TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Revenue and Fiscal Affairs Office (RFA), the Commercial Mobile Radio Service (CMRS) Enhanced 9-1-1 (E9-1-1) Advisory Committee (Committee), and local E9-1-1 officials seek to collaboratively transform South Carolina's 9-1-1 system into a robust system that is capable of effectively supporting the growing needs of South Carolina residents and visitors. Such an effort involves the coordination and cooperation of multiple entities and stakeholders. The complexities involved in a project of this magnitude require active and sustained executive support. Before diving into the assessment and analysis of statutes and regulations in preparation of Next Generation 9-1-1 (NG9-1-1), it will be important for the State to assess its current role and assure that it has the authority and capability for statewide planning, coordination and implementation of an NG9-1-1 system.

A strategic plan is a path to get from the current legacy environment to a full NG9-1-1 system in South Carolina. An important aspect of planning for NG9-1-1 is keeping this plan current and relevant as the state moves through the transition, implementation and operation of NG9-1-1. Updating the South Carolina Strategic 9-1-1 Plan (Strategic Plan) will help to keep the 9-1-1 program, the State and participating entities on track and accountable to the objectives in the Strategic Plan. Once it is clear how the network will be implemented, the State will better know their needs for governance including, stakeholder involvement, feedback and role definition (9-1-1 authorities, service providers, equipment vendors, etc.); performance and implementation metrics; appropriate project and change management; coordinated development, distribution and application of best practices and operational policy as it relates to Statewide connectivity.

During the compilation of this Strategic Plan the State made it clear that the their level of involvement in NG9-1-1 system or model envisioned would be up to the 9-1-1 stakeholders across the State and that the Strategic Plan would be a plan for South Carolina by South Carolinians that maximizes cost efficiencies, considers economies of scale, and sets clearer lines of authority. Successful deployment of the South Carolina NG9-1-1 System requires interaction and partnership with a wide ranging community of stakeholders. Once the stakeholders come to an agreement on these specific issues, the Strategic Plan can be used to move forward toward NG9-1-1. During the data collection phase of this planning effort, 9-1-1 stakeholders were asked what the State's level of involvement should be at the six town hall meetings that were conducted across the State and on the surveys that were sent to the local jurisdictions. The survey results showed that a plurality (46 percent) of responding 9-1-1 stakeholders want to see the State manage NG9-1-1 implementation while 23 percent support local implementation and 20 percent support regional implementation. When it comes to what role the State should play in implementation, 66 percent of respondents prefer that the State provide the Emergency Services Internet Protocol Network (ESInet) and NG9-1-1 core services (including but not limited to the ESRP, ECRF, LVF, Policy Store, logging services etc.) while 17 percent preferred that the local public safety answering point (PSAP) provide everything and 11 percent prefer that the State provide the backbone only with no NG9-1-1 core services. In conducting stakeholder meetings across the state, the primary hurdle that was identified is the funding of or cost of establishing NG9-1-1 statewide.

The system or model envisioned by 9-1-1 professionals across this nation is one where networks, databases and applications are shared among all emergency responders and response agencies. It implicitly assumes that the State will take a more active role in the implementation, operation and maintenance of a Statewide NG9-1-1 ESInet, and that the State will aid in the coordination of resource sharing across counties and agencies. As a result, any funding method implemented needs to account for these assumptions and provide a sufficient rate and base to fund

the state's long-term needs. Both statewide and regional ESInets would allow and encourage the sharing of centralized applications and systems and would also support inter-network access to other databases, e.g., emergency operations center (EOC) hazardous material information

South Carolina's current E9-1-1 network was developed and implemented around wireline technology and was not designed to facilitate the transmission of text messages and data images such as pictures and video. Consumers are driving the telecommunications landscape and public safety answering points (PSAPs) need to be able to meet expectations and accommodate a wider range of communication methods. The public expects PSAPs to handle instant messaging, text messages, telematics (automatic crash notification) and live video feeds. The move to integrate these emerging technologies is gaining momentum as PSAPs have either replaced, or are in the process of replacing old technology with new equipment capable of managing present-day communications requirements. While the new PSAP equipment may be capable of receiving these new data sets, the network on which most are currently connected cannot support the transmission of the information.

As South Carolina PSAPs consider transitioning to an NG9-1-1 system and the associated ESInet, it's absolutely critical that the system be developed using open standards that interfaces between the PSAP, ESInet and the caller's device. Components of the National Emergency Number Association (NENA) NG9-1-1/ESInet are frequently referred to as the i3 Architecture that defines the ESInet model, functions, interfaces and required services. The i3 Architecture identifies the external interfaces between the PSAP and public access networks, the Internet and legacy wireless and wireline networks. It further describes the systems and databases that intelligently deliver the 9-1-1 call to the appropriate PSAP and supplies important data to assist the telecommunicator. In transitioning to NG9-1-1, South Carolina plans to be NENA i3 compliant.

While a single Statewide ESInet in South Carolina could serve all PSAPs within the State, the State understands the complexity of funding, procuring and maintaining a statewide system. South Carolina Statutes would most likely need to be amended to create a revenue stream to fund a Statewide ESInet. .The State maintains a wireless reimbursement program for PSAPs to get financial assistance in order to comply with statutory requirements. The reimbursement requirements create a hardship for many PSAPs. Many PSAPs in the State are not in the financial position to purchase the needed technology and then request reimbursement. It is likely that this hardship is the cause of the disparate number of reimbursement applications from all jurisdictions. Kimball supports South Carolina's goal to establish funding legislation that enacts one statewide fee for any device that can access 9-1-1. The legislation should be crafted to allow for future technologies and flexibility. It should allow the State to modify the fee (either up or down) if needed within a set range. The fee should be based on the cost of providing those 9-1-1 services the State has approved and distributed per a method other than the number of PSAPs within a county.

Currently, numerous jurisdictions throughout the State maintain geographic information system (GIS) location data at the local level. Local GIS data from numerous sources such as county, municipal or PSAP jurisdictions is typically stored in different formats. Aggregating this data for provisioning within emergency call routing function (ECRF) and location validation function (LVF) systems presents unique challenges for NG9-1-1 systems to properly function. The storage and handling of this data on a statewide level will require coordination with the local jurisdictions. In some cases, the local authority would have the systems in place to be compliant with the NENA standards and the State should utilize those resources when developing the state policies for how that data will be utilized.

As PSAPs migrate to new technology, system support is likely to change and will look to a NG9-1-1 system provider

(vender) to support the local operations for support of the newly deployed technology. The integration of new 9-1-1 call taking technology with the existing local systems could be problematic. In some cases where local information technology (IT) support is provided, there will be a need to support updated training on that technology and the integration of existing systems.

Today, the wireless 9-1-1 surcharges provides approximately $28,000,000. Of the wireless revenue, $29,500,000 was disbursed using distribution formula in place (distributions based on Wireless call volume and reimbursements). The remainder of the total cost (approximately $34,245,409.40) of providing 9-1-1 and dispatch services is made up at the local level through the use of general revenue funds, and local wireline surcharges. Based on the assumptions identified, the total cost of providing 9-1-1 and dispatch services in South Carolina is $62,704,305.45 annually.

The State sets nine goals in this Strategic Plan. The State will work with local stakeholders to decide how to meet each objective.

The balance of this page is intentionally left blank.

1. INTRODUCTION

1.1 Background

1.1.1 Revenue and Fiscal Affairs Office

The South Carolina Legislature established the Revenue and Fiscal Affairs Office (RFA) with Act 121 of 2014. Three entities under the Budget and Control Board were combined under the 2014 Restructuring Act to form RFA. These three entities were the Board of Economic Advisors (BEA), the Office of Research and Statistics (ORS), and the Office of State Budget (OSB). Currently, RFA consists of seven major sections including the Mapping and Census section which includes Wireless E9-1-1.

The Revenue and Fiscal Affairs Office manages the Wireless E9-1-1 Program under South Carolina Code of Laws Title 23 Chapter 47. The program provides assistance to 50 local jurisdictions' PSAPs, which include all 46 counties and the 4 municipalities of Clemson City, Goose Creek, Summerville and Hanahan. With the advice of the South Carolina Commercial Mobile Radio Service (SC CMRS) Advisory Committee, the office disburses funds and reimbursements to local 9-1-1 centers for costs related to wireless services. The Revenue and Fiscal Affairs Office also provides GIS services to the PSAPs by constructing, mapping, and correcting road centerline and address structure files used in the 911 system.

The Wireless E9-1-1 Program is currently staffed with two employees, an E9-1-1 Program Manager and an E9-1-1 Program Coordinator. In addition, the Program staffs a GIS Manager who will continue to play an important role moving forward with strategic planning and NG9-1-1.

1.1.2 Revenue and Fiscal Affairs Board

The Revenue and Fiscal Affairs Office is governed by the three appointed members of the Board of Economic Advisors (BEA). Under S.C. Code of Laws §11-9-820, membership on the BEA is comprised of: one member appointed by the Governor to serve as chairman, one member appointed by the chairman of the Senate Finance Committee, one member appointed by the chairman of the House Ways and Means Committee, and the Director of the Department of Revenue who serves ex officio with no voting rights. The BEA members have a working knowledge and experience in economics, revenue forecasting, and the state budget process.

1.1.3 South Carolina 9-1-1 Advisory Committee

The South Carolina 9-1-1 Advisory Committee was created to assist the board in the mission of implementing a wireless enhanced 9-1-1 system consistent with FCC Docket Number 94-102. A recent proviso charged the Executive Director of the Revenue and Fiscal Affairs Office with appointing an individual with technical or operational knowledge of E9-1-1 systems to the South Carolina 9-1-1 Advisory Committee, which formerly had an appointment of a director of a division of the State Budget and Control Board, ex officio. In addition to the members designated to serve on the advisory committee, the Executive Director of the Revenue and Fiscal Affairs Office may appoint a designee to serve on the advisory committee on his behalf. The committee, appointed by the Governor, consists of: the Director of the Office of Research and Statistics; two employees of CMRS providers licensed to do business in

the State; two 9-1-1 system employees; and one employee of a telephone (local exchange access facility) service supplier licensed to do business in the State; and one consumer. Local governments and related organizations such as the National Emergency Number Association may recommend PSAP Committee members, and industry representatives may recommend wireline and CMRS Committee members to the Governor.

The balance of this information is intentionally left blank.

2. SOUTH CAROLINA CURRENT 9-1-1 ENVIRONMENT

South Carolina's current Enhanced 9-1-1 (E9-1-1) network is comprised of multiple telephone company networks designed and installed more than 20 years ago, and remains largely unchanged today. Most PSAPs are directly connected to a telephone company central switch that routes calls to the appropriate PSAP.

The current E9-1-1 network was developed and implemented around wireline technology and was not designed to facilitate the transmission of text messages and data images such as pictures and video.

Consumers are driving the telecommunications landscape and PSAPs need to be able to meet expectations and accommodate a wider range of communication methods. The public expects PSAPs to handle instant messaging, text messages, telematics (automatic crash notification) and live video feeds. A communications shift is also occurring among the hearing and speech impaired community. Because of the telecommunication device for the deaf/teletype (TDD/TTY) equipment is nearly obsolete and not portable, the hearing and speech impaired community have embraced new technologies in their everyday lives, such as wireless phones and smart devices that bring portability and ease of use.

Many of South Carolina's 75 PSAPs do not support the latest applications; therefore there is a need to transition South Carolina's current E9-1-1 network to NG9-1-1 technology. The move to integrate these emerging technologies is gaining momentum as PSAPs have either replaced, or are in the process of replacing old technology with new equipment capable of managing present-day communications requirements. Additionally, the South Carolina Wireless E9-1-1 Program was developed in response to changing technology and is charged with avoiding duplicative or unnecessary technology. While the new PSAP equipment may be capable of receiving these new data sets, the network on which most are currently connected cannot support the transmission of the information.

While the current 9-1-1 system has served the State well for decades, consumers and new technologies are driving South Carolina's communications industries to rapidly move to an infrastructure that offers enhanced capabilities and increased capacity. NG9-1-1 would utilize an ESInet to easily interface with the communication methods available today and those communications methods of the future. NG9-1-1 involves the evolution of E9-1-1 to an all-Internet Protocol (IP)-based emergency communications system. The move to integrate these emerging technologies has gained momentum as PSAPs have either replaced, or are in the process of replacing old technology with new equipment capable of managing present-day communications requirements. While the new PSAP equipment may be capable of receiving new data sets, the network on which most are currently connected cannot support the transmission of the information.

Not only do consumers expect PSAPs to keep pace with new technologies, they also expect the same level of service in rural South Carolina that they receive in urban parts of the State. While South Carolina's urban areas tend to have greater resources, the State has been able to incrementally bridge the technology gap by establishing a reimbursement list and providing funding for all PSAPs. Some jurisdictions have explored and implemented ways of providing more efficient 9-1-1 service in order to improve procedural efficiency and technical capabilities of emergency call-taking, emergency call processing, and all emergency response communications. Charleston County completed a Countywide Emergency Communications Services Consolidated Feasibility Study and found that the current emergency call processing was inefficient, potentially detrimental, involving five PSAPs, one secondary PSAP, and four dispatch-only centers, and that 9-1-1 emergency calls frequently have built-in delays involving transfers to other centers. In 2008 Charleston County established the Charleston County Consolidated 9-1-1 Center

to provide improved police, fire and emergency medical service communications within the Consolidated Service Area. Greenville County is also implementing an i3 system deployment process for the jurisdictions within Greenville County.

The balance of this page is intentionally left blank.

3. NEXT GENERATION 9-1-1 ENVIRONMENT OPTIONS

3.1 Next Generation 9-1-1 Concepts and Options

The State recognizes that in many of South Carolina's PSAPs, the majority of 9-1-1 calls are made from wireless devices instead of traditional wireline telephones tethered to homes and businesses. Also, text messaging has become as common as voice dialing which puts additional pressure on PSAPs to be able to communicate with the 9-1-1 caller in new ways. Therefore, South Carolina's current E9-1-1 network is in need of an update.

To accommodate the technology changes, PSAPs will need to migrate to an NG9-1-1 system that can easily interface with the many different types of communication methods available today and the near future. Next Generation 9-1-1 is the evolution of E9-1-1 to an all-IP-based emergency communications system. The NG9-1-1 system is designed to recognize the device and the type of message (e.g. a voice call, text, photo or video) and route the emergency call in a timely manner to the correct PSAP. Voice calls (including voice over Internet protocol [VoIP]) text messages or data images will be delivered to the appropriate PSAP using an IP-based network known as an ESInet. The ESInet is a secure private IP network with enhanced call routing and a delivery function on the ESInet that is capable of re-routing calls to other PSAPs connected to the ESInet.

As South Carolina PSAPs consider transitioning to an NG9-1-1 system, it's absolutely critical that the system be developed using open standards that interfaces between the PSAP, ESInet and the caller's device. Components of the NENA NG9-1-1/ESInet are frequently referred to as the NENA i3 Architecture that defines the ESInet model, functions, interfaces and required services. The NENA i3 Architecture identifies the external interfaces between the PSAP and public access networks, the Internet and legacy wireless and wireline networks. It further describes the systems and databases that intelligently deliver the 9-1-1 call to the appropriate PSAP and supplies important data to assist the telecommunicator. The functional elements found on either a State-level or regional ESInet in South Carolina needs to consist of the following components:

- An Emergency Services Routing Proxy (ESRP) server properly routes emergency calls using location information and the desired service uniform resource name (URN), to the appropriate local ESInet based upon currently prevailing PSAP status.
- An ECRF converts location information (either civic address or geo-coordinates) to provide a uniform resource identifier (URI) that can be used to route an emergency call toward the appropriate PSAP for the callers location. In today's 9-1-1 system, location information is primarily a fixed address of a home or business stored in an automatic location information (ALI) database. The ECRF interacts closely with the ESRP function.
- A policy routing function (PRF) refers to the determination of the next hop to which a call is forwarded by an ESRP, which is based on the policy of the PSAP that would normally receive the call.
- A BCF provides a layer of security for all calls entering the ESInet. The BCF includes firewall applications to prevent malicious attacks on of the PSAPs connected to the ESInet.
- A location information server (LIS) and GIS enables the PSAP call taker to view locations (such as a street address) and geographic information on a map at their consoles.

As South Carolina's PSAPs plan for NG 9-1-1, it's critical that NENA's recommended i3 Network Architecture is closely followed to ensure interoperability with other ESInets. NENA recognizes that it is desirable to have a single

backbone that would eventually be interconnected with a national ESInet to optimize routing of calls between states.

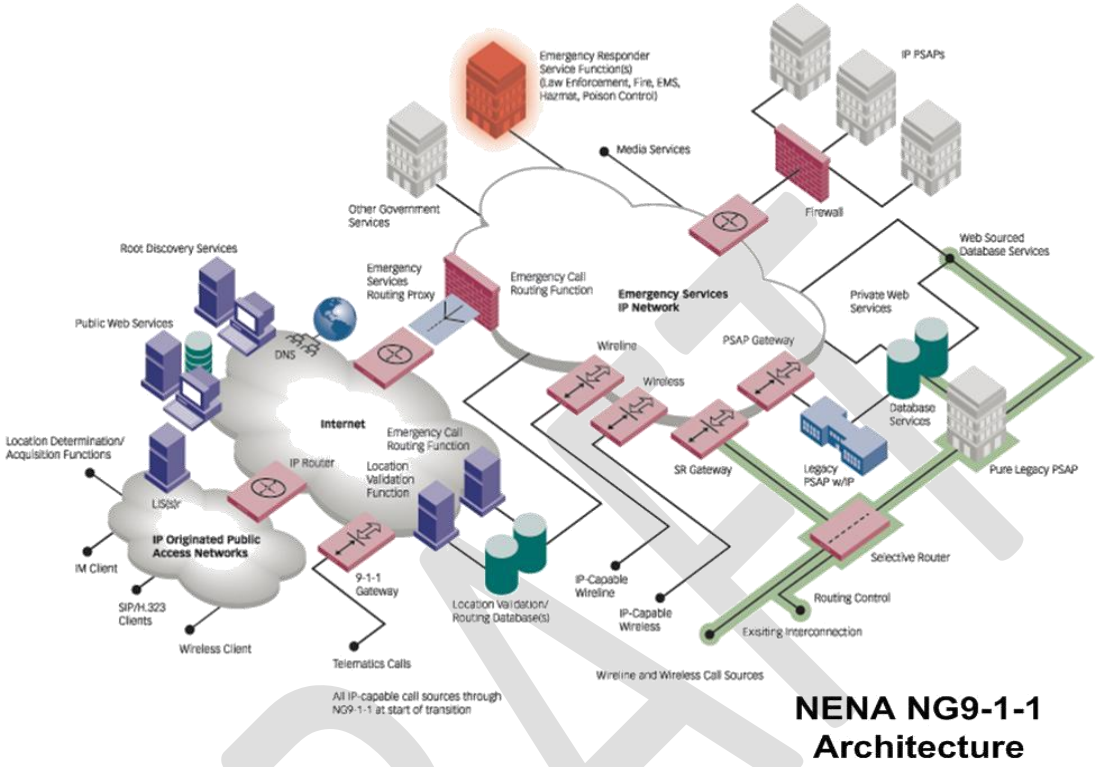


Figure 1—NENA NG9-1-1 Architecture

While a single Statewide ESInet in South Carolina could serve all PSAPs within the State, stakeholders throughout the State understand the complexity of funding, procuring and maintaining a statewide system. South Carolina Statutes would most likely need to be amended to create a revenue stream to fund a Statewide ESInet.

The State should provide leadership and assistance in planning for NG9-1-1 and eventually develop a request for proposal (RFP) for an ESInet regardless of whether a regional or Statewide ESInet is deployed. Later sections of this Strategic Plan introduce tasks and work products that need to be completed from initiation to implementation of NG9-1-1.

3.1.1 State-level Emergency Services Internet Protocol Network

A State-level ESInet would perform location-based emergency call routing using the location to service translation (LoST) protocol. All emergency calls ingress (enter) and egress (exit) the ESInet via secured BCF. The State-level ESInet is interoperable with and interconnects to regional ESInets, Federal ESInets and ESInets belonging to other states.

The drawing below is a general concept of a state-level ESInet environment where all PSAPs in South Carolina are

connected to a single network or a regional ESInet that will connect to all other PSAPs in the State.

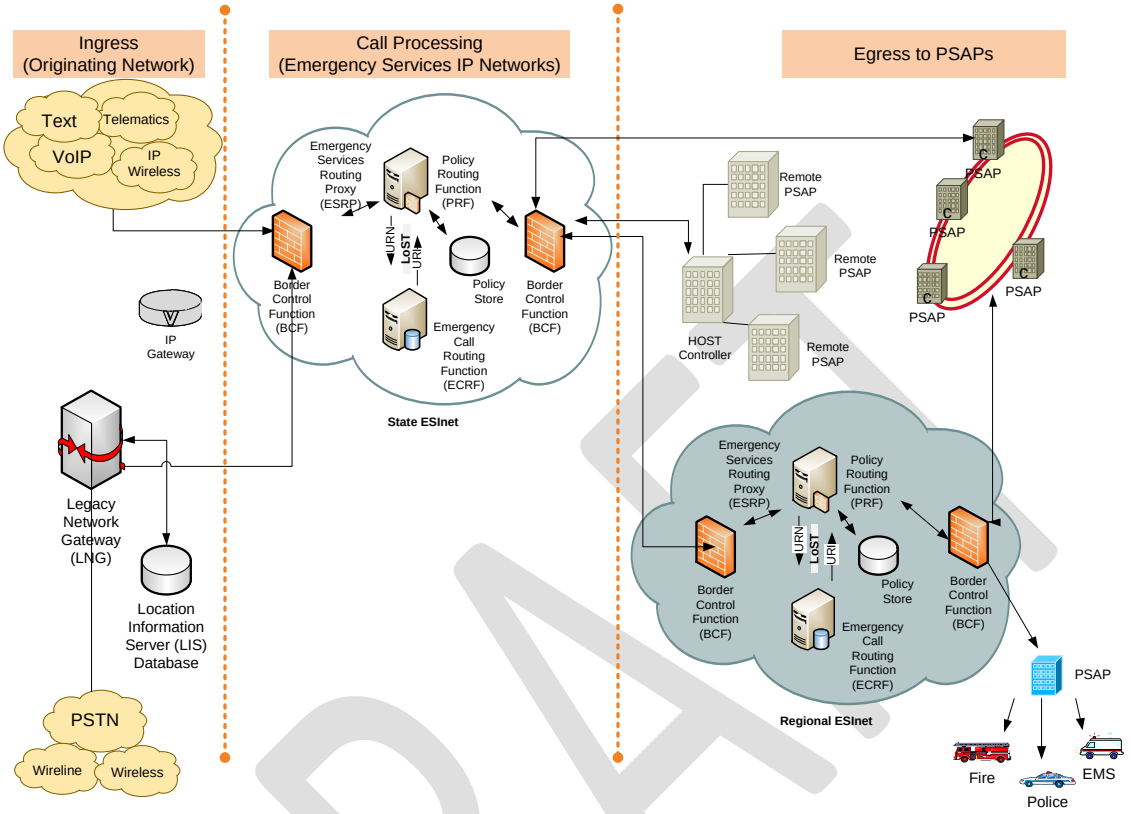


Figure 2—General Concept of a State-level ESInet with Regional ESInet and local PSAP connections

This network can be interconnected with neighboring state ESInets so that calls can be routed from border communities to the appropriate PSAP.

3.1.2 Regional Emergency Services Internet Protocol Network

Regional ESInet connectivity would be driven almost exclusively by the presence of carrier and vendor services in a given geographic area. Metropolitan PSAPs, PSAP networks and rural PSAPs will have different circuit and customer premise equipment (CPE) (Information Technology [IT]) that will impact how they interconnect to a Regional ESInet. A robust and 'diverse' IP connectivity is ***critical*** to maintain five-nines operational readiness and reliability.

The drawing below is a general concept of a regional ESInet environment where local PSAPs are interconnected to other PSAPs within the region.

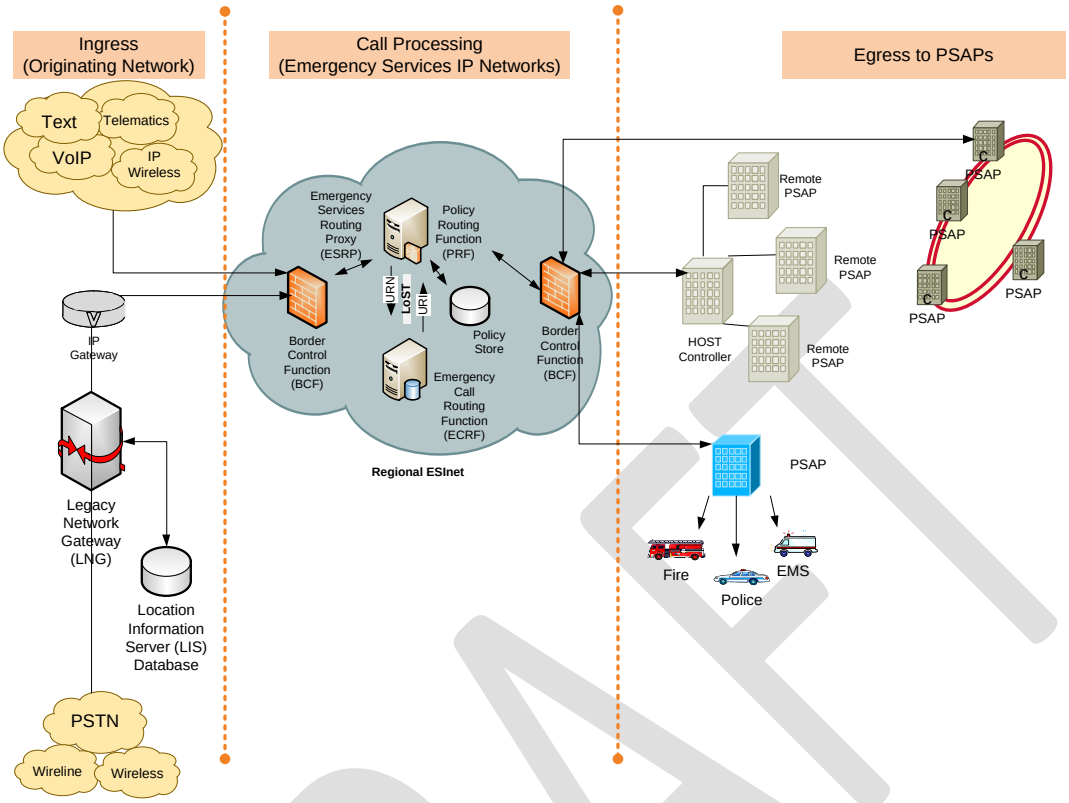


Figure 3—General Concept of a Regional ESInet Environment

3.1.3 Connecting Regional Emergency Services Internet Protocol Network

The drawing below shows an example of an ESInet interconnected to other regional ESInets within the state.

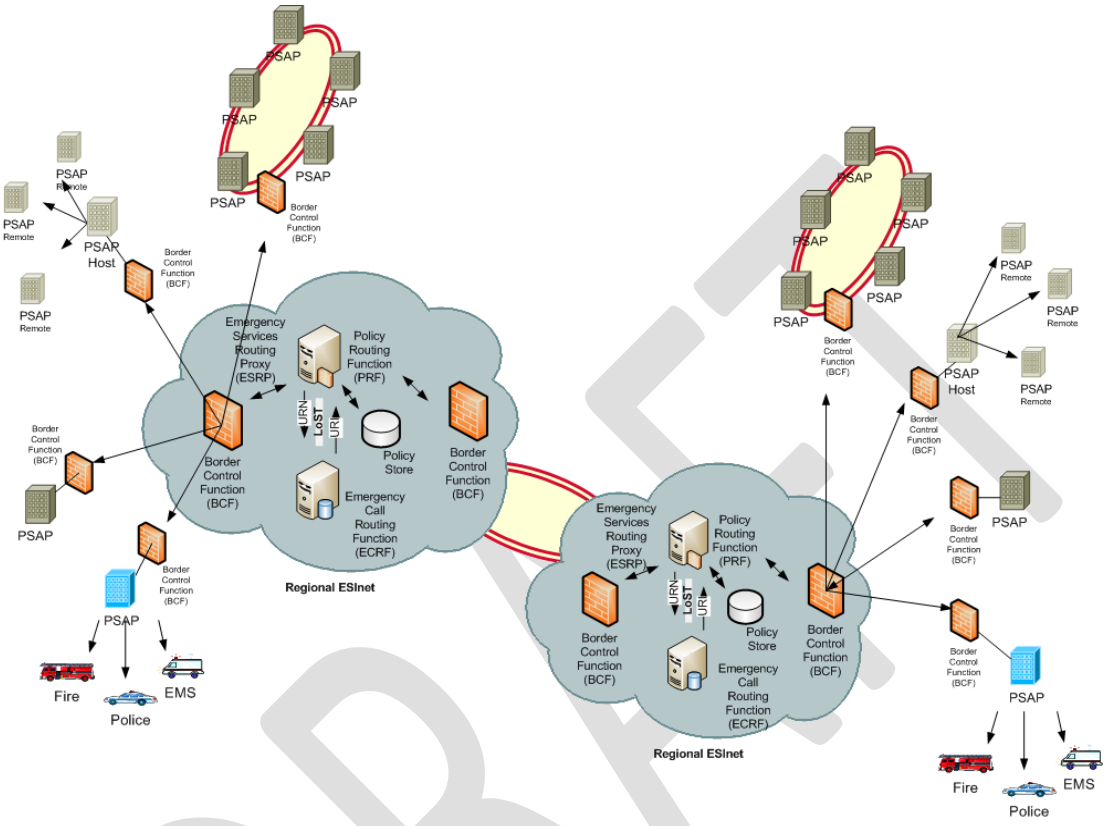


Figure 4—Example of an ESInet Interconnected to Other Regional ESInets within the State

Both statewide and regional ESInets would allow and encourage the sharing of centralized applications and systems and would also support inter-network access to other databases, e.g., EOC hazardous material information.

The ESInets would support interoperability among South Carolina's diverse geography and enable dissemination of emergency incident information to help expand mutual aid. These benefits could create cost efficiencies among all PSAPs connected to an ESInet.

3.2 State's Role in Next Generation 9-1-1 Implementation

During the compilation of this Strategic Plan the State made it clear that the their level of involvement in NG9-1-1 implementation would be up to the 9-1-1 stakeholders across the State and that the Strategic Plan would be a plan for South Carolina by South Carolinians. During the data collection phase of this planning effort, 9-1-1 stakeholders were asked what the State's level of involvement should be at both the six town hall meetings that were conducted across the State and on the surveys that were sent to the local jurisdictions.

The survey results showed that a plurality (46 percent) of survey respondents want to see the State manage NG9-1-1 implementation while 23 percent support local implementation and 20 percent support regional implementation. The remaining 11 percent chose other and suggested that the Association of Public-Safety Communications Officials (APCO) and NENA work with the State and locals to implement NG9-1-1, that all scenarios should be implemented so that ESInets are implemented at the local, state and regional levels so that PSAPs could decide what's best for them.

When it comes to what role the State should play in implementation, 66 percent of respondents prefer that the State provide the ESInet and NG9-1-1 core services while 17 percent preferred that the local PSAP provide everything and 11 percent prefer that the State provide the backbone only. One comment specified that the State should set up an ESInet and have it be optional and free for PSAPs to utilize it and allow for PSAPs to provide their own functional elements if they wish. The majority of respondents want to see the state provide funding, training and technical support.

At the Town Hall meetings stakeholders asked that the State:

- Provide Funding
  - Fund or provide equipment
  - Have the option to procure equipment and services on a State Contract
    - Have PSAP input using a Committee that decides on vendors that are qualified to provide service.
    - Give PSAPs the final say of vendor selection.
  - Provide smaller counties with services
  - Keep same distribution.
- Set Standards
  - Determine interoperability requirements for vendors
  - Educate PSAPs on standards
  - Enforce standards.
- Provide NG9-1-1 Implementation
  - Build statewide core and ESInet.
  - Build State managed backbone with local/regional control and governance committees
    - Smaller agencies partner with the regional hub agencies
    - Participate in the regional governance committee as an equal partner
  - Manage a phased NG9-1-1 implementation schedule
  - Provide implementation testing through stages.
- Establish State-level Governance and Coordination
  - Educate local officials
  - Facilitate interstate coordination and communication.
  - Determine State governance body with authority for decision making
    - Include More PSAP representatives along with State Staff and Service Providers
    - Include term limits
- Resolve Legislative issues
  - Highlight local control

- Establish enforcement of legislation
- Change legislation to address the necessary changes in the committee to support the implementation of NG9-1-1.

- Provide State-level GIS coordination.
  - State support/coordination for local GIS
  - Provide a statewide GIS database
- Provide 24/7 Technical expertise at the State
  - For design and implementation
- Not release unfunded mandates.
- Keep everything the same.
- Keep local control of call reporting to the state versus the State manages the collection of call data.
- Provide Training.
  - Establish a state training coordinator
  - Provide initial training and secondary training
  - Gather PSAP input on training requirements
  - Provide a seat on the training academy
  - Provide mandatory training for telecommunicators
  - Include Telecommunicators into the Law Enforcement retirement system

3.3 South Carolina Hurdles to Next Generation 9-1-1

Table one, below shows possible hurdles to NG9-1-1 implementation in the South Carolina. The data in the table is from the response to the survey and the Town Hall meetings across the State.

HURDLE	ISSUE			
Funding	Keep local jurisdictions whole		Develop a sustainable funding source	
Legislation	Modify existing legislation	Local elected officials support		Legislative support
Education	PSAP personnel	General Public	Elected officials	
Training	New technologies	Revised standards		
Technology	State contracts, technical support	Standards based	Local flexibility	Impact on local vendors
State data tracking	Local control on data collection	Utilize a statewide data retrieval system		
GIS	State/local involvement	Data sharing	Sustainable funding for mapping	

Table 1—Hurdles to NG 9-1-1

Currently 9-1-1 delivery across the state is provided from the local level. Each jurisdiction has the responsibility of providing the service the local constituents expect. Historically, there has always been some concern when the state wants to come in and get involved with setting the methodologies on how this service should be delivered. Most local

entities do not have the proper funding nor training programs to transition to NG9-1-1. There are some local entities that have begun to transition to NG9-1-1 technologies and should be allowed to continue on that path with little state oversight. In other cases, local jurisdictions will need much more support both financially and with technology from the State. This mix of communities should be involved with the final direction the State of South Carolina takes in implementing NG9-1-1.

In conducting stakeholder meetings across the state, the primary hurdle that was identified is the funding of or cost of establishing NG9-1-1 statewide.

From a technology perspective it was suggested in several discussions that where local technology is compliant with NENA i3 standards for NG9-1-1, it should be utilized regardless of the final state concept or design. This could provide an incentive for local acceptance and participation. The State could develop statewide contracts for the various technologies and allow the local jurisdictions to purchase the technology from the state contracts.

3.3.1 Allocation/Distribution of State and Local Funding for Equipment and Operations

3.3.1.1 Use of Surcharge Funds

The State is empowered by statute to oversee and approve the allowable uses of wireless surcharge revenues, which has been done. Title 23 - Law Enforcement and Public Safety Chapter 47 covers the allowable uses of surcharge revenues along with the compliance review process. It appears that, based upon the State's reviewing of PSAP reports; compliance with Chapter 47 continues to improve. However, some instances of non-compliance have been noted and the State's ability to enforce compliance is very limited. Absent statutory authority to enforce compliance, the State must continue to encourage voluntary compliance.

3.3.1.2 Surcharge Funding and Other Local Funding

Prior to changes enacted by the South Carolina Legislature in 1998, 9-1-1 surcharge revenues were assessed only on wireline circuits. Each local political subdivision established the fee and retained that fee for local 9-1-1 service. In 1998, the legislature established the CRMS wireless fee funding structure. That fee was managed by the state. There was an authorized reimbursement methodology established for that fund. In order to maintain the local 9-1-1 functions, the local entities uses the local wireline funds along with the wireless reimbursement program to support the local operations. The balance of these local operating costs are funded by local dollars diverted from other county and city revenue streams. With the changes implemented since 1998, the share of wireless 9-1-1 costs statewide covered by surcharge revenues has increased; but an effective, efficient and sustainable funding model needs to be established and implemented in order to move the State into the next generation of 9-1-1. In the long term, communities across the State and all 9-1-1 stakeholders will benefit from an open discussion to arrive at a consensus, if possible, on the appropriate share of 9-1-1 costs that should be covered by both wireline and wireless 9-1-1 surcharge revenues. The State should lead this discussion and, in addition, take the lead in developing a long-term strategy to achieve and maintain the appropriate balance of funding sources following NG9-1-1 implementation.

3.3.1.3 Sustainability of Funding

Many things relative to 9-1-1 has changed over the years – not the least of which was the cost of providing modern 9-1-1 dispatch services. Fortunately, during this time when the cost of providing 9-1-1 services was rapidly escalating, the use of wireless technology was exploding and, along with it, the revenues generated by the wireless 9-1-1 surcharge also increased. The extraordinary expansion in the use of cell phones had a dramatic impact on counties' and cities' ability to keep up with increasing 9-1-1 costs over the past years. While the utilization of the wireless surcharges has been a good stopgap measure, it appears doubtful that cities and counties can expect similar growth in 9-1-1 surcharge revenues over the next couple of decades.

It is uncertain if the future growth in wireline and wireless 9-1-1 surcharge revenues will keep pace with the cost of providing 9-1-1 services. There is no statutory mechanism to address inflationary increases in the cost to provide 9-1-1 services. The State will maintain focus on the future funding of 9-1-1 and will lead the discussion to identify opportunities to improve the sustainability of the wireline and wireless 9-1-1 surcharge revenues.

3.3.1.4 Wireless Surcharge Remittance Audits

Sustainable funding of 9-1-1 services is dependent upon wireless surcharge revenues collected by many service providers and retailers. Collecting and remitting the appropriate 9-1-1 surcharge revenues is required by State law. However, without periodically auditing the records of these private companies to determine if the appropriate amounts have been remitted to the South Carolina State Treasurer, there is limited assurance that accurate remittances are occurring. The State should coordinate with the Department of Revenue's audit program and the Consolidated Procurement Code, to verify the accuracy of proprietary information submitted to the Revenue and Fiscal Affairs Office by CMRS providers or PSAPs, or if new legislation is needed to establish audit authority.

3.3.1.5 Public Safety Answering Point Reimbursement

The State maintains a wireless reimbursement program for PSAPs to get financial assistance. The State is required by statute to "hold and distribute not more than fifty-eight and two-tenths percent of the total monthly revenues in the interest-bearing account solely for the purposes of complying with applicable requirements of FCC Docket Number 94-102."[1] In addition, the State is to "hold and distribute not more than thirty-nine and eight-tenths percent of the total monthly revenues in the interest-bearing account to PSAP administrators based on CMRS 911 call volume for expenses incurred for the answering, routing, and proper disposition of CMRS 911 calls."[2]

The goal is to provide financial assistance to PSAPs that need help in funding costs necessary to achieve or maintain compliance with the standards set out in Title 23 - Law Enforcement and Public Safety, Chapter 47 sections 23-47-30 (B). Money must be used to fund the purchase of property identified as allowable nonrecurring costs of establishing a 9-1-1 system. Any property acquired with reimbursement funds must be used for the direct benefit of the PSAP throughout the useful life of the property.

---

1 Title 23 - Law Enforcement and Public Safety, Chapter 47 (section 65 C (1) (b)
2 Title 23 - Law Enforcement and Public Safety, Chapter 47 (section 65 C (1) (a)

The reimbursement requirement creates a hardship for many PSAPs. Many PSAPs in the State are not in the financial position to purchase the needed technology and then request reimbursement. It is likely that this hardship is the cause of the disparate number of reimbursement applications from all jurisdictions.

3.3.2 Governance, Cost Allocation, Legal and Regulatory Considerations

The roles and responsibilities of 9-1-1 stakeholders from PSAPs to state government will likely evolve as NG9-1-1 matures. A governance entity will need to facilitate the definition of roles and responsibilities of local, regional and State government through stakeholder involvement. An appropriate governance structure should be established with the direct involvement of local PSAP participation. This will help to establish and maintain an effective and seamless deployment and operation of NG9-1-1, and provide guidance and accountability.

If, for whatever reason, the State is unable to cover all core NG9-1-1 costs from the 9-1-1 wireless fund, a fair share methodology of cost allocation should be proposed by the State. In the future, the same cost allocation methodology would be applicable to other emergency services sharing the ESInet. This methodology enables economies of scale that will provide parity of emergency services capabilities, interoperability, increased efficiency or cost savings within all aspects of emergency communications.

Legislative changes are necessary to support this Strategic Plan and should be continually be reviewed to assure laws allow for:

- Architecture and technology neutrality
- The delivery of new services by non-local exchange carrier (LEC) service providers or service providers with new technologies
- The extension of liability protection laws to current and future service providers
- The alignment of new service arrangements, costs and funding mechanisms with NG9-1-1

With the availability of more data associated with the 9-1-1 caller and his/her location, the confidentiality of personally identifiable information (PII) will have to be examined and protected. The State will facilitate and coordinate this effort with its stakeholders.

Currently, the South Carolina Public Service Commission (SC PSC) approves a wireline 9-1-1 Tariff that sets current legacy 9-1-1 network and database rates paid by the 9-1-1 service providers. It is unclear what role if any the SC PSC will play in the NG9-1-1 system.

3.3.3 Geographic Data (GIS) for the Next Generation 9-1-1 System

Currently, the South Carolina Geodetic Survey (SCGS) is another section within RFA and ensures the integrity of geodetic control throughout South Carolina so that land and land-related items can be accurately referenced to the national horizontal and vertical coordinate system. The SCGS accomplishes this by operating a statewide real-time global positioning system (GPS) network and upgrading county geodetic networks. The SCGS's county aerial orthophotography program began in 1986 was the catalyst for creating and maintaining an accurate, up-to-date, uniform statewide mapping system on a county-by-county basis.

While the NG9-1-1 program geospatial issues would be a new opportunity for the State, it will require the addition of

properly trained GIS staff to manage the influx of information that is received from the local jurisdictions and to manage the master database. In some cases, the local jurisdiction does not have the trained GIS personnel to develop, maintain or manage the GIS data and the State would need to develop a process with the SCGS to assure the information from that local jurisdiction was completed and made part of the state database. A primary function for this state GIS position(s) would have to include the coordination of local boundary issues or error reports, as well as issues faced with the contiguous states. By implementing this new opportunity, the State would need to establish a training program for local GIS personnel, when and how local data would be uploaded (pushed) to the state database. As new standards are developed for ECRF routing, the State should be in a position to migrate any revised standards to the local authority.

The current legacy 9-1-1 network uses customer telephone records and tabular databases listing street names, address ranges, etc. to determine which PSAP a 9-1-1 call should be routed to. The NG9-1-1 system will use dynamic GIS to make ECRF and LVF decisions. These decisions will promote the utilization of NG9-1-1 technology for locating and mapping calls in the NG9-1-1 system. Specific NENA standards for this data are being finalized. The adoption of these standards will ensure all NG9-1-1 GIS data will be compatible. The State, recognizing the potential challenges associated with creating this data, will make it the State's top priority. Not only will the NG9-1-1 system need this data, but statewide public safety GIS datasets will be of immense value to virtually all aspects of public safety in South Carolina as they do not exist today.

Currently, numerous jurisdictions throughout the State maintain GIS location data at the local level. Local GIS data from numerous sources such as county, municipal or PSAP jurisdictions is typically stored in different formats. Aggregating this data at a statewide level for provisioning within ECRF and LVF systems presents unique challenges for NG9-1-1 systems to properly function. The storage and handling of this data on a statewide level will require coordination with the local jurisdictions and additional GIS staff at the state. In some cases, the local authority would have the systems in place to be compliant with the NENA standards and the State should utilize those resources when developing the state policies and how that data will be utilized. The state should provide training to the local jurisdictions to assure compliance with NG9-1-1 approved standards as identified by the SC 911 Advisory Committee.

Preference should be given to the data developed at the local level, however the development and maintenance of the GIS layers critical to NG911 is not always possible at the local level. So, the same layers will need to be built and maintained at the state level. Furthermore, in order to assure proper accuracy and timely mapping updates for this latter group, procedures must be set in place in order to properly notify personnel at the state level of changes as they occur.

In addition to aggregating the base GIS data up to statewide layers, a methodology and process will need to be developed to assure the data is kept as current as possible. Numerous key stakeholders will be involved in the development of the maintenance process, including local city and county GIS and IT staff, and vendors that maintain local GIS data for numerous cities and counties in the State.

The aggregation and maintenance of this GIS dataset must provide for near real time updates of the geospatial data and is expected to facilitate the following:

- Update receipt and integration of geospatial data from each 9-1-1 entity's GIS
- Assure accurate updates by applying unique IDs to all GIS-related features and entities across

all layers and remove potential duplication of features across data sets
- Perform quality assurance on the data to meet accuracy standards
- Facilitate and coordinate resolution of conflicting geospatial datasets
- Execute timely export of the geospatial data on a permission basis
- Assure dynamic (real time) changes to routing geospatial data, and its export
- Make the processed, integrated data available for re-incorporation/upload to each of the NG911 entities at the local level to assure the most up to date data is continually available

Of primary concern from the stakeholders is the addition of aerial imagery to the GIS environment in order to properly support the update and maintenance of GIS features (e.g. road centerlines, structure address points, etc.). A methodology needs to be developed on how to secure funding for statewide aerial imagery that will meet the needs of NG 911 and be available to local jurisdictions. This sharing would allow authorized entities to access the aerial imagery for 911 and public safety purposes. Stakeholders should be involved in determining the technical specifications of the imagery.

3.3.4 Operations in a Next Generation 9-1-1 Environment

With the transition to NG9-1-1, PSAP personnel across South Carolina will undergo several changes in roles and responsibilities. One of the major changes the local PSAP will be facing is the receipt of 9-1-1 service request from many sources. That influx of information will dramatically impact the operation and management of the PSAP. Local staff will need to be prepared for that change in call delivery.

New technology will give way to new forms of communications that will be available to PSAP call-takers, dispatchers and management staff. While this technology is implemented to improve 9-1-1 service levels, PSAPs will need to be prepared for how to handle these new forms of calls coming into the PSAP such as text, video and telematics. These technology changes will be ever present in the years to come and training programs should be planned for across the State.

As PSAPs migrate to new technology, system support is likely to change and will look to the NG9-1-1 system provider to support the local operations for support of the newly deployed technology. The integration of new 9-1-1 call taking technology with the existing local systems could be problematic. In some cases where local IT support is provided, there will be a need to support updated training on that technology and the integration of existing systems.

Data sharing across the PSAPs will be increasing with the transition to NG9-1-1. This will be a new challenge for many PSAPs and will require updated training. The PSAPs may have to look at their staffing levels as a result of these changes. Operational standards and policies should be created or updated in response to the anticipated changes in PSAP operational models.

There are many operational management decisions that will need to be made as the State moves closer to the transition to NG9-1-1, such as when to accept text messages or deploy specific applications.

3.4 Potential Next Generation 9-1-1 Efficiencies and Costs Savings

With the decrease in wireline funding over the years, the states, counties and other jurisdictions have found it necessary to allot more of their general fund budgets to 9-1-1 and raise the wireline surcharge so that public safety level of service is not compromised. While legacy systems are housed, maintained and controlled in individual jurisdictions, NG 9-1-1 promotes the ability to provide shared services between jurisdictions, without the jurisdictions giving up their own identity, individuality or uniqueness. This can be accomplished through regionalization. Regionalization allows PSAPs to combine expenses for items such as 9-1-1 CPE, computer aided dispatch (CAD), mapping, NENA-defined core services and radio without giving up their own individuality. While governance of the systems must first be established, economies of scale are usually achieved. While regionalization may not provide a reduction in costs for the 9-1-1 CPE overall, economies of scale can be realized within the CAD, mapping, records management and radio arenas. This sharing of systems can have a savings overall. The State should consider a fund to promote regionalization.

Kimball strongly encourages the State to consider procuring certain key functionality at the State level. By procuring a network backbone and NG9-1-1 core functionality at the State level, Kimball believes that there is a potential for a reduction in cost of 9-1-1 across the State. The actual figures for cost savings are not available and further analysis will need to be performed in order to estimate what the future costs and savings might be. There are still important decisions that need to be made regarding what the State will provide to the regions/counties/PSAPs and how; however, having the State or local entity to establish regional ESInets and provide the network backbone and core functionality is the best way to monitor the funds expended on that effort. Further, having the State or region provide certain core functions and a backbone could provide savings to the counties and PSAPs because they will be able to connect to the network system and have access to these core services as opposed to purchasing the equipment and services themselves.

The balance of this page is intentionally left blank.

4. FUNDING ANALYSIS

4.1 Background

4.1.1 Funding Statutes and Administrative Rules

In 1998, the legislature established the CRMS wireless fee funding structure. That fee is managed by the state. There was an authorized reimbursement methodology established for that fund. In order to maintain the local 9-1-1 functions, the local entities uses the local wireline funds along with the wireless reimbursement program to support the local operations. The balance of these local operating costs are funded by local dollars diverted from other county and city revenue streams.

4.2 Methodology

4.2.1 Data Collection

Kimball provided an online Web based survey to all the existing 54 Jurisdictions within the State of South Carolina. This survey was to collect the last three years of PSAP income and expense for the purposes of calculating the current and trending costs of 9-1-1 within the state. Kimball requested the local 9-1-1 funding from the user fees and the general fund, as well as the expense for equipment, connectivity, training office expenditures as well as salaries, benefits and support costs. Kimball collected the last three years of data collection and disbursement for wireless funds from the State.

4.2.2 Data Analysis

Kimball understood that one hundred percent participation would not be realistic as usual participation runs in the 45 to 70 percent range. While there were 64 percent participation to the Jurisdiction Survey Questions, only 26 percent of the jurisdictions responded to the cost analysis section. Although the response was low on the cost analysis data, Kimball was able to compare the responses against experience with other state projects and found the State of South Carolina's responses to be similar. Kimball removed the two largest Jurisdictions from the analysis and averaged the costs for connectivity, office expense, training, salaries, benefits and support staff and applied these to the non-responsive jurisdictions.

4.2.3 Assumptions

With the low 26 percent response to the cost portion of the survey, Kimball relied on experience with funding from other states to compare the South Carolina survey responses and found them to be similar. Kimball has to assume that there are no large abnormalities in the funding and expense streams for those jurisdictions that did not respond.

There are many costs associated with transition from a legacy 9-1-1 system to a NG9-1-1 system. During the initial transition phase from the legacy system to the NG9-1-1 system, there will be a period during which it will be necessary to pay current legacy system costs, while also paying for the NG9-1-1 system. It is difficult to estimate the length of time necessary to maintain the two systems simultaneously as there are many factors that contribute to this

timeframe. The transition period will need to be tightly managed to minimize the time the two systems would operate in parallel, thereby minimizing transition costs. A detailed analysis and timeline of the NG9-1-1 transition will need to be conducted in order to more accurately predict costs.

Another consideration is the cost of public education and outreach needed for the transition to NG9-1-1. It will be necessary to educate the public on new services available as a result of NG9-1-1 and on the appropriate use of these services. Public education campaigns can be as basic as creating an informational brochure or as extensive as creating and airing public service messages. The costs associated with these efforts vary widely. The State will need to determine the level of outreach and factor the associated costs into its NG9-1-1 transition plan.

Outreach to stakeholders, PSAPs and other entities will be necessary during the NG9-1-1 planning and transition phases. The State will need to coordinate an effort, possibly through focus group meetings, to address the following:

- System participation
- Interconnection to other entities
- Governance planning
- Other regional needs based on the new system

In the transition to NG9-1-1, PSAP telecommunicators may be faced with changing job responsibilities. Training will be needed on new data, new protocols, equipment and other media that expand traditional functions within the PSAP. Consistent training standards and implementation will require planning and uniform implementation statewide.

There will be administrative costs involved with planning and implementing the transition to NG9-1-1. For example, scoring, awarding and negotiating an RFP for the procurement of system components will require extensive time and effort. It will be necessary to study call volume statistics to plan for future needs. In addition, managing the actual transition will be a time consuming task, the State may need to have a resource dedicated to managing the transition process. Finally, there will be future costs that are unforeseen at this time, but must be taken into consideration.

4.3 Current Funding Provisions

4.3.1 Current Fund Distribution Inefficiencies

The 2014 Wireless 9-1-1 surcharge provided $28,458,896.05 to fund wireless 9-1-1 service throughout the State. Of the 2014 total wireless revenue, and in accordance with Chapter 47 Section 23-47-65, $11,290,069.51 was distributed to PSAPs based on CMRS 9-1-1 call volume, $14,283,699.93 was distributed to PSAPs for upgrading, acquiring, maintaining, programming and installing necessary data, hardware and software and $4,040,926.28 was remitted to the CMRS providers licensed to do business in this State for the purposes of connection and compliance with FCC requirements. The remainder of the total cost (approximately $34,245,409.40) of providing 9-1-1 and dispatch services is made up at the local level through the use of general revenue funds, and local wireline surcharges. Based on the assumptions identified in section 4.2.3, the total cost of providing 9-1-1 and dispatch services in South Carolina in 2014 was $62,704,305.45.

Furthermore, users of new technologies may not be required by statute to pay the 9-1-1 fees, even though they are able to access the 9-1-1 system. This means that wireline and wireless carriers, their users, and local government

are left to subsidize 9-1-1 system access for providers and users of new technologies.

The survey shows that many jurisdictions show a deficiency in funds, yet, analysis of the data shows there are some jurisdictions where surpluses are being maintained. The State is to hold and distribute not more than thirty-nine and eight-tenths percent of the total monthly revenues in the interest-bearing account to PSAP administrators based on CMRS 9-1-1 call volume for expenses incurred for the answering, routing, and proper disposition of CMRS 9-1-1 calls. Title 23 - Law Enforcement and Public Safety Chapter 47 covers the allowable uses of surcharge revenues along with the compliance review process. Absent statutory authority to enforce compliance; the State must continue to monitor financial reports for non-compliance and encourage voluntary compliance.

Figure 5 on the following page shows the breakdown of expenses among the survey respondents.

The balance of this page is intentionally left blank.

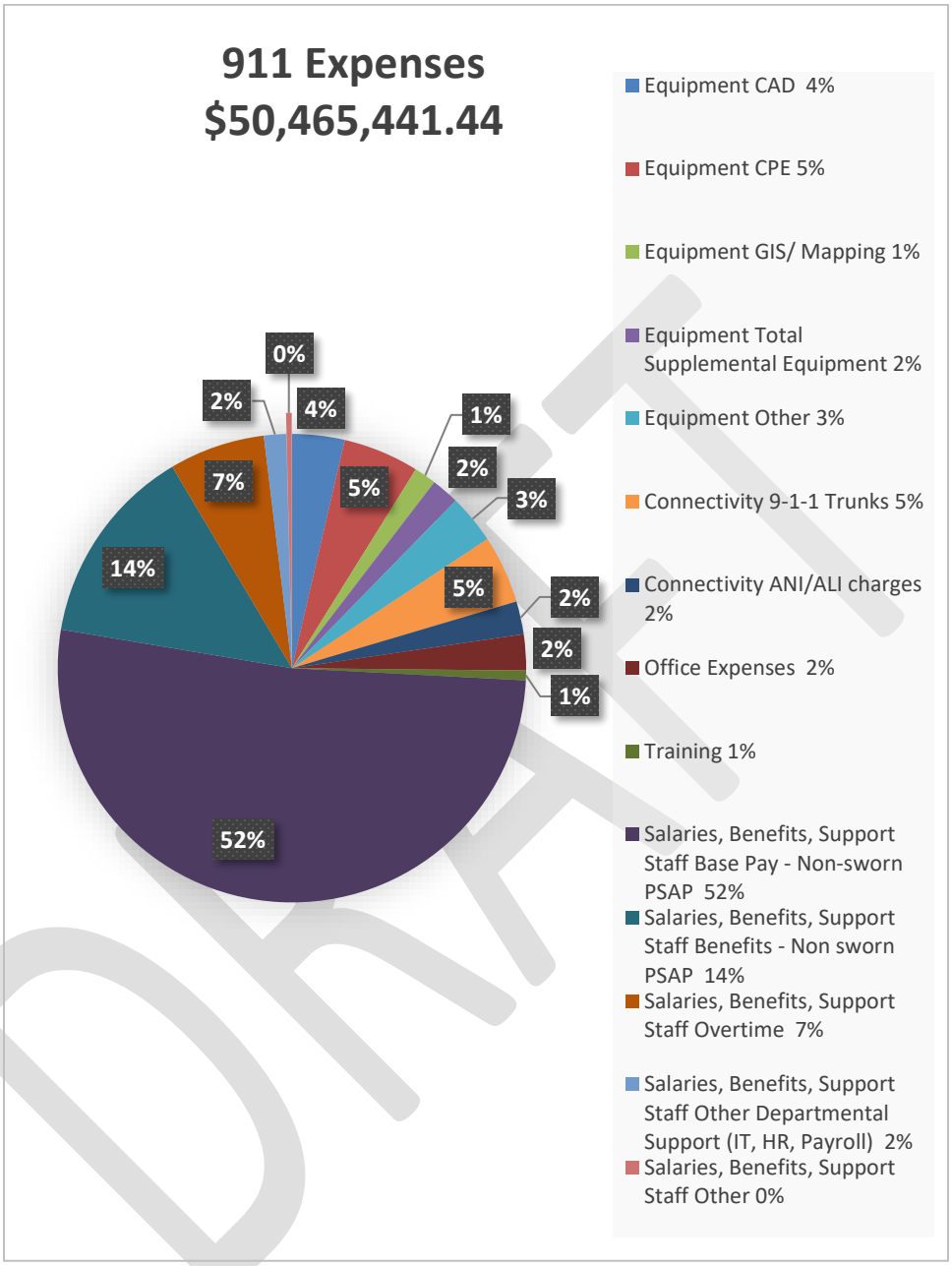


Figure 5—Survey Expense Breakdown

The chart below shows the calculated expense breakdown for the South Carolina Jurisdictions.

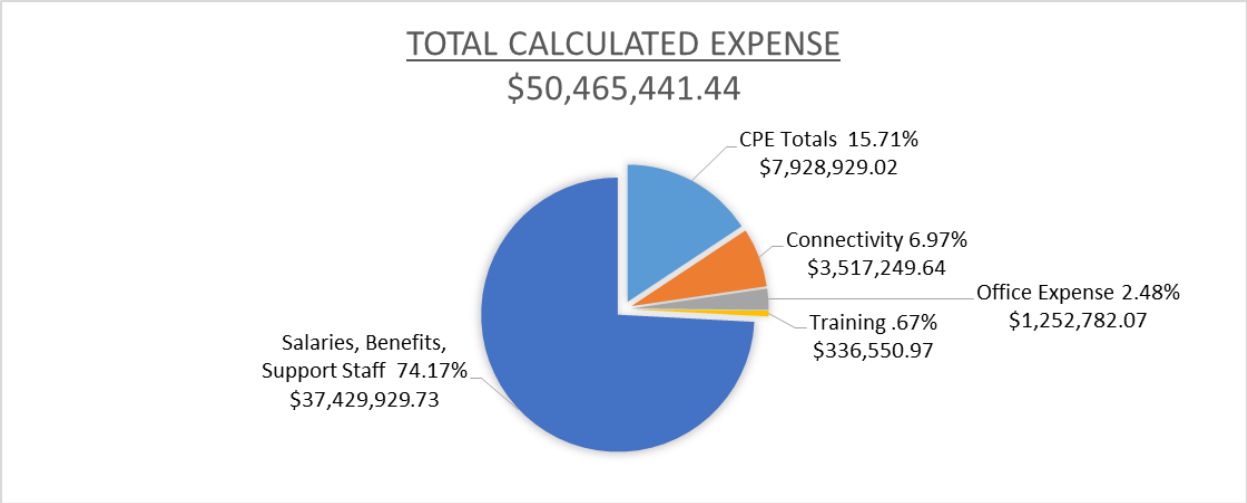


Figure 6—Total PSAP Calculated Expense

The following is the calculated funding division within the state:

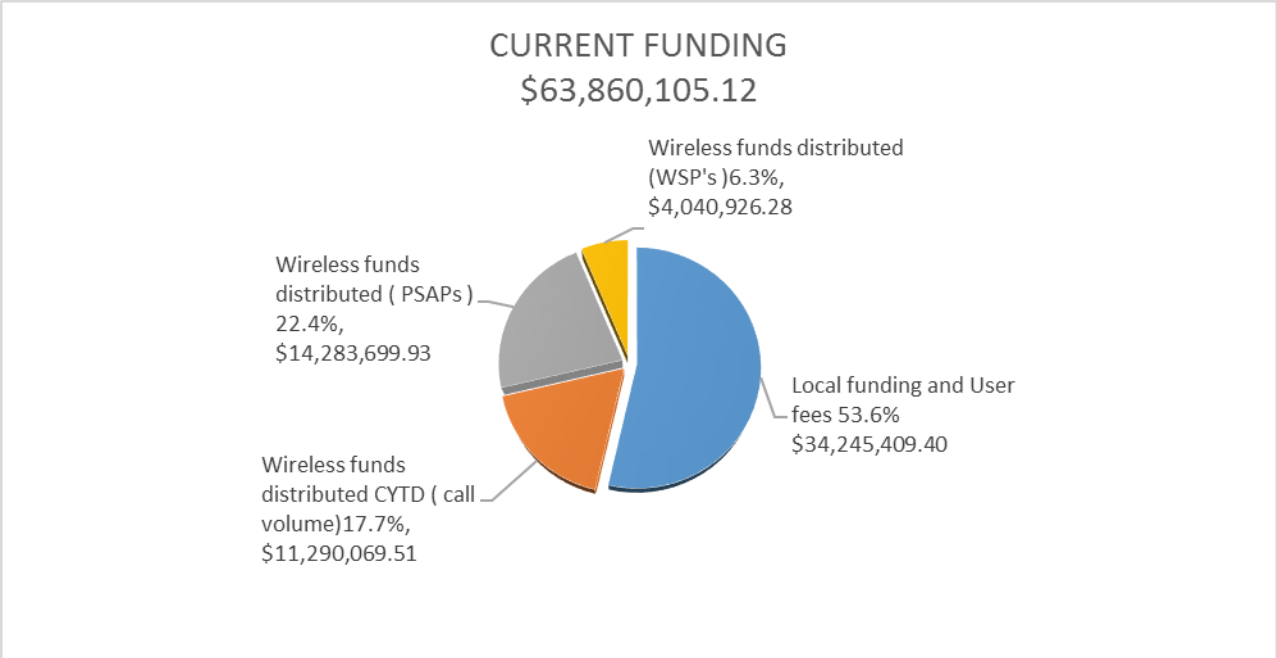


Figure 7—Current Funding

The chart below shows the local funding (including user fees) against the wireless funding.

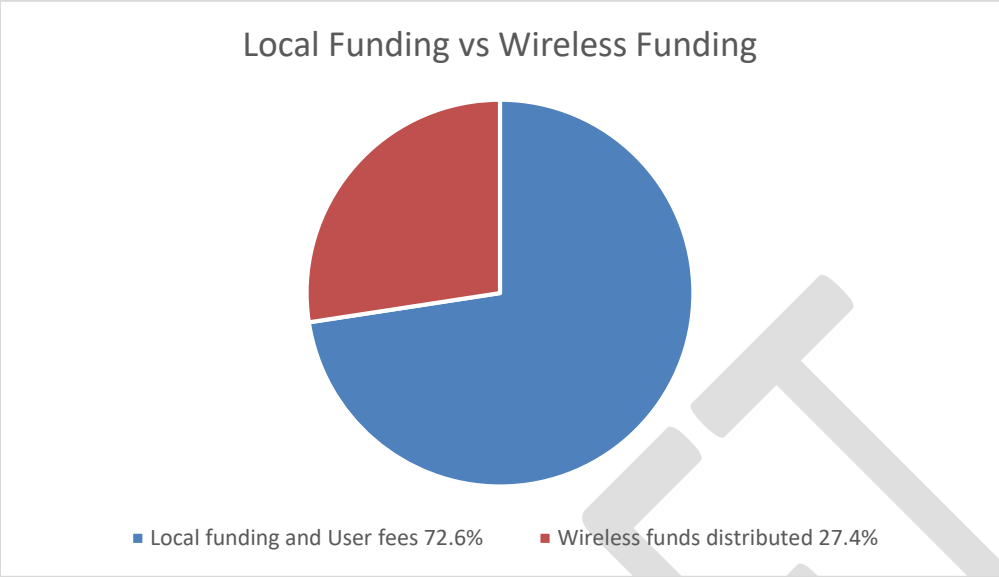


Figure 8—Local versus Wireless Funding

4.3.2 Considerations for Funding Next Generation 9-1-1

The limitations of the existing revenue model drive the need for a new funding model, as does the NG9-1-1 technology. According to the E9-1-1 Institute, "…the way we do business in the 9-1-1 community nationwide is changing rapidly. Currently, in the vast majority of our 9-1-1 centers, we attempt to respond to today's requests for service using yesterday's technology. The new technology associated with Next Generation 9-1-1 cannot be implemented piecemeal and on an 'as a local government can afford it' basis. We must have a plan and funding in place to implement Next Generation 9-1-1. Our neighbors in the next county…must have the same technology and ability to process 9-1-1 calls and data on the same level if we are to be successful…."[3]

The public's expectation is that 9-1-1 service is all encompassing, seamless, transparent, and universal for all technologies and devices that are capable of accessing 9-1-1. To meet that expectation, the State needs to upgrade the current E9-1-1 networks to a Statewide NG9-1-1 Network so PSAPs and response agencies can respond to a 9-1-1 communication anytime, anywhere and from any device.

The system or model envisioned by 9-1-1 professionals across the State of South Carolina as well as nationwide is one where networks, databases and applications are shared among all emergency responders and response agencies. It implicitly assumes that the State will take a more active role in the implementation, operation and maintenance of a Statewide NG9-1-1 ESInet, and that the State will aid in the coordination of resource sharing across counties and agencies. As a result, any funding method implemented needs to account for these

[3] E9-1-1 Institute IP Issues Committee, Business Operation Subcommittee document. http://www.e911institute.org/ipssuescommittee/Papers/IP%20Operations%20Subcommittee%20Final%20Report%20v3.pdf

assumptions and provide a sufficient rate and base to fund the state's long-term needs.

The model assumes that emergency response will remain a local response. That is, while telecommunications is becoming increasingly borderless, E9-1-1 service and emergency response will always be a local response. It does not matter what the funding source is, as long as the full costs of providing service are adequately funded in the long-run. If something goes wrong with a 9-1-1 call or response, local authorities will still be held accountable to the public. Any funding paradigm implemented in South Carolina needs to account for this fact.

This funding model implicitly assumes that broadband access providers will become one entity responsible for determining the location of 9-1-1 calls. In this scenario, funding moves from the calling network to the access network. Regardless of application, the surcharge in this model would capture all devices and points that are or will be capable of accessing E9-1-1 services. As new carriers enter the IP telephony market, surcharges on calling services become more and more limiting and obsolete. By applying the E9-1-1 excise tax on access points, this problem is eliminated. A final reason for this revenue model is that more and more IP telephony services are being provided by international companies over which state and local governments have no control. The access market, however, is always local. In fact, the only limitation to this funding model is that it is new and relatively unfamiliar. NENA expects this model to be cost-neutral to consumers.[4]

It is important to note, that while Kimball agrees the approach above has been discussed at the national level for several years, it is not yet ready to be implemented. This approach should be kept in mind as a long term goal and not as an immediate solution.

Other areas in the country have attempted to implement alternative funding methods similar to the access point model described above. In Tennessee, the Emergency Communications Board attempted to implement a 9-1-1 fee on electric bills; however because of very strong opposition from the electric utility companies, the idea was abandoned. One county in Kentucky has begun to impose a 9-1-1 fee on water utility bills. However, a city within the county boundary intends to file a lawsuit to challenge the new fee and its implementation. Another Kentucky county, which is a part of the Cincinnati Ohio metropolitan area, has imposed a 9-1-1 service fee on parcels of real estate, after a failed attempt to impose a fee on resident's electric bills. The real estate fee is also being challenged in court by a city within the county boundary and there is a legal precedent for the fee to be ruled an unconstitutional tax. At this time, the states that have updated their funding methods to prepare for NG9-1-1 have done so within the traditional methods of placing a service fee on the communications device that contacts 9-1-1. For example, several years ago Alabama reworked its funding structure, which had previously been a combination of wireline fees collected locally and wireless fees collected at the state level, to a statewide 9-1-1 charge that is assessed on all voice communications and remitted to the state. In addition, the new legislation created a 9-1-1 board that will have authority for 9-1-1 within the state. The new statewide charge will be calculated by the new 9-1-1 board to produce revenue for the districts equal to the amount collected previously by each district.

Appendix B contains the NENA Chart on 9-1-1 surcharge fees collected by state. This provides a high level view of the range of surcharge being collected throughout the nation. The states surrounding South Carolina collect a range

[4] NENA Next Generation Partner Program, Funding 9-1-1 into the Next Generation: An Overview of NG9-1-1 Funding Model Options for Consideration. March 2007, page 6-7.

of fees to fund 9-1-1. North Carolina imposes a $.60 fee on all wireline, wireless and VoIP and 2 percent of sales on prepaid. Georgia collects $1.50 on wireline, $1.00 -$1.50 on wireless, $1.50 on VoIP and $.75 on prepaid wireless devices to fund 9-1-1. West Virginia charges one of the highest fees ranging from $.98 - $6.40 on wireline and VoIP, 6 percent on wireless prepaid and a flat $3.00 for wireless.
Kimball recommends that South Carolina continue to monitor those areas that have attempted an alternate funding mechanism for future consideration while updating the funding mechanism in South Carolina to collect a fee on all devices that access 9-1-1.

Kimball recommends that in order to provide the most adequate long-term funding source for 9-1-1 into the future, funding mechanisms should meet the following criteria:

- The funding method should be technology, vendor and competitively neutral, so it does not give competitive advantages to one telecommunications, broadband or data provider at the expense of other providers.
- The funds collected should be used only for their intended purposes and should not be re-allocated at the state or local level for non-9-1-1 purposes.
- The funding method should be easy to understand and administer.
- The funding method should be fair and equitable to all individuals and devices capable of accessing the current and future 9-1-1 network.
- The funding method should be stable, and therefore not require frequent legislative adjustments.

4.3.3 Kimball Recommended Distribution Model

South Carolina should begin to look at all emergency communications as a whole in order to improve communications, interoperability, and information sharing between public safety agencies statewide. South Carolina should consider coordinating 9-1-1 with other public safety departments at the state level in order to allow a unified approach and long term planning.

Kimball recommends that South Carolina establish funding legislation that enacts one statewide fee for any device that can access 9-1-1. The legislation should be crafted to allow for future technologies and flexibility. It should allow the State to modify the fee (either up or down) if needed within a set range. The fee should be based on the cost of providing those 9-1-1 services the State has approved and distributed per a method other than the number of PSAPs within a county. Kimball recommends the South Carolina's RFA amend legislation to require all jurisdictions to report each year on the cost of providing 9-1-1 service and review the reports to determine if the fee requires modification.

In addition to a fee on devices that access the 9-1-1 network, the State should ensure statutes, regulations and tariffs enable system components to be shared among the agencies and that there is a mechanism for these agencies and entities to share the costs.

The funds from the statewide fee would be collected at the state level and remain in a dedicated account that allows any interest accrued to remain in the dedicated account. Kimball recommends that staff will be needed to support the work of the 9-1-1 Coordinator. For purposes of this report, Kimball refers to the 9-1-1 Coordinator and staff as the South Carolina 9-1-1 Coordinating Entity. The South Carolina 9-1-1 Coordinating Entity should create distribution rules to specify what expenditures would be allowable expenses for money distributed to the jurisdictions.

Kimball recommends that in order to facilitate the transition to an NG9-1-1 network the funds cover limited expenses initially and are then revisited after the state is operating on the new network. Initially the funds should be distributed for:

- Costs to cover auditing expenses for the Department of Revenue.
- A percentage for the carriers to retain to cover the costs of collecting and remitting the fee.
- An amount to fund administrative and staffing costs for the Board.
- The RFA should pay the costs to build, maintain and operate the IP network and the PSAP connections to the IP network directly. This will allow the State to obtain better pricing for the network and to ensure a unified approach to deployment of the network.
- The State should establish a Capital Expenditures account for future network upgrades and expenses.
- The State should create a PSAP consolidation incentive account.
- The remaining funds should be allocated to the counties for distribution to the PSAPs that meet the technical and operational standards established by the State.

Kimball recommends the State establish a training committee to determine the minimum statewide training standards for South Carolina telecommunicators. Once the training standards have been established the State would determine how best to allocate and distribute funding to pay for the training.

Kimball recommends that the State fund the State-level ESInet andNG9-1-1 core services while the local PSAP funds be used for interconnecting to the State-level ESInet and other 9-1-1 related expenses, such as:

- Local 9-1-1 network
- 9-1-1 equipment and equipment maintenance
- GIS and GIS maintenance
- Telecommunicator training and certification
- Emergency back-up equipment

The State might consider allowing additional PSAP expenditures to some areas as part of a consolidation incentive. For example, furniture/work station expenses or a percentage of personnel expenses.

Once the NG9-1-1 network is in place and operational for at least a year; Kimball recommends the State do a distribution study to revisit the distribution of funds; based at least partly on total 9-1-1 call volume. This can't be done until the new network is in place and call statistics are being tracked consistently in the same manner across the state.

Kimball recommends that audits on service provider fee remittances be conducted annually to ensure accuracy and compliance with legislative intent.

The balance of this page is intentionally left blank.

5. UPDATING THE STRATEGIC PLAN

An important aspect of planning for NG9-1-1 is keeping the Strategic Plan current and relevant as the state moves through the transition, implementation and operation of NG9-1-1. Updating the Strategic Plan will help to keep the 9-1-1 program, State, and participating entities on track and accountable to the objectives in the Strategic Plan. On an annual basis, South Carolina will assess the status of progress on the objectives and update the goals and objectives within the Strategic Plan. This annual review can be administered by the 9-1-1 Program Coordinator who should assess the status of the progress on the objectives and update the goals and objectives within the Strategic Plan. However, if during an annual review there is a situation where it is appropriate to revise, add or subtract goals and objectives, these types of changes must be approved by the State. Performing these types of reviews annually will allow flexibility in NG9-1-1 planning as regulations and technology changes.

Statewide 9-1-1 planning is a detailed, dynamic process that will take several years to complete its transition and must be maintained once in place. As a result, the State Strategic Plan should be a dynamic, up to date document that will require review and possible updates on a regular basis. These updates will help to keep the State and participating entities accountable to the objectives in the Strategic Plan. Regular updates will keep the PSAPs throughout the State up to date on the status of the network and other initiatives. During Strategic Plan reviews, the State and participating entities will need to assess the status of progress on the Strategic Plan objectives. Goals and objectives within the Strategic Plan may need to be updated at that time, or at a set time determined by the State.

Official updates to the Strategic Plan will be made once per year in the month of June and an official version will be released shortly thereafter. Revisions and updates will be tracked throughout the year, but the official Strategic Plan update will be made in June with the approval of the State. This yearly review will assure that the Strategic Plan remains relevant but prevents constant changes to the Strategic Plan which may become unmanageable to the responsible party. This review schedule will allow flexibility in NG9-1-1 planning and maintenance as regulations and technology changes.

The balance of this page is intentionally left blank.

6. MECHANISM(S) FOR OVERSEEING AND MANAGING THE SOUTH CAROLINA NEXT GENERATION 9-1-1 SYSTEM

As South Carolina moves through the procurement process for NG9-1-1 components, more detail should be added to this section of the Strategic Plan. Once it is clear how the network will be implemented, the State will know better their needs for stakeholder involvement, feedback, and role definition (9-1-1 authorities, service providers, equipment vendors, etc.); performance and implementation metrics; appropriate project and change management; coordinated development, distribution and application of best practices and operational policy as it relates to Statewide connectivity. Policies and procedures are often based upon institutional relationships in a state, along with related roles and responsibilities.

The 9-1-1 Coordinator, employed by the State, provides local governments in South Carolina with assistance interpreting the 9-1-1 laws and administrative rules in their area and by addressing statewide issues common to all 9-1-1 centers and providing information and guidance needed by local jurisdictions to make their endeavor successful. The State provides guidance to local governments on a wide variety of topics. This mechanism will continue to be used for the NG-9-1-1 migration, the implementation of a redundant IP network backbone, and the migration of existing E9-1-1 circuits and PSAPs onto it.

The State will have responsibility for the basic mechanism for overseeing and managing the state's 9-1-1 system with the following responsibilities:

- Coordinating the development and implementation of the state 9-1-1 Strategic Plan
- Providing a single point of accountability for statewide 9-1-1 issues related to the Strategic Plan
- Updating the Strategic Plan annually
- Coordinating 9-1-1 implementation activities Statewide
- Providing a clearing house for information about State, local and national 9-1-1 issues
- Gathering and disseminating information on how the Strategic Plan's initiatives are progressing
- Being the liaison between local and regional 9-1-1 stakeholders and the State, as well as Federal agencies

The balance of this page is intentionally left blank.

7. INITIATING AN IMPLEMENTATION PLAN

7.1 Initiation Phase

7.1.1 Overview

This Statewide NG9-1-1 Strategic Plan commences the Initiation Phase of the South Carolina's NG9-1-1 implementation project. The Initiation Phase is comprised of tasks that will be the first steps in the transition to a NG9-1-1 environment.

7.1.2 Tasks

The description of each task is a detailed explanation of the importance of the task. Expected outcomes and dependencies are identified at the end of the section.

7.1.2.1 Statutory and Regulatory Environment

7.1.2.1.1 Obtain Executive Sponsorship

The State should actively seek and maintain executive sponsorship and support. The South Carolina NG9-1-1 Initiative seeks to collaboratively transform South Carolina's 9-1-1 system into a NG9-1-1 system that is capable of effectively supporting the growing needs of South Carolina residents and visitors. Such an effort involves the coordination and cooperation of multiple entities and stakeholders. The complexities involved in a project of this magnitude require active and sustained executive support.

7.1.2.1.2 Align role of South Carolina Revenue and Fiscal Affairs Office with Responsibilities and Requirements Unique to Next Generation 9-1-1

Before diving into the assessment and analysis of statutes and regulations in preparation of NG9-1-1, it will be important for the State to assess its current role and assure that it has the authority and capability for statewide planning, coordination and implementation of an NG9-1-1 system.

While staffing PSAPs and handling 9-1-1 calls will remain local functions, aspects of NG9-1-1 will require State-level planning and coordination. The need for statewide coordination has been introduced and continually stressed by Congress. The Wireless Communications and Public Safety Act of 1999 encouraged states to implement seamless, end-to-end emergency communications services. The 1999 Act notes that this "requires statewide coordination of efforts of local Public Safety, fire service and law enforcement officials, emergency dispatch providers, and transportation officials; the establishment of sources of adequate funding for carrier and Public Safety, fire service, and law enforcement agency technology development and deployment; the coordination and integration of emergency communications with traffic control and management system." The Ensuring Needed Help Arrives Near Callers Employing 911 (ENHANCE 911) Act of 2004, as amended, further reinforced and expanded on the concept of state-level leadership by making it a requirement for the receipt of grant funding.

A coordinating entity will need to be assigned to coordinate the transition to NG9-1-1 whether that entity is a State Agency or a Stakeholder group that represents regions or localities. Adequate budget, staffing, and training levels need to be in place to support migration to NG9-1-1 and beyond. It will be necessary for the coordinating entity to have adequate staff, capabilities, and budget necessary to adequately and effectively fulfill its obligations in a NG9-1-1 environment. Roles and responsibilities of all system participants will need to be established. Responsibilities will include certain NG9-1-1 core services being carried on the NENA i3-compliant ESInet, as well as negotiation responsibilities with venders during and after the NG9-1-1 transition. These negotiations will include contract, pricing, and SLAs as the State moves to and maintains the NG9-1-1 system. As addressed in the Background section of this Plan, currently, the Board is currently budgeted for two employees, one of which is the position of the E9-1-1 Program Coordinator. The position is already strained to keep up with the current needs of the state. Additional staff will be required to staff additional duties related to NG9-1-1 if the Board were to be designated as the coordinating entity. A staffing assessment should be conducted to determine the appropriate level of staffing needed.

The State should reevaluate its role during and after the transition to NG9-1-1.

7.1.2.2 Governance

7.1.2.2.3 Consider the Need for Next Generation 9-1-1 Governance

As a result of the way 9-1-1 and E9-1-1 evolved, the current 9-1-1 system is made up of independent and unconnected systems with varying levels of capability. Up to this point, who is responsible for what, and who owns what at what level of system operations has not been an issue because 9-1-1 systems are completely isolated from each other. But, the 9-1-1 environment is in transition as a result of technological advancements, consumer expectations, and the need for greater interoperability and data sharing capabilities. The technological transition that is occurring requires that the historical institutional governance structures that are in place also transition into the Next Generation of 9-1-1.

By nature, 9-1-1 is a locally based service and this fact is part of the reason why 9-1-1 governance is so diverse. Historically, a state's 9-1-1 Authority is the governance group at the state level concerned with planning and preparation for 9-1-1 service evolution. Regardless of the degree to which the state-level or statewide entity exercises authority over 9-1-1 service, 9-1-1 largely continues to be governed at the sub-state level and each local jurisdiction governs 9-1-1 differently than any other jurisdiction.

The 9-1-1 environment becomes more complex with the transition to NG9-1-1 and will require collaboration among all the stakeholders in a way that was not necessary in the past. Policy and governance issues cannot be addressed by individual PSAPs or individual 9-1-1 authorities.[5] Governance for 9-1-1 at the sub-state level is focused on three types of stakeholder groups; regional 9-1-1 authorities, PSAP host local governmental agencies, and the PSAPs themselves. While those stakeholder groups will continue to be central to the transition to NG9-1-1, NG9-1-1 is not intended to reflect closed systems that are unique to the delivery of 9-1-1 calls, or local sets of emergency responders. Next Generation 9-1-1 is designed around shared, interconnected systems potentially involving a wide

[5] Next Generation Partner Program, Next Generation 9-1-1 Transition Policy Implementation Handbook, March 2010, 2.

variety of public and private stakeholders in a position to facilitate emergency response and incident management.

An NG9-1-1 system is supported by a network environment that separates data transport from those applications that ride on top of that transport. Applications are those task specific functions that are designed to ride on top of the transport involved (e.g., the delivery of a 9-1-1 call). For Public Safety, the transport example above is the ESInet. ESInets have the ability to connect a plethora of stakeholders that all have a common interest in public safety and emergency services. The ESInet provides the opportunity to interact and share data, resources and functions beneficial to emergency incident outcome. There is one key feature of this environment that potentially impacts governance. Application platforms are independent of the ESInet. Who owns, deploys and/or manages an ESInet may not be the same stakeholders that own, deploy and manage the applications utilizing the ESInet for transport and connectivity. The delivery of a 9-1-1 call may represent only one application of many. Other applications may include first responder communications, additional incident data providers and incident management functions. The FCC's Network Reliability and Interoperability Council VII suggested that such connectivity could extend well beyond the traditional Public Safety community, and include the following:

- Traditional public safety agencies: law enforcement, fire services, emergency medical services (EMS), 9-1-1
- Citizens and businesses: connections between them and agencies (e.g.; E9-1-1, truck fleet management systems)
- Business safety providers (e.g.; telematics, alarm monitoring systems, hazmat service providers)
- Hospitals/Clinics
- Public health
- Emergency management
- Transportation departments
- Different transportation modes (e.g.; railroads, ports, trucking)
- Non-governmental organizations: Red Cross, Salvation Army, etc.
- Mental health organizations
- National Guard
- United States Department of Defense (US DoD)
- Utilities, public works, recreation departments
- Media
- Schools
- Critical infrastructure companies[6]

Interconnection between these kinds of stakeholders provides an opportunity for coordination and the sharing of information and data that would ultimately benefit emergency response and incident outcome. But, NG9-1-1 networks, applications and enhanced data availability by themselves won't bring 9-1-1 into the next generation. There are human processes that must be addressed to realize the full potential of NG9-1-1 including system management, policy, institutional, and governance considerations.

6 FCC NRIC VII FG1D, 62, *available at* http://www.nric.org/fg/index.html .

7.1.2.2.4 Define and Engage the Stakeholder Community

Initiating NG9-1-1 Governance involves identifying the stakeholder community and defining how they will be engaged throughout the South Carolina NG9-1-1 Initiative. Successful deployment of the South Carolina NG9-1-1 System requires interaction and partnership with a wide ranging community of stakeholders. Stakeholders might include local 9-1-1 and government authorities, legislators, vendors, telecommunications companies, special interest groups, and others. Identify **who** the primary, secondary and tertiary stakeholders are, and **how** they will be engaged during the process. Stakeholders must actively represent their constituency throughout the process. At the same time, each stakeholder must come to the table prepared to understand the needs of the other stakeholders and strive to achieve mutually agreeable compromise.

7.1.2.2.5 Technology

South Carolina will need to determine whether it currently has the authority to manage the technology and interconnections between multiple local and regional ESInets. Emergency Services Internet Network are the IP-enabled backbone networks over which NG9-1-1 services are delivered. They host numerous hardware and software application layer services that support interoperability among diverse regional/local networks and agency applications. NENA defines an ESInet as "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 NG9-1-1 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)."

South Carolina will need to assess whether it has an adequate mechanism to effectively coordinate the activities of local 9-1-1 authorities and other public safety or government stakeholders who may share the ESInet backbone (including interconnections with ESInets in neighboring states, or federal entities). The ability and authority to coordinate the technology employed, public safety agencies that will use them, and manage the interconnections between multiple regional ESInets are essential State-level functions in a NG9-1-1 environment. South Carolina will need to establish minimum technology requirements and processes for the PSAPs. Establishing these technology requirements should involve prospective vendors and suppliers to validate products are available to meet the defined requirements. Once those have been identified, the State should develop a list of approved technology that can provide the needed delivery of service, as well as any interoperability requirements.

7.1.2.3 Operations

One essential task to operations in the Initiation Phase is to create an education and awareness program for the State. This Strategic Plan must be created with a target audience in mind. Implementing an NG9-1-1 system Statewide affects PSAPs, first responders and citizens at many levels. Creating an education and awareness plan from the very beginning in the Initiation Phase will help with public expectations and support throughout the project. A robust education and awareness campaign should include (but is not limited to) the following:

- Targeted messaging
- Conference appearances
- Presentations

- A list of talking points for PSAP leaders to use to educate stakeholders in their individual communities
- Media policies

A well-planned education program will help garner support throughout the 9-1-1 community in South Carolina, as well as other stakeholders throughout the state. This effort will begin in the Initiation Phase but will be carried out throughout the entire NG9-1-1 project.

7.1.2.4 Security

Like the rest of the nation, South Carolina's 9-1-1 systems are dedicated, closed, single purpose systems. They exist solely for transmitting 9-1-1 calls and minimal data (e.g. caller phone number or address) and nothing else. Typically 9-1-1 call recordings and data in South Carolina are stored at the PSAP that received and dispatched the call. Preserving the confidentiality of this information and retaining appropriate records as required by local or State law is a fairly straightforward process. As South Carolina transitions to NG9-1-1, today's 9-1-1 voice and data could be aggregated, shared, transferred and perhaps stored in more than one location (including remote, off site locations). A recent NENA publication accurately observed that ;"maintaining confidentiality under those circumstances is not something envisioned by current local, state, and federal confidentiality, retention and disclosure laws."

Therefore, South Carolina will encounter a new challenge: ensuring that information delivered over NG9-1-1 systems is delivered to the appropriate PSAP and can be appropriately shared with federal, state and local emergency response organizations while conforming to applicable federal, State, and/or local confidentiality, disclosure and information retention statutes and rules. South Carolina should assess all confidentiality regulations and statutes at a federal, State and local level to determine potential application to NG9-1-1.

7.1.3 Key Decision Points

The State and the PSAPs must work together to determine the vision of a Statewide NG9-1-1 system. Additionally, the State needs to identify key stakeholders and determine how the NG9-1-1 vision aligns with these stakeholders. Once these stakeholders are identified, the state should determine how, when and what kind of involvement they will have over the life of the project. Decisions will need to be made regarding an educational awareness campaign including scope, scale, and financial impact.

7.1.4 Critical Dependencies

Gaining support for the NG9-1-1 project will depend heavily on the support of the State and support of stakeholders across the state.

Creating an education and awareness program will hinge on support from the State and stakeholders, as well as financial backing from appropriate organizations.

7.1.5 Work Products

The following work products are outputs of this phase:

- Stakeholder List
- Stakeholder Involvement Criteria
- Educational Awareness Campaign Plan

7.2 Assessment and Analysis Phase

7.2.1 Overview

An assessment is an important step in a NG9-1-1 project. South Carolina should begin by assessing its current 9-1-1 system to fully understand the capabilities of the current system and what equipment is currently in use. This assessment will help South Carolina to plan and prepare for a transition to an upgraded NG9-1-1 system. The tasks below identify important areas that need to be assessed in order to plan for a successful transition to NG9-1-1.

7.2.2 Tasks

The following sections describe each task, why they are important, and expected outcomes.

7.2.2.1 Statutory and Regulatory Environment

Conduct an assessment and analysis of current laws, regulations and tariffs that impact 9-1-1 service in South Carolina to determine whether changes are necessary to support NG9-1-1. From a regulatory perspective, NG9-1-1 presents a new set of challenges and decisions. Next Generation 9-1-1 systems are typically much larger in scope and provide service to multiple jurisdictions and diverse agencies, therefore, changes in policy will be a critical part of establishing seamless, end-to-end NG9-1-1 systems. South Carolina's assessment and analysis should include a review of the following areas as they relate to 9-1-1 and NG9-1-1:

- Statutes, regulations, tariffs and agreements
- Funding
- Establishing Statewide ESInets
- Confidentiality
- Liability

The following sections discuss each of these topics:

7.2.2.1.1 Review Statutes, Regulations, Tariffs and Agreements

South Carolina 9-1-1 related laws, regulations and tariffs were written for E9-1-1, before NG9-1-1 existed, and they make specific references to older technologies that may present roadblocks to implementing NG9-1-1. For example, the South Carolina 911 Advisory Committee was charged with assisting the Revenue and Fiscal Affairs Office in implementing a wireless enhanced 911 system consistent with FCC Docket Number 94-102, which is an outdated docket addressing old technologies that have already been implemented. In order to provide a seamless and efficient transition from E9-1-1 to NG9-1-1, it is essential that South Carolina assess and analyze all current laws and

regulations to assure that they have a mechanism to keep pace with advancements in telecommunications and 9-1-1. A few examples of legislative/regulatory matters that should be assessed include:

- Provisions regarding the eligible use of 9-1-1 funds.
- Provisions that reference or require specific legacy technology components of E9-1-1 service; technology neutral provisions are preferable.
- Language (including provisions in tariff) that prohibit the sharing of 9-1-1 system components and data (with appropriate safeguards for security and confidentiality).
- Existing 9-1-1 service arrangements and tariffs that inhibit new entrants from making similar competitive services available to state or local authorities responsible for procuring 9-1-1 services.[7]
- Tariffs and any applicable interconnection agreements should also be analyzed to assure that they do not contain provisions that would impede the new interconnections and relationships that are necessary for a NG9-1-1 system.

7.2.2.1.2 Funding

Funding sources need to be adequate to support migration to NG9-1-1 and they must be consistent with emerging technologies."[8] In order to maximize funding and assure sufficient resources are made available to implement and operate the NG9-1-1 system, South Carolina should review all current funding provisions. This review should focus on making sure that there will be adequate revenues to fund services throughout the transition (when costs will be temporarily higher) and beyond. There will be time during the implementation of NG9-1-1 when funding will be required to sustain both the current legacy 9-1-1 system and NG9-1-1. With the full implementation of NG9-1-1 comes the virtual plethora of future applications. The one thing that is known is, with the coming of these applications, increased costs for bandwidth, hardware, software or all three will follow. The State should maintain a sufficient balance within the fund for such occurrences. Additionally, eligible uses of funds need to be reviewed to ensure unique NG9-1-1 system components are covered. A new funding model may be required in order to generate adequate funds from all kinds of telecommunications providers. Section 3.3.1 of this Strategic Plan reviews the current funding structures in South Carolina.

7.2.2.1.3 Confidentiality

Like the rest of the nation, South Carolina's 9-1-1 systems are dedicated, closed, single purpose systems. They exist solely for transmitting 9-1-1 calls and data and nothing else. Typically 9-1-1 call recordings and data in South Carolina are stored at the PSAP that received and dispatched the call. Preserving the confidentiality of this information and retaining appropriate records as required by local or state law is a fairly straightforward process. As

---

7 National Emergency Number Association Next Generation Partner Program Next Generation 9-1-1 Transition Policy Implementation Handbook, March 2010, 14.

8 FCC, Communications Security, Reliability and Interoperability Council, "Working Group 1, December 2011, 40, *available at* http://www.nric.org/fg/index.html. (Last visited 2/22/2013.

South Carolina transitions to NG9-1-1, today's 9-1-1 voice and data will be shared, transferred and perhaps stored in more than one location (including remote, off site locations). A NENA publication accurately observed that "Maintaining confidentiality under those circumstances is not something envisioned by current local, state, and federal confidentiality, retention and disclosure laws."[9] Therefore, South Carolina will encounter a new challenge: ensuring that information delivered over NG9-1-1 systems is delivered to the appropriate PSAP and can be appropriately shared with federal, state and local emergency response organizations *while* conforming to applicable federal, state, and/or local confidentiality, disclosure and information retention statutes and rules.

7.2.2.1.4 Liability

Another significant challenge related to regulation and policy for NG9-1-1 is liability. Lack of legal clarity on the issue of liability can lead to significant issues, including delays in provisioning critical NG9-1-1 services. The New and Emerging Technologies 9-1-1 Improvement Act of 2008 (Net 9-1-1 Act) expands state liability protections to PSAPs, services providers and their vendors. The NG9-1-1 Advancement Act of 2012 extends immunity from liability to NG9-1-1 service providers specifically and to PSAPs.

7.2.2.2 Governance

To begin the process of creating a governance model it is necessary to conduct a thorough analysis of the governance frameworks that exist in South Carolina today. Such an analysis of State, county and local decision making and authority will shed light on how decisions are made with regard to 9-1-1 in South Carolina. It will be helpful to look at governance models outside of the 9-1-1 purview in order to identify any new models that might work for the NG9-1-1 system.

Along with the assessment of governance models, an assessment of the state statutory environment and policies will need to be undertaken to assure that they support these new and evolving arrangements, and institutional structures. Most States that have implemented a governance structure for an ESInet and/or NG9-1-1 have found success with a representative based model where users of the system make up a Board or Committee that is either Advisory or vested with Authority to either have input into or control the management of the System. NENA has observed that "[t]ransitioning our nation's legacy 9-1-1 system to a modern IP-based Next Generation 9-1-1 (NG9-1-1) system must be a major policy objective at all levels of government."[10] Following is a list of state/sub-state governance related responsibilities, activities and authorities that NENA has identified as being essential to the full implementation of NG9-1-1:

- Ensure that an organization (or organizations) exists, with appropriate authority and/or capability for statewide planning, coordinating and implementing NG9-1-1 systems.
- Confirm that such planning and coordination reflects effective coordination with relevant stakeholders within and beyond the state.
- Ensure that appropriate state-level authority exists to adopt and enforce appropriate industry-

[9] Ibid, 18.

[10] National Emergency Number Association (NENA), "Next Generation 9-1-1 Transition Policy Implementation Handbook," March 2010, 1*, available at*, http://www.nena.org/?NGPPPolicyTransHndbk.

based standards, rules, policies and procedures.

- Evaluate and implement regulations and laws that facilitate (or do not inhibit) the local, regional and state interoperable environment of NG9-1-1, recognizing the intergovernmental, public/private IP-based, software and database controlled structure of NG9-1-1.
- Ensure statutory support for intergovernmental cooperation and arrangements essential to an efficient statewide system environment.
- Ensure that policymakers at all levels are formally committed to the development and deployment of interoperable Statewide ESInets as a fundamental 9-1-1 and emergency communications policy objective
- Ensure that policymakers are committed to providing authority for 9-1-1 entities to work interactively through cooperative governmental arrangements to support regional and state-level NG9-1-1 systems that maximize interoperability and functional sharing of resources and costs[11].
- Ensure changes in the state/federal regulatory environment surrounding the changing nature of competition within the telecommunications industry related to NG9-1-1 are considered and carried-out In the Next Generation Partner Program's *Next Generation Transition Policy Implementation Handbook*, NENA noted that "it is critical that state regulatory bodies and the FCC take timely and carefully scrutinized action to analyze and update existing 9-1-1, PSTN, and IP rules and regulations to ensure they optimize 9-1-1 governing authority choices for E9-1-1 and NG9-1-1 and foster competition by establishing a competitively neutral marketplace."[12]

7.2.2.3 Technology

A detailed assessment of current technology systems and providers is needed to properly identify the technology requirements and steps needed to migrate from the current 9-1-1 system to a NG9-1-1 system. This assessment will identify technology and systems that may need to be replaced and upgraded. This assessment will enable the State to:

- Identify technical functions that are important to the current systems
- Identify current infrastructure components that can be used with the NG9-1-1 system
- Assist in determining the conceptual design of the system

It is important during these assessments to keep in mind the goal of transition to a NG9-1-1 system. PSAPs should be examined to see what will be needed in order to ensure a proper transition.

The following technologies and systems should be assessed:

- PSAP locations
- Call volumes
- Call flow
- Location of serving offices/selective routers

11 Ibid.

12 NENA Next Generation Partner Program Next Generation 9-1-1 Transition 12.

- Automatic location identification (ALI) provider information
- Current bandwidth capacity
- Current redundancy levels
- Geographic coverage area
- Facility locations
- Current plans for interoperability
- Operational infrastructure
- Regional connectivity options
- Network topology in use
- Hardware
- CPE
- hardware (e.g. private branch exchanges [PBXs], switches, servers, workstations, trunks)
- Software
- CPE software (e.g. call taking applications,)
- CAD systems,
- Emergency notification systems,
- Management information systems (MIS) databases
- Data
- GIS

Geographic information systems will play a far more critical role within the NG9-1-1 environment. Today, GIS is primarily used within the mapping modules of CAD systems or other like-systems, but not routing. However, within NG9-1-1, all 9-1-1 calls will be routed based on location using GIS datasets. The change to GIS-enabled call routing re-emphasizes the priorities for the way public safety departments manage and store location data.

The first step South Carolina should take in preparing its data for NG9-1-1 is to assess the GIS datasets across the State in preparation for a more comprehensive NG9-1-1 data readiness assessment. A data readiness assessment should include the following:

- Determine applicable South Carolina Geospatial Information Office (GIO) Statewide policies and standards.
- Display existing GIS data layers used by each PSAP.
- Provide a baseline assessment between GIS data and master street address guide (MSAG) to determine current accuracy level.
- Determine if PSAPs have taken steps to regionalize datasets with neighboring PSAPs and reconcile any edge-matching issues with neighboring roads and/or boundaries.
- Determine if a data maintenance plan is in place and the frequency of GIS data updates
- Determine what data standards and policies exist
- Review any existing addressing policies and inter-governmental data sharing agreements to ensure long term sustainability of GIS data accuracy, maintenance and standards
- Identify, assess and determine implementation of a statewide and/or regional enterprise GIS database repository(ies)

7.2.2.4 Operations

A PSAP is comprised of people and technology coming together to deliver public safety communications. In order to operate a PSAP, there must be a knowledgeable staff, as well as clear and effective policies and procedures that include a comprehensive training program.

With the transition to NG9-1-1, PSAP staff will undergo a change in roles and responsibilities. New technology will breed new forms of media that will be available to PSAP call-takers, dispatchers and management staff. While this technology is implemented to improve 9-1-1 service levels, PSAPs will need to learn how to handle these new forms of calls coming into the PSAP such as text, video, and telematics. This technology will include new, visual forms of media that PSAP staff has not yet had to experience. The new visual imagery may be distressful and must be addressed in advance to the degree possible and should be continually monitored. The US Department of Transportation's (USDOTs) "A National Plan for Migrating to IP-enabled Systems" notes:
"The increased quantity of available multimedia data will enhance and expand existing call-taking functions. It may also extend the time it takes to process 9-1-1 calls, increase the workload of the call taker, and significantly change the call taker's experience (e.g., seeing the incident versus hearing the incident)."[13]

Additional changes that can be expected with the NG9-1-1 transition are increased resource and data sharing across multiple PSAPs. While this increases the ability to respond to emergencies, it may present a new challenge to some PSAPs. Training and staffing concerns should be assessed and operational standards and policies should be created or updated to account for these changes in the PSAPs' operational models. The following operational models should be assessed in South Carolina PSAPs to help achieve the goals of a successful NG9-1-1 transition:

- Operational management
- Policies and standards
- Staffing
- Training

7.2.2.4.1 Operational Management

Establishing a management model prior to the NG9-1-1 transition will help PSAPs determine how to handle these new types of challenges as they arise. An operation management assessment includes the following:

- Interoperability across many jurisdictions
- Change management
- Rules adoption
- Application installation management
- Standards for interconnection

South Carolina should start by determining what management mechanisms are in place and assess whether and how they will handle these operational challenges moving forward into an NG9-1-1 environment. This assessment can be conducted utilizing known benchmarks across the country. The results of the assessment will enable PSAPs

[13] National E9-1-1 Implementation Coordination Office: A National Plan for Migrating to IP-Enabled 9-1-1 Systems, September 2009,1-4.

to make the proper adjustments in advance of the technological changes that are coming in the future.

7.2.2.4.2 Policies and Standards

Operational policies and standards will need to be reevaluated to prepare for a transition to an NG9-1-1 environment. The State will need to work with PSAP managers to identify and implement changes in operational policies and standards to promote coordination, resource sharing, and confidentiality issues. South Carolina will need to assess what is in place today and determine if changes will need to be made to prior to the NG9-1-1 transition. The state needs to determine which existing policies and procedures will remain in the NG9-1-1 environment and which will need to be adjusted moving forward.

7.2.2.4.3 Staffing

While PSAP staffing is and will remain a local issue in the State of South Carolina, staffing models must be assessed in preparation for the changes NG9-1-1 will cause within the PSAP. Job descriptions and duties for staff positions will change in the NG9-1-1 environment because of new technologies and applications. Also, staffing numbers and requirements will likely change for similar reasons. There will be an increased need for proper technical staff to support the IP environment in the PSAPs. PSAPs will have to have IT professionals available either on staff or contracted to assist with public safety environment that necessitates extremely fast response times with IT issues arise. Staff expertise will become critical as different skills will be needed to attend to the new network and equipment as well as call taking and dispatching.

PSAPs should be prepared for staff turnover challenges with the increased demands and training requirements before, during and after the transition to NG9-1-1. The state and local PSAPs should be aware of current PSAP staffing and monitor the staffing levels to determine the appropriate number of staff as they move through and complete the transition.

An assessment of the PSAP staffing across the state should be coupled with stakeholder input to create a staffing plan that will be part of an operations plan in preparing for the NG9-1-1 environment.

7.2.2.4.4 Training

As the state transitions to NG9-1-1, training is a major factor in preparation and operation of the new network. A training plan must be in place to prepare for the challenges to come. Telecommunicators will need to prepare for operating new technology, new types of data, new policies and procedures and new standards. Consistent training across the state will help staff work within the new environment and with each other. South Carolina should assess the training plans and requirements that are currently in place in the PSAPs. The State must work with stakeholders to develop new or additional training standards in order to meet NG9-1-1 requirements. This Strategic Plan should include a mechanism for periodic adjustments of the training program.

7.2.2.5 Security

Traditionally 9-1-1 has been a closed system thereby minimizing the risk and effectiveness of cyber-attacks. However, the IP-enabled, interconnected nature of NG9-1-1 radically alters the attack surface of the local PSAP and

the overall NG9-1-1 system. This exponential increase in attack vectors is magnified by the attractiveness 9-1-1 systems offer cyber attackers. Accordingly, it is critically important to ensure that cyber security controls are planned for and built into the system from the outset and over the course of the project. Cyber security should be architected into any South Carolina NG9-1-1 System.

NENA released the NG9-1-1 Security Standards (NG-SEC) in early 2010. These standards provide detailed requirements on how to secure NG9-1-1 systems. Presently, several states, cities and counties have adopted, or are considering adopting NG-SEC standards as the core foundation of their security program. When coupled with any additional customization of security controls necessary for the state of South Carolina, the NG-SEC standards can become a useful framework to build an effective security program. In addition to considering the use of NENA security standards, the State may be required or choose to comply with additional federal and/or state security requirements.

South Carolina's current 9-1-1 system comprises a wide-ranging set of telecommunications companies, CPE vendors, implementations, and local policy constraints. This broad spectrum of systems has likely created a wide ranging approach to mitigating security risks across the state. In order to gauge current risk levels an assessment is necessary. In order to integrate cyber security into the South Carolina NG9-1-1 System it is necessary to establish a security baseline of the current system. As an alternative to assessing each individual PSAP (a task that would be both cost and time prohibitive), a statistical sampling that is representative of South Carolina's PSAPs should be used (e.g. large/small, small, vendor A, vendor B, etc.). The security assessment should be based on the NG-SEC standards and any other applicable frameworks South Carolina is required to comply with or that it intends to leverage in the South Carolina NG9-1-1 System.

7.2.3 Key Decision Points

For the assessment and analysis phase, the State must plan for the scope of these assessments. Determining what must be assessed, how the assessments will take place, and who will perform these assessments are all decisions that must be made during this phase. Funding may be needed to conduct these assessments which require financial planning in advance.

7.2.4 Critical Dependencies

The assessments discussed in this section will each depend on the resources available to conduct the assessments. Additionally, the technology, operations, and security assessment will depend upon PSAP participation across the state. Examining related statewide projects will be dependent upon cooperation of agencies representing those projects.

7.2.5 Work Products

The following work products are outputs of this phase:

- Regulatory, Legislative, Tariff, and Funding Study
- Governance Study
- Technology Assessment

- Operations Study
- Security Assessment
- Related Projects Study

7.3 Requirements Design and Planning Phase

7.3.1 Overview

Once all of the proper assessments have been completed to fully understand the current state of the South Carolina 9-1-1 system, the State should have a snapshot of what needs to be done in order to be ready for the transition to NG9-1-1. South Carolina can then begin to define the requirements for its NG9-1-1 system. Along with requirements, the State will begin to define deployment options and create governance and deployment plans that will include security and operations issues.

7.3.2 Tasks

7.3.2.1 Statutory and Regulatory Environment

7.3.2.1.1 Update Statutes, Regulations, Tariffs and Agreements

Ensuring that statutory and regulatory requirements are appropriately defined is critical. Requirements should be identified based on the results of assessment of the statutory and regulatory environment introduced in the previous section of this Strategic Plan.
Begin the process of making necessary changes to laws, regulations, tariffs and other enforcement mechanisms based on the results of the regulatory, legislative and funding assessments. These changes have to be both defined and implemented at this stage so that any roadblocks are eliminated prior to the implementation of other NG9-1-1 tasks. For example, the NG9-1-1 environment is inherently competitive. Therefore, it is important that the South Carolina regulatory environment, including tariffs and interconnection agreements provide competitive 9-1-1 System Security Plans (SSPs) with the same reasonable and nondiscriminatory treatment as incumbent 9-1-1 SSPs. All such requirements should be neutral with regard to technologies, manufacturers or providers.

In order for South Carolina to move forward with adopting a comprehensive, end-to-end NG9-1-1 system, the state should:

- Determine whether the changes identified in the assessment require statutory treatment, or would be better addressed through regulations or tariffs.
- Identify all of the appropriate stakeholders that will be affected by the changes and ensure their input.
- Determine whether the desired statutory and regulatory changes can be made through 9-1-1 and public safety leadership alone or are external experts needed?
- Develop materials to educate the state legislature, other agencies and regulatory bodies to ensure they understand how current regulations and laws promote or hinder NG9-1-1.
- Determine whether to draft a single, omnibus bill that addresses all of the issues or to address issues piecemeal.

- Seek waivers of some current rules and regulation in the short term during the initial transition to NG9-1-1 before final policy changes can be made.
- Adopt an appropriate strategy with the media to gain support for the overall transition to NG9-1-1 and specific policy related efforts.[14]

7.3.2.1.2 Define Funding Model

As noted, it is imperative to ensure that sufficient funding will be available to cover the increased costs that will be incurred during the transition from the current E9-1-1 system to the NG9-1-1 system. With the information gleaned from the assessment and analysis phase, South Carolina should take positive steps to address the following items to maximize funding and ensure sufficient resources will be available to implement and operate the NG9-1-1 system:

- Assess reasonable and equitable fees on all end user communication technologies or services capable of accessing 9-1-1.[15]
- Assess prepaid fees.
- Define the eligible uses of 9-1-1 funds and establish penalties to deter misuse of funds.
- Ensure statutes, regulations and tariffs enable system components to be shared among the agencies and entities that use it and that there is a mechanism for these agencies and entities to share the costs.
- Audit service provider fee remittances annually to ensure accuracy and compliance with legislative intent.
- Audit state and local use of 9-1-1 revenues annually.[16]

7.3.2.1.3 Establish statewide emergency services IP networks (ESInets)

In order for South Carolina to establish an ESInet, the state should develop requirements that consider legislating and funding State-wide ESInets (or regional, interconnected ESInets) and the NG9-1-1 services hosted on or accessed by them.[17]

Emergency service agencies should consider sharing infrastructure with other governmental entities as a matter of affordability.

7.3.2.1.4 Confidentiality

---

14 National Emergency Number Association Next Generation Partner Program *Next Generation 9-1-1 Transition Policy Implementation Handbook,* March 2010, 25.

15 South Carolina should view this as a relatively short-term step. At some point in the future, an entirely different funding model may be more appropriate. *See* NENA publication, "Funding 9-1-1 Into the Next Generation: An Overview of NG9-1-1 Funding Model Options for Consideration," March 2007.

16 National Emergency Number Association Next Generation Partner Program *Next Generation 9-1-1 Transition Policy Implementation Handbook,* March 2010, 9-10.

17 Ibid, 16-17.

With regard to confidentiality, South Carolina should consider the following when developing requirements:

- Update statutes to define a broad definition of a "9-1-1 call" using the concept presented in the USDOT's NG9-1-1 Initiative publications.
- Adequately protect the types of 9-1-1 calls and call content that will exist in a NG9-1-1 environment and make any necessary modifications.
- Clearly address the responsibility of all persons who may have access to 9-1-1 call information when that information is stored in non-local or shared repositories.
- Assure that non-local agencies or local PSAP telecommunicators working in a virtual PSAP environment have access to 9-1-1 call data and adhere to confidentiality provisions.
- Require state and local 9-1-1 governing authorities to develop standard operating procedures (SOPs) that govern who has access to 9-1-1 call information, under what circumstances and how.[18]

7.3.2.1.5 Liability

South Carolina should leverage the assessments that were conducted to develop requirements that assure that all entities involved in emergency response in the NG9-1-1 environment are protected. Assure all statutory and regulatory language is technology neutral, rather than applying to any particular technology (e.g. wireline, wireless, VoIP), and extend liability protection to all types of originating service providers regardless of technology.

- Extend liability protection beyond the PSAP environment to all entities involved in emergency response.
- Apply liability protection to all 9-1-1 SSPs and their third party vendors, regardless of whether that SSP is a traditional regulated local exchange carrier (LEC) or an unregulated competitive SSP.
- Apply liability protections to providers of external data sources that support or supplement the normal information sent with a 9-1-1 call.[19]

7.3.2.2 Governance

South Carolina should leverage the results of the governance initiation and assessment to identify the requirements necessary to support a collaborative vision of NG9-1-1 in South Carolina. These requirements should be comprehensive and representative of the stakeholder community and applicable regulations and/or statutes. The complexities involved in managing the interconnections between state, regional and local NG9-1-1 systems requires a defined governance model that clearly identifies the roles, responsibilities, and authority by which decisions are made.

The South Carolina NG9-1-1 governance model will be based on the outcome of the requirements definition phase and will be the framework for the management of the NG9-1-1 system. In order to create a consensus-based governance model that can be implemented Statewide, South Carolina must prepare the stakeholders that were

18. USDOT NG9-1-1 Transition Plan, February 2009, 43.
19 FCC NRIC VII FG1b, available at http://www.nric.org/fg/index.html> (Last visited 2/19/13).

identified in the initiation phase to contribute in an effective way to the development of the governance plan. These stakeholders should have expertise in their field and an understanding of what is involved and expected of them in creating a governance model. It is important to train these stakeholders in NG9-1-1 to ensure they have a unified understanding of what NG9-1-1 is and how it presents a need for effective governance. Once these stakeholders gain an understanding of the task they will be able to provide input and gain ownership of the governance model. Their ownership will promote an atmosphere of acceptance of the model throughout the State. A governance model that is established using the feedback and consensus of those stakeholders that are impacted by the system will avoid roadblocks during the implementation of the NG9-1-1 governance model. USDOT's NG9-1-1 System Initiative noted that the "…deployment of NG9-1-1 will require increased coordination and partnerships among government and public safety stakeholders, 9-1-1 Authorities, service and equipment providers, and PSAP Administrators in planning and implementing NG9-1-1."[20]

The State together with its governance stakeholders will create a governance framework in the form of a charter or other mechanism that describes the governance structure in clear terms. An effective NG9-1-1 governance model will enable critical stakeholders to enter into complex service arrangements that insure the utility and quality of the services. The governance model for a shared system defines decision making processes and policies (such as change management) that will be responsive to PSAP needs and allow local participation. Roles must be assigned, security maintained, and every change managed. It will set forth policies and procedures and explain why they are in place. The governance framework will address but is not limited to:

- Scope
- Authority
- Roles and responsibilities
- Membership
- Stakeholder representation
- Components
- Agreements
  - Interlocal agreements
  - Interstate agreements
- Plans that need to be developed and maintained
- Reporting procedures
- A tiered system of governance *may* consist of a board or council that uses standing committees with specific responsibilities such as a Technology Committee, an Operational Committee and a Training Committee. The Technology Committee may be made up of technical staff from both state and local entities with responsibilities for reviewing new applications, keeping up with security standards, and providing technical recommendations for the governance leadership.

Along with requirements definition and planning, this phase should include the active elimination of roadblocks to NG9-1-1 governance. Address those roadblocks that were identified during the assessment and analysis phase and plan for their elimination. Any changes to State statutes and regulations that were identified in the assessment and analysis phase should be initiated in order to support the new relationships and service arrangements that NG9-1-1

[20] USDOT NG9-1-1 Transition Plan, February 2009, 43.

envisions.

NOTE: Any statute and regulatory changes that are required should be started as soon as possible in the planning stage because those processes have the potential to take a long time and delay the implementation of NG9-1-1.

The same new relationships and service arrangements must also be facilitated and institutionalized by formal agreements between the governmental agencies, units of Public Safety and other stakeholders involved. The necessary agreements should be identified and planned for during this phase. Who is responsible for what, and who owns what at what level of system operations will need to be determined in the new NG9-1-1 environment. For example, NG9-1-1 involves network and system functions that may not be operated at the PSAP level, but might be the responsibility of a regional or state level entity in this new environment. Those arrangements and institutional design functions will have to be strategically addressed during the planning phase. People and entities in current Public Safety roles may be required to take on roles and responsibilities outside of their current scope in order to facilitate NG9-1-1. The FCC's NRIC VII suggested that "*... the roles of the PSAPs, responders, and related entities are expected to expand beyond traditional 9-1-1 services with higher levels of interaction, managed situational intelligence, enhanced capabilities, and more comprehensive communication and coordinated response services.*"[21] While the local nature of 9-1-1 is not likely to change, the full vision of NG9-1-1 will depend upon the development of new and more complex interrelationships and governing environments.

The technical requirements and planning for the NG9-1-1 system will impact the governance model that is implemented. Historically, the CRMS Advisory Committee has been relied upon as the governance group for planning and preparation for 9-1-1 service evolution, decision making and coordination of NG9-1-1 implementation in the State. The CMRS Advisory Committee should have operational and support responsibility for ESInet and NG9-1-1 functions if it is implemented at the state level, directly or through vendors.[22] However, NG9-1-1 systems can be built up from local and regional levels, in which case the governance model might be different. NENA's Next Generation Partner Program stated it this way: "*This is the case for three primary reasons: (1) in many states, the state-level governance structure and authority for state-level 9-1-1 entities, if such a structure exists, is largely based only on collecting and distributing 9-1-1 funds to localities, rather than administering and managing an overall state-wide 9-1-1 system; (2) many parts of the architecture and functions of NG9-1-1 systems may be more efficiently managed at a regional, state or even multistate level (while the 9-1-1 call-handling operations and response will remain primarily local), and (3) the increased information sharing capabilities of NG9-1-1 systems means that 9-1-1 and emergency communications systems will be much more interrelated in a next generation environment, calling for more coordinated and cooperative governance of the entire emergency communications enterprise.*"[23]

7.3.2.3 Technology

The State should create detailed technical and functional requirements based on the results of the technology assessment and analysis phase, the unique factors present in South Carolina, the needs of the stakeholder

21 FCC NRIC VII FG1b, *available at* http://www.nric.org/fg/index.html> (Last visited 2/19/13).
22 The Communications Security, Reliability and Interoperability Council Working Group 1 Report Dec. 2011, 30.
23 Next Generation Partner Program, Next Generation 9-1-1 Transition Policy Implementation Handbook, March 2010, 2.

community, and lessons learned from other states migrating to NG9-1-1. Requirements should address key issues of redundancy, availability and incident response or disaster recovery as applicable. Technical requirements should address the domains noted in Table 2, below:

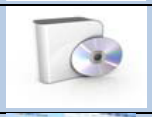
	Hardware Network: Routers, Switches, LANs: Workstations, Servers, etc.
	Software Applications: CPE, etc. Protocols: ECRF, etc.
	Data Analytics: Enterprise Data Gathering, Reporting GIS: Mapping requirements, etc.

Table 2—Technical Requirement

The State should use stakeholder focus groups to gather information that will be used to develop the requirements. Information acquired should include known standards, best practices, and technical solutions available on the market. Once the State defines the requirements it can prioritize them.

Support for the NG9-1-1 system after deployment will be critical. The State and its stakeholders must create a comprehensive and holistic support plan that addresses fault management, maintenance and monitoring. It should address desired service levels, key performance indicators (KPIs) and other performance criteria. It should clearly identify who is responsible for each aspect of support, and provide detailed escalation paths. It should synchronize with change management policies across the enterprise.

7.3.2.4 Operations

7.3.2.4.1 Define Operational Requirements

It is necessary for South Carolina to define the operational requirements that need to be in place for a successful NG9-1-1 implementation. The assessment process coupled with key stakeholder input will provide the information necessary to define these unique requirements for the state. By going through the process of defining these operational requirements, the State will have an understanding of what needs to be in place to successfully operate the new system and what is important to the stakeholder community. The following is a non-inclusive list of items that South Carolina may want to consider when defining their operational requirements:

- Operations Management
- Change management
- Rule adoption for new applications
- Interconnection standards
- Access management
- New users
- New technologies

- Policies and standards
- Statewide coordination
- Resource sharing
- Determine how calls will be handled
- Determine how new technologies and increased access will be handled
- Managing an influx of data into the PSAP
- New types of data for telecommunicators
- Training
- Determine the training that is necessary to support the changing system environment
- Training for changing job descriptions
- Training for new job requirements and expectations
- New skill sets in the PSAP
- There will be an increase in data and types of data
- New training standards and training assessments
- Staffing
- Determine new job requirements and descriptions
- Determine the staff needed to implement policies
- Analyze the need for additional positions and increased staff in the PSAP
- Determine what types of staff expertise is needed to operate the new system
- Work with Law Enforcement Training Council (LETC) for hiring standards and training requirements of staff

7.3.2.5 Security

During this phase, the State, with involvement of key stakeholders, will begin to define its security requirements. The definition process may incorporate the following activities or items:

- Security industry best practices
- Stakeholder surveys/focus groups
- Goals from the South Carolina Strategic 9-1-1 Plan
- Consensus based standards
- Vendor specifications
- NG9-1-1 standards (e.g. NG-SEC)
- South Carolina preference
- Interconnectivity constraints
- Security controls and safeguards.
- Frameworks, standards, regulations, compliance issues such as NG-SEC, National Institute for Standards and technology (NIST), Health Insurance Portability and Accountability Act (HIPAA), etc.)

A security plan provides the overarching strategy and vision for securing the South Carolina NG9-1-1 system and is the foundation of an effective security program. Ideally, it should come before an organization starts to select or implement security technology, managed services vendors, etc. It may be advisable for local PSAPs to create their own security plans as well.

A security plan is the starting point for securing an NG9-1-1 system and formally documents the goals and objectives regarding the security of the NG9-1-1 system. Typically, a security plan accomplishes the following:

- Documents the goals, objectives and intentions regarding cyber security within the NG9-1-1 system
- Exercises due care by managing the risk of security exposure or compromise within the NG9-1-1 system
- Promotes and increases awareness of security across the NG9-1-1 system
- Identifies the standards and frameworks applicable by legislative, regulatory, policy, or choice with which the South Carolina NG9-1-1 system shall comply (e.g. NG-SEC, NIST, Criminal Justice Information Services [CJIS], South Carolina law/policy, etc.)
- Identifies the security policies necessary to implement and enforce objectives and goals
- Clarifies the security aspects of the management governance structure, as it applies to the South Carolina NG9-1-1 system
- Identifies order of magnitude estimates for implementation of security across the South Carolina NG9-1-1 system

The security plan must find the appropriate balance between cost, the limitations and restrictions imposed by the plan, and the risks to public safety.

7.3.2.6 Next Generation 9-1-1 Detailed Planning

- NG9-1-1 Strategic Plan
- Update legislation, regulations and funding Model(s)
- Update procurement vehicles / contracts
- Create governance model
- Create technology support plan
- Create an operations plan
- Create a GIS guide
- Create a security plan

7.3.3 Key Decision Points

For the Requirements, Design and Planning Phase, the State will have to decide who will contribute to determining the requirements for the South Carolina NG9-1-1 System. There are many technical decisions that need to be made at this point including what existing infrastructure will be used for the NG9-1-1 system, what elements will be included (e.g. calls, texts, video, telematics, sensors, etc.) and what transport methodologies will be used.

7.3.4 Critical Dependencies

The conceptual system design and detailed plans will depend on the successful and thorough completion of the preceding phases and tasks, as well as available funding. All requirements definition tasks will depend on the cooperation and input of the State, 9-1-1 program staff, and other stakeholder involvement.

7.3.5 Work Products

- The following work products are outputs of this phase:
- Conceptual system design
- Conceptual design document
- Regulatory, legislative and funding requirements
- Governance Plan
- Technology requirements document (hardware, software, data)
- Operations requirements
- Security requirements
- NG9-1-1 Strategic Plan
- Detailed planning
- Updated regulation/legislation
- Governance model
- Technology support plan
- GIS guide
- Operations plan
- Security plan

7.4 Proof of Concept Phase

7.4.1 Overview

Performing a pilot or proof of concept project will test and validate the NG9-1-1 design concept on a smaller scale before being deployed statewide. A proof of concept may help to encourage local PSAPs to participate in and buy into the NG9-1-1 planning and implementation. The following task details a proof of concept project, why it is important, and expected outcomes.

7.4.2 Tasks

7.4.2.1 Governance

The governance model that was formed as a result of the initiation, requirements design and planning phases should be implemented in conjunction with the other NG9-1-1 tasks for the purposes of testing the chosen governance model and related requirements. Detailed lessons learned should be documented for the governance portion of the proof of concept in order to update the Strategic Plan and develop a final system design.

7.4.2.2 Technology

Depending on the conceptual design and the selected deployment model(s) proof of concept/pilot projects can begin to be rolled out. Proof of concept/pilot projects are used to validate the NG9-1-1 implementation plan and to test the chosen solution. The proof of concept/pilot projects should involve a group of PSAPs that are representative of several PSAP types and different PSAP equipment. This sampling should reflect the various systems currently

deployed or expected to be used in the NG9-1-1 system.

Each proof of concept/pilot project should use the requirements defined in the implementation plan. This effort can be used to validate selected portions or all of the requirements. The State, in conjunction with the pilot PSAPs and involved vendors should develop detailed project plans for each proof of concept/pilot project to include the equipment or process being validated, expected results, and testing processes. Detailed lessons learned should be documented for each proof of concept/pilot project for use in updating the implementation plan and developing a final system design.

7.4.3 Key Decision Points

Prior to the beginning of any pilot project, the State must first determine the goals and success measurements for the proof of concept/pilot projects. This will be critical in the evaluation of the project upon completion and moving forward with NG9-1-1 deployment. The results of the proof of concept will lead to updating the planning documentation and, most importantly, the requirements determined and documented in the design and planning phase.

7.4.4 Critical Dependencies

Proof of concept/pilot project(s) are dependent upon having a quality NG9-1-1 plan and following that plan throughout the process. The project should have the conceptual designed determined in the planning phase in place with the proper technology and standards. This scenario may require some statutory and regulatory changes in order to carry out the project. These projects also need sufficient funding in order to be carried out correctly and thoroughly.

7.4.5 Work Products

The following work products are outputs of this phase:

- Proof of concept project plans
- Proof of concept test results
- Lessons learned documentation

7.5 Implementation Phase

7.5.1 Overview

Once a pilot project is successfully completed and documented, the State of South Carolina should move on towards the implementation phase of NG9-1-1. This is where the network will be deployed. A transition plan should be created in this phase to take the state as smoothly as possible from the pilot to actual implementation.

7.5.2 Tasks

7.5.2.1 Governance

Develop a transition plan for the governance model that executes the governance plan and applies the lessons learned from the proof of concept phase. Implement the transition plan in conjunction with the other NG9-1-1 tasks.

7.5.2.2 Operations

An important step in the implementation phase is creating a detailed transition plan that will take the State from the pilot phase into actual NG9-1-1 deployment. This transition plan will outline technical development, testing, implementation and other initiatives important to the state of South Carolina. This transition plan should contain specific details regarding the steps necessary to execute the NG9-1-1 implementation plan and deploy the PSAPs and other systems to the NG9-1-1 system. The state and stakeholders will be involved in developing the transition plan based on the Strategic Plan and the lessons learned from the pilot project.

Because a transition plan must account for Statewide and regional deployments, it is very important to have stakeholder input when developing this plan. Local PSAPs and regions should have their own transition plans that are in line with and complement the statewide transition plan. Each PSAP and provider should be tracked. The plan should account for them and provide an order and a schedule for transition activities so that all of the participants are informed and ready for their individual transition to the NG-1-1 network. A transition plan should contain, at minimum, the following details:

- Roles, responsibilities and authority of all stakeholders
- Process
- Detailed procedures and checklists
- Back out plans
- Change control plan
- Testing procedures and checklists
- Acceptance criteria
- Communications plan
- Technology
- Schedule

A transition plan at the State level will be instrumental in deploying NG9-1-1 across the State; however, this State-level plan will help PSAPs and regions to plan and carry out the transition. Working together with all stakeholders will help to create a plan that can organize and coordinate a successful transition and deploy NG9-1-1 in a consistent manner that allows for success for all stakeholders. Working together to plan the transition will allow the lessons learned from the pilot project to be communicated and used to improve the transition process and avoid making the same mistakes not only at the state level, but at the regional and local levels as well.

7.5.2.3 Technology

This phase refers to the implementation of processes, policies and procedures that must be updated to migrate to NG9-1-1. The implementation phase is representative of the entire set of steps necessary to implement NG9-1-1 in

South Carolina.

During this phase the South Carolina NG9-1-1 System should be deployed in a phased manner per a pre-developed transition plan. This phase should include the specific processes associated with installing needed equipment, testing the equipment, any related services, interconnecting PSAPs and the call origination network to the NG9-1-1 system. At completion of the deployment, detailed as-built documentation of equipment and configurations should be created for each PSAP and the complete system. These as-built documents should be maintained on an on-going basis to reflect the actual system architecture.

Clearly, full participation in NG9-1-1 requires PSAP systems that can accept an IP connection and properly handle NG9-1-1 protocols in accordance with the NENA i3 standards.

Some vendor's state that their IP-based equipment is NG9-1-1 compliant or NG9-1-1 ready, when, in fact, the equipment satisfies only some aspects of NG9-1-1. For example, the system may accept Session Initiation Protocol (SIP) calls, but not the ALI data in the presence information data format location object (PIDF-LO). While such partial compliance with NG9-1-1 may be an asset, it may also be the source of many interoperability problems with equipment from other vendors. Ideally, a PSAP would replace its existing equipment with a fully NENA i3 compliant system. Such an approach would offer the maximum interoperability and achieve the goals of the State of South Carolina in a timely manner.

It may be some time before the entire South Carolina 9-1-1 system migrates to NG9-1-1. As such, an NG9-1-1 PSAP may have to continue to accept calls on legacy trunks and use legacy ALI systems. This can be accomplished by installing legacy network gateways (LNGs) at the PSAP in front of the NG9-1-1 equipment. Some vendors are implementing this sort of solution fairly inexpensively. Some refer to this as a dual mode PSAP, able to receive calls from both the legacy and the NG9-1-1 networks.

Some PSAPs may wish to wait until existing PSAP equipment reaches the end of life-cycle before incurring the cost of replacing existing equipment with NG9-1-1 equipment. When this occurs, there are several options:

- Wait until the PSAP is ready before migrating. This may delay migration of call originating networks to the ESInet infrastructure.
- Install a LNG converting NG9-1-1 signaling back to traditional trunking for the existing PSAP CPE. This limits PSAP functionality and may cause interoperability issues. Of particular concern is the functionality of the NG9-1-1 to legacy gateway with respect to functions such as call transfer.
- Operate limited new and old equipment side-by-side. This presents cost and operational challenges.

The initial deployments of NG9-1-1 are not expected to present serious challenges to call takers; from their perspective the operations of the old and new systems may not be significantly different.

Infrastructure, and service and support issues will be more difficult. Some PSAPs may have limited IP expertise in-house, and may have to seek assistance from local outside vendors. While there are many IP vendors, many have limited SIP, IP-telephony, and, especially, limited NG9-1-1 experience. Support may not come from traditional sources, such as the local telephone company. However, IP networks enable remote support in ways not previously

possible, so much less on-site support may be required, and vendors may contract with local computer vendors for hardware support while providing NG9-1-1 software support remotely. This is possible because NG9-1-1 makes use of commercial off-the-shelf (COTS) hardware.

7.5.3 Key Decision Points

During the transition phase, several key decision points must be considered. The State must define a transition methodology that works for all of the stakeholders. This will require communication and stakeholder feedback. Procurement methodologies must be decided upon including the financial impact of those decisions. Another important decision that must be coordinated with local PSAPs and regions is a deployment schedule. A deployment schedule must be specific and agreed upon by the stakeholders in order to plan for the appropriate steps to be taken during the transition.

7.5.4 Critical Dependencies

The creation of a transition plan is dependent upon the successful completion and documentation of the pilot project. Additionally, communication throughout the State at the state, regional, and local levels will determine the functionality of the transition plan.

Next Generation 9-1-1 deployment is dependent upon available funding and on whether the statutory and regulatory environment allows for this deployment to take place in the manner that the state plans for it.

7.5.5 Work Products

The following work products are outputs of this phase:

- Transition Plan
- Project Plan(s)

7.6 Maintenance and Management Phase

7.6.1 Overview

Once the South Carolina NG9-1-1 system is in place, system management activities will be important not only to maintain the system but to help the NG9-1-1 system meet its full potential presently and into the future. As technology changes, the network will need to adapt. Users of the network may shift once it is in place. All of these network maintenance issues must be planned for and managed in order to assure the network is being used to its full potential and remains secure and functional.

7.6.2 Tasks

7.6.2.1 Technology

With a fully deployed NG9-1-1 System, traditional lifecycle management activities of the system can commence. For

example, these activities include:

- **Fault management (technical support, break/fix, etc.).** Detect, isolate, notify, and correct State-level and Regional ESInets' incidents and problem in the network
- **System management and maintenance.** The State-level and Regional ESInets' management and maintenance strategies must align to reduce the risk of unplanned failure in the ESInet. This strategy combines both network policy/governance with operations and the deployment of operational tools that provide oversight of the South Carolina NG9-1-1 System. After coupling the IT Infrastructure Library (ITL) with the International Organization for Standardization (ISO) the State recognizes eight specific areas as a foundation of the fundamental State-level and Regional strategy for the ESInet hierarchy.
- **Configuration management (changes, Upgrades, Improvements).** Configuration Management verifies the impact of changes and the relationship to other configuration items (CI) before updating the change management database (CMDB) for the State-level and Regional ESInets.
- **KPIs/performance management.** Monitor and measure various aspects of performance so that overall performance can be maintained at an acceptable level for the State-level and Regional ESInets.
- **Managed services (monitoring).** Managed services should perform oversight functions as the State's agent. The contracted service should administer all aspects of interconnection, configuration, security, use, and maintenance of NG 9-1-1 by all service providers, by PSAPs, by PSAP vendors, and by any other stakeholder interconnected with the State of South Carolina NG9-1-1.
- **Security management.** Once the design has been implemented monitoring must be put into place to ensure that pre-set thresholds are not exceeded for capacity of all security elements. When thresholds are close to being reached, then processes should be in place for adding additional resilient security components and services. The State-level ESInet and Regional ESInet could potentially be at risk of security breaches such as spoofing. Policies should be followed that includes testing all products and services in a lab before implementation. Policies will be followed for patch management to ensure that security patches are kept up-to-date.
- **Incident response/management.** There is a potential risk of PSAP isolation or CPE failure in the new network. Contingency plans should be developed for the Regional ESInet re-directing calls to a pre-determined PSAP along with a contingency plan for recovering services to and at the PSAP.
- **Dashboards/portals.** The State-level ESInet and Regional ESInets have a need to be aware of service failure or termination, independent of the service interactions they initiate. To facilitate this requirement, the State-level ESInet and the Regional ESInet will need to create a dashboard/portal for notification best practices regarding service awareness that allow service requestors and providers deal with these cases in a consistent fashion.

7.6.3 Key Decision Points

There are several decisions that need to be made in order to manage the network effectively. Many of these decisions need to be made prior to the implementation of the network. One of the big advantages of NG9-1-1 will be the ability to add new forms of technology to the network. The State of South Carolina needs to determine how new

forms of technologies, data, and information will be allowed to use the NG9-1-1 network.

Another decision that will need to be made is regarding the policies and procedures for the network. These policies and procedures will need to be determined during the planning phase of this process, but will need to be reexamined and updated as the network is maintained.

7.6.4 Critical Dependencies

System management will depend largely on the following issues:

- Monitoring
- Fault Management
- Configuration Management
- Change Management
- Incident Response/Management

7.6.5 Work Products

Work products for the maintenance and monitoring phase will be ongoing throughout the day to day activities of maintaining a network. Through network maintenance and monitoring, the plan and other network documentation should be maintained as well. Strategic Plan maintenance is further addressed in Section 5 of this document.

The balance of this page is intentionally left blank.

8. GOALS AND OBJECTIVES

8.1 Developing Goals and Objectives

The goals South Carolina sets for itself are high-level, general directions. The State will work with local stakeholders in the decision process on the goals and objectives. The objectives set for achieving the goals are concise, specific and measurable. Each objective should have a deadline for completion and an associated metric to measure progress. Objectives are updated as they are completed or at least annually, even if the duration of activities associated with an objective is longer than one year.

In order to meet the consensus goals, the State has identified several actionable objectives. The goals and objectives are interrelated and may be executed concurrently.

Goal One: South Carolina will have a statutory environment that facilitates the implementation of and transition to NG9-1-1

Objective 1.1: South Carolina will review the 9-1-1 regulatory framework for roadblocks after NG9-1-1 system specifications and requirements are defined

Objective 1.2: South Carolina will expand its statutory authority to include the authority to operate and manage a State-level i3-compliant ESInet and promulgate rules

Objective 1.3: South Carolina will develop legislation that includes a broad definition of calls; this will include other types of communications, in addition to voice calls, that could be used to request 9-1-1 service

Objective 1.4: South Carolina will develop legislation that combine the relevant portions of the definitions for Basic 9-1-1, Enhanced 9-1-1 and 9-1-1 system or 9-1-1 service. This objective establishes a strong and unified definition of 9-1-1 that covers all potential technologies and eliminates the existing voice-specific definitions; any type of communication with 9-1-1 should be covered

Objective 1.5: South Carolina will legislatively amend the statute to modify the definitions for VoIP and "Commercial Mobile Radio Service", as well as the several references to Voice over Internet Protocol service and wireless telecommunications service that occur throughout the statute and modify the existing language to include internet protocol services that should cover any/all technology capable of accessing 9-1-1

Objective 1.6: South Carolina will legislatively amend and expand the confidentiality provision found in SCCL 23.47.75 to include a provision that protects any type of data associated with any type of 9-1-1 call and permit the aggregation and analysis of general call data. The statute should also be amended to provision for access restrictions to network stored data. South Carolina will promulgate rules to establish policies and procedures, setting access rights, controls and processes

Objective 1.7: South Carolina will work with the legislature to expand the statutory liability protection provided in SCCL 23.47.70 to clearly cover all NG9-1-1 services and be broad enough to encompass all players involved in provisioning NG9-1-1

Objective 1.8: South Carolina will develop legislation to obtain statutory authority to enforce compliance of administrative rules on the appropriate use of surcharge funds by PSAPs

Goal Two: South Carolina will create new administrative rules as the 9-1-1 system transitions and will routinely update all administrative rules

Objective 2.1: South Carolina will create a timeline and procedure for updating all administrative rules

Objective 2.2: South Carolina will create administrative rules related to the operational impacts from new NG9-1-1 services such as social media, applications and text messaging

Objective 2.3: South Carolina will create an administrative rule detailing the compliance program for appropriate use of surcharge funds including plans for bringing PSAPs into compliance and penalties for non-compliance

Goal Three: In recognition of a competitive marketplace, South Carolina will support a technology-neutral, vendor-agnostic environment where the State and carriers communicate and keep each other apprised of NG9-1-1 plans and developments

Objective 3.1: South Carolina will create a communications plan for coordination with carriers and NG9-1-1 service providers

Objective 3.2: South Carolina will develop service level agreements (SLAs) with carriers for transition to IP-enabled call delivery

Objective 3.3: South Carolina will work with 9-1-1 service providers to account for the responsibility for cost distribution for the decreasing use of shared legacy components, like selective routers, to prevent increased costs during the transition when legacy components are still relied on

Goal Four: South Carolina will establish a statewide NENA i3-compliant ESInet that will work in coordination with regional and local ESInets that are also NENA i3-compliant

Objective 4.1: South Carolina will design and implement a NENA i3-compliant ESInet that allows for regional and local connection to the state ESInet.

- Measurement - South Carolina will create a detailed ESInet plan by (Date)

Objective 4.2: South Carolina will conduct an in-depth financial analysis of the designed ESInet

- Measurement – South Carolina will perform an in depth financial analysis of the cost of transition by (Date) Measurement – South Carolina will perform an in depth financial analysis of on-going maintenance by (Date)
- Measurement – South Carolina will perform an in depth financial analysis to determine future funding needs by (Date)

Objective 4.3: South Carolina will establish the standards that regional and local NENA i3-compliant ESInets can connect to the statewide ESInet

- Measurement: South Carolina will draft the standards by (Date)
- Measurement: South Carolina will establish the final standards by (Date)

Objective 4.4: South Carolina will establish a governance model to oversee the implementation and maintenance of the ESInet

- Measurement: South Carolina will develop a governance model by (Date)
- Measurement: South Carolina will establish the governance model by (Date)

Goal Five: PSAPs will have the ability to share statewide NENA i3 Core Services and ESInet

Objective 5.1: South Carolina will identify core services that will be provided by the state

- Measurement: South Carolina will identify the core services by (Date)

Objective 5.2: South Carolina will establish what is needed in order for PSAPs to accept and share services.

- Measurement: South Carolina will draft the standards by (Date)
- Measurement: South Carolina will establish the final standards by (Date)

Goal Six: South Carolina manages the acquisition, implementation and maintenance of a statewide i3-compliant ESInet

Objective 6.1: South Carolina will issue RFPs for equipment and services necessary for the i3-compliant ESInet

Objective 6.2: South Carolina will create an administrative rule detailing the requirements for connecting to the statewide ESInet

Objective 6.3: South Carolina will establish processes and procedures for resolving and escalating contract and service issues procured under state contract. For example but not limited to:

- Contract and service issues resolution and escalation
- Data quality assurance
- Security and data rights management

Goal Seven: Develop PSAP Grant Programs to provide enhanced 9-1-1 services initiative that promote efficiency through consolidation, shared services and training

Objective 7.1: South Carolina will establish a grant program, as funding allows, to encourage and assist PSAP consolidation.

- Measurement: Identify funding available by (Date).
- Measurement: Develop criteria for application by (Date).
- Measurement: Open grant application process by (Date).
- Measurement: Award grants by (Date).

Objective 7.2: South Carolina will establish a grant program, as funding allows, to encourage and assist PSAP shared services.

- Measurement: Identify funding available by (Date).
- Measurement: Develop criteria for application by (Date).

- Measurement: Open grant application process by (Date).
- Measurement: Award grants by (Date).

Objective 7.3: South Carolina will establish a grant program, as funding allows, to encourage and support training of PSAP personnel.

- Measurement: Identify funding available by (Date).
- Measurement: Develop criteria for application by (Date).
- Measurement: Open grant application process by (Date).
- Measurement: Award grants by (Date).

Goal Eight: Based on new NG9-1-1 standards and responsibilities, identify the necessary resources to accommodate or satisfy those requirements

Objective 8.1: Conduct a workload assessment to determine if current resources are sufficient to accommodate the new standards and responsibilities.

- Measurement: Workload assessment completed by (Date)

Objective 8.2: If current resources are not sufficient, identify and obtain the appropriate resources to accommodate these new services

- Measurement: Identify necessary resources by (Date)

Goal Nine: South Carolina will establish a PSAP Training Committee to provide Telecommunicators with the necessary training needed for transition to the NG9-1-1 environment.

Objective 9.1: South Carolina will establish a PSAP Training Committee.

- Measurement: Committee established by (Date).

Objective 9.2: South Carolina will develop recommendations for basic Telecommunicator training for Board adoption.

- Measurement: South Carolina will research 9-1-1 PSAP basic Telecommunicator training standards by (Date).
- Measurement: South Carolina will develop recommendations for Board adoption by (Date).

Objective 9.3: South Carolina will work in partnership with the South Carolina Criminal Justice Training (SCCJT) Academy to implement training that meets or exceeds the adopted standards.

- Measurement: South Carolina will review the current SCCJT curriculum by (Date).
- Measurement: South Carolina will develop modifications to the SCCJT curriculum for basic training of 9-1-1 Telecommunicators.

Objective 9.4: South Carolina will establish a mechanism for certifying PSAP training programs in lieu of utilizing the SCCJT training program

- Measurement: South Carolina will research standards for certification of PSAP training programs by (Date)
- Measurement: South Carolina will develop or adopt standards for certification of PSAP training programs by (Date)

- Measurement: South Carolina will develop recommendations for Board adoption by (Date)

Goal Ten: South Carolina will establish a process that will support GIS needs of the NG9-1-1 environment.

Objective 10.1: South Carolina will establish a process to integrate and standardize local data into a statewide database

Objective 10.2: South Carolina will establish a process to build and maintain layers at the state level for those at the local level that are unable to develop and provide data that meets NG911 standards. Training and other support will be provided by state GIS staff.

Objective 10.3: South Carolina will establish a statewide aerial imagery program that will support the needs of NG911 and public safety on an on-going basis

8.2 Tracking Progress

The Board may adopt a policy that stipulates one month each year when the appropriate subcommittee is responsible for bringing forth administrative rule updates, and reports on progress towards achieving these goals.

The balance of this page is intentionally left blank.

9. CONCLUSIONS AND RECOMMENDATIONS

When the State set out to create a plan by South Carolinians, for South Carolinians, there were several goals in mind. This document is based around those goals and ideas. This section summarizes the goals laid out in the original RFP and outlines Kimball's recommendations for South Carolina moving forward.

9.1 Standards for Meeting Current and Future 9-1-1 Requirements

The South Carolina Strategic Plan is developed with the understanding that all activities shall be based on open industry standards where applicable. Any and all solution(s) and products that are discussed or derived from the Strategic Plan shall be configured in a manner that utilizes the latest NENA and APCO Next Generation 9-1-1 recommendations. The primary focus is to assure that both systems and operational methodology are interoperable within all PSAPs. This focus will encourage the effective and efficient use of the technology and resources that are required to process any type of 9-1-1 call for assistance throughout the State of South Carolina.
NENA is continually developing standards that specifically address future NG9-1-1 directions. The current relevant standards are:

- NENA Generic Standards for E9-1-1 PSAP Equipment, Technical Reference NENA 04-001, Issue 2, dated August 2000.
- NENA Recommended PSAP Master Clock Standard, NENA 04-002, Issue 3, May 17, 2000
- NENA NG9-1-1 GIS Data Model, NENA 02-010, and NENA 02-014.
- NENA Interface to IP Capable PSAP 08-501
- NENA VoIP I1, I2, I3.
- NENA Functional and Interface Standards for NG9-1-1 i3, NENA 08-002
- NENA Detailed Functional and Interface Standards for the NENA i3 Solution, NENA 08-003.
- NENA Methods for Location Determination to Support IP-Based Emergency Services Information Document, NENA 08-505.
- NENA Emergency Services IP Network Design for NG9-1-1 Information Document, NENA 08-506.
- NENA NG-SEC Document 75-001
- NENA i3 Technical Requirements Document 08-751

Where applicable, all solutions must comply with applicable industry standards, such as:

- National Fire Protection Association (NFPA) - NFPA 1221 requirements
- Underwriters Laboratories (UL)
- International Organization of Standards (ISO)
- Open System Interconnection (OSI) Institute of Electrical and Electronics Engineers (IEEE) - IEEE 802 at ISO Layer-2, and IP and TCP, as defined by the Internet Engineering Task Force (IETF) in the applicable RFCs, at ISO Layer-3 and above.
- American National Standards Institute (ANSI) - Both APCO and NENA approved standards
- Alliance for Telecommunications Industry Solutions (ATIS) - J-Std-036A and addendums

9.2 How to Determine What Data, Applications and Procedures Will be required for NG9-1-1

As South Carolina PSAPs consider transitioning to an NG9-1-1 system and the associated ESInet(s), it's absolutely

critical that the migration to NG9-1-1 environment be developed using open standards that interface between the PSAP, ESInet and the caller's device. Components of the NENA NG9-1-1/ESInet are frequently referred to as the i3 Architecture that defines the ESInet model, functions, interfaces and required services. The i3 Architecture also identifies the external interfaces between the PSAP and public access networks, the Internet and legacy wireless and wireline networks.

Geographic Information Systems (GIS) are an essential part of NG9-1-1. The first step South Carolina should take is to assess the GIS datasets across the State in preparation for a more comprehensive NG9-1-1 data readiness assessment. While the NG9-1-1 program geospatial issues would be a new opportunity for the State, it will require the addition of properly trained GIS staff to manage the influx of information that is received from the local jurisdictions and to manage the master database. In some cases, the local jurisdiction does not have the trained GIS personnel to develop, maintain or manage the GIS data and the State would need to develop a process with the SCGS to assure the information from that local jurisdiction was completed and made part of the state database. A methodology needs to be developed on how local jurisdictions can receive funding to update the mapping at a local level and then share with the State. This sharing would also allow authorized entities to access the aerial data for public safety purposes.

A procedure that is recommended for South Carolina is to assess the current 9-1-1 environment to fully understand the capabilities of the current system and what equipment is currently in use. This assessment will help South Carolina to plan and prepare for a transition to an upgraded NG9-1-1 system. This assessment of current technology systems and providers is needed to properly identify the technology requirements and steps needed to migrate from the current 9-1-1 system to a NG9-1-1 system. This assessment should identify technology that may need to be replaced and upgraded. This assessment will enable the State to:

- Identify technical functions that are important to the current systems
- Identify current infrastructure components that can be used with the NG9-1-1 system

This assessment will determine what equipment (including network, GIS data and CAD to CAD interfaces) is needed across the state to transition to a NG9-1-1 system.

Additional changes that can be expected with the NG9-1-1 transition are from the operational perspective due to increased resource and data sharing across multiple PSAPs. Training and staffing concerns should be assessed and operational standards and policies should be created or updated to account for these changes in the PSAPs' operational models. South Carolina should start by determining what operational mechanisms are in place and assess whether and how they will handle these operational challenges moving forward into an NG9-1-1 environment. This assessment can be conducted utilizing known benchmarks across the country. The results of the assessment will enable PSAPs to make the proper adjustments in advance of the technological changes that are coming in the future.

9.3 Timeframe

The timeline illustrated below is an approximately seven -year guideline to reflect the anticipated phases and time(s) necessary to complete a NG9-1-1 implementation. This timeline is dependent on variables that have the potential to impact the timeline such as; funding cycles, regulatory changes, CPE readiness and facility preparedness. Every PSAP will require a unique view of the specific dependencies and deliverables at each phase of implementation.

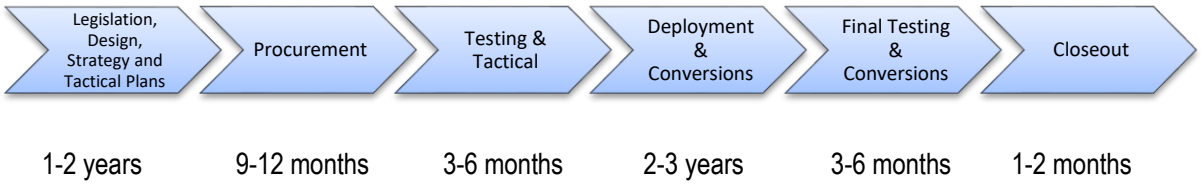


Figure 9—Timeline

Legislative Updates, Design, Strategy and Tactical Plans Phase

Implementation elements in the legislation, strategy and plans phase include:

- Update legislation to allow for the planned method of NG9-1-1 implementation
- Model system design to determine the appropriate design for the State of South Carolina
- Size applications according to best practices to ensure that not only the initial deployment model requirements are met, but that expected expansion and scalability needs are defined
- Review reliability requirements
- Assure that all availability requirements are evaluated, including continuity
- Develop and document recovery plans for additions, upgrades, and unforeseen service interruptions

Procurement Phase

Implementation elements in the procurement process phase include:

- Develop an RFP(s) for vendor response
- Select vendors to respond
- Analyze responses and select a vendor(s) for award
- Contract negotiations
- Contract finalization and signing

Testing (Functional, Non-Functional and Adjustments) and Tactical Phase

Implementation elements in the testing and tactical phase include:

- Test plan development
- Validation processes
- Evaluation criteria
- Support strategy
- Controls
- Breach management

Network Deployment and Initial Conversion/Test Phase

Implementation elements in the network deployment and conversion include:

- Network deployment management
- Configuration and release management
- PSAP cutovers (equipment and network)
- System acceptance

Final Testing (Functional and Cross-Functional) and Conversions Phase

Implementation elements in the final testing include:

- Assess knowledge gained
- Maximize lessons learned

Project/Phase Closeout

Conversion of the successful testing and acceptance of the NG9-1-1 system, network and equipment, delineates phase or project closeout. Any incomplete deliverables or objectives should be measured and closed as soon as practical to allow for project closure.

9.4 NG9-1-1 Migration Options and Resources

Before transitioning to NG9-1-1, it will be important for the State to assess its current roles and assure that it has the authority and capability for statewide planning, coordination and implementation of an NG9-1-1 system.

While staffing PSAPs and handling 9-1-1 calls will remain local functions, aspects of NG9-1-1 will require State-level planning and coordination. The need for statewide coordination has been introduced and continually stressed by Congress. The Wireless Communications and Public Safety Act of 1999 encouraged states to implement seamless, end-to-end emergency communications services. The 1999 Act notes that this "requires statewide coordination of efforts of local Public Safety, fire service and law enforcement officials, emergency dispatch providers, and transportation officials; the establishment of sources of adequate funding for carrier and Public Safety, fire service, and law enforcement agency technology development and deployment; the coordination and integration of emergency communications with traffic control and management system". The Ensuring Needed Help Arrives Near Callers Employing 911 (ENHANCE 911) Act of 2004, as amended, further reinforced and expanded on the concept of state-level leadership by making it a requirement for the receipt of grant funding.

A coordinating entity within the RFA office needs to be assigned for the transition to Statewide NG9-1-1. If the Wireless E9-1-1 Program is considered to play the coordination role, the operations of the Wireless E9-1-1 Program need to be assessed to determine if adequate budget, staffing, and training levels are in place and what changes are necessary to support migration to Statewide NG9-1-1 and beyond. It will be necessary to assess current staffing levels, capabilities, and other budgetary concerns for the Wireless E9-1-1 Program to adequately and effectively fulfill its obligations in a Statewide NG9-1-1 environment. It is likely that the responsibilities of the Wireless E9-1-1 Program will increase, thus potentially requiring a budget adjustment and increased staffing, training, and other similar requirements. As addressed in the Background section of this Plan, the state Wireless E9-1-1 Program is currently budgeted for two employees, one of which is the position of the E9-1-1 Program Coordinator. The position is already strained to keep up with the current needs of the state program. Additional staff will be required to staff additional duties related to NG9-1-1. A staffing assessment should be conducted to determine the appropriate level of staffing needed.

South Carolina will also need to assess whether it has the ability to effectively coordinate the activities of local 9-1-1 authorities and other Public Safety or government stakeholders who may share the ESInet backbone (including

interconnections with ESInets in neighboring states, or federal entities). The ability and authority to coordinate the technology employed, Public Safety agencies that will use them, and manage the interconnections between multiple regional ESInets are essential State-level functions in a NG9-1-1 environment. The State will establish minimum technology requirements and processes for the PSAPs. Establishing these technology requirements will involve prospective vendors and suppliers to validate products are available to meet the defined requirements. Once those have been identified, the State will develop a list of "approved technology" that can provide the needed delivery of service, as well as any interoperability requirements.

The State should reevaluate its role during and after the transition to NG9-1-1.

Several options for implementing an interoperable NG9-1-1 network were discussed at the six Town Hall meetings held across the State as well as through surveys issued to each county. .

9.4.1 Option 1 – A Statewide ESInet with NG9-1-1 Core Services

A Statewide ESInet would perform location-based emergency call routing using the location based protocols to all PSAPs within the state. Two primary controllers would route all calls to the appropriate PSAP. All emergency calls placed within the state would ingress (enter) and egress (exit) the network via secured Border Control Function (BCF). The Statewide ESInet would be interoperable with and interconnect to any future Federal ESInets and ESInets belonging to other states.

9.4.2 Option 2 – A Statewide Network Backbone and Regional ESInets

A Statewide ESInet, would perform location-based emergency call routing using the location based protocols. All emergency calls within the coverage area would ingress (enter) and egress (exit) the network via secured Border Control Function (BCF). This state supported ESInet could provide the "backbone" for the state for other regional ESInets to connect to. The Statewide ESInet would be interoperable with and interconnect to all future regional ESInets, Federal ESInets and ESInets belonging to other states. This method would allow for connection to other regional ESInets and provide the required system backups/failovers for the state as a whole. The Statewide ESInet would also function as a regional ESInet for those PSAPs not covered by a regional ESInet.

9.4.3 Option 3 – Regional ESInets Only

In this option, regional ESInets would be set up by regions across the state in the hopes of connecting to each other independent of a statewide backbone. Connectivity would be driven almost exclusively by the presence of carrier and vendor services in a given geographic area. Metropolitan PSAPs, PSAP networks and rural PSAPs will have circuit and CPE (Information Technology [IT]) differences in how they interconnect to their Regional ESInet. It would be the decision of each regional ESInet system on how they would/could connect to other regional ESInets. Robust and 'diverse' IP connectivity is critical to maintain "five-nines" reliability.

9.4.4 Potential Cost Efficiencies

Based on feedback from the South Carolina 911 community and looking at other states initiatives, the CMRS committee recommends implementing Option 2. Both statewide and regional ESInets will allow and encourage the future sharing of centralized applications and systems as well as support inter-network access to other databases. This sharing of technology within ESInets will also save individual PSAPs the cost of equipment and maintenance. Additionally, the State (or a region) comes together to procure an ESInet and NG9-1-1 functionality, many cost

efficiencies may be realized including:

- The State can create and release one RFP for the network and equipment needed for a statwide ESInet as opposed to numerous PSAPs creating and releasing RFPs across the state. This will save time, resources and money and will create general efficiencies that could be used for NG9-1-1.
- Procuring all of the network services and equipment together presents an opportunity to save money by "buying in bulk". The State can negotiate the best price with the venders on behalf of the PSAPs and therefore receive a better price.
- The networks systems identified above would support interoperability among South Carolina's diverse geography and enable dissemination of emergency incident information to help expand mutual aid. These benefits will create cost efficiencies among all PSAPs connected to an ESInet.
- Regional ESInets in conjunction with a statewide ESInet backbone could enable the opportunity for PSAPs connected to the network to become the necessary backup facilities to each other, therefore saving the cost of additional local or regional backup systems.

9.5 Recommendations for amending statutory provisions to achieve the strategic plan and regulatory requirements for approving or updating 911 plans

The RFA staff will need to have the authority and capability for statewide planning, coordination and implementation of an NG9-1-1 system. Changes are needed in the existing statutory environment to support the goals and objectives in this Strategic Plan and allow for:

- Architecture and technology neutrality
- The delivery of new services by service providers with new technologies
- The extension of liability protection laws to current and future service providers
- The alignment of new service arrangements, costs and funding mechanisms with NG9-1-1

South Carolina's laws, regulations and tariffs make specific references to older technologies that are not necessarily compatible with NG9-1-1 and may present roadblocks to implementing this Strategic Plan. In order to provide a seamless and efficient transition from E9-1-1 to NG9-1-1, it is essential that South Carolina assess and analyze all current laws and regulations to assure that they have a mechanism to keep pace with advancements in telecommunications and 9-1-1. A few examples of legislative/regulatory matters that should be assessed include:

- Provisions regarding the eligible use of 9-1-1 funds.
- Provisions that reference or require specific legacy technology components of E9-1-1 service; technology neutral provisions are preferable.
- Language (including provisions in tariff) that prohibit the sharing of 9-1-1 system components and data (with appropriate safeguards for security and confidentiality).
- Existing 9-1-1 service arrangements and tariffs that inhibit new entrants from making similar competitive services available to state or local authorities responsible for procuring 9-1-1

services.[24]

- Tariffs and any applicable interconnection agreements should also be analyzed to assure that they do not contain provisions that would impede the new interconnections and relationships that are necessary for a NG9-1-1 system.
- The confidentiality of personally identifiable information (PII) will have to be examined and protected due to the availability of more data associated with the 9-1-1 caller.

Funding statutes and regulations should be updated to support this Strategic Plan with the objective that reimbursements to PSAPs won't be diminished from their current funding level. Statutes should be amended to collect a technology neutral fee at the state-level. Rules should be promulgated to specify what expenditures would be allowable expenses for money distributed to the jurisdictions. Initially the funds should be distributed as follows, not necessarily in priority order, and then revisited after implementation:

- Costs to cover administrative expenses for the Department of Revenue.
- A percentage for the carriers to retain to cover the costs of collecting and remitting the fee.
- An amount to fund administrative and staffing costs for the Board.
- The RFA should pay the costs to build, maintain and operate the IP network and the PSAP connections to the IP network directly. This will allow the State to obtain better pricing for the network and to ensure a unified approach to deployment of the network.
- The Board should establish a Capital Expenditures account for future network upgrades and expenses.
- The Board should create a PSAP consolidation incentive account.
- The remaining funds should be allocated to the counties for distribution to the PSAPs that meet the technical and operational standards established by the Board.
- GIS

Official updates to this Strategic Plan should be made once per year in the month of June and an official version should be released shortly thereafter. Yearly review will assure that the Strategic Plan remains relevant but prevents constant changes to the Strategic Plan which may become unmanageable to the responsible party. Revisions and updates will be tracked throughout the year, but the official Strategic Plan update will be made in June with the approval of the Board. This review schedule will allow flexibility in NG9-1-1 planning and maintenance as regulations and technology changes.

9.6 Summary Recommendations

CMRS committee recommends the following for the State of South Carolina:

1. The RFA agency should assess their current roles and assure that they have the authority and capability for statewide planning, coordination and implementation of an NG9-1-1 system. It is likely that the responsibilities of the State will increase, thus potentially requiring a budget adjustment and increased staffing, training, and other similar requirements.
2. The RFA agency should reevaluate its role during and after the transition to NG9-1-1.

[24] National Emergency Number Association Next Generation Partner Program Next Generation 9-1-1 Transition Policy Implementation Handbook, March 2010, 14.

3. The RFA agency should take the lead in developing a long-term strategy to achieve and maintain the appropriate balance of funding sources following NG9-1-1 implementation.
4. The RFA agency should establish funding legislation that enacts one statewide fee for any device that can access 9-1-1. In order to facilitate the transition to an NG9-1-1 network the funds cover limited expenses initially and are then revisited after the state is operating on the new network. Additionally, this fee would compensate the local entity for cost incurred related to NG9-1-1 and still allow for a local funding to exist for other services provided locally.
5. As South Carolina PSAPs consider transitioning to an NG9-1-1 system and the associated ESInet, it's absolutely critical that the system be developed using open standards that interface between the PSAP, ESInet and the caller's device. It's critical that NENA's recommended i3 Network Architecture is closely followed to ensure interoperability with other ESInets.
6. The RFA agency should use its positioning as a State of South Carolina governmental entity to provide leadership and assistance in planning for NG9-1-1 and eventually developing an RFP for an ESInet.
7. The RFA agency should establish both a statewide and regional ESInet deployment schedule. This dual deployment will allow for those areas that can support their respective regional ESInet to do so and those areas that need the state support to move forward will have that path.
8. The RFA agency should facilitate the definition of roles and responsibilities of local, regional and State government through stakeholder involvement. An appropriate structure should be established with the direct involvement of local PSAP participation.
9. The RFA agency should identify key local and state stakeholders and determine how the NG9-1-1 vision impacts the stakeholders.
10. The RFA agency, recognizing the potential challenges associated with creating a statewide GIS database, should make it the State's top priority. Not only will the NG9-1-1 system need this data, but statewide public safety GIS datasets will be of immense value to virtually all aspects of public safety in South Carolina as they do not exist today.
11. The RFA agency recognizing the critical role that GIS will play in NG9-1-1, should develop a sustainable model for building, maintaining, updating and integrating key GIS layers at the statewide level. Training and other support will be provided by state GIS staff.
12. The RFA agency, recognizes the need for statewide aerial imagery to both support development and maintenance of NG9-1-1 critical GIS data, as well as determining accurate locations of callers. They should develop a statewide aerial imagery program that will support the needs of the NG911 and public safety environment on an on-going basis.
13. Operational standards and policies should be created or updated in response to the anticipated changes in PSAP operational models.
14. The RFA agency should create detailed technical and functional requirements based on the results of the technology assessment and analysis phase, the unique factors present in South Carolina, the needs of the stakeholder community, and lessons learned from other states migrating to NG9-1-1. The State should use stakeholder focus groups to gather information that will be used to develop the requirements.
15. The RFA agency should establish a training committee to determine the minimum statewide training standards for South Carolina telecommunicators.

APPENDIX A—STATE FEES

State	Wireline	Wireless	VoIP
Alabama	$1.60	$1.60 $1.60 Prepaid	$1.60
Alaska	$0.00 - $2.00	$0.00 - $2.00	
Arizona	$0.20	$0.20	$0.20
Arkansas	5% - 12% of Tariff Rates	$0.65 $0.65 Prepaid	$0.65
California	.50% of intrastate calls	.50% of intrastate calls	.50% of intrastate calls
Colorado	$0.43 - $1.50 (max)	$0.43 - $1.50 (max) 1.4% of Sale - Prepaid	$0.43 - $1.50 (max)
Connecticut	$0.67	$0.67 $0.67 Point of Sale - Prepaid	$0.67
Delaware	$0.60	$0.60	$0.60
District of Columbia	$0.76 Wireline $0.62 Centrex $4.96 PBX Trunk	$0.76 2.0% Point of Sale - Prepaid	$0.76
Florida	$0.50 (Max)	$0.50	$0.50
Georgia	$1.50	$1.00 - $1.50 $0.75 Prepaid	$1.50
Hawaii	$0.27	$0.66	$0.66
Idaho	$1.00 (max)	$1.00 (max)	$1.00 (max)
Illinois	$0.25 - $5.00	$0.73 $2.50 City of Chicago 7.0% of Sale City of Chicago - Prepaid 1.5% of Sale - Prepaid	$0.25-$5.00
Indiana	$0.90	$0.90 $0.50 of Sale- Prepaid	$0.90
Iowa	$1.00 Max	$0.65 $0.33 Point of Sale - Prepaid	$0.65
Kansas	$0.53	$0.53 1.06% of Retail Sale -Prepaid	$0.53
Kentucky	$0.36 - $4.50	$0.70 $0.70 Prepaid	$0.36 -$4.50

State	Wireline	Wireless	VoIP
Louisiana	$0.62 - $1.00 Residential $1.30 - $2.00 Business	$0.85 - $1.50 (max) 2% of Retail Sale - Prepaid	$1.00
Maine	$0.45	$0.45 $0.45 Point of Sale- Prepaid	$0.45
Maryland	$1.00	$1.00	$1.00
Massachusetts	$0.75	$0.75 $0.75 Prepaid	$0.75
Michigan	$0.19 State Fee $0.00 - $3.00 by County	$0.19 State Fee $0.00 - $3.00 by County 1.92% Point of Sale - Prepaid	$0.19 State Fee $0.00 - $3.00 by County
Minnesota	$0.80	$0.80	$0.80
Mississippi	$1.00 Res $2.00 Commercial	$1.00 $1.00 Prepaid	$1.00
Missouri	2% - 15% of Base Rate (52 Counties) 1/8% - 3/4% of Sales Tax (44 Counties) General Revenue (2 Counties) Unfunded (16 Counties)	None	
Montana	$1.00	$1.00	$1.00
Nebraska	$0.50 - $1.00	$0.45 - $0.70 (Max) 1.1% of Retail Sale - Prepaid	
Nevada	Varies by Jurisdiction – Property tax and/or Surcharge	Must be equal to wireline Surcharge	
New Hampshire	$0.57	$0.57	$0.57
New Jersey	$0.90	$0.90	$0.90
New Mexico	$0.51	$0.51	
New York	$0.35 - $1.00	$1.20	$0.35
North Carolina	$0.60	$0.60 $0.60 Point of Sale – Prepaid *	$0.60
North Dakota	$1.00 - $1.50 (max)	$1.00 - $1.50 (max) $1.00 - $1.50 max) - Prepaid	$1.00 – 1.50 (max)
Ohio	$0.50 (Max) (Legally limited to a few Counties, no general surcharge.)	$0.25 0.2% Point of Sale – Prepaid *	
Oklahoma	3-15% of Base Rate	$0.50 (Approx. 42 Counties)	$0.50

State	Wireline	Wireless	VoIP
		$0.50 Prepaid	
Oregon	$0.75	$0.75	$0.75
Pennsylvania	$1.00 - $1.50	$1.00 $1.00 Point of Sale - Prepaid	$1.00
Rhode Island	$1.00	$1.26	$1.26
South Carolina	$0.30 - $1.00	$0.62 $0.62 Prepaid	$0.30 - $1.00
South Dakota	$1..25	$1.25 2% Point of Sale - Prepaid	$1.25
Tennessee	$0.45 - $1.50 Res./ $1.52 - $3 Bus	$1.00 $0.53 Point of Sale - Prepaid	$1.00
Texas	$0.50 State Program Fees Vary – District	$0.50 2% of Sale - Prepaid	$0.50
Utah	$0.61 Local Fee plus $0.08 State Fee	$0.61 Local Fee plus $0.08 State Fee 1.9% Point of Sale - Prepaid	$0.61 Local Fee plus $0.08 State Fee
Vermont	Universal Service Funding	Universal Service Funding	
Virginia	$0.75	$0.75 $0.50 Prepaid	$0.75
Washington	$0.25 Statewide $0.70 by Counties	$0.25 Statewide $0.70 by Counties	$0.25 Statewide $0.70 by Counties
West Virginia	$0.98 - $6.40 by County	$3.00 6% Point of Sale - Prepaid	$0.98 - $6.40 by County
Wisconsin	$0.40 - $1.00	None	
Wyoming	$0.25 - $0.75	$0.25 - $0.75	$0.25-$0.75

APPENDIX B – GLOSSARY OF TERMS

All definitions are from the NENA Master Glossary of 9-1-1 Terminology, NENA-ADM-000.18-2014.

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 of the location from which a call originates.

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

Border Control Function (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 deliberate or malicious attacks on PSAPs or other entities connected to the ESInet.

Call -- A generic term used to include any type of Request for Emergency Assistance (RFEA); and is not limited to voice. This may include a session established by signaling with two way real-time media and involves a human making a request for help. We sometimes use "voice call", "video call" or "text call" when specific media is of primary importance. The term "non-human-initiated call" refers to a onetime 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" can 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 NG9-1-1.

Computer Aided Dispatch (CAD) -- A computer based system, which aids PSAP Telecommunicators by automating selected dispatching and record keeping activities.

Customer Premises Equipment (CPE) -- Communications or terminal equipment located in the customer's facilities – Terminal equipment at a PSAP.

Emergency Call Routing Function (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 Services IP Network (ESInet) -- An ESInet is 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 NG9-1-1 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 Services Routing Proxy (ESRP) -- An i3 functional element which is a SIP proxy server that selects the

next hop routing within the ESInet based on location and policy. There is an ESRP on the edge of the ESInet. There is usually an ESRP at the entrance to an NG9-1-1 PSAP. There may be one or more intermediate ESRPs between them.

Emerging Technologies -- New technologies and network to deliver communications.
Geographic Information System (GIS) -- A system for capturing, storing, displaying, analyzing and managing data and associated attributes which are spatially referenced.

Hosting -- The provision of services to one or more remote sites. Rather than install complete systems in multiple sites, the control equipment may be located in a central site and shared across several remote sites.

I3Public Safety Answering Point (i3 PSAP)-- A PSAP that is capable of receiving IP-based signaling for delivery of emergency calls and for originating calls and is conformant to NENA specifications for such PSAPs.

Incumbent Local Exchange Carrier (ILEC) -- A telephone company that had the initial telephone company franchise in an area.

Interoperability -- The capability for disparate systems to communicate with one another.

Legacy Network Gateway (LNG) -- A signaling and media interconnection point between callers in legacy wireline/wireless originating networks and the i3 architecture, so that i3 PSAPs are able to receive emergency calls from such legacy networks.

Local Exchange Carrier (LEC) -- A Telecommunications Carrier (TC) under the state/local Public Utilities Act that provide local exchange telecommunications services.

Location Information Server (LIS) -- A Location Information Server (LIS) is 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 by an endpoint for its own location, or by another entity 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 is also the entity that 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. Used generally for location-based call routing. In NG9-1-1, used as the protocol for the ECRF and LVF.

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 database 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.

Next Generation 9-1-1 (NG9-1-1) -- NG9-1-1 is an Internet Protocol (IP)_based system comprised of managed Emergency Services IP networks (ESInets), functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provides additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected communications sources, and provide multimedia data capabilities for Public Safety Answering Points (PSAPs) and other emergency service organizations.

Next Generation 9-1-1 Core Services [1] – Core services perform the actual 9-1-1 call routing control process, provide the ability to share 9-1-1 caller voice and data between multiple PSAPs, and provide the ability to control 9-1-1 call flows and to dynamically rearrange NG9-1-1 call routing zones. Additionally, other data sources can be connected to the NG9-1-1 system, such as a call, caller, or data providers needed for access by PSAPs or other entities.

Origination Network -- The network which originates a 9-1-1 call. Includes the access network and the calling network. Typically operated by carriers or other service providers.

Policy Routing Function (PRF) -- That functional component of an Emergency Services Routing Proxy that determines the next hop in the SIP signaling path using the policy of the nominal next element determined by querying the ECRF with the location of the caller. A database function that analyzes and applies ESInet or PSAP state elements to route calls, based on policy information associated with the next-hop.

Robust[25]-- Sturdy in construction; able to withstand or overcome adverse conditions.

Selective Router -- The Central Office that provides the tandem switching of 9-1-1 calls. 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.

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

Service Uniform Resource Name (Service URN) -- A URN with “service” as the first component supplied as an input in a LoST request to an ECRF to indicate which service boundaries to consider when determining a response. A service URN is also used to mark a call as an emergency call.

Session Initiation Protocol (SIP) -- An IETF defined protocol (RFC3261) that defines a method for establishing multimedia sessions over the Internet. Used as the call signaling protocol in VoIP, i2 and i3.

[25] This definition is not in the NENA Master Glossary of 9-1-1 Terminology