

**REPORT OF THE SECRETARY OF PUBLIC  
SAFETY AND HOMELAND SECURITY**

**E-911 Border Response  
Workgroup Report  
(2020 Appropriation Act,  
Item 391.F.)**

**TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA**



**HOUSE DOCUMENT NO. 5**

**COMMONWEALTH OF VIRGINIA  
RICHMOND  
2021**





# COMMONWEALTH of VIRGINIA

Office of the Governor

Brian J. Moran  
Secretary of Public Safety  
and Homeland Security

April 15, 2021

General Assembly  
900 East Main Street  
Richmond, Virginia 23219

Dear Members of the General Assembly,

Enclosed, please find the Emergency -911 (E-911) Border Response Workgroup Report pursuant to Item 391, paragraph F, Chapter 1289 of the 2020 Acts of Assembly.

F. The Secretary of Public Safety and Homeland Security shall establish an E-911 Border Response Workgroup. The Workgroup shall assess the deficiencies related to the timely routing of Emergency 911 (E911) calls to the appropriate public-safety answering point (PSAP) across either state or county borders. At a minimum, the workgroup should work with stakeholders to collect information on problems with the current system and processes; review mitigation solutions already implemented by localities and citizen groups; determine best practices; and provide inputs and recommendations to the General Assembly on technology, training, and compensation that would be necessary to address the identified deficiencies. The Secretary shall provide the recommendations of the Workgroup to the Governor and General Assembly no later than April 1, 2021.

Pursuant to the above budget direction please find enclosed a responsive report. This report should serve as a guide and bring focus toward potential policy development related to the timely routing of 911 emergency calls. The Commonwealth is moving forward to evolve 911 and ensure quality service to its citizens and visitors. I want to thank all of the participants who despite COVID-19 concerns dedicated their time and effort to this report.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. Moran', written over a circular stamp or seal.

Brian Moran

Secretary of Public Safety and Homeland Security





Office of Public Safety  
and Homeland Security



Virginia Department of  
Emergency Management

# E-911 BORDER RESPONSE WORKGROUP REPORT

Improve the routing and processing of 9-1-1 calls to the appropriate PSAP across state borders and/or county boundaries based on lessons learned from experiences in order to prevent future tragedies.



# 1. Executive Summary

The General Assembly formed the E-911 Border Response Workgroup (the “Workgroup”) to assess the deficiencies related to the timely routing of 911 calls to the appropriate public-safety answering point (PSAP) across either state or county borders. The Virginia Secretary of Public Safety and Homeland Security (the “Secretary”) appointed individuals to the Workgroup representing the following stakeholder groups:

- Virginia Office of Secretary of Public Safety and Homeland Security
- Virginia General Assembly
- Virginia Residents
- Virginia 9-1-1 Services Board
- 9-1-1/PSAP Community
- Emergency Management Community

The Workgroup’s objective was to complete a report by April 1, 2021 that contains recommendations to improve the routing and processing of 9-1-1 calls to the appropriate PSAP across state borders and/or county boundaries based on lessons learned. To develop this report, the Workgroup met virtually and collaborated with the Virginia Department of Emergency Management’s (VDEM’s) 9-1-1 and Geospatial Services (NGS) Bureau staff to collect information on problems with the current system and processes; review mitigation solutions already implemented by localities and citizen groups; and, determine best practices. The Workgroup investigated the five functional areas related to 9-1-1 systems and processes:

- Governance
- Technology/NG9-1-1 Deployment
- Equipment, Operations and Mitigation Strategies
- 9-1-1 Personnel and Training
- Funding and Compensation

The Workgroup had an extensive list of findings and the following recommendations:

- Develop a Cross Border 9-1-1 Call Processing Best Practice
- Support the implementation of additional 9-1-1 best practices in the Commonwealth
- Improve wireless 9-1-1 location accuracy
- Address telecommunicator compensation, reclassification, recruitment, training, and retention
- Form a NG9-1-1 Leadership Commission

## 2. Introduction

### Problem Statement

The General Assembly formed the E-911 Border Response Workgroup (the “Workgroup”) to assess the deficiencies related to the timely routing of 911 calls to the appropriate public-safety answering point (PSAP) across either state or county borders. At a minimum, the workgroup had the following tasks to complete:

- Work with stakeholders to collect information on problems with the current system and processes
- Review mitigation solutions already implemented by localities and citizen groups
- Determine best practices
- Provide inputs and recommendations on technology, training, and compensation that would be necessary to address the identified deficiencies

### Workgroup Membership

The Virginia Secretary of Public Safety and Homeland Security (the “Secretary”) appointed the following individuals, representing a variety of stakeholder groups to the Workgroup:

- **Deputy Secretary Shawn Talmadge, Chair**
- **Delegate David Reid, General Assembly**
- **Delegate Tyler, General Assembly**
- **Pastor Michelle Thomas, citizen representative**
- **Sherry Herzing, citizen representative**
- **Christian Yohannes, youth citizen representative**
- **Grant Sheets, youth citizen representative**
- **Curtis Brown, 9-1-1 Services Board**
- **Devon Clary, PSAP Representative, Brunswick County Sheriff’s Office**
- **Theresa Kingsley-Varble, PSAP Representative, Washington County**
- **Eddie Reyes, PSAP Representative, Prince William County Government**
- **Sonny Saxton, PSAP Representative, Charlottesville-UVA-Albemarle County ECC**
- **Patty Turner, PSAP Representative, Loudoun County Fire and Rescue**
- **Melissa Meador, Emergency Management Representative, Greene County**
- **Rebecca Vargas-Jackson, M.D., COVID 19 Health Equity Group**
- **Dorothy Spears-Dean, Ph.D., Deputy State Coordinator, VDEM**



## 3. Objectives, Scope, and Method

### Objective

The objective for the Workgroup is to provide a report to the Secretary. This report should contain recommendations to address the conditions identified in the Problem Statement. The Secretary shall provide the Workgroup's Report to the Governor and General Assembly no later than April 1, 2021.

### Scope

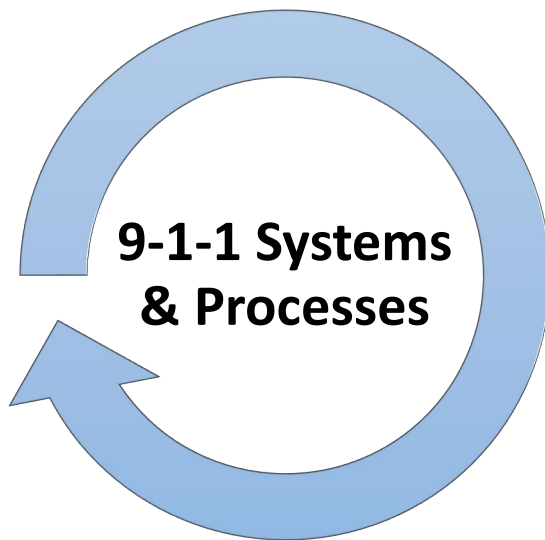
The Workgroup collaborated with stakeholders and NGS Bureau staff to collect information on problems with the current system and processes; review mitigation solutions already implemented by localities and citizen groups; and determine best practices.

### Method

The Workgroup met virtually on an agreed upon schedule to focus on 9-1-1 systems and processes key functional areas to develop recommendations that addressed identified gaps within the 9-1-1 ecosystem, unmet needs within PSAPs, and areas requiring mitigation and/or improvement. Members of the Workgroup discussed these functional areas as discrete topics in separate meetings to ensure they achieved adequate depth in these key functional areas.

## 4. Background

The graphic below identifies the five functional areas related to 9-1-1 systems and processes recommended by NGS Bureau staff for the Workgroup to investigate:



- **Governance**
- **Technology/NG9-1-1 Deployment**
- **Equipment, Operations & Mitigation Strategies**
- **9-1-1 Personnel & Training**
- **Funding & Compensation**

### **9-1-1 Systems and Processes Functional Areas**

The Workgroup had less than 10 weeks to complete its report and relied on NGS Bureau staff to coordinate presentations to provide members with substantive information on the above 9-1-1 systems and processes functional areas. Presentations provided by NGS Bureau staff and 9-1-1 professionals provided an overview of 9-1-1 call processing in Virginia to enable Workgroup members to identify where problems may exist with related current systems and processes.

#### **Governance**

A PSAP is the entity responsible for receiving and processing 9-1-1 calls according to its governing body's operational policies and must adhere to any applicable federal or state mandates. A primary PSAP is a facility to which 9-1-1 calls are routed directly, and will be staffed 365 days per year, 24 hours a day, 7 days a week. A secondary PSAP has 9-1-1 calls transferred to them from a primary PSAP and cannot receive 9-1-1 calls directly.

The governance of a PSAP must be defined by the jurisdiction(s) served by the PSAP. While there is no, one best governance structure, it must be established in writing to ensure the governance structure is known by all. PSAPs may be governed by any government entity such as

a law enforcement, fire, EMS, emergency management agency, a sheriff's office, or a board/authority. A PSAP may also be a stand-alone agency within a local government, but regardless of the governance structure, one person or entity must be responsible for the operations of the PSAP. Below is a breakdown of the PSAP organizational models of Virginia across the states:

- Sheriff's Office - 59
- Standalone Department - 24
- Police Department - 23
- Regional Partnership / Commission / Authority - 11
- Emergency Management - 4
- Fire Department - 3

## Technology

The Commonwealth's 9-1-1 system is dependent on legacy architecture built in the 1970s and based on decades-old circuit switched technology originally built to process landline calls. A caller's location from a landline phone is determined through the Automatic Location Identification (ALI) function. In the mid-1990s, with the proliferation of wireless technologies, Virginia's 9-1-1 system faced a new challenge – receiving 9-1-1 calls from cell phones and identifying the location of the caller.

Out of the approximate four million calls made to Virginia PSAPs, around 80 percent are made from wireless devices. However, wireless calls make the emergency response process more difficult. Cell phones are not tied down to any one location, so telecommunicators don't know your exact whereabouts when you call from a mobile device. Instead, the call goes to the PSAP associated with the cell tower your phone is using. This can result in the routing of a 9-1-1 call to the wrong PSAP, particularly if a cell tower is close to a PSAP boundary.

The Commonwealth is moving forward to evolve 9-1-1 and ensure quality service to its citizens and visitors. To accomplish this, the Board has begun moving to a Next Generation 9-1-1 (NG9-1-1) system. NG9-1-1 is a modern internet protocol (IP) network that has the ability to deliver calls to the appropriate PSAP faster, transfer 9-1-1 calls and associated data anywhere needed, interconnect with other public safety systems and databases, and in the future, securely receive multimedia communications like text, photos and videos. As service providers begin abandoning the legacy circuit-switched technology, the urgency to update the 9-1-1 infrastructure to NG9-1-1 increases tremendously. Actions to transform outdated system into a digital network that is faster, more efficient, and has greater capabilities to serve Virginia residents is currently underway.

## Equipment, Operations, and Mitigation Strategies

PSAP service areas must be established to ensure that 9-1-1 calls made from any address or location are routed to the correct PSAP. The routing of wireless 9-1-1 calls may initially be based on the cellular sector receiving the call. The routing of wireline and VoIP calls to 9-1-1 will be based on the registered address for that telephone. In either case, 9-1-1 calls for service are usually routed through local exchange carriers' (LECs') selective routers to get to the appropriate PSAP. An Emergency Services IP network (ESInet) will replace this routing configuration utilizing selective routers with the deployment of NG9-1-1.

All PSAPs must install and maintain the following technical systems:

- 9-1-1 call handling equipment to receive and process 9-1-1 calls. PSAPs should establish a service and maintenance contract for the call handling equipment to ensure rapid response to system failures and routine, periodic preventive maintenance.
- A CAD system to receive and process public safety calls for service. PSAPs are encouraged to consider utilizing a shared CAD system with one or more other PSAPs. This shared services approach increases interoperability, situational awareness, and data shared between localities.
- A mapping display system to plot 9-1-1 calls. This equipment must have the capability to automatically plot the address or latitude and longitude (lat/long) of a 9-1-1 call on a map as well as capable of replotting the location information and update the map as the caller may be mobile. If a wireless 9-1-1 call is routed based on a cellular sector, the location of the tower and direction of the sector should also be plotted. The mapping display system may also accept and plot location and incident data from the CAD system. All data in the mapping display system should be updated on an established schedule that ensures accurate, up-to-date data.

Workgroup PSAP representatives and other 9-1-1 professionals presented on the following migration strategies and best practices:

- CAD2CAD
- No-Call Transfer Projects
- Northern VA Emergency Response System (NVERS)
- Available options to address carrier gaps with location accuracy
- Carrier/service provider outage notification strategies
- Regional workgroups

- One-button transfers for 9-1-1 direct or emergency 10-digit numbers to each adjacent locality's PSAP
- The telecommunicator should stay on the line until the connection is complete and all pertinent information, as determined by the PSAP, has been relayed
- Blind transfers (when the call is sent to another location and the initial call taker drops off before connection is complete and information relayed) of emergency calls should never occur

### 9-1-1 Professionals and Training

All personnel that dispatch for law enforcement are required to complete the Department of Criminal Justice Services (DCJS) Basic Telecommunicator program within the first two years of their employment ([§ 9.1-102.10](#)). PSAP management must identify in SOPs, General Orders, or Policies all other training that is required of their personnel. Other critical areas of telecommunication training recommended by the Board includes the following:

- NG9-1-1
- Wireless 9-1-1
- Text-to-9-1-1
- GIS
- Dispatch Training (Fire, Rescue and Law Enforcement)
- Critical Incident Stress Management (CISM)
- Technical Systems used by the PSAP (CHE, CAD, mapping, etc.)
- Continuing Education/In-service Training

The Board has accepted the following best practices previously published by NGS Bureau staff:

- [9-1-1 Addressing Operational and Administrative Best Practice](#)
- [9-1-1 Call for Service Dispatching Best Practice](#)
- [Public Safety Call Processing Best Practice](#)
- [Wireless 9-1-1 Call Routing Optimization](#)
- [Optimal PSAP Staffing Structure Best Practice v1.1](#)

### Funding and Compensation

The Wireless E-911 Fund collects about \$60 million annually through pre- and post-paid 9-1-1 surcharges on Virginia residents' service bills. This funding is used to support Virginia's 9-1-1 Program. The entry-level pay range for Virginia telecommunicators is from \$26,185 to \$48,070.

## 5. Analysis

A qualitative analysis approach that employed individual interviews and groups discussions was used to develop the findings and recommendations contained in this report.

## 6. Findings

An amendment from the 2020 General Assembly Special Session directed the Secretary of Public Safety and Homeland Security to establish an E-911 Border Response Workgroup to make recommendations based on the guidance of the budget amendment related to Virginia's existing 9-1-1 system. The goal of the Workgroup is to improve the routing and processing of 9-1-1 calls to the appropriate PSAP across state borders and/or county boundaries based on lessons learned from experiences in order to prevent future tragedies. The findings below are the basis for the recommendations contained in the report:

1. Virginia PSAPs process over 4 million 9-1-1 calls annually through a variety of venues. Examples include voice calls and text sessions. Through these actions, telecommunicators play a significant role in processing emergency requests for service. Virginia PSAPs process most 9-1-1 calls effectively, but when the processing of a 9-1-1 call is compromised, there is the potential for significant negative outcomes.
2. Virginia communities would benefit in understanding how their local 9-1-1 call center operates, identifying potential gaps with recommendations outlined in the 2020 edition of the 9-1-1 Comprehensive Plan, and to support obtaining resources to implement any required changes.
3. Virginia PSAPs must be able to locate all 9-1-1 callers, accurately and timely. The deployment of NG9-1-1 will result in a fully interoperable, statewide NG9-1-1 i3 ecosystem. The National Emergency Number Association (NENA) established the NG9-1-1 i3 standard. This standard provides end-to-end IP functionality and improves the ability for call centers to locate callers.

4. 9-1-1 planning efforts must be comprehensive and support the collaboration between state and local governments, and other stakeholders.
5. To improve 9-1-1 call routing and wireless location accuracy, the carrier community must participate in planning starting at the local level to improve call location accuracy and confidence in communication carrier data.
6. Telecommunicators must be trained to effectively communicate with callers in a culturally aware, responsive, and evidence-based manner that considers multiculturalism, bias, discrimination, active listening, and other key factors. Telecommunicators must also be able to relate to diverse communities in order to help identify and rectify potential caller location errors (e.g. predominant and non-predominant ethnic groups, non-English speaking, gender, lifestyle, hearing impaired, generational, etc.).
7. In order to provide effective 9-1-1 call handling, telecommunicators must possess personal and professional maturity to manage complex caller situations, understand applicable technologies, and have knowledge of the geographic area served by the local PSAP.
8. PSAP managers must recruit a diverse work force that is representational of the communities served by their local PSAPs.
9. While some local PSAPs are resourced with the latest technology, advanced training, and ample staffing, this does not reflect call centers statewide. Many communities struggle to obtain access to technology, training, and other resources to rapidly locate callers, especially in areas away from public roadways where location is difficult to describe.
10. At the local level, telecommunicators are routinely asked to carry out non-9-1-1 related tasks. These expectations often hamper telecommunicators when attempting to perform their essential duties.
11. Currently, statewide training recommendations or requirements for telecommunicators do not exist. Call takers working in centers dispatching law enforcement agencies are required to complete DCJS Basic Dispatcher Training, which is primarily focused on law enforcement operations. Telecommunicators would benefit from additional training in other public safety disciplines such as fire and emergency medical services. The training should also include cultural awareness training and procedural safeguards to help identify and resolve potential caller location errors.

12. Local PSAPs must make career development and salary investments to address growing attrition of experienced staffing leaving in search of better paying jobs. As seen in other public safety professions, a comprehensive pay plan is required to address compensation, reclassification, recruitment, training, and retention.
13. Virginia PSAPs must be adequately staffed at all times to provide required “head-set” coverage necessary to effectively serve communities 365 days per year, 24 hours a day, 7 days a week. Staffing must be sufficient to allow telecommunicators to receive continuing education training.
14. 9-1-1 callers are facing a crisis when seeking emergency services and may not know their current location. To help callers orient themselves, location tools, such as water signage and land markers with QR codes are essential. These tools must be utilized to the fullest extent possible especially in public areas lacking traditional street signs (parks, rivers, etc.).
15. All 9-1-1 call systems and processes must be interoperable. For example, if PSAPs could see each other’s CAD systems, telecommunicators and responding agencies could share situational awareness related to events at county and state borders.
16. Location accuracy is improving, but there are still limitations in the quality of the location data provided by wireless carriers to the PSAP and callers are not aware of these limitations. They expect PSAPs to be able to accurately know their location when calling 9-1-1 on wireless devices.
17. Technical enhancements to 9-1-1 capabilities are emerging at a breakneck pace. Apple and Google have enabled device-based hybrid location that vastly improves upon carrier locations and makes this information available to PSAPs through third-party integrators.
18. While new capabilities and training are available to PSAPs, implementation is often limited by resource constraints (time, staffing funding, etc.).



## 7. Recommendations

The findings captured in the previous section yielded five recommendations that are listed below in the order of their criticality and anticipated completion date:

### **1. Develop a Cross Border 9-1-1 Call Processing Best Practice Guide (September 2021)**

The NGS Bureau will produce a Cross Border 9-1-1 Call Processing Best Practice Guide with the assistance of Bureau interns under the direction of subject matter experts. The document will leverage information presented during a previous Workshop session provided by 9-1-1 professionals from the National Capitol Region (NCR) and Southwest Virginia. This document should also address specific PSAP needs, such as coordination among PSAPs impacted by misrouted calls, analysis of call routing data reports to decrease misrouted calls in affected areas, and the identification of additional mitigation tools and resources.

Our existing Workgroup will meet on August 24, 2021 to review and accept promising practices. 9-1-1 Services Board members will review and vote on this document during their September 9, 2021 meeting.

### **2. Support the Implementation of Additional 9-1-1 Best Practices in the Commonwealth (September 2021)**

Create a strike team to determine if additional NGS Bureau staff is needed to assist localities with the following: implementing new technologies, replacing existing protocols with new ones, and providing additional training opportunities to address identified gaps. This team would focus their efforts on smaller PSAPs, or ones facing challenges in technology, implementing procedures, or obtaining training to reduce call location errors. If the determination is made that additional staff is needed, the team would also provide technical assistance and consulting to better prepare PSAPs for their transition to NG9-1-1. This recommendation specifically addresses those PSAPs that are unable to implement new technologies or procedures due to staffing shortages, as well as other stressors.

### **3. Improve Wireless 9-1-1 Location Accuracy Project (December 2021)**

The NGS Bureau will develop a project plan to analyze the extent of wireless location accuracy issues in Virginia and provide remediation recommendations. This project will involve the wireless carrier and handset community to focus on improving the routing of 9-1-1 calls based on the increased accuracy of caller location data.

Our existing Workgroup will meet on April 20, 2021 to review and accept the project plan. 9-1-1 Services Board members will review and vote on this document during their May 13, 2021 meeting.

### **4. Address Telecommunicator Compensation, Reclassification, Recruitment, Training, and Retention Initiative (December 2021)**

The 9-1-1 Services Board's 9-1-1 Comprehensive Plan includes telecommunicator professional development as a priority and establishes an initiative to address the needs identified by Virginia's 9-1-1 community. The Board's expectation is that the NGS Bureau will work with stakeholders to complete this initiative and provide guidance to Virginia's 9-1-1 community. This action will enable Virginia local governments to review current pay plans and consider any necessary revisions to address any compensation, recruitment, retention, training and reclassification needs, focusing on diversity, equity and inclusion.

Our existing Workgroup will meet on June 15, 2021 to review and provide input on the project plan.

### **5. Form a NG9-1-1 Leadership Commission (July 2022)**

The 9-1-1 Services Board should evaluate the need for an NG9-1-1 Leadership Commission to facilitate the transition to NG9-1-1 statewide and identify ways to increase the reliability and accuracy of emergency services to all Virginia communities by utilizing this new infrastructure.



