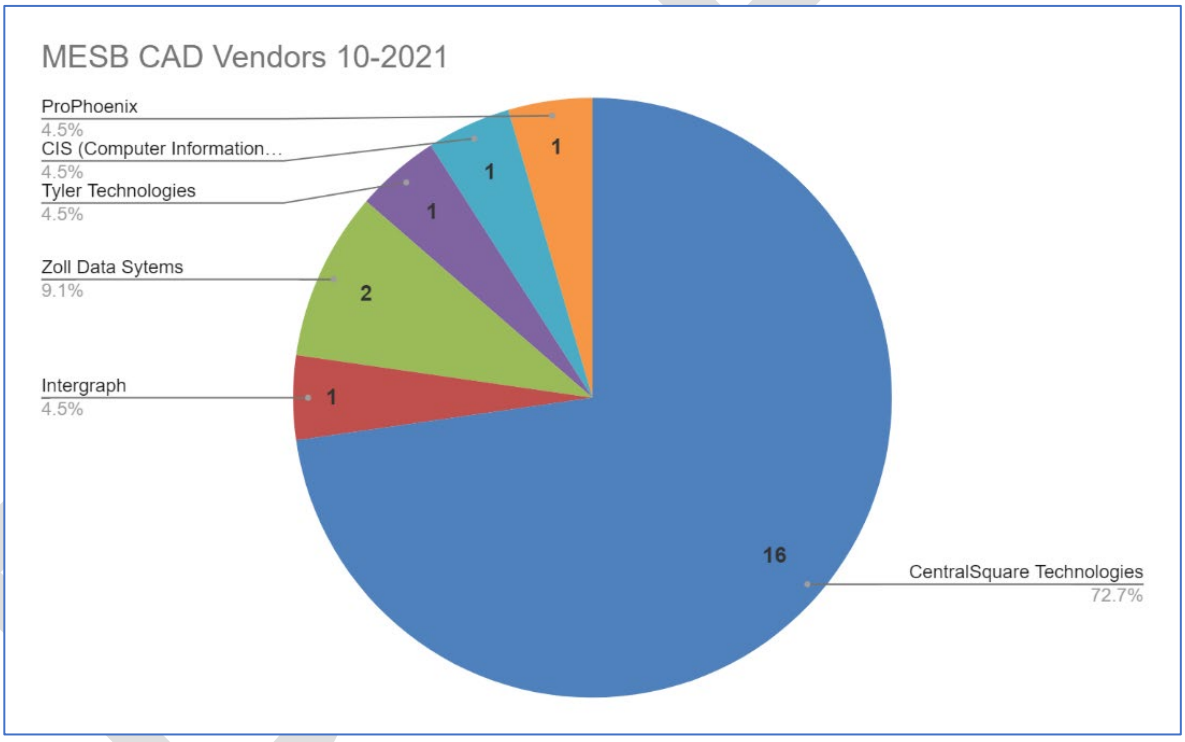
### 4.3.1 CAD in the Region

CAD is often the starting point for responding to any type of call for service – while the CHE system processes 9-1-1 and administrative calls, CAD delivers the call information, including 9-1-1 call mapping, to first responders. This data shared between the CHE to CAD includes the caller's location information, phone

number, and the responding agency information.

After a call comes into CAD other critical information is attached or added to the call for service record for responders to see. That information can include a narrative of the caller's conversation with the 9-1-1 first responder, responding agency unit recommendations and assignments, and hazard and notification information. CAD is the repository and/or linkage point of all existing hazard and notification information. This type of information includes prior incidents at a location or received from a given phone number, history associated with reporting persons, call type protocols, and building pre-plans (such as floor plans, location of hazardous materials, water shut offs, etc.).

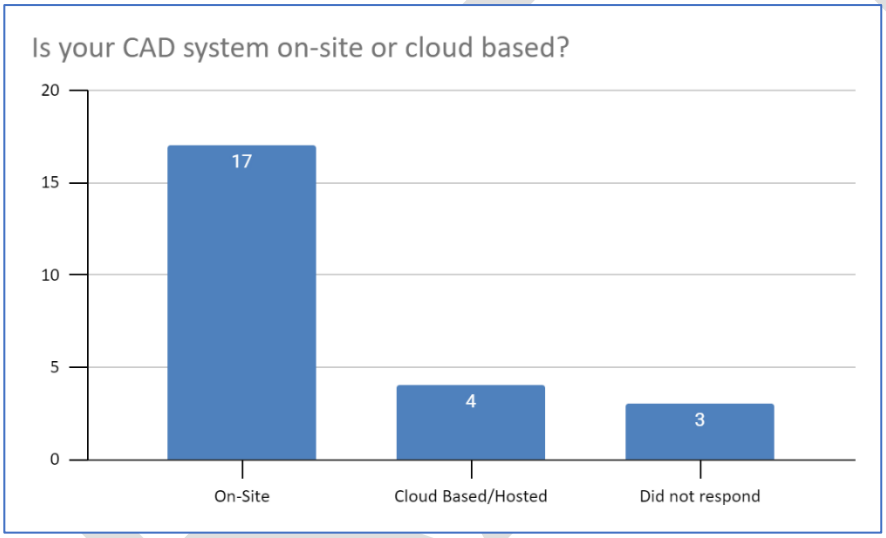
Reflective of the CAD market across the country, the MESB PSAPs reported a number of different CAD systems with different capabilities, features and functions. The chart below shows the reported CAD system breakdown by vendor.




16 PSAPs reported using a CAD application from CentralSquare Technologies. Digging deeper into the responses reveals differences within those platforms and largely indicates that each PSAP has a unique version of CAD that may be specific to the operation or the specific mission of the responding agencies.

| CentralSquareTechnologies Breakdown | |
|---|---|
| **Enterprise CAD** | 4 |
| **Inform CAD** | 8 |
| **LETG/Zuercher** | 2 |
| **SunGard One Solution CAD (OSSI)** | 1 |
| **Zuercher Suite** | 1 |
| **Total** | **16** |

We also asked PSAPs if their CAD systems were on site (premised based) or cloud/hosted based. The chart below shows the results.




Today, as reflected in the survey data above, the CAD market is dominated by premise-based, client-server solutions. However, cloud-based and hosted solutions are a growing percentage of the market. Established solution providers are moving to cloud-based/hosted applications in keeping with the rising prominence and support for hosted cloud solutions. As these solutions emerge, they must provide the same functionality that have become standard in public safety.

The current client server models have larger costs associated with the purchase of the software, while cloud-based/hosted systems have greater costs for subscription fees. Client-server based systems require more investment in premise-based hardware and infrastructure, while cloud-based/hosted solutions tend to require greater expenditures on network bandwidth. In some situations, cloud-based solutions require expansion of high bandwidth capacity to areas where such capacity did not previously exist, or to support a larger number of users.

Matching agency needs to the configuration is the most crucial aspect of choosing between computing platforms. The computing platform needs to complement the agency's operating procedures, be scalable, and cost-effective. These variables are critical evaluators when selecting between cloud-based or dedicated server solutions. Agencies often consider leveraging a hybrid approach, which combines dedicated servers and cloud-based/hosted applications. It is expected that vendors will need to be able to meet these varied needs and provide potentially blended solutions.

### 4.3.2 Additional Data Repositories (ADR)

With the implementation of NG9-1-1 there will be many forms of Additional Data available to telecommunicators and emergency responders beyond the primary call data typical of a legacy 9-1-1 call system. Additional Data is information which can be associated with a given emergency call, and is managed and sourced from outside the ESInet and its associated NG9-1-1 Core Services. The NENA Standard for NG9-1-1 Additional Data (NENA-STA-012.2-2017, December 21, 2017), defines additional data in three categories. They are:

1. Additional Data for the Location
2. Additional Data for the Call
3. Additional Data for the Caller

**Additional Data for the Location**: provides data about the location associated with the origination of the call, beyond the primary street address or geodetic location. Additional Data for the Location contains descriptive information about the site and/or structure beyond what PIDF-LO can incorporate

**Additional Data for the Call**: provides contact information for the OSP or an intermediary, the service used by the caller, and any subscriber identity and contact information disclosed by the provider of the Call data

**Additional Data for the Caller**: provides information which describes the caller, including name, common address(es), biographic statistics, medical conditions, and emergency contact information.

**Device Based Hybrid (DBH) Location Data:**

Today (early 2022), the most prevalent form of available ADR data falls into the location category and derives additional data from the caller's device using a solution known as Device Based Hybrid (DBH) location. DBH is a proven location method for commercial location services. Google maps, Apple maps, Uber and like applications use DBH with very good results. DBH produces the highest accuracy in all settings, dense urban, urban, suburban, rural for both indoor and outdoor calls according to testing done by the FCC.

DBH relies on multiple sources of information (GPS, WiFi access points, blue tooth etc.) available to the device to determine the location of the device. Using location information from multiple sources increases accuracy

and in many cases this information is constantly available and updated on the device, so location delivery is nearly instantaneous when 9-1-1 is dialed.

The level of DBH integration for 9-1-1 varies by carrier; some are limiting deployment to new devices. This means that additional data will not be available for all 9-1-1 calls or all 9-1-1 callers. The survey asked the PSAPs if there are any ADR applications in use across the MESB region. The responses are provided below.

| Agencies reported using an Additional Data Repository (ADR) | |
|---|---|
| **RapidSOS/ RapidSOS portal** | 13 |
| **Mapped ALI/CAD** | 13 |
| **Rave/Smart911 Service** | 3 |

16 PSAPs total reported using a form of ADR in daily operations. This is an excellent indication that the PSAPs of the MESB are progressive in their operations and demonstrate a willingness to employ various forms of technology resources when responding to 9-1-1 calls.

### 4.3.3 Recording in the Region

The survey asked PSAPs to provide information relative to the 9-1-1 call recording systems in use across the region. As expected, a number of different systems with different capabilities were reported in the table below.

| PSAP Recording Systems | |
|---|---|
| **Verint** | 7 |
| **RevCord** | 4 |
| **Equature** | 4 |
| **NICE** | 3 |
| **Unknown** | 4 |
| **Higher Ground** | 2 |
| **Nexlog Mediaworks** | 1 |
| **Total** | 25 |

A particular recording capability is necessary for recording 9-1-1 calls in a NG9-1-1 system and that is the ability to record SIP sessions. The survey asked about the SIP recording capabilities of the recorders installed across the region. The results are presented in the table below.

| Recorder is SIP Capable (for NG9-1-1) | |
|---|---|
| **Yes, SIP capable recording** | **20** |
| **Unknown** | **5** |
| **Total** | **25** |

| Recorder is SIP Capable (for NG9-1-1) |
|---|
| *(17 of 19 Primary PSAPs reported SIP capability)* |

Responses indicate that the majority of the recording solutions in place across the region will not require any replacement when the transition to full NG9-1-1 occurs.

### 4.3.4 Alerting in the Region

Alerting, station alerting, mobile alerting in general are terms used to describe the process of notifying and coordinating first responder field units and first responder resources that an emergency incident/event is in progress. The alerting function itself and the numerous tools that have evolved over the years to support this function have allowed PSAPs to better coordinate responses and responders to produce better outcomes.

Alerting technology in and of itself has evolved from radio tone generating speaker systems in fire stations and air sirens in the middle of town to smart phone applications that send text messages and can perform other coordination functions in notifying first responders and coordinating a specific response to a specific incident.

20 PSAPs provided information related to the responder alerting applications in use across the region.

| Reported Alerting Applications | |
|---|---|
| **Active 911/Active Alert** | 14 |
| **I am Responding** | 3 |
| **Zipit** | 1 |
| **First Watch** | 1 |
| **Fusus** | 1 |
| **US Digital Fire Station Alerting** | 4 |

The usage of these tools across the region to proactively manage and extend the coordination capabilities of the PSAPs is outstanding. While NG9-1-1 focuses primarily on 9-1-1 call routing and delivery and does not directly impact functions like alerting, the future only points to futher integration with and usage of the data and information available in an NG9-1-1 operating environment.

## 4.4 Findings and Conclusions

The following list summarizes the findings and conclusions for MESB NG9-1-1 Assessment Report:

- The MESB PSAPs are well prepared for the transition to NG9-1-1 as evidenced by the level of investment in technology, applications, resources and funding committed to public safety across the MESB region in addition to specific 9-1-1 funding from ECN

- As more integration occurs across the MESB region on applications like CAD and CHE the more efficient the MESB PSAPs become operating as one logical entity at the systems level. Examples include CAD to CAD interoperability, hosted Call Handling Equipment and alerting applications

- The MESB PSAPs will benefit from a diverse, scalable, redundant NG9-1-1 system that delivers data and information about and from emergency events (calls, data and supplemental information).
    - The NG9-1-1 system will allow for increased situational awareness and enhance the prioritization of events based upon the additional intelligence delivered with the call.

- Once the NG9-1-1 system is operational, the MESB region will have the ability to prepare alternative arrangements, agreements including mutual aid for the PSAPs.
    - Arrangements may be developed that enhance the operational polices of the PSAPs to aid in how each PSAP interoperates and shares information and/or systems where appropriate.

- The NG9-1-1 system will provide for a common approach for Cybersecurity across all MESB PSAPs in addition to the current local efforts. This will enhance the ability to recognize, divert or isolate DDoS, TDoS and intrusions that can compromise the entire operation.

- Establishment of a centralized monitoring and reporting capability that can manage all operational components within the Service Level Agreement (SLA) and maintain integrity across all MESB PSAPS. This capability will ensure consistent monitoring and management of the services provided (ESInet, Hosted Call Handling, GIS, Telecommunications, Radio, CAD, Recording, etc.) and quick resolution of any problem or trouble with the associated provider.

# Appendix A – Glossary of Terms

**For the complete NENA Master Glossary of Terminology (NENA ADM-000.22.2018, 04/13/2018) please use the following link:**

https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

**9-1-1:** A three-digit telephone number to facilitate the reporting of an emergency requiring response by a public safety agency.

**9-1-1 Service Area:** The geographic area that has been granted authority by a state or local governmental body to provide 9-1-1 service.

**9-1-1 System:** The set of network, database, and CPE components required to provide 9-1-1 service.

**9-1-1 Tandem:** (See E9-1-1 Control Office)

**Abandoned Call:** A call placed to 9-1-1 in which the caller disconnects before the call can be answered by the Public Safety Answering Point (PSAP) attendant.

**Additional Data**: Data that further describe the nature of how the call was placed, the person(s) associated with the device placing the call, or the location the call was placed from. There are three types of Additional Data:

- Additional Data for the Call
- Additional Data for the Caller
- Additional Data for the Location

**Additional Data Repository (ADR):** is a data retrieval facility for Additional Data. The ADR dereferences a URI passed in a Call-Info header field or PIDF-LO <provided-by> and returns an Additional Data object block. An Identity-Searchable Additional Data Repository (IS-ADR) returns Additional Data associated with an identity.

**Access Line:** The connection between a customer premises network interface and the Local Exchange Carrier that provides access to the Public Switched Telephone Network (PSTN).

**ALI Retrieval:** A request for ALI record from the PSAP to the ALI database.

**Alternate PSAP:** A PSAP designated to receive calls when the Primary PSAP is unable to do so.

**Alternate Routing:** The capability of routing 9-1-1 calls to a designated alternate location(s) if all 9-1-1 trunks to a Primary PSAP are busy or out of service. May be activated upon request or automatically, if detectable, when 9-1-1 equipment fails or the PSAP itself is disabled.

**Automatic Location Identification (ALI):** The automatic display at the PSAP of the caller's telephone number,

the address/location of the telephone and supplementary emergency services information.

**Automatic Number Identification (ANI):** Telephone number associated with the access line from which a call originates.

**Backup Public Safety Answering Point (Backup PSAP):** Typically a disaster recovery answering point which serves as a backup to the Primary PSAP and is not co-located with the Primary PSAP.

**Border Control Function or BCF:** provides a secure entry into the ESInet for emergency calls presented to the network. The BCF incorporates firewall, admission control, and may include anchoring of session and media as well as other security mechanisms to prevent accidental, deliberate, or malicious attacks on PSAPs or other entities connected to the ESInet.

**Busy Hour:** The hour each day with the greatest call volume.

**Busy Tone:** An audible signal indicating a call cannot be completed because the called access line is busy. The tone is applied 60 times per minute.

**Call:** a session established by signaling with two-way real-time media and involves a human making a request for help or a non-human initiated call. Sometimes it is referred to as a "voice call", "video call" or "text call" when specific media is of primary importance. The term "non-human-initiated call" refers to a one-time notification or series of data exchanges established by signaling with at most one-way media, and typically does not involve a human at the "calling" end. The term "call" may also be used to refer to either a "Voice Call", "Video Call", "Text Call" or "Data–only call", since they are handled the same way through most of Next Generation 9-1-1. It is an element of current and anticipated 9-1-1 payloads.

**Call delivery:** the capability to route a 9-1-1 call to the designated selective router for ultimate delivery to the designated PSAP for the caller's ANI.

**Call Processing:** the system and process that permits a PSAP to receive, receive, process, and route a 9-1-1 call and other current and anticipated payloads to a PSAP within the defined environment providing complete payloads with callback and location information of the calling party to the call taker position. Call processing also includes the ability to identify and answer TDD/TT/TTY and abandoned and silent calls including complete and accurate ANI and ALI of the TDD/TT/TTY calls.

**Call Transfer:** The capability to redirect a call to another party.

**Cell:** The wireless telecommunications (Cellular or PCS) antenna serving a specific geographic area.

**Cell Sector:** One face of a cell antenna (typically 3-sided) that operates independently of the other sectors.

**Cell Site:** The location of a cell and related equipment.

**Central Office (CO):** The Local Exchange Carrier facility where access lines are connected to switching

equipment for connection to the Public Switched Telephone Network.

**Centralized Automated Message Accounting (CAMA):** An MF signaling protocol originally designed for billing purposes, capable of transmitting a single telephone number.

**Circuit Route:** The physical path between two terminal locations.

**Civic Address:** any city-style address that includes a house number and a street name is considered a Civic Address. Civic addresses include a community name that may or may not be recognized by the United States Postal Service or be MSAG valid. Civic addresses may be used as Postal address if recognized by the United States Postal Service. Civic Addresses may be used as MSAG addresses if they are an exact match to the MSAG address. A rural route delivery address or FPO or APO address is not considered a Civic address.

**Class of Service:** A designation of the type of telephone service, e.g. residential, business, centrex, coin, PBX, wireless.

**Communication Services:** includes any of the following: (a) the transmission, conveyance or routing of real-time, two-way voice communications to a point or between or among points by or through any electronic, radio, satellite, cable, optical, microwave, wireline, wireless or other medium or method, regardless of the protocol used; (b) the ability to provide two-way voice communication on the public switched network; (c) wireless enhanced 9-1-1 service; (d) wireline enhanced 9-1-1 service; (e) interconnected VoIP provider service as defined by the regulations of the FCC regulations; (f) IP -enabled service; or (g) prepaid wireless service.

**Communication Service Provider:** an entity that provides communication services to a subscriber or end user.

**Company Identifier (Company ID):** A 3-5 character identifier chosen by the Local Exchange Carrier that distinguishes the entity providing dial tone to the end user. The Company Identifier is maintained by NENA in a nationally accessible data base.

**Computer Aided Dispatch (CAD):** A computer based system which aids PSAP attendants by automating selected dispatching and record keeping activities.

**Consolidated PSAP:** A facility where one or more Public Safety Agencies choose to operate as a single 9-1-1 entity.

**Customer Premises Equipment:** (CPE) equipment at a PSAP.

**Cutover:** The activation of a new telephone call processing or switching system.

**Data Base:** An organized collection of information, typically stored in computer systems, comprised of fields, records (data) and indexes. In 9-1-1, such data bases include MSAG, telephone number/ESN, and telephone customer records.

**Data Base Management System (DBMS):** A system of manual procedures and computer programs used to

create, store and update the data required to provide Selective Routing and/or Automatic Location Identification for 9-1-1 systems.

**Dedicated Trunk:** A telephone circuit used for a single purpose; such as transmission of 9-1-1 calls.

**Default PSAP:** a PSAP that is equipped to receive incoming calls that do not contain ANI or ALI or otherwise incomplete information allowing the proper routing of a payload.

**Default Routing:** The capability to route a 9-1-1 call to a designated (default) PSAP when the incoming 9-1-1 call cannot be selectively routed due to an ANI failure or other cause.

**Digital Logging Recorder (DLR):** digital logging recorder that records date, time, audio and call detail data, and other transactions involved in the processing of calls to the PSAP.

**Diverse Routing:** The practice of routing circuits along different physical paths in order to prevent total loss of 9-1-1 service in the event of a facility failure.

**Emergency Call:** A telephone request for public safety agency emergency services which requires immediate action to save a life, to report a fire or to stop a crime. May include other situations as determined locally.

**Emergency Call Routing Function or ECRF:** a functional element in an ESInet which is a LoST protocol server where location information (either civic address or geo-coordinates) and a Service URN serve as input to a mapping function that returns a URI used to route an emergency call toward the appropriate PSAP for the caller's location or towards a responder agency.

**Emergency Message (EM) Circuits:** The special service circuits used to carry 9-1-1 calls to the PSAP.

**Emergency Service Central Office Number (ESCO):** The information delivered to the PSAP when there is an ANI failure between the end office and the 9-1-1 Control Office. When ANI is not available, the 9-1-1 call is default routed and the ANI display at the PSAP will be "9-1-1-0TTT" (or 9-1-1-TTTT) with TTT identifying the incoming trunk group.

**Emergency Services Internet Protocol Network or ESInet:** a managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core functional processes can be deployed, including, but not restricted to, those necessary for providing Next Generation 9-1-1 services. ESInets may be constructed from a mix of dedicated and shared facilities. ESInets may be interconnected at local, regional, state, federal, national and international levels to form an IP-based inter-network (network of networks).

**Emergency Service Number (ESN)/ Emergency Service Zone (ESZ):** An ESN is a three to five digit number representing a unique combination of emergency service agencies (Law Enforcement, Fire, and Emergency Medical Service) designated to serve a specific range of addresses within a particular geographical area, or Emergency Service Zone (ESZ). The ESN facilitates selective routing and selective transfer, if required, to the appropriate PSAP and the dispatching of the proper service agency (s).

**End Office:** (See central office).

**End User:** The 9-1-1 caller

**Enhanced 9-1-1 (E9-1-1):** An emergency telephone system which includes network switching, database and CPE elements capable of providing Selective Routing, Selective Transfer, Fixed Transfer, ANI and ALI.

**Enhanced 9-1-1 Network Features:** the components of enhanced 9-1-1 service that provide selective routing, automatic number identification and automatic location identification.

**Enhanced 9-1-1 Service:** a service consisting of communication network, database and equipment features provided for subscribers or end users of communication services enabling such subscribers or end users to reach a PSAP by dialing the digits 9-1-1, or by other means approved by the department, that directs calls to appropriate PSAPs based on selective routing and provides the capability for automatic number identification and automatic location identification.

**Enhanced 9-1-1 Service Provider:** any entity that provides 1 or more of the following 9-1-1 elements: network, database or PSAP customer premises equipment.

**Enhanced 9-1-1 Systems:** a distinct entity or geographical segment in which enhanced 9-1-1 service is provided, consisting of network routing elements serving as a control office and trunking connecting all central offices within a geographical segment, and including PSAPs and network used to deliver location data to PSAPs from a data base.

**Enhanced 9-1-1 (E9-1-1) Control Office:** The Central Office that provides the tandem switching of 9-1-1calls. It controls delivery of the voice call with ANI to the PSAP and provides Selective Routing, Speed Calling, Selective Transfer, Fixed Transfer, and certain maintenance functions for each PSAP. Also known as 9-1-1 Selective Routing Tandem or Selective Router.

**Enhanced 9-1-1 (E9-1-1) Tandem Office:** (See E9-1-1 Control Office)

**Exchange:** A defined area, served by one or more telephone central offices, within which a Local Exchange Carrier furnishes service.

**Fast Busy:** (see Reorder Tone)

**FCC:** the Federal Communications Commission.

**Fixed Transfer:** The capability of a PSAP attendant to transfer a 9-1-1 call to a pre-determined location by activating a single button.

**Footprint:** The geographic area covered by a particular wireless cell or cell sector.

**Functional Element:** major process, application, or appliance, including network bandwidth and bandwidth support.

**Geographic Information Systems or GIS:** a computer software system that enables one to visualize geographic aspects of a body of data. It contains the ability to translate implicit geographic data (such as a civic address) into an explicit map location. It has the ability to query and analyze data in order to receive the results in the form of a map. It also can be used to graphically display coordinates on a map i.e., latitude/longitude from a wireless 9-1-1 call.

**Global Positioning System (GPS):** A satellite based Location Determination Technology (LDT).

**Grade of Service:** The probability (P), expressed as a decimal fraction, of a telephone call being blocked. P.01 is the grade of service reflecting the probability that one call out of one hundred during the average busy hour will be blocked. P.01 is the minimum recommended Grade of Service for 9-1-1 trunk groups.

**Immediately Redirected:** the instantaneous redirection of a 9-1-1 call to a PSAP to prevent the loss of a 9-1-1 call.

**Instant Recall Recorder (IRR):** (see Recall Recorder)

**Inter-Tandem Transfer:** The capability of transferring a call over the 9-1-1 network from a PSAP served by one 9-1-1 tandem to a PSAP served by a different 9-1-1 tandem.

**Interoperability:** The capability for disparate systems to work together.

**IP-enabled Service:** a service, device or application which makes use of Internet Protocol, or IP, and is capable of entering the digits 9-1-1, or by other means as approved by the department, for the purposes of interconnecting users to the enhanced 9-1-1 systems including, but not limited to, voice over IP and other services, devices, or applications provided through or using wireline, cable, wireless, or satellite facilities or any other facility that may be provided in the future.

**Legacy Network:** a 9-1-1 network that is operating as a basic or enhanced 9-1-1 system and/or the existing analog-based enhanced 9-1-1 systems in the MESB region.

**Legacy Network Gateway (LNG):** a a signaling and media interconnection appliance between analog callers in legacy wirelines/wireless originating networks and an i3 architecture so that PSAPs are able to receive emergency calls from such legacy networks.

**Legacy PSAP:** a PSAP that cannot process calls received via i3-defined call interfaces (IP-based calls) and still requires the use of CAMA or ISDN trunk technology for delivery of 9-1-1 emergency calls.

**Legacy PSAP Gateway (LPG):** an i3 functional element that supports the interconnection of the ESInet with legacy PSAPs.

**Legacy Selective Router Gateway (LSRG):** This gateway facilitates the routing/transfer of emergency calls between the ESInet and the legacy emergency services network. The LSRG will have to interwork location infrastructure between Next Generation 9-1-1 and legacy emergency services environments.

**Local Exchange Carrier (LEC):** A Telecommunications Carrier (TC) under the state/local Public Utilities Act that provides local exchange telecommunications services. Also known as Incumbent Local Exchange Carriers (ILECs), Alternate Local Exchange Carriers (ALECs), Competitive Local Exchange Carriers (CLECs), Competitive Access Providers (CAPs), Certified Local Exchange Carriers (CLECs), and Local Service Providers (LSPs).

**Location Information Server or LIS:** a functional element that provides locations of endpoints. A LIS can provide Location-by-Reference, or Location-by-Value, and, if the latter, in geo or civic forms. A LIS can be queried for the location of an endpoint. In either case, the LIS receives a unique identifier that represents the endpoint, for example an IP address, circuit-ID or MAC address, and returns the location (value or reference) associated with that identifier. The LIS also provides the dereferencing service, exchanging a location reference for a location value.

**Location to Service Translation (LoST) Protocol:** a protocol that takes location information and a Service URN and returns a URI, is used generally for location-based call routing and, in Next Generation 9-1-1, is used as the protocol for the ECRF and LVF.

**Location Validation:** refers to the action of ensuring that a civic address can be used to discern a route to a PSAP.

**Location Validation Function or LVF:** function that provides sufficient location-based information to a PSAP that allows a 9-1-1 call taker to dispatch emergency responders to a 9-1-1 call scene. The location information is provided by civic based addresses or latitude/longitude data.

**Logging Recorder:** A voice-band audio recorder which records to and plays from a permanent storage media such as tape or disk. Logging recorders are typically multi-channel so as to simultaneously record from several sources.

**Management Information System (MIS):** A program that collects, stores and collates data into reports enabling interpretation and evaluation of performance, trends, traffic capacities, etc.

**Master Street Address Guide (MSAG):** A data base of street names and house number ranges within their associated communities defining Emergency Service Zones (ESZs) and their associated Emergency Service Numbers (ESNs) to enable proper routing of 9-1-1 calls.

**Mobile Switching Center (MSC):** The wireless equivalent of a Central Office, which provides switching functions from wireless calls.

**Mobile Switching Office (MSO):** (See Mobile Switching Center (MSC))

**Multi-line Telephone System or MLTS:** a system comprised of common control units, telephones and control

hardware and software providing local telephone service to multiple end-use customers. Multi-line telephone system includes VoIP and includes network and premises based systems such as centrex, private branch exchange or pbx, and hybrid key telephone systems, but does not include key telephone systems.

**National Emergency Number Association (NENA):** The National Emergency Number Association is a not-for-profit corporation established in 1982 to further the goal of "One Nation-One Number." NENA is a networking source and promotes research, planning and training. NENA strives to educate, set standards and provide certification programs, legislative representation and technical assistance for implementing and managing 9-1-1 systems.

**NENA i3 Standards or i3:** NENA Next Generation 9-1-1 standards and requirements, including without limitation, the NENA Security for Next Generation 9-1-1 Standard and the NENA i3 Technical Requirements Documents, now available or as may become available in the future.

**Network Components:** any software or hardware for a control switch, other switch modification, trunking or any components of a computer storage system or database used for selective routing of 9-1-1 calls, automatic number identification and automatic location identification, including a PSAP.

**NextGen Core Services:** The base set of services needed to process a 9-1-1 call on an ESInet. Includes the ESRP, ECRF, LVF, BCF, Bridge, Policy Store, Logging Services and typical IP services such as DNS and DHCP. The term NG9-1-1 Core Services includes the services and not the network on which they operate.

**Next Generation 9-1-1:** an enhanced 9-1-1 system that incorporates the handling of all 9-1-1 calls and messages, including those using IP-enabled services or other advanced communications technologies in the infrastructure of the 9-1-1 system itself.

**Next Generation 9-1-1 System or System:** the Next Generation 9-1-1 emergency communication system procured under this RFS.

**Open Systems Interconnection Model or OSI model:** a seven layer hierarchical reference model structure developed by the International Standards Organization for defining, specifying, and relating communications protocols.

**Overflow:** The process of automatically rerouting calls to an alternate facility.

**Payload:** any multi-media that presents to the network as a call, request for emergency assistance, or an equivalent, including without limitation, real-time communication and non-real time communication, voice, text, video, images, alerts, alarms, graphics, or telematics.

**P.01 Grade of Service** (See Grade of Service.)

**Point of Presence or POPs:** the location at which an Internet service provider exchanges traffic and provides interconnect services.

**Primary PSAP:** a PSAP equipped with automatic number identification and automatic location identification displays, and is the first point of reception of a 9-1-1 call. It serves the municipality in which it is located.

**Primary Public Safety Answering Point (PSAP):** A PSAP to which 9-1-1 calls are routed directly from the 9-1-1 Control Office. (See PSAP)

**Private Branch Exchange (PBX):** A private telephone system that is connected to the Public Switched Telephone Network.

**Private Switch ALI (PS/ALI:)** A service option which provides Enhanced 9-1-1 features for telephone stations behind private switches. e.g. PBXs

**Pseudo Automatic Location Identification (pALI):** An ALI record associated with a pANI, configured to provide the location of the wireless cell or sector and information about its coverage or serving area (footprint).

**Pseudo Automatic Number Identification (pANI):** A telephone number used to support routing of wireless 9-1-1 calls. It may identify a wireless cell, cell sector or PSAP to which the call should be routed. Also known as routing number.

**Public Safety Answering Point (PSAP):** A facility equipped and staffed to receive 9-1-1 calls. A Primary PSAP receives the calls directly. If the call is relayed or transferred, the next receiving PSAP is designated a Secondary PSAP.

**Public Switched Telephone Network (PSTN):** The network of equipment, lines, and controls assembled to establish communication paths between calling and called parties in North America.

**Redundancy:** Duplication of components, running in parallel, to increase reliability.

**Remote Call Forwarding:** As utilized within Interim Number Portability, a permanent call forwarding feature that allows a call to one Directory Number to be automatically advanced to a Directory Number of another Local Exchange Carrier.

**Reorder Tone:** An audible tone of 120 interrupts per minute (ipm) returned to the calling party to indicate the call cannot be processed through the network. Sometimes referred to as fast busy.

**Response Agency:** The public safety agency having legal or consensual obligation to respond to a call for service.

**Ringback Tone:** A tone returned to the caller to indicate that a call is being processed.

**Route Diversity:** (See Diverse Routing)

**Routing Number:** (see pANI)

**Secondary PSAP:** A PSAP to which 9-1-1 calls are transferred from a Primary PSAP. (See PSAP)

**Selective Routing (SR):** The routing of a 9-1-1 call to the proper PSAP based upon the location of the caller. Selective routing is controlled by the ESN which is derived from the customer location.

**Selective Routing Data Base (SRDB):** The routing table that contains telephone number to ESN relationships which determines the routing of 9-1-1 calls.

**Selective Transfer:** The capability to transfer a 9-1-1 call to a response agency by operation of one of several buttons typically designated as police, fire, and emergency medical; based on the ESN of the caller.

**Service:** means 9-1-1 call and traffic delivery, i3 ESInet Network Services and reporting and monitoring in connection with, and service and support for the operation of, the States Network.

**Service Provider:** An entity providing one or more of the following 9-1-1 elements: network, CPE, or database service.

**Serving Central Office:** The central office (CO) from which a subscriber is served. (See Central Office)

**Signaling System 7 (SS7) /Common Channel Signaling 7 (CCS7):** An inter-office signaling network separate from the voice path network, utilizing high speed data transmission to accomplish call processing. (The Public Switched Telephone Network is in the process of upgrading from MF Signaling to SS7)

**Single Point of Failure:** A hardware or software component or sub-system which experiences a failure causing more than 50% of the total system to fail. (Ref. NENA 04-001 Reliability Objectives)

**Spatial:** relating to, occupying, or having the character or space. Geographical information systems store spatial data in regional databases.

**System Service Provider (SSP):** they entity acting as the prime 9-1-1 service provider for all calls and traffic throughout the State.

**Tandem Central Office (Tandem CO):** (See E9-1-1 Control Office)

**Telecommunicator:** As used in 9-1-1, a person who is trained and employed in public safety telecommunications. The term applies to call takers, dispatchers, radio operators, data terminal operators or any combination of such functions in a PSAP.

**Teletypewriter (TTY):** Also known as TDD. A device capable of information interchange between compatible units using a dial up or private-line telephone network connections as the transmission medium. ASCII or Baudot codes are used by these units. (per EIA PN-1663)

**Three-Way Calling:** (see Conference Transfer)

**Transfer:** A feature which allows the PSAP Telecommunicator to redirect a 9-1-1 call to another location.

**Transfer Key:** A key which is programmed to dial a telephone number, a selective routing transfer code, or a speed dial code to accomplish the transfer of calls.

**Trouble:** any event that: 1) impacts the functioning or operations of a PSAP; or 2) is reported to the contractor's help desk by a PSAP or the State 9-1-1 Department.

**Trouble Ticket:** a tracking document that contains a concise, complete, and accurate history of the trouble from the time the trouble is reported to repair of the trouble. A trouble ticket shall include, but not be limited to, PSAP location, date and time of ticket opening, date and time of ticket closing, ticket number, detailed description of problem, all steps taken during repair efforts and reason for closing ticket.

**Trunk:** Typically, a communication path between central office switches, or between the 9-1-1 Control Office and the PSAP.

**Trunk Group:** One or more trunks terminated at the same two points.

**Trunk Seizure:** The point in time at which a 9-1-1 call is assigned to a trunk and acknowledgment is provided by the equipment at the distant end.

**URI or Uniform Resource Identifier:** a predictable formatting of text used to identify a resource on a network.

**URN or Uniform Resource Name:** a uniform resource identifier that uses the URN scheme and is intended to serve as persistent, location-independent resource names.

**Uninterruptible Power Supply (UPS):** An auxiliary power unit which provides continuous battery backup power in the event of a commercial power failure.

**Universal Coordinated Time (UTC):** Also known as Zulu or Greenwich Mean Time (GMT).

**Voice over Internet Protocol or VoIP:** a type of IP-enabled service that allows for the two-way real time transmission of voice communications and has access to the public switched network.

**Wireless Enhanced 9-1-1 Service:** the service required to be provided by wireless carriers under, and governed by, FCC order.

**Wireless Telecommunications:** The family of Telecommunications services under the heading of Commercial Mobile Radio Service. Includes Cellular, Personal Communications Services (PCS), Mobile Satellite Services (MSS) and Enhanced Specialized Mobile Radio (ESMR).

**Wireline Carrier:** an incumbent local exchange carrier or local exchange carrier operating in the commonwealth, or a telephone company, or any other person, corporation or entity that provides local exchange service.

**Wireline Enhanced 9-1-1 Service:** service provided by a wireline carrier that connects a subscriber dialing or entering the digits 9-1-1 to a PSAP.

## Appendix B – MESB PSAP Survey 2021

TO BE INSERTED FOR FINAL VERSION

*-Nothing Follows-*

Please review the list of members of the PSAP Roundtable to ensure that we are reaching everyone and that our information is correct.

| **Agency** | **Representative Name** | |
|---|---|---|
| Allina | Angie | Fox |
| Allina | Victoria | Vadnais |
| Anoka | Heidi | Meyer |
| Anoka | Val | Sprynczynatyk |
| Anoka Co | Kari | Morrissey |
| Bloomington | LaVae | Robinson |
| ~~Bloomington~~ | ~~Michael~~ | ~~Utecht~~ |
| ~~Bloomington~~ | ~~Thomas~~ | ~~Bearheart~~ |
| Carver Co | Chris | Vandenbroeke |
| Carver Co | Josh | Harincar |
| Carver Co | Susan | Bowler |
| Carver Co | Todd | Moen |
| Chisago Co | Alicia | Stovern |
| Dakota Co | Cheryl | Pritzlaff |
| Dakota Co | Tom | Folie |
| Dakota Co | Troy | Ruby |
| Dakota Co | Vicki | Nelson |
| ECN | Cathy | Anderson |
| Eden Prairie | Lisa | Vik |
| Edina | Janelle | Harris |
| Edina | Jennifer | Radde |
| Edina | Katie | Danielson |
| HEMS | Daniel | Klawitter |
| Hennepin Co | Dawn | Kenyon |
| Hennepin Co | Jack | Cooper |
| Hennepin Co | Jayson | Johnson |
| Hennepin Co | Tonia | Klinkner |
| Hennepin Co | Tony | Martin |
| Isanti | Robert | Dowd |
| MACC | Candy | Capra |
| MACC | Lauren | Peterson |
| MACC | Sara | Jackson |
| Metro Transit | Bill | Anderson |
| Metro Transit | Chad | Loeffler |
| Metro Transit | Christine | Kuennen |
| Minneapolis | Joni | Hodne |

| | | |
|---|---|---|
| Ramsey Co | Bobby | Adney |
| Ramsey Co | Joe | Dillenburg |
| Ridgeview | Jeff | Fredrick |
| Scott Co | Carrie | Bauer |
| Scott Co | Kelly | Dolan |
| Scott Co | Nathan | Theis |
| State Patrol | Sheri | Stevens |
| State Patrol | Tim | Boyer |
| State Patrol | Twylla | Vickmark |
| University of Minnesota | Jeffrey | Lessard |
| Washington Co | Darlene | Pankonie |
| Washington Co | Karen | Schmid |
| Washington Co | Linda | Curtis |
| Washington Co | Sarah | Miller |

**Metropolitan Emergency Services Board**
**9-1-1 Technical Operations Committee**
**Network Report**
**January 14, 2021**

**Agenda Number 6.C.**

**Text-to-9-1-1:**
Washington Co. is the only remaining primary PSAP in the metro area that has not yet implemented text capabilities on their answering applications. They are scheduled to go live with text on their new CPE on January 25th.

**NG9-1-1 ESInet:**
The NG9-1-1 ingress system implementation is underway. Work continues for the MESB and ECN on the RFP(s) for NG9-1-1 core services and 9-1-1 system egress connectivity between the core services and the PSAP. ECN has contracted with Federal Engineering for professional and technical services to assist in the RFP process. The MESB has contracted with 911 Authority for professional and technical services to also assist in the core services and egress RFP process. The RFP will be posted in late January or February of 2022.

**Workload Sharing/CAD2CAD**
The MESB continues to focus on giving our PSAPs better continuity-of-operations (COOP) options as well as enabling workload sharing for the PSAPs that are interested in working together. An all-day in-person meeting has been scheduled for Tuesday February 15th at HCSO Communications. Winbourne Consulting and the MESB workgroup will meet to discuss CAD2CAD requirements and governance models. MESB Board has approved an amendment to the Winbourne contract for them to provide us a "Lessons Learned" document containing their experiences from successful regional CAD2CAD projects throughout the nation.

**2021 9-1-1 Network Highlights**

- Ramsey County and Washington County implemented new geo-diverse CPE systems.
- Scott County joined as a subscriber to the Motorola hosted SaaS system.
- Washington County went live with new CPE on 12/27/21 that is direct SIP. All Metro PSAPs are now connected by direct SIP for 9-1-1.
- Ramsey County started receiving Z coordinate in ALI feed and is working on having it displayed.

End of report.

**Metropolitan Emergency Services Board**
**9-1-1 Technical Operations Committee**
**9-1-1 Data Report**
**January 20, 2022 Meeting**

1. **Importance of GIS for 9-1-1:** PSAP managers are strongly encouraged to assist their GIS counterparts in communicating to key decisionmakers and county leadership what a **vital role GIS has to their current and future PSAP operations**. Geospatial datasets provide foundational data for PSAP CAD/mapping systems and future NG9-1-1 core services, as well as support many other non-public safety uses that are important to cities and counties.

2. **Regional Data QA/QC:**
   a. MESB has been reviewing results from the metro regional data for **NG9-1-1 data validations** conducted internally at MESB and through GeoComm's Data Hub. This review has resulted in outreach to the county GIS contacts for recommended data remediations.
   b. **Proactive 9-1-1 call location audits** continue for the 10-county region once a week using ALI retrieval logs and the metro regional road centerline, address point, and MSAG data. This process has been helpful in identifying needed VoIP service provider data remediations, as well as some address point additions.

3. **Metro Regional GIS-derived MSAG transition:**
   a. ***Complete****:* Chisago County, Dakota County, Anoka County, Eden Prairie, St Louis Park, Edina, Bloomington, Ramsey County, Isanti County, Hennepin Sheriff
   b. ***In preparation stage at MESB****:* Carver County, Scott County (early-stage preparation)

4. **ECN 1Spatial Project:**
   a. ***Regional Data Submission for NG9-1-1 data validation:*** The MESB team has been able to submit the regional datasets, run the 1Spatial validations, and receive preliminary results from the state's platform. ECN, MnGeo, and 1Spatial have also provided an initial outline of the polygon-related validations they have under development. MESB will continue to monitor the statewide aggregation/validation processes and to evolve how best to integrate those validations with the other tools in use for the metro area.

5. **Regional Dataset Aggregation Portal Methodology**: MetroGIS partners are actively migrating to a new portal for county dataset submission for regional aggregation/validation. The CKAN portal previously used by MetroGIS for regional aggregation is being sunset by the state. The MetCouncil staff who manage the regional MetroGIS processes were instrumental in developing the new method and working with the metro partners on the transition.

6. **Statewide GIS Data Standards:**
   a. A **polygon standard for the exchange of 9-1-1 emergency service boundaries** (PSAP, ESZ/ESN, and response agency) has been submitted by the SECB NG9-1-1 GIS Workgroup to the GAC Standards Committee for consideration. It is anticipated that the standard will be sent out for at least one round of public review.
   b. The NG9-1-1 Committee will be coordinating the circulation of a proposed domain list of **normalized/standardized response agency names** to be used in the GIS data. This is

needed for the statewide polygon standard. PSAPs will be asked to review that list and confirm that all agencies they dispatch for are included and there are no significant concerns with the proposed naming that would be used in the GIS data. A similar domain list of PSAP names will also need to be finalized.

7. **ECN NG9-1-1 Federal Grant work:**
   a. ***Metro Regional GIS-derived MSAG Processes:*** MESB staff continues to use GeoComm's Data Hub for supplemental NG9-1-1 validations, as well as GeoComm's GIS-derived MSAG output for the transition of PSAP MSAGs.
   b. ***Sherburne County:*** GeoComm is starting to wrap up their work with Sherburne County's GIS data. They are finalizing the data's NG9-1-1 readiness and conformance to conditions of the grant work.

**ONGOING ACTIVITIES**

8. **Wireless Cell Sector/Routing Data:** MESB processes wireless routing updates for all carriers on behalf of the metro PSAPs. Should PSAPs want the routing for a specific cell sector or 9-1-1 call reviewed, just email ***mesbgis@mn-mesb.org*** and MESB staff will investigate.

9. **Regional GIS Data Aggregation:**
   a. ***Road Centerline and Address Points:*** The MetroGIS/Met Council processes regional road centerline and address point dataset updates nightly to the MN Geospatial Commons website. Each metro county's most recent centerline and address point data that has been uploaded to the portal and passed validations is included in the regional datasets. The regional road centerline and address point datasets comply with the current MN Geospatial Advisory Council (GAC) data standards.
   b. ***Boundary Polygons:*** MESB maintains the regional PSAP, ESZ, MSAG community, law, fire, and EMS boundary polygon layers in coordination with the PSAPs. These datasets are updated as boundaries change or at a minimum of quarterly. Mobile Positioning Center, Text Control Center, and VoIP Positioning Center vendors are directed to the MN Geospatial Commons for downloads of metro's PSAP boundary polygons.

10. **Regional Data Viewer:** PSAPs are encouraged to use the 9-1-1 dataviewer developed by MetroGIS/Met Council to view the geospatial data county GIS departments consider valid & current for regional 9-1-1 use. (https://www.metrogis.org/projects/9-1-1-Data-Viewer.aspx.)

11. **Q1 2022 MSAGs** have been distributed to PSAP Data Coordinators and GIS partners.