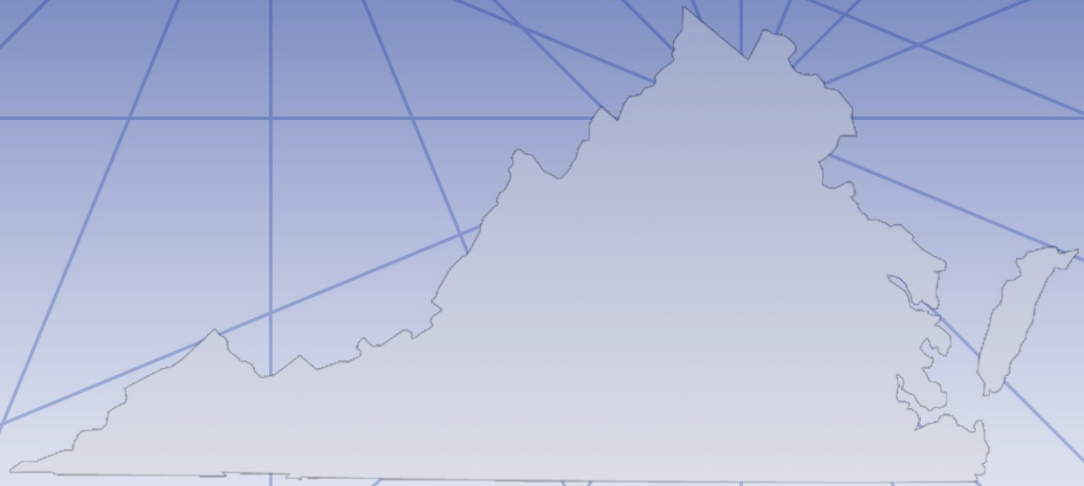


Virginia Information Technologies Agency



Standard 9-1-1 Capabilities and Services For Virginia Public Safety Answering Points



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Introduction

This document serves to describe the current standard capabilities and services that all PSAPs in Virginia must provide and is not intended to be aspirational or future focused. This standard does not prescribe a particular way of meeting the requirements. That is up to each PSAP to determine based on their operation, management and/or governance. However, best practices from VITA or other professional organizations can assist in this process.

While most Virginia PSAPs will already meet this standard, PSAPs that do not should develop a plan to achieve compliance in the future. Those that meet this standard should consider improvements and enhancements to exceed these standard capabilities and services. These standards will be reviewed annually for potential update to reflect changes in capabilities, services, best practices, technology, industry trends and public expectations. While grant funding from the 9-1-1 Services Board may be available for components of this standard, it should not be assumed that funding will be provided for all. Many are already funded locally and will need to continue to be funded in this manner.

The capabilities and services that are required are noted with a “must” or “shall” statement. Those that are recommended or suggested are noted with a “should” or “may” statement.

I. 9-1-1 & Operations

The provision of 9-1-1 is defined in Section 56-484.16 of the Code of Virginia. In their geographical area of responsibility, Public Safety Answering Points (PSAPs) must be able to receive and process 9-1-1 calls through the following services:

- Wireline 9-1-1
- Wireless 9-1-1
- Voice over Internet Protocol (VoIP) 9-1-1
- Short Messaging Service (SMS)/Text Messaging
- Multi Line Telephone System (MLTS)/Private Branch Exchange (PBX)
- Telecommunication Device for the Deaf (TDD)/Video Relay Services.

A. Governance and Organization

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 PSAP 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, but one person or entity must be responsible for the operations of the PSAP. This entity must establish written Standard Operating Procedures (SOP) or General Orders under which the PSAP must operate. A manager/director must be identified to lead the PSAP organization, but below that position, PSAP organizations may vary greatly depending on size and types of services provided. The manager/director must ensure compliance with all state and federal regulations. For example, all PSAPs must comply with Library of Virginia records retention and Federal Communications Commission orders.

B. General Call Processing and Dispatch

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' (LEC's) selective routers to get to the appropriate PSAP. To ensure diversity and redundancy in the system, each PSAP should be served with a minimum of two wireline and two wireless 9-1-1 telephone trunks from two diverse selective routers. The number of trunks in a PSAP will be agency-specific. Combining wireline and wireless trunks is not recommended. This configuration of routing through selective routers and trunks will be replaced by an Emergency Services IP network (ESInet) once Next Generation 9-1-1 (NG9-1-1) is deployed.

All 9-1-1 calls must be answered in a timely manner with a consistent greeting established by SOP or General Order, such as "<PSAP name> 9-1-1, Where is your emergency?" The National Emergency Number Association (NENA) has established a reasonable standard for call answering times of 90% answered within 10 seconds. All calls must be processed consistent with local SOPs or General Orders. The Virginia 9-1-1 Call Processing best practice may be used as a template for this. Transferring a call to another PSAP (another primary or a secondary) is permitted as necessary, but care should be taken to minimize the number of transfers. All transfers should be announced by the transferring PSAP, and care should be exercised to ensure successful transfer to the PSAP that will handle the call. "Blind transfers" are not permitted. PSAPs must be able to process 9-1-1 calls from speakers of other languages and users of telecommunications devices for the deaf (TDDs).

All PSAPs should establish and maintain a quality assurance/quality control (QA/QC) program to ensure that 9-1-1 calls are processed in accordance with local SOPs and General Orders. The QA/QC program should include a regular review of 9-1-1 calls to determine training needs or public education issues.

All PSAPs should establish and maintain a public education program. At a minimum, public education programs should provide educational resources for local schools and senior care facilities.

II. Professional Development

A. Recruitment and Hiring

Each PSAP must have the ability to recruit and hire staff as warranted. PSAPs should consider recruitment practices that result in the best candidates for the positions being filled. PSAPs should have a locally established selection process that is used consistently for all hiring processes within the PSAP. This process may necessarily differ from the hiring processes used elsewhere in the locality. This will ensure that all personnel within the PSAP have met the same minimum requirements that are needed to ensure the functioning of the PSAP. A career development program may be considered as a way of retaining existing employees thus preventing the need for additional recruitments.

B. DCJS 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 year of their employment (§ 9.1-102.10). PSAPs should strive to send new personnel to this training as early in their employment as possible. Additionally, PSAPs not dispatching law enforcement may consider sending their staff to the DCJS training, if permitted.

C. Additional Training

PSAPs must identify in SOPs or General Orders all other training that is required of their personnel. Emergency Medical Dispatcher (EMD) training is highly recommended with the implementation of an EMD program. Continuing education is also highly recommended to ensure call taking and dispatching skills are maintained.

Other areas that may be considered for the training of telecommunicators include, but are not limited to, the following:

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

III. Technical Systems

A. NENA i3 Standard

All PSAPs must adhere to the National Emergency Number Association i3 standard for any deployment of Next Generation 9-1-1 (NG9-1-1) core services and an Emergency Services IP Network (ESInet). This will allow any ESInet deployments in Virginia to be interoperable with one another, interconnecting to form a statewide NG9-1-1 network. In addition, all PSAPs must adhere to any Virginia specific requirements for connection to the Virginia ESInet.

B. Call Handling Equipment

All PSAPs must install and maintain appropriate 9-1-1 call handling equipment to receive and process 9-1-1 calls. This equipment must have, at a minimum, the capability to answer, transfer, place on hold and disconnect calls on all 9-1-1 trunks into the PSAP. It must also have access to sufficient, 10-digit telephone lines available to place outgoing calls, return calls, receive nonemergency calls or receive calls from outside the PSAP service area. 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.

C. Computer Aided Dispatch (CAD)

All PSAPs must install and maintain 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 and data shared between localities. Whether shared or individual, this system must have, at

a minimum, the capability to enter pertinent incident information (location, call type, comments, etc.), track unit status (both on incidents and independent of any incident) and track the incident through to its final disposition. It must validate any incident location entered for dispatch to ensure it exists and appropriate units are assigned. The PSAP may interface the CAD system with other systems such as fire station alerting, mobile data, alarm companies or records management systems. Desired interfaces should be identified at the time of procurement to ensure that the selected system provides them. CAD systems require significant data to be entered and maintained to ensure effective operation. The PSAP must establish a process to ensure this maintenance occurs in a timely manner. PSAPs also should establish a service and maintenance contract for the CAD system to ensure rapid response to system failures and routine, periodic preventive maintenance.

D. Mapping Display System

All PSAPs must install and maintain 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 computer-aided dispatch (CAD) system. This could include active incident locations, unit locations through automatic vehicle location (AVL) or direction information for responding units. The mapping display system must also have the capability to zoom, pan or rotate the map, as well as providing the capability of a user to enter an address or lat/long and having it plot accurately. All data in the mapping display system should be updated on an established schedule that ensures accurate, up-to-date data. PSAPs should establish a service and maintenance contract for the mapping display system to ensure rapid response to system failures and routine, periodic preventive maintenance.

E. Voice/Data Logging Recording

All PSAPs must install and maintain a voice/data logging recording capability to record all telephone lines coming into the PSAP, including 9-1-1, and radio channels managed by the PSAP. This equipment must have, at a minimum, the capability to record and playback all audio sources in the PSAP. The system should allow the playback of the audio in either real time (with dead air between transmissions) and compressed (just periods of audio are played back). PSAPs should establish a service and maintenance contract for the voice/data logging recorder to ensure rapid response to system failures and routine, periodic preventive maintenance.

F. Radio Systems

All PSAPs must install and maintain a land mobile radio (LMR) system to support emergency response operations. This system should be designed to support public safety operations with full geographic coverage and type of equipment utilized. Coverage engineering should support handheld radio operations throughout the area of operations of the PSAP. Mobile data may also be included or may also be provided through a commercial data service provider. PSAPs should establish a service and maintenance contract for the radio systems to ensure rapid response to system failures and routine, periodic preventive maintenance.

G. Citizen Notification Systems

PSAPs may implement and maintain a citizen notification system to send alerts to citizens. This system should have, at a minimum, the capability to send voice, text or email messages to citizens to alert them to emergent situations. SOPs must be established to who is authorized to approve alerts to be sent, write the text of the alert, record the alert and send the alert. It is essential that procedures define the operating parameters to ensure that alerts are clear and concise as this is direct contact with the public. The PSAP may also want to consider leveraging social media (Twitter, Facebook, etc.) as a means for getting out alert information to the citizens or establishing an information line for citizens to call.

The contact information for the citizen notification system may come from a number of sources including the citizen subscription, ALI database, etc. Each source has its limitations that must be understood by the PSAP. As an example, a citizen subscription approach only alerts those people that have signed up for the service. Since not all citizens will sign up, it cannot be relied upon for widespread notifications. As another example, the ALI database only includes landline telephone subscribers at a time when over 20% of the population relies on a wireless telephone only. Those citizens with only wireless would not get notification unless the PSAP also interfaces with the Wireless Emergency Alerts (WEA) service with the wireless carriers. PSAPs should establish a process for maintaining the contact information especially for the subscription based to ensure old data is purged. If the notification system includes on-site hardware and software, the PSAP should establish a service and maintenance contract for the system to ensure rapid response to system failures and routine, periodic preventive maintenance.

H. Clock Synchronization

PSAPs may install and maintain clock synchronization to ensure that all systems in the PSAP utilize the same time source. This equipment must be tied to a credible time source (such as the NIST Atomic Clock) and should have, at a minimum, the capability to provide a time feed to all servers, clients, consoles and other equipment in the PSAP. PSAPs should establish a service and maintenance contract for the clock synchronization equipment to ensure rapid response to system failures and routine, periodic preventive maintenance.

I. Security

All PSAPs must maintain the physical security of the PSAP and any other location housing PSAP equipment. The PSAP may use card keys, remote electronic locks, etc. to maintain security. Those entering the PSAP should be escorted. Service personnel routinely entering the PSAP to perform maintenance should be subject to the same level of background check as other PSAP personnel.

Cyber-security of technical systems within the PSAP must be maintained by all PSAPs. PSAPs should have a policy or SOP to establish how cyber-security will be maintained. This may include utilizing a separate network for PSAP systems (physically separate or virtual private network), prohibiting loading external software on PSAP equipment, or requiring external scanning of all devices (USB drives, DVDs, etc.) attached to PSAP equipment.

All PSAPs need to routinely patch software and upgrade hardware systems to keep old, identified security issues from becoming a problem. Software vendors routinely release patches and versions to address vulnerabilities that have been discovered. Additionally, vendors routinely retire support for particular hardware and software including operating systems. Failure to maintain currency can inadvertently make a PSAP vulnerable. Introducing a virus or security vulnerability into PSAP systems, even accidentally, can cause system performance issues, release of confidential information or system failure.

IV. Data Development, Maintenance & Support

A. Technical System Support

All PSAPs must have access to adequate technical support to maintain systems 24/7/365. Just as the function of the technical systems varies greatly, so do the appropriate models to support them. These models may include local government technical support availability, contracted technical support service or on-site, PSAP specific, support staff. PSAPs rely on these systems to accurately receive and process the calls service to the PSAP, so the support mechanisms must be put in place by the PSAP to ensure proper functioning of these systems.

B. Geographic Information

PSAPs must have access to and utilize accurate, current geographic data that reflects real-world conditions. PSAPs rely heavily on geographic information for determining the location of 9-1-1 callers and to assist responding units in dispatch. This data is utilized in the PSAP's mapping display system and/or Computer Aided Dispatch (CAD) system. As such, the data for these systems should be regularly updated in a timely manner.

In a Next Generation 9-1-1 environment, geographic data will be used to route 9-1-1 calls to the appropriate PSAP based on the location of the caller; therefore, accuracy of the data will become even more important. PSAPs, GIS professionals and other pertinent staff must begin preparation of GIS data for use in the NG9-1-1 environment. Project planning at the local level is necessary to make sure resources are in place to assure accurate mission critical data, which includes road centerlines, PSAP boundaries, and address points. Applicable data standards and best practices should be followed. Workflows must be established to ensure proper maintenance and utilization of the data, and that QA/QC methods are put in place and followed. Because the data for these systems often does not originate in the PSAP, other departments, such as Building or Planning and Zoning, may need to be involved in the process.

C. Call Routing and Delivery

All PSAPs must have a process for ensuring maintenance of the Automatic Number Information (ANI)/Automatic Location Information (ALI) and Master Street Address Guide (MSAG) databases. 9-1-1 calls originating from a landline phone are currently routed and delivered to the appropriate PSAP through the utilization of data in the ANI, ALI and MSAG databases. Calls placed to 9-1-1 through wireless devices are routed and delivered to a PSAP based on cellular tower sector routing databases. PSAPs must periodically work with 9-1-1 service providers to conduct test calls and validate the databases. SOPs detailing how to accomplish testing, error reporting and data correction or refinement must be developed and followed to ensure accurate routing and delivery of 9-1-1 calls.

D. Data Synchronization

All PSAPs should synchronize their GIS with MSAG and ALI databases. Having MSAG, ALI, and GIS datasets in agreement is crucial to providing telecommunicators the information they need to correctly verify the location of a caller and provide proper emergency response. NENA 71-501 states that GIS, MSAG and ALI data should have a match rate of at least 98% with one another, and that all of these datasets should be maintained in a manner so that the match rate is no lower than 98%.

V. Analysis & Planning

A. Call Accounting

Each PSAP must have in place a call accounting system. These systems collect data regarding call events and allow for analysis of the data. PSAP Managers should routinely run reports from these systems, at least monthly, to understand the performance of their PSAP and its personnel. Reports such as answer time, call transfer and call load reports can provide excellent insight into the work of the PSAP.

Additionally, these systems are used by the PSAPs to provide to the 9-1-1 Services Board total incoming 9-1-1 call count and total incoming wireless 9-1-1 call count. This information is needed to calculate the pro rata percentage of the 9-1-1 fund that each PSAP receives. It is a requirement of the Board that PSAPs provide supporting documentation from a call accounting system, verifying the numbers reported. As of 2017, the 9-1-1 Services Board is funding a state-wide call accounting system called ECATS. This system has been installed at each primary PSAP, and configurations are being finalized. Once those are complete, each PSAP will have access to the data and reports contained in the system. VITA staff and the Board will also have access to the data and reports. It is conditionally mandatory that PSAPs allow the installation of ECATS, meaning that they must participate as long as the Board funds the product and service.

B. 9-1-1 Data Analytics

Data analytics is a process of gathering and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making. In the Commonwealth, the implementation of ECATS at all primary PSAPs provides a single 9-1-1 call detail data collection and analysis tool. Both the PSAPs and VITA ISP staff will have access to these data and reports. The goals of the 9-1-1 Board regarding analysis of these data is to determine the current functional levels of the 9-1-1 system, to perform optimizations on the system and service where opportunities exist, and to help make sure implementation of NG9-1-1 does not adversely affect the 9-1-1 system or service. PSAPs will play an active role in the state-wide 9-1-1 data analytics effort, and should individually use the ECATS system to facilitate efficient operations of their PSAPs.

C. Planning

All PSAPs must continuously carry out the process of planning; thinking about and organizing the activities required to achieve a desired goal. Plans should relate to the following areas:

- Strategic Planning
- Budget Planning
- Staffing Planning

- Equipment Planning
- NG9-1-1 Transition Planning
- Disaster Recovery and Contingency Planning (CoOP)
- Any other plans deemed necessary by the PSAP governing body

All plans should be well-documented and readily available for review by all interested parties. Plans should be reviewed and updated annually or other periodic schedule adopted by the locality.

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