

COMMISSION  
ON STATE  
EMERGENCY COMMUNICATIONS

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STRATEGIC PLAN FOR  
STATEWIDE 9-1-1 SERVICE  
FOR  
FISCAL YEARS 2017 – 2021

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## **I. PURPOSE**

Section 771.055 of the Health and Safety Code requires the Commission on State Emergency Communications (CSEC) to prepare for each state fiscal biennium a strategic plan for statewide 9-1-1 service for the following five state fiscal years. This document is submitted in fulfillment of that requirement.

The strategic plan must:

- (1) include a survey of the current performance, efficiency, and degree of implementation of emergency communications services throughout the whole state;
- (2) provide an assessment of the progress made toward meeting the goals and objectives of the previous strategic plan and a summary of the total expenditures for emergency communications services in this state;
- (3) provide a strategic direction for emergency communications services;
- (4) establish goals and objectives relating to emergency communications;
- (5) provide long-range policy guidelines for emergency communications;
- (6) identify major issues relating to improving emergency communications;
- (7) identify priorities for this state's emergency communications system; and
- (8) detail the financial performance of each regional planning commission in implementing emergency communications service including an accounting of administrative expenses.

## **II. SURVEY OF 9-1-1 SERVICE IN TEXAS**

9-1-1 service is statutorily defined as a communications service that connects users to a Public safety Answering Point (PSAP) through a 9-1-1 system. In Texas, 9-1-1 service is provided by a mix of 9-1-1 Entities consisting of 53 Emergency Communication Districts (ECDs)<sup>1</sup> and the state program administered by the CSEC and operated by 22 Regional Planning Commissions (RPCs). Texas Health and Safety Code, Chapter 771, is the statutory basis for the CSEC/RPC 9-1-1 program. Under the program, the CSEC contracts with the RPCs for the provision of 9-1-1 service in those areas of the state where 9-1-1 service is not provided by an ECD. The statewide program is well

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<sup>1</sup> Twenty-six Emergency Communication Districts have been formed and operate under the authority of Health and Safety Code Chapter 772. Twenty-six municipalities and one county that are recognized as Emergency Communication Districts in Health and Safety Code § 771.001(3)(A) operate 9-1-1 systems that are independent of the state's system. 9-1-1 service in the incorporated portion of Dallas County is provided by Emergency Communication Districts, or pursuant to the North Central Texas Council of Governments' Regional 9-1-1 Plan. 9-1-1 service in the unincorporated portion of Dallas County is provided by Dallas County Sheriff's Office.

established, and the CSEC and the RPCs work together to further develop and maintain access to efficient and effective statewide 9-1-1 services. Figure 1 – *Map of Texas 9-1-1 Service Entities* - illustrates the geographical service areas of the 9-1-1 Entities.

**A. DEGREE OF IMPLEMENTATION**

The following levels of 9-1-1 service have been implemented by all 9-1-1 Entities in all areas of the state.

- Basic 9-1-1 provides the caller the ability to reach a PSAP by dialing the digits 9-1-1
- Enhanced 9-1-1 (E9-1-1) adds the following three key capabilities to basic 9-1-1 service, and has been implemented throughout the state for landline, wireless and voice over internet protocol (VoIP) service.
  - Selective routing provides intelligence and flexibility in the routing of calls to the correct, predetermined PSAP;
  - Automatic Number Identification (ANI) provides the caller’s telephone number so call takers can call back if the call is disconnected; and
  - Automatic Location Identification (ALI) provides call takers with the caller’s location or address, which assists in the dispatch of emergency services.

**B. CURRENT PERFORMANCE**

Citizens rely on 9-1-1 to reach assistance in times of individual crisis or major disaster. The mission of the CSEC is to preserve and enhance public safety and health in Texas through reliable access to emergency communications services. In accomplishing our mission, the CSEC collaborates with regional and local governments and other state agencies to promote stewardship and accountability, set high standards, and foster efficient emergency communications services. Performance is reflected by the number of calls to 9-1-1.

**9-1-1 Call Volume for Calendar Year 2015**

- 29,005,100 per year
  - 79,466 per day
    - 3,311 per hour

Type of Service	Total 911 Calls
Wireline	2,980,196
Wireless	24,917,198
VoIP	878,125
Other	229,581
<b>Total</b>	29,005,100

Limitations on performance exist. The performance of the current 9-1-1 infrastructure is subject to inherent limitations due to its age and design. The existing 9-1-1 infrastructure is based on wireline technologies established decades ago, and uses outdated systems to deliver 9-1-1 calls and location information to the PSAPs. While wireless phone service is assumed to be ubiquitous, it is often not reliable or available at all in sparsely populated rural areas of the state which prevents the ability to dial 9-1-1. The current 9-1-1 system cannot accept digital media such as text messages, photographs or video, all of which are mainstream technologies used by the public today; nor is the current 9-1-1 system interoperable with emergency responder public safety communications systems.

### **C. EFFICIENCY**

The technology supporting the current 9-1-1 system is nearing end-of-life and will soon be obsolete. The national telecommunications infrastructure is changing as is the way the public communicates and adopts new technology. These changes have a direct impact on the ability of 9-1-1 service to support and serve the public. As more new digital communications technologies are introduced that cannot access the existing 9-1-1 system, the effectiveness and efficiency of 9-1-1 service will erode. The cost of supporting and maintaining the aging 9-1-1 infrastructure, if possible at all, will increase.

Recent actions by the Federal Communications Commission will require the wireless carriers to send and receive text messages to better serve the needs of the deaf and hard of hearing, as well as those “callers” that would put themselves in danger by speaking aloud to a 9-1-1 call taker. Texas’ major telephone companies that currently provide the 9-1-1 infrastructure have begun planning to decommission and replace their aging network and equipment.

Incorporating these advanced capabilities will require major changes to the 9-1-1 infrastructure. A digital replacement of the current analog 9-1-1 system is needed to leverage and increase the efficiency of the existing 9-1-1 system.

## **III. ASSESSMENT OF PROGRESS ON MEETING THE GOALS AND OBJECTIVES OF 2015 – 2019 PLAN**

The goal of the previous biennium’s plan was to establish a more effective, efficient and resilient 9-1-1 system for providing 9-1-1 service. The following objectives were established to obtain the goal. The progress made to-date on each objective is noted.

1. Maintain the present level of 9-1-1 service while transitioning to a system capable of addressing newer consumer devices and other needs.
  - The current level of 9-1-1 service, Enhanced 9-1-1, has been maintained throughout the state.

2. Plan and deploy the CSEC State-level ESInet.

- The 83<sup>rd</sup> Legislature (2013) appropriated \$12.8 million for FY 2014 – 2015 for Phase I of the CSEC State-level ESInet: 9-1-1 geospatial data development and the first phase of a state-level digital 9-1-1 network. Geospatial database management services have been procured and data development has commenced at the RPCs in the CSEC program. On the digital 9-1-1 network, CSEC completed the initial stakeholder assessment and planning project in FY 2014; and, procured technical services, equipment and network components in FY 2015 to achieve its strategic plan performance measure to connect eighty (80) PSAPs to a state-level network.
- The 84<sup>th</sup> Legislature (2015) appropriated \$7.8 million for FY 2016 – 2017 for Phase II of the implementation of the CSEC State-level ESInet. The CSEC has adopted a hybrid – dedicated/shared infrastructure ESInet architecture model whereby hardware components providing required functionality are deployed in a combination of both owned and shared infrastructure as appropriate. This architecture allows 9-1-1 Entities to share certain infrastructure and functions (such as 9-1-1 call routing and processing) while maintaining dedicated infrastructure for other functions (such as Computer Aided Dispatch). Funding for this biennium will be used for the procurement of multiple contracts with multiple vendors specializing in certain aspects, components, and functions of the network, to implement the CSEC State-level ESInet.

3. Plan and deploy Regional ESInets.

- Twenty-one of the twenty-two RPCs in the CSEC program have implemented or partially implemented regional ESInets; specifically, 285 of the 300 PSAPs in the CSEC/RPC program have regional connectivity between Public Safety Answering Points;
- Ten individual ECDs, report having planned, implemented, or partially implemented regional ESInets.

4. Identify, develop and adopt operational and technical guidelines and requirements that govern the CSEC State-level ESInet.

- During the FY 2014 – 2015 biennium, the CSEC Emergency Communications Advisory Committee (ECAC) developed and recommended several policies and standards to the Commission. The following ECAC recommended policies and standards were adopted by the Commission in February 2015:
  - Relevant Standards for CSEC State-level ESInet Design, Implementation, and Operations (March 2015)

- CSEC State-level ESInet Security Policy (March 2015)
  - CSEC NG9-1-1 GIS Data Standard (March 2015)
- The ECAC has identified and prioritized the policy issues to consider, develop and/or recommend to the Commission during the FY 2018 – 2019 biennium. These policy issues reflect the current and planned Texas NG9-1-1 environment that will consist of multiple interconnected ESInets, including the CSEC State-level ESInet and Regional ESInets that are owned and operated by 9-1-1 Entities, as well as vendor provided ESInet service offerings. More detail is provided in Appendix 1, *CSEC Next Generation 9-1-1 Master Plan Ver. 5 (June 2016)*.
- Interoperability and Interconnectivity
  - GIS Data
  - Outreach & Awareness
5. Identify resources and tools to educate and support 9-1-1 Entities, in particular smaller entities that may lack resources at the local level.
- Comprehensive outreach and education for both 9-1-1 Entity stakeholders and the public is critical to the effectiveness and overall acceptance of all aspects of NG9-1-1. During the current biennium, CSEC has delivered consistent messages to stakeholders including informational items such as brochures, newsletters, news articles, video blogs and social media posts. These messages provide key information and reinforcement regarding the transition to NG9-1-1.
- CSEC has created and utilized a Next Generation 9-1-1 Educator Network as a resource to help deliver these messages to stakeholders and in turn, provide feedback. The Next Generation 9-1-1 Educator Network has played a pivotal role by providing feedback through:
- Email and informal conversations and/or meetings
  - Surveys
  - Focus groups and workshops
  - Social Media and Video Blogs
- By leveraging social media for this project, such as Facebook, Twitter, LinkedIn and YouTube, CSEC continues to deliver key messages in a resourceful way. The collaboration of the NG9-1-1 Educator Network and project staff has helped to refine the tactical execution of this strategy by taking resources provided by CSEC and distributing them to various stakeholders within the community including elected officials, executive leadership, PSAP staff, and more. Messages shared include knowledge of the ESInet project and the NG9-1-1 system, belief that the system is

current than the better system, and that everyone's interests are represented.

#### IV. SUMMARY OF TOTAL EXPENDITURES

The annual cost for calendar year 2015 for emergency communications services for the state of Texas was \$232,792,529. This figure is based on the assumption that 9-1-1 fee collections in the ECD areas and appropriated 9-1-1 fees and equalization surcharge for the CSEC state 9-1-1 program equal expenditures. Fee collections were reported to the FCC in June of 2016 as mandated by the federal New and Emerging Technologies Improvement Act of 2008. Reported collections are summarized in Table 2.<sup>2</sup>

Service Type	Total Amount Collected (\$)
Wireline	\$69,900,837
Wireless	\$108,963,296
Prepaid Wireless	\$24,885,131
Voice Over Internet Protocol (VoIP)	Amount included in Wireline collections above
Other (State Equalization Surcharge)	\$19,189,471
<b>Total</b>	<b>\$222,938,735</b>

#### V. MAJOR ISSUES RELATING TO IMPROVING 9-1-1 SERVICE IN TEXAS

The current 9-1-1 system is approaching the end of its useful life. It uses legacy technology to deliver 9-1-1 calls and location data for landline voice, and landline teletype/telecommunications device for the deaf (TTY/TDD); and "bolted on" additional systems to deliver, wireless/cellular voice, and VoIP 9-1-1 to the Public Safety Answering Point (PSAP). Each introduction of a new access technology (e.g., wireless, text messaging) or expansion of system functions (e.g., determining the location of a

<sup>2</sup> The difference between costs and collections is due to CSEC being appropriated more funds for 9-1-1 service than the amount collected during the same period.



caller or emergency situation) requires significant engineering and system modifications. The existing system is based on technologies that were established decades ago and is a barrier to creating an integrated emergency call management system that would have the ability to exchange voice, data, text, photographs and live video through the 9-1-1 emergency communications center. These capabilities would assist law enforcement, fire departments, and emergency medical services in tailoring their response to conditions at the scene of the emergency.

An advanced, integrated 9-1-1 system would also provide the ability to quickly and easily reroute emergency calls to another call center when the primary answering point is unavailable or overloaded. The incorporation of these advanced capabilities would no doubt enhance the ability to provide more efficient, effective and dynamic emergency responses; however, major changes will be required in the 9-1-1 system. The new system is referred to as Next Generation 9-1-1, or NG9-1-1.

The major issues framing the necessary improvements and the future of 9-1-1 service in Texas and the nation are:

#### **A. KEEPING UP WITH CHANGING TECHNOLOGY**

Consumer calling devices and modes of communication continue to evolve, with changes measured in weeks and months. Changes to 9-1-1 systems seem to be measured in years. That differential can preclude callers from being able to access 9-1-1 at a critical time. As an example, use of text messaging would be the preferred method of communication during a domestic violence or active shooter incident, when speaking aloud would endanger the caller. Short of another “bolt-on” solution, there is no way for text messages to directly access the 9-1-1 system with the analog technology in place currently in a majority of the regions of the state.

As of August 2014, the FCC requires wireless service providers to make Text-to-9-1-1 service available upon receipt of a valid request by a public safety authority. The capability to receive Text-to-9-1-1 in Texas has been accomplished primarily in the more urban and metropolitan areas served by the Emergency Communication Districts and larger RPCs. To-date, the following Texas 9-1-1 Entities have reported to the FCC [via the PSAP Text-to-9-1-1 Readiness and Certification Registry](#) they are capable of receiving Text-to-9-1-1.

- Abilene/Taylor County 9-1-1 District
- Bexar Metro 9-1-1 Network
- Brazos Valley Council of Governments
- Cameron County Emergency Communication District
- Emergency Communication District of Ector County
- Galveston County 9-1-1 Emergency Network
- Greater Harris County 9-1-1 Emergency Network
- Lubbock County Emergency Communication District
- McLennan County Emergency Assistance District (City of Woodway)

- North Central Texas Council of Governments
- City of Rowlett
- Wichita/Wilbarger 9-1-1 Communication District

In 2015, the Commission staff requested and received authorization to develop a Text-to-9-1-1 implementation plan to assist the RPCs and facilitate the implementation. Completion of Text-to-9-1-1 is planned no later than the end of FY 2019. The 9-1-1 Entities and PSAPs will be responsible for requesting and implementing text. The Commission has adopted policies and instructions for the implementation of Text-to-9-1-1 to ensure consistency in implementation. However, the ability of a PSAP to request this new service will depend significantly on its ability to have implemented digital network connectivity and upgraded call taking equipment.

Texas' major telephone company that currently provides the 9-1-1 infrastructure (e.g. selective routing of all 9-1-1 calls in the state) is planning to decommission and replace the aging networks and equipment by 2020. Thus, it is critical that the 9-1-1 Entities in Texas replace this infrastructure to support enhanced next generation emergency communication capabilities. As legacy systems become modernized, emergency communications are improved by better access to 9-1-1 and Poison Control services; older systems are replaced with more efficient shared resource IP based infrastructure; security concerns are identified and mitigated; and, the platform will exist for future operational improvements.

## **B. SYSTEM VULNERABILITIES AND POTENTIAL SINGLE POINTS OF FAILURE**

Security breaches to major corporations, the all levels of government and many more, underscore security risks to all types of mission critical networks, including 9-1-1. Lack of redundancy and diversity in 9-1-1 networks can impact their reliability. Outage of a single key network element can result in a service outage over a widespread area. Additionally, 9-1-1 systems are vulnerable to outage in the event of major manmade and natural disasters. Hurricanes have an immense impact on large areas of the Texas coast, and the current, manual, method of rerouting 9-1-1 calls is insufficient to support the emergency communications needs. Isolated 9-1-1 outages occur on a daily basis as a result of inadvertent acts such as the cutting of a buried cable by a construction crew.

Going forward, additional resources will be needed to comply with new requirements for enhanced cyber security planning for the agency operations as well as 9-1-1 and Poison Control programs. Senate Bill 1597 (83<sup>rd</sup> Legislature) requires each state agency to submit a security plan to the Department of Information Resources (DIR) in October of each even-numbered year. Security planning involves developing security policies and controls, implementing tools and techniques to aid in security across five concurrent and continuous functions: Identify, Protect, Detect, Respond, and Recover. This requirement has direct implications on two CSEC initiatives, and also may impact RPC and 9-1-1 District technology initiatives.

### **C. LOST OPPORTUNITIES TO IMPROVE EMERGENCY RESPONSE**

Many newer calling devices incorporate features that can generate additional data, such as imagery or advanced telematics (e.g. automatic crash information from OnStar and Ford Sync – type services) that could be useful to call takers or emergency responders in tailoring the response to conditions. Additionally, information like building plans, which could be of assistance to law enforcement or fire fighters, is readily available in electronic form. However, little information beyond a voice call can be sent via the current 9-1-1 systems.

The inability to interoperate with other public safety communications systems can result in less than adequate customer service to the citizens of Texas. Inter-regional radio interoperability and the coming of a nationwide public safety broadband network, also known as FirstNet, illustrates and emphasizes the need for 9-1-1 to interoperate with others systems in the emergency communications ecosystem.

### **D. PREDICTABLE AND ADEQUATE LEVELS OF FUNDING**

Sufficient 9-1-1 service fee and equalization surcharge revenue is collected from the public and remitted to the state to support the current system and the transition to IP-based 9-1-1 systems, but only if it is appropriated for use by the 9-1-1 programs. In previous biennia, not all of this dedicated revenue has been appropriated to the CSEC for 9-1-1 programs. This practice has resulted in significant balances in these dedicated fund accounts. In addition to the revenue projected to be collected in the FY 2018 – 2019 biennium, there will also be projected to be \$164,000,000 in the balance at the end of FY 2017.

The 83rd Legislature provided CSEC with funding in the FY 2014 – 2015 biennial appropriation for NG9-1-1 Implementation – State-level ESInet (Phase I). Funding was again appropriated in the FY 2016 – 2017 biennium for Phase II of project. Funding will again be required in FY 2018 – 2019 and FY 2020-2021 to complete the transition and reach an operational state of the implemented components of the new state-level digital network. Funding is also required to implement and maintain regional networks. Once the transition is complete, legacy network elements can be decommissioned and their associated costs eliminated.

Significant lead time for procuring and awarding contracts for capital budget projects such as the CSEC State-level ESInet, coupled with variable amounts of funding from biennium-to-biennium, makes effective long range planning very difficult. It increases risks of lapsing funds and future requests for additional funding to implement unfinished portions of the project. Authority to use unexpended balances of capital budget appropriations across biennia would mitigate these risks and enhance the CSEC's ability to plan, procure, and deploy the CSEC State-level ESInet in an effective and efficient manner, thereby reducing transitional costs of maintaining dual network systems through completion.

## **E. MAINTENANCE OF THE CURRENT LEVEL OF SERVICE DURING TRANSITION**

Although migration to an advanced, integrated 9-1-1 system is a priority, it is important to maintain the current level of service in existing 9-1-1 systems during migration. As a part of normal operating costs, call taker equipment must be replaced at the end of its service life. The CSEC's standard for equipment replacement in the state program is based upon computer industry standards. The risk of losing emergency calls due to equipment failure increases when these replacement thresholds are not met. Costs for equipment maintenance and repair also increase when equipment is required to remain in service after the vendor has designated the item end-of-life or obsolete. Equipment failures, due to age and/or equipment operating past recommended life cycles, could materially affect public safety and health.

## **VI. STRATEGIC DIRECTION AND LONG-RANGE POLICY GUIDELINES**

In order to address the issues inherent in today's 9-1-1 technology, Texas 9-1-1 Entities should implement Next Generation 9-1-1, or NG9-1-1. NG9-1-1 planning, transition and implementation will be an extensive, multi-year effort. Implementing the new 9-1-1 system presents both opportunity and challenge. The opportunity lies in the ability to enhance a vital public safety service. The challenge will be to marshal the resources required to effect the change.

### **A. NEXT GENERATION 9-1-1 (NG9-1-1)**

The National Emergency Number Association (NENA) defines NG9-1-1 as follows:

*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.*

### **B. TEXAS NG9-1-1 SYSTEM**

The Texas NG9-1-1 System will be realized with the implementation of a state-level ESInet that will interconnect with regional ESInets and individual PSAPs.

The Texas NG9-1-1 System will be comprised of interconnected and interoperable NG9-1-1 systems of local, regional, and state emergency services networks with multiple vendors/solutions deployed across the state. The CSEC state-level ESInet will provide NG9-1-1 services directly and indirectly. Direct services will be provided to those entities that subscribe to CSEC's State-level ESInet services. Indirect services will be available to provide region-to-region ESInet interoperability facilitated by the

CSEC State-level ESInet’s functional elements. Outside of the CSEC State-level ESInet, interoperability may also be provided via region-to-region interconnectivity.

**C. CSEC STATE-LEVEL ESINET**

The CSEC State-level ESInet is defined in Health and Safety Code 771.0511(a)(2) as:

*[A] private internet protocol network or Virtual Private Network that is used for communications between and among public safety answering points and other entities that support or are supported by public safety answering points in providing emergency call handling and response; and, will be a part of the Texas Next Generation Emergency Communications System.*

For implementation of the CSEC State-level ESInet, the Commission has adopted an “Owner-Operator” model with the intent that the RPC stakeholders be involved and engaged with the planning and implementation. Doing so not only garners input from end-users, but also allows CSEC to procure and contract for “best of breed” hardware, software and services and not be limited to one contract with one vendor, thereby mitigating risks to the project. The CSEC ESInet may also be used to support the needs of other emergency communication stakeholders in the state, such as radio interoperability and eventually the network for Poison Control.

A CSEC State-level ESInet Governance Structure has been developed with leadership and input from the RPCs to ensure maximum results and outcomes from the implementation of a state-level ESInet and NG9-1-1. The governance has been approved and adopted by the Commission (February 2016) for purposes of effective operations amongst the RPCs which participate in the CSEC State-level ESInet. The model is a set of defined interactions, expectations, decisions, roles and processes that guide the governance of the CSEC State-level ESInet. A representative model has been established to ensure all RPCs have access and an opportunity to participate through a committee structure.

**D. EMERGENCY COMMUNICATIONS ADVISORY COMMITTEE (ECAC)**

As required by Health & Safety Code § 771.0511, the CSEC adopted Rule 252.8 to establish ECAC as an advisory committee composed of stakeholder representatives, under Government Code Chapter 2110.

The Committee’s tasks are to:

- Advise CSEC on matters regarding the establishment and management of the CSEC State-level ESInet; and
- Provide for 9-1-1 Entity collaboration on the management of the CSEC State-level ESInet, collective decision-making, and assurance that the requirements of the 9-1-1 Entities are met.

The membership of this committee includes representatives from RPCs and ECDs and formalizes the cooperative working relationship between entities to facilitate the

effective implementation of a state-level ESInet that will meet the needs of the entire state.

ECAC has developed and recommended several policies and standards to the Commission, including for the FY 2014 – 2015 biennium those listed in the section on Assessment of Progress on Meeting the Goals and Objectives of 2015—2019 Plan. However, as the Texas NG9-1-1 environment develops, policies and standards will need to be reviewed and revised as more information and knowledge is gained through implementation.

The ECAC has identified and prioritized the following policy issues to consider, develop and/or recommend to the Commission during the FY 2018 – 2019 biennium. These policy issues reflect the current and planned Texas NG9-1-1 environment that will consist of multiple interconnected ESInets, including the CSEC State-level ESInet and Regional ESInets that are owned and operated by 9-1-1 Entities, as well as vendor provided ESInet service offerings.

- Interoperability and Interconnectivity
- GIS Data
- Outreach & Awareness
- 9-1-1 Applications

#### **E. NEXT GENERATION 9-1-1 MASTER PLAN**

The *CSEC Next Generation 9-1-1 Master Plan Ver. 5 (June 2016) (Master Plan)* presents the Texas perspective of the Texas NG9-1-1 System's functionality, management, operations, security and governance; and, includes guidance for implementing NG9-1-1. The purpose of the document is to communicate the vision of the Texas NG9-1-1 System to stakeholders so that they may be actively engaged in its development and deployment. The Master Plan was originally published in 2010, revised in 2014 and again in 2016 to directly solicit and incorporate input from the ECAC, RPCs and ECDs. The Master Plan will be updated biennially and included in future iterations of the Statewide Plan.

The Master Plan provides detailed information on the strategic direction and long-range policy issues related to the implementation of NG9-1-1 service. The Master Plan includes the following sections:

- Vision of the Texas NG9-1-1 System
- Texas NG9-1-1 System Overview
- CSEC NG9-1-1 System Overview
- Transition Overview
- Method of Finance
- Policies and Standards

- System Management and Operations of the CSEC State-level ESInet
- CSEC State-level ESInet Governance Model
- Resource Sharing
- Public Education
- Supporting Radio Communications Interoperability
- Activities to Date
- Texas NG9-1-1 System and ESInet Vision Diagram

As reflected in the Master Plan, timing of the CSEC state 9-1-1 program's transition to NG9-1-1 is dependent upon appropriation of adequate resources. It is planned in three phases that will be aligned with state planning and biennial funding cycles.

- FY 2015 (Phase I - complete)
  - NG9-1-1 Geospatial Data Initiative
    - Enterprise Geospatial Database Management Services (EGDMS) – Implementation
    - 9-1-1 Database Management System – Procurement
  - State-level ESInet (Phase I) – Procurement
  - Regional ESInets – Procurement and Implementation
  
- FY 2016 – 2017 (Phase II: in progress)
  - NG9-1-1 Geospatial Data Initiative
    - 9-1-1 Database Management System - Implementation (FY 2016)
  - State-level ESInet (Phase II) – Procurement & Implementation (FY 2016 - 2017)
  - Regional ESInets Procurement, Implementation and Maintenance
  
- FY 2018 – 2019 (Phase II: planned)
  - State-level ESInet (Phase II) – Implementation & System Operationalization (FY 2018 - 2019)
  - Traffic Migration Commencement (FY 2019)
  - Regional ESInet – Procurement, Implementation and Maintenance (FY 2019)
  - Implement Text to 911 (FY 2018 – 2019)
  
- FY 2020 – 2021 (Phase III: projected)
  - CSEC State-level (Phase III) – Procurement, Implementation & System Operationalization (FY 2020 – 2021)
  - Traffic Migration Completion (FY 2021)
  - Completion of integration of participating RPC Public Safety Answering Points (PSAPs) into the CSEC State-level ESInet (FY 2021)
  - Regional ESInets fully functional and interconnected to CSEC State-level ESInet (FY 2021)
  - Legacy 9-1-1 Systems – Decommissioned (FY 2021)

## **VII. GOALS, OBJECTIVES AND PRIORITIES FOR TEXAS 9-1-1 SERVICE**

Goal: Establish a more effective, efficient, resilient and enhanced Texas NG9-1-1 System.

Objectives (in priority order):

1. Maintain the present level of 9-1-1 service while transitioning to NG9-1-1.
2. Continue to Implement Text to 911 service in those areas of Texas seeking to do so.
3. Plan and deploy the CSEC State-level ESInet
4. Plan and deploy Regional ESInets
5. Identify, develop and adopt operational and technical guidelines and requirements that govern the CSEC State-level ESInet.
6. Identify resources and tools to educate and support 9-1-1 Entities, in particular smaller entities that may lack resources at the local level.
7. Develop and recommend standards for interoperability with public safety communications.

## **VIII. FINANCIAL PERFORMANCE OF RPCs IN PROVIDING 9-1-1 SERVICE**

Figure 2 details the financial performance of each RPC in providing 9-1-1 service.



# STATEWIDE 9-1-1 PLAN FIGURES

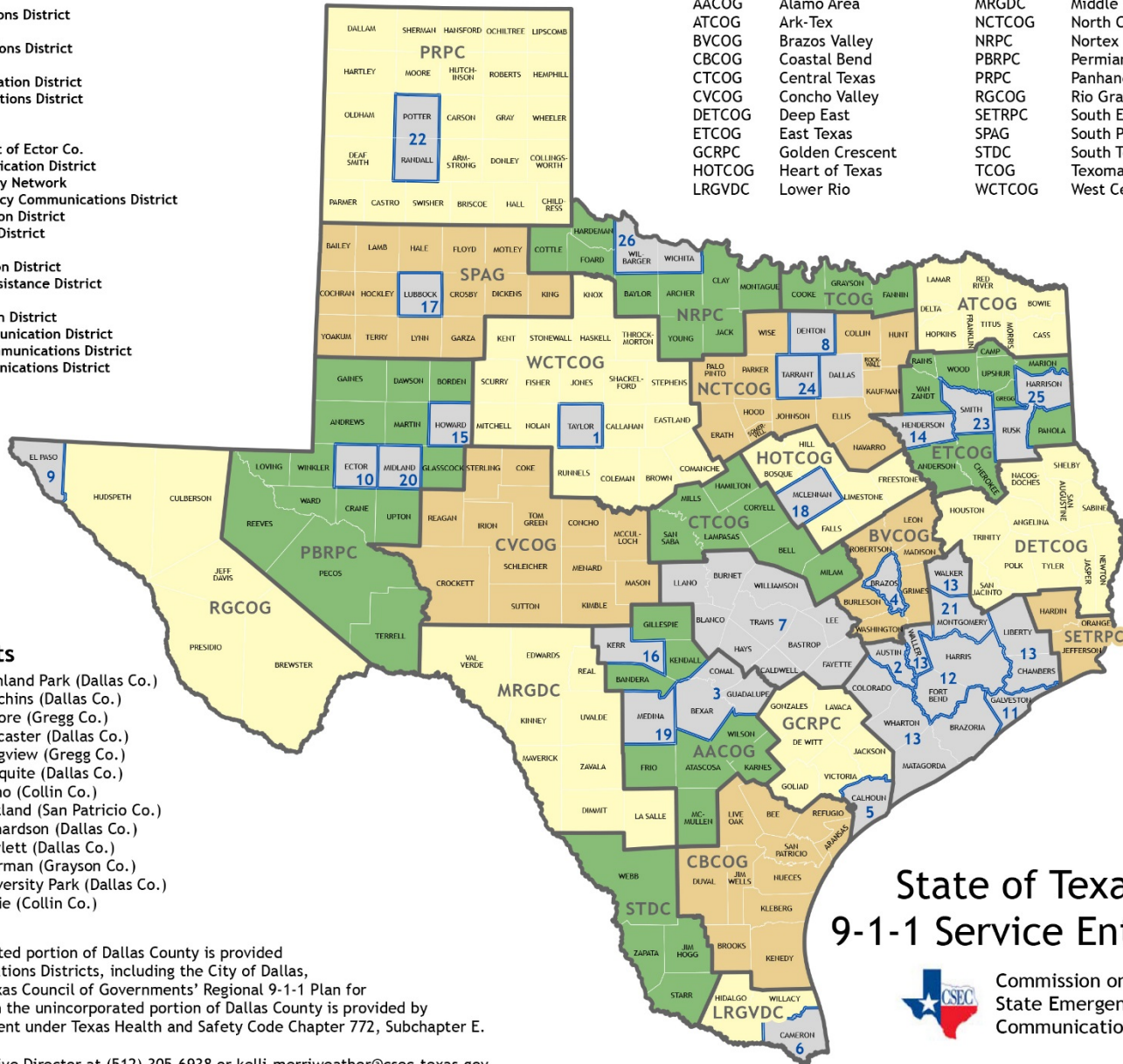
**FIGURE 1: MAP OF TEXAS 9-1-1 ENTITIES**

## Emergency Communications Districts

- 1 Abilene/Taylor Co. 9-1-1 District
- 2 Austin Co. Emergency Communications District
- 3 Bexar Metro 9-1-1 Network
- 4 Brazos Co. Emergency Communications District
- 5 Calhoun Co. 9-1-1 District
- 6 Cameron Co. Emergency Communication District
- 7 Capital Area Emergency Communications District
- 8 Denco Area 9-1-1 District
- 9 El Paso Co. 9-1-1 District
- 10 Emergency Communication District of Ector Co.
- 11 Galveston Co. Emergency Communication District
- 12 Greater Harris Co. 9-1-1 Emergency Network
- 13 Gulf Coast Regional 9-1-1 Emergency Communications District
- 14 Henderson Co. 9-1-1 Communication District
- 15 Howard Co. 9-1-1 Communication District
- 16 Kerr Emergency 9-1-1 Network
- 17 Lubbock Emergency Communication District
- 18 McLennan Co. 9-1-1 Emergency Assistance District
- 19 Medina Co. 9-1-1 District
- 20 Midland Emergency Communication District
- 21 Montgomery Co. Emergency Communication District
- 22 Potter-Randall Co. Emergency Communications District
- 23 Smith Co. 9-1-1 Emergency Communications District
- 24 Tarrant Co. 9-1-1 District
- 25 Texas Eastern 9-1-1 Network
- 26 Wichita -Wilbarger 9-1-1 District

## Regional Planning Commissions

- |        |                 |        |                    |
|--------|-----------------|--------|--------------------|
| AACOG  | Alamo Area      | MRGDC  | Middle Rio         |
| ATCOG  | Ark-Tex         | NCTCOG | North Central      |
| BVCOG  | Brazos Valley   | NRPC   | Nortex             |
| CBCOG  | Coastal Bend    | PBRPC  | Permian Basin      |
| CTCOG  | Central Texas   | PRPC   | Panhandle          |
| CVCOG  | Concho Valley   | RGCOG  | Rio Grande         |
| DETCOG | Deep East       | SETRPC | South East         |
| ETCOG  | East Texas      | SPAG   | South Plains       |
| GCRPC  | Golden Crescent | STDC   | South Texas/Laredo |
| HOTCOG | Heart of Texas  | TCOG   | Texoma             |
| LRGVDC | Lower Rio       | WCTCOG | West Central       |



## Municipal Emergency Communication Districts

- |                             |                              |
|-----------------------------|------------------------------|
| Addison (Dallas Co.)        | Highland Park (Dallas Co.)   |
| Aranas Pass (Aranas Co.)    | Hutchins (Dallas Co.)        |
| Cedar Hill (Dallas Co.)     | Kilgore (Gregg Co.)          |
| Coppell (Dallas Co.)        | Lancaster (Dallas Co.)       |
| Corpus Christi (Nueces Co.) | Longview (Gregg Co.)         |
| Dallas (Dallas Co.)         | Mesquite (Dallas Co.)        |
| De Soto (Dallas Co.)        | Plano (Collin Co.)           |
| Denison (Grayson Co.)       | Portland (San Patricio Co.)  |
| Duncanville (Dallas Co.)    | Richardson (Dallas Co.)      |
| Ennis (Ellis Co.)           | Rowlett (Dallas Co.)         |
| Farmers Branch (Dallas Co.) | Sherman (Grayson Co.)        |
| Garland (Dallas Co.)        | University Park (Dallas Co.) |
| Glenn Heights (Dallas Co.)  | Wylie (Collin Co.)           |

Note: 9-1-1 service in the incorporated portion of Dallas County is provided by Municipal Emergency Communications Districts, including the City of Dallas, or pursuant to the North Central Texas Council of Governments' Regional 9-1-1 Plan for four municipalities. 9-1-1 service in the unincorporated portion of Dallas County is provided by the Dallas County Sheriff's Department under Texas Health and Safety Code Chapter 772, Subchapter E.

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## State of Texas 9-1-1 Service Entities



Commission on  
State Emergency  
Communications

**FIGURE 2: RPC FINANCIAL PERFORMANCE (2014-2015)**

Details of the Financial Performance of Each Regional Planning Commission									
	Appropriation Year 2014					Appropriation Year 2015			
	Administration	Network Operations	Equipment Replacement	AY 2014 Total		Administration	Network Operations	Equipment Replacement	AY 2015 Total
Alamo Area	\$124,456	\$695,752	\$0	\$820,208		\$100,529	\$729,020	\$265,644	\$1,095,193
Ark-Tex	\$121,749	\$1,163,712	\$0	\$1,285,461		\$117,060	\$1,204,110	\$125,000	\$1,446,170
Brazos Valley	\$58,640	\$519,192	\$0	\$577,832		\$65,745	\$663,534	\$30,642	\$759,921
Capital Area *	\$358,866	\$4,750,560	\$0	\$5,109,426		\$407,242	\$5,594,625	\$0	\$6,001,867
Central Texas	\$44,783	\$1,085,453	\$0	\$1,130,236		\$172,088	\$2,165,945	\$589,698	\$2,927,731
Coastal Bend	\$176,101	\$751,032	\$0	\$927,133		\$186,588	\$804,317	\$184,782	\$1,175,687
Concho Valley	\$52,838	\$1,073,242	\$0	\$1,126,080		\$60,512	\$1,147,773	\$0	\$1,208,285
Deep East	\$103,821	\$1,366,474	\$36,504	\$1,506,799		\$119,738	\$1,496,508	\$156,721	\$1,772,967
East Texas	\$199,259	\$1,040,615	\$0	\$1,239,874		\$328,692	\$2,083,164	\$157,419	\$2,569,275
Golden Crescent	\$52,238	\$505,634	\$0	\$557,872		\$25,155	\$670,905	\$34,832	\$730,892
Heart of Texas	\$75,831	\$405,935	\$0	\$481,766		\$60,461	\$706,188	\$30,161	\$796,810
Houston-Galveston	\$218,933	\$3,205,559	\$0	\$3,424,492		\$202,762	\$2,923,712	\$0	\$3,126,474

## Details of the Financial Performance of Each Regional Planning Commission

	Appropriation Year 2014				Appropriation Year 2015			
	Administration	Network Operations	Equipment Replacement	AY 2014 Total	Administration	Network Operations	Equipment Replacement	AY 2015 Total
Lower Rio	\$351,468	\$2,142,569	\$0	\$2,494,037	\$349,344	\$2,787,255	\$289,849	\$3,426,448
Middle Rio	\$25,034	\$748,164	\$0	\$773,198	\$78,266	\$809,757	\$198,463	\$1,086,486
Nortex	\$39,590	\$554,923	\$0	\$594,513	\$36,887	\$600,091	\$21,857	\$658,835
North Central	\$308,635	\$3,435,913	\$0	\$3,744,548	\$328,910	\$4,950,036	\$0	\$5,278,946
Panhandle	\$161,526	\$1,372,980	\$0	\$1,534,506	\$161,526	\$1,399,244	\$49,100	\$1,609,870
Permian Basin	\$80,251	\$579,662	\$0	\$659,913	\$72,296	\$810,116	\$0	\$882,412
Rio Grande	\$31,336	\$477,760	\$0	\$509,096	\$38,626	\$416,582	\$67,408	\$522,616
South East	\$122,467	\$1,249,685	\$0	\$1,372,152	\$127,833	\$2,130,794	\$98,429	\$2,357,056
South Plains	\$222,379	\$502,292	\$0	\$724,671	\$221,946	\$839,754	\$182,390	\$1,244,090
South Texas	\$0	\$834,395	\$0	\$834,395	\$0	\$1,289,520	\$49,650	\$1,339,170
Texoma	\$33,428	\$460,761	\$0	\$494,189	\$45,820	\$478,358	\$234,235	\$758,413
West Central	<u>\$85,691</u>	<u>\$1,309,253</u>	<u>\$0</u>	<u>\$1,394,944</u>	<u>\$79,000</u>	<u>\$1,596,313</u>	<u>\$115,416</u>	<u>\$1,790,729</u>
<b>TOTAL</b>	<b>\$3,049,320</b>	<b>\$30,231,517</b>	<b>\$36,504</b>	<b>\$33,317,341</b>	<b>\$3,387,026</b>	<b>\$38,297,621</b>	<b>\$2,881,696</b>	<b>\$44,566,343</b>
* Effective 09-01-2013, Capital Area withdrew from the statewide 9-1-1 regional plan and became a regional emergency communications district per SB628, 83rd Leg, RS								

**APPENDIX 1:  
CSEC NEXT GENERATION 9-1-1 MASTER PLAN VER. 5 (JUNE 2016)**



Next Generation 9-1-1 Master Plan

# COMMISSION ON STATE EMERGENCY COMMUNICATIONS

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## NEXT GENERATION 9-1-1 MASTER PLAN

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## DOCUMENT CHANGE HISTORY

<b>Version</b>	<b>Publication Date</b>	<b>Description of Change</b>
v1.0	February 2009	Initial Publication
v2.0	July 2009	Added Migration Path and minor corrections.
V3.0	December 2010	Revised Background to include promulgation of CSEC Rule 252.8. Added section on Radio over IP. Edits to clarify PSAP connectivity as via Regional ESInet and updated Drawing 1 to reflect it. Additional edits to address consideration of transitional systems, cyber security and IPv6.
V4.0	July 2014	Revised based on May 7, 2014 <i>Texas NG-1-1 Master Plan Recommended Updates</i> , stakeholder input facilitated and gathered by Mission Critical Partners. The Master Plan will be the basis of Fiscal Years 2016 2017 Strategic Plan for Statewide 9-1-1 Service.
V5.0	June 2016	Revised based on stakeholder input ( <i>i.e.</i> , Legislative Working Group, Emergency Communications Advisory Committee, and the 911 Strategy Governance Committee)



# EXECUTIVE SUMMARY

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THE EXISTING 9-1-1 SYSTEM IS OUTDATED.

A digital replacement of the current analog 9-1-1 system is needed.

The technology supporting the current 9-1-1 system uses legacy technology to deliver 9-1-1 calls and location information is nearing end-of-life and will soon be obsolete. The national telecommunications infrastructure is changing as is the way the public communicates and adopts new technology. These changes have a direct impact on the ability of 9-1-1 service to support and serve the public.

THE CURRENT 9-1-1 SYSTEM IS NOT INTEROPERABLE WITH OTHER PUBLIC SAFETY COMMUNICATIONS SYSTEMS.

It is critical that public safety communication systems be interoperable and with the ability to exchange information with first responders, and quickly reroute emergency calls during natural and manmade disasters.

NEXT GENERATION 9-1-1

The National Emergency Number Association (NENA)<sup>3</sup> refers to the new system as Next Generation 9-1-1, or NG9-1-1, and defines it as:

- *An Internet Protocol (IP) based system comprised of managed Emergency Services IP networks, functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provides additional capabilities. It is designed to provide access to emergency services from all connected communications sources, and provide multimedia data capabilities for PSAPs and other emergency service organizations.*

INCORPORATING THESE ADVANCED CAPABILITIES WILL REQUIRE MAJOR CHANGES TO THE 9-1-1 INFRASTRUCTURE.

- NG9-1-1 planning, transition and implementation will be an extensive, multi-year effort. Implementing the new 9-1-1 system presents both opportunity and challenge.

The *CSEC Next Generation 9-1-1 Master Plan (Ver. 5.0, June 2016)* sets the strategic direction and long-range policy guidelines, as well as the new system's functionality, management, operations, security and governance, and charts the course for the transition.

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<sup>3</sup> A Glossary of Terms (commonly used acronyms) is provided at the end of this Master Plan.



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## • INTRODUCTION

The current 9-1-1 system, while working well today, is approaching the end of its useful life. It uses legacy technology to deliver 9-1-1 calls and location data for landline voice, landline teletype/telecommunications device for the deaf (TTY/TDD); and bolted on additional systems to deliver, wireless/cellular voice, and VoIP 9-1-1 to the Public Safety Answering Point (PSAP). Each introduction of a new access technology (e.g., wireless) or expansion of system functions (e.g., location determination) requires significant engineering and system modifications. The existing system is based on technologies that were established decades ago and is a barrier to creating an integrated emergency call management system that would have the ability to exchange voice, data, text, photographs and live video through the 9-1-1 emergency communications center. These capabilities would assist law enforcement, fire departments, and emergency medical services in tailoring their response to conditions at the scene of the emergency. An advanced, integrated 9-1-1 system would also provide the ability to quickly and easily reroute emergency calls to another call center when the primary answering point is unavailable or overloaded. The incorporation of these advanced capabilities would no doubt enhance the ability to provide more efficient, effective and dynamic emergency responses; however, major changes will be required in the 9-1-1 system. The new system is referred to as Next Generation 9-1-1, or NG9-1-1.

The purpose of this document is to communicate the vision of the Texas NG9-1-1 System to stakeholders so that they may be actively engaged in its development and deployment. The Commission on State Emergency Communications (Commission or CSEC) NG9-1-1 Master Plan (Master Plan) presents a Texas perspective of the system's functionality, management, operations, security and governance. The Master Plan was developed to ensure the successful transition from the current 9-1-1 system to the Texas NG9-1-1 System using a phased approach. It charts the course of CSEC activities necessary to transition all Texas Public Safety Answering Points (PSAPs) from the current Enhanced 9-1-1 system(s) to the Texas NG9-1-1 System; and includes a high level transition plan of CSEC initiatives and activities on this extensive, multi-year effort.

## • VISION OF THE TEXAS NG9-1-1 SYSTEM

The Texas NG9-1-1 System will be comprised of interconnected and interoperable NG9-1-1 systems of local, regional, and state emergency services networks. As a



“system-of-systems” and “network-of-networks,” the Texas NG9-1-1 System will provide 9-1-1 Entities the choice to connect their PSAPs directly to emergency services networks and utilize NG9-1-1 Core Services (NGCS) provisioned by NG9-1-1 systems deployed by the CSEC, Texas 9-1-1 Alliance and collaborating 9-1-1 Entities at the regional level in Texas. (Figure 1 to the Master Plan is a diagram of the Texas NG9-1-1 System and ESInet Vision.) These interconnected NG9-1-1 systems will serve as multiple input points for all 9-1-1 calls in the State of Texas.

The Federal Communications Commission’s (FCC’s) Task Force on Optimal PSAP Architecture (TFOPA) Final Report<sup>4</sup> recommends:

*9-1-1 Authorities explore the use of a shared infrastructure model and embrace strategies to collaborate and share resources when transitioning to NG9-1-1 as a way to meet their responsibility for providing an optimally effective and efficient emergency communications system for their citizens and emergency responders.*

## • TEXAS NG9-1-1 SYSTEM OVERVIEW

The Texas NG9-1-1 System is aligned with the following:

- NENA 08-003 v 1.0, Detailed Functional and Interface Specification for the NENA i3 Solution – Stage 3<sup>5</sup>
- NENA 08-506 v 1.0, Emergency Services IP Network Design for NG911<sup>6</sup>
- NENA 75-001 v 1.0, Security for Next Generation 9-1-1 Standard (NG-SEC)<sup>7</sup>
- U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA) - NG9-1-1 System Initiative- Concept of Operations<sup>8</sup>

According to NENA, the basic building blocks required for NG9-1-1 are (see diagram):

- **Emergency Services IP Network (ESInet)** - Network capable of carrying voice plus large amounts of varying types of data using IP and standards; intended to be multi-purpose, supporting extended Public Safety communications services in addition to 9-1-1.
- **International Standards Compliant IP Functions** - Internet Engineering Task Force (IETF) protocol standards provide the basic functionality of the system.

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<sup>4</sup> FCC TFOPA Final Report page 148, available at [https://apps.fcc.gov/edocs\\_public/attachmatch/DA-16-178A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DA-16-178A1.pdf).

<sup>5</sup> NENA 08-003 available at [http://www.nena.org/?page=i3\\_Stage3](http://www.nena.org/?page=i3_Stage3).

<sup>6</sup> NENA 08-506 available at [http://www.nena.org/?IP\\_Network\\_NG911](http://www.nena.org/?IP_Network_NG911).

<sup>7</sup> NENA 75-001 available at [http://www.nena.org/?page=NG911\\_Security](http://www.nena.org/?page=NG911_Security).

<sup>8</sup> USDOT, RITA – *Next Generation 9-1-1 Initiative – Concept of Operations* available at <http://www.its.dot.gov/ng911>.



NENA applied standards from IETF and other standards developing organizations (SDOs) to specific NG9-1-1 requirements.

- **Software Services/Applications** - NG9-1-1 uses service oriented architecture, software applications and data content to intelligently manage and control its IP based processes. NG9-1-1 is software and database driven to enable an exponential increase in available data and information sharing possibilities.
- **Databases and Data Management** - NG9-1-1 uses a set of database systems to house and provide management of the above data content.
- **Security** - NG9-1-1 provides extensive security methods at the hardware and software levels to replicate the privacy and reliability inherent in Enhanced 9-1-1 services.
- **Human Processes** - NG9-1-1 as a service system, involves a multitude of human procedures and system operations procedures to control and monitor the functionality and effectiveness of the systems and services that provide NG9-1-1 service.<sup>9</sup>

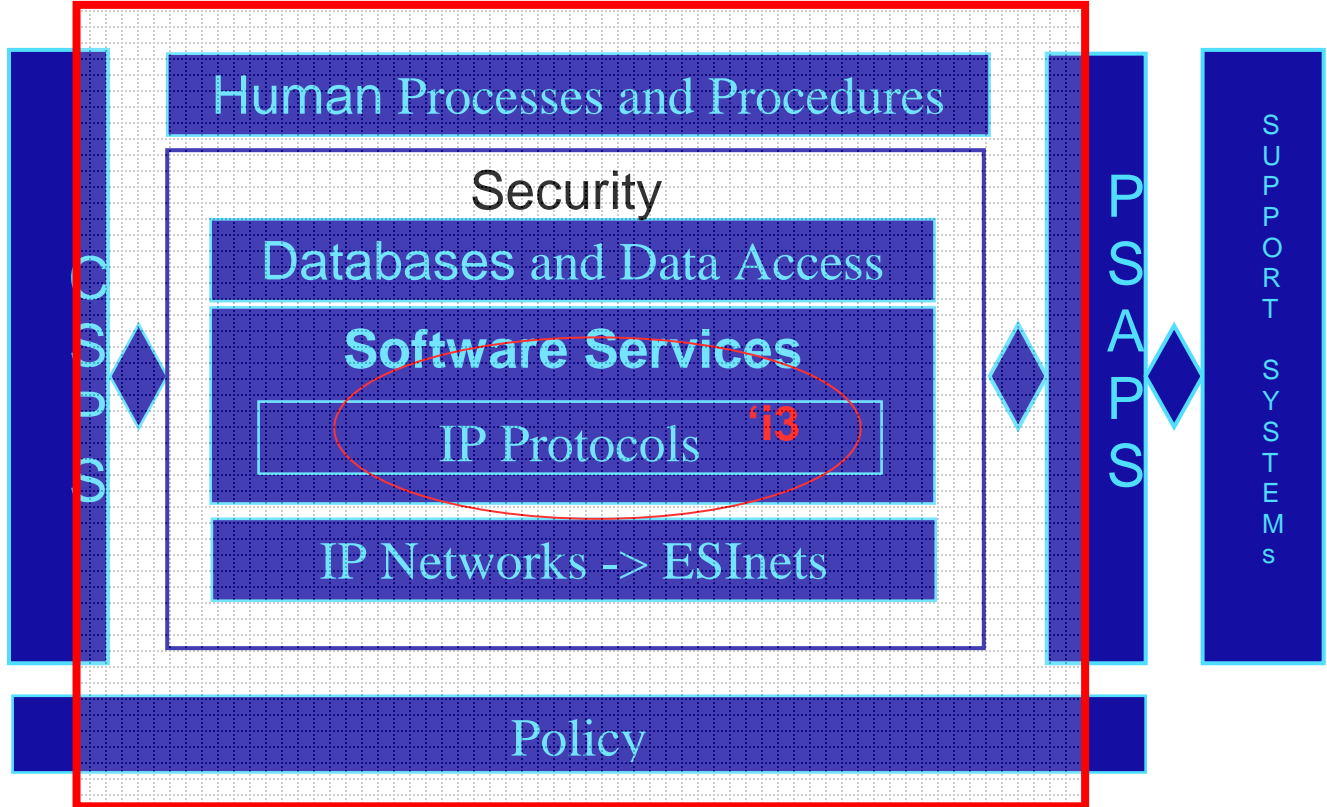
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<sup>9</sup> NENA - *A Policy Maker Blueprint for Transitioning to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1*, September 2008: Appendix B available at <http://www.nena.org/?page=NGPartnerProgram>.



# NG9-1-1 Building Blocks<sup>10</sup>

## NG9-1-1 System Standards and Recommendation



## • CSEC’S NG9-1-1 SYSTEM OVERVIEW

The CSEC is implementing a NENA compliant NG9-1-1 system based on TFOPA’s Hybrid – Dedicated / Shared Infrastructure Architecture Model.<sup>11</sup>

*In a Hybrid Dedicated & Shared Infrastructure Architecture, server-based hardware and storage components providing required PSAP functionality are deployed in a combination of both on premise dedicated and shared infrastructure as required and appropriate. This model allows administrators to share certain PSAP infrastructure and functions (such as call processing and mapping) while maintaining dedicated infrastructure for other functions (such as CAD, RMS and incident recording).*

<sup>10</sup> See [http://www.nena.org/resource/resmgr/ng9-1-1\\_project/ng9-1-1\\_overview\\_030909.ppt](http://www.nena.org/resource/resmgr/ng9-1-1_project/ng9-1-1_overview_030909.ppt).

<sup>11</sup> FCC TFOPA Final Report page 94, available at [https://apps.fcc.gov/edocs\\_public/attachmatch/DA-16-178A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DA-16-178A1.pdf).



The CSEC's NG9-1-1 system, referred to as the CSEC State-level ESInet will be:

- configured to ingress 9-1-1 calls from Originating Service Providers (OSPs) to an Origination Access ESInet via legacy Time Division Multiplex (TDM) circuits into gateway devices that convert TDM protocols to Internet protocols (IP), as the "first" hop;
- configured to provision NG9-1-1 Core Services (NGCS) to PSAPs as a "second" hop;
- designed to interconnect with multi-state hosted solution(s) to provide for interstate connectivity;
- designed to provide NGCS in geo-diverse data centers that are owned and managed by the State of Texas and vendors;
- configured to host NG9-1-1 PSAP functional infrastructure elements within facilities of the 9-1-1 Entity and/or that of a PSAP, enabling multiple PSAPs to share the server-side components of NG9-1-1 PSAP functional infrastructure elements;
- constructed from a mix of dedicated and shared transport facilities that are owned and managed by a combination of the State of Texas, 9-1-1 Entities and vendors;
- managed to meet performance, reliability, redundancy and security requirements for IP Services;
- designed to include a security infrastructure that includes appliances and practices to secure, monitor, detect intrusions, authenticate users, mitigate events and recover; and
- provisioned, monitored, reported and maintained using a management infrastructure that considers operational risks in a dynamic and changing operating environment.

## • OTHER ACTIVITIES

The Texas 9-1-1 Alliance is an association of 26 Emergency Communication Districts established and operated under Chapter 772 of the Texas Health and Safety Code (772 ECDs). Currently these 772 ECDs provide 9-1-1 service to approximately 16.7 million or 64% of the State's population. Although these 772 ECDs are independent with their own governing boards, they share knowledge and resources and coordinate common activities, including migration to NG9-1-1. To assist in that effort, they cooperatively participate in the Texas 9-1-1 Alliance (Alliance), an administrative entity created by the 772 ECDs under the Interlocal Cooperation Act. Through collective and individual efforts, Alliance members are currently active in data projects essential to NG9-1-1, and the establishment of



regional ESInets and an Alliance wide emergency services IP network infrastructure and connectivity essential to that migration. It is anticipated that the Alliance member network, data, and operational environment will interoperate with the CSEC State-level ESInet and other ESInets based on standards and interlocal agreements to provide a statewide NG9-1-1 environment.

Similar to the Texas 9-1-1 Alliance, is MECDA, the Municipal Emergency Districts Association. The 21 member agencies of MECDA represent what has traditionally been called the Home Rule City or Municipal Emergency Communication Districts (Municipal ECDs). MECDA member agencies provide 9-1-1 services to cities as large as Dallas, and as small as Glenn Heights. As Home Rule City ECDs, MECDA agencies are independent, but share knowledge and resources and coordinate common public safety activities, including migration to NG9-1-1. To assist in that effort, member cities cooperatively participate in MECDA, electing their own MECDA board members and conducting all member meetings six times per year. Members are also active on the MECDA website, sharing information, and asking for input from other agencies on various public safety communication matters. MECDA board members are currently active in various projects essential to NG9-1-1, and are beginning to join established regional ESInets. It is anticipated that the MECDA member agencies will also participate in a statewide NG9-1-1 environment, utilize services provided by the CSEC State-level ESInet, and other available ESInets, via interlocal agreements.

## • TRANSITION OVERVIEW

The Texas NG9-1-1 environment will differ considerably from the current 9-1-1 environment. The changes are not limited to standards and technology. They include the governance, security, management and operation of the system and the delivery of services. The changes affect the entire 9-1-1 community, including the general public and other emergency services. The planning and transition to NG9-1-1 will be an extensive, multi-year effort, and completely dependent upon the availability of funds.

The transition strategy from legacy 9-1-1 to NG9-1-1 is critical to the success of NG9-1-1 implementation. The strategy is impacted by the sheer complexities involved and by costs imposed for operating concurrent 9-1-1 systems until transition is complete. Planning will help facilitate implementation within a reasonable time frame, and through



economies of scale 9-1-1 Entities can minimize transitional costs and maintain positive outcomes with maximum fiscal responsibility. The Texas transition will require CSEC and the seventy five (75) Texas 9-1-1 Entities<sup>12</sup> to plan, coordinate and collaborate on the migration of five hundred and seventy three (573) PSAPs from the current 9-1-1 system to the Texas NG9-1-1 System. Each entity or groups of entities, will need to carefully examine its own needs and circumstances to determine their migration to NG9-1-1.

## • TRANSITION STAGES

There are three foundation elements that must be established to achieve NG9-1-1<sup>13</sup>. These elements are: ESInet, IP PSAPs, and GIS Data Preparation. These elements do not necessarily need to be implemented in any particular order. The sequence and completion is planned according to goals and plans for the CSEC State-level ESInet and the implementation of NG9-1-1 core services. The CSEC's ability to fund these various stages of system development and implementation will determine the timeline.

The following diagram illustrates these foundational elements and the migration to NG9-1-1.

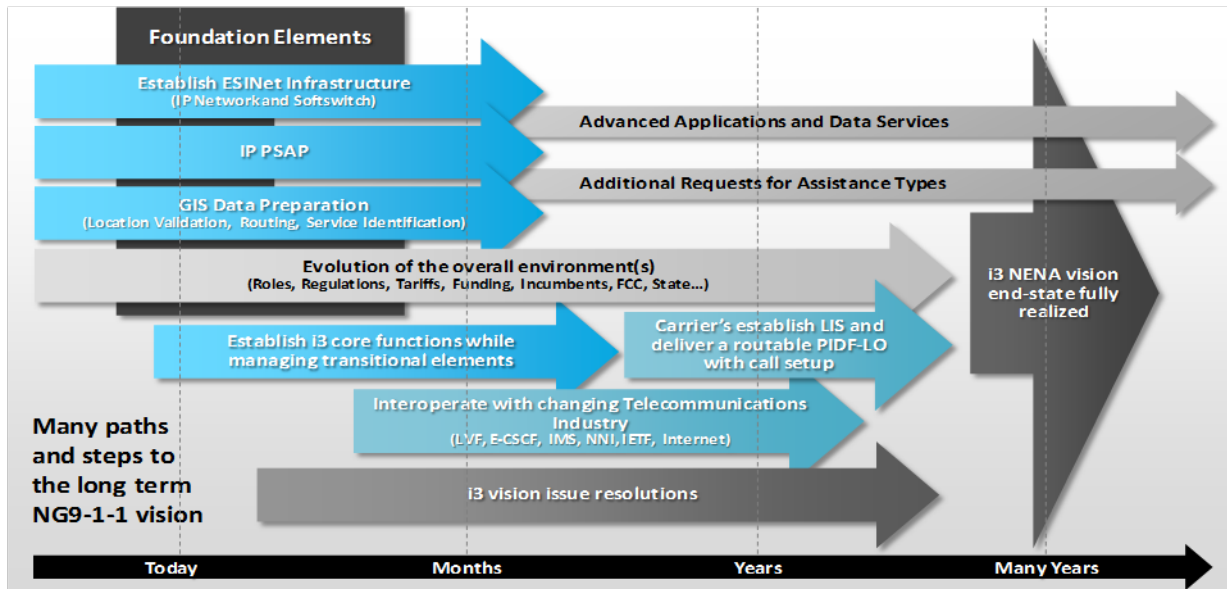
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<sup>12</sup> The 9-1-1 administrative entities consist of 53 Emergency Communication Districts (ECDs) and the state program administered by the CSEC and operated by 22 Regional Planning Commissions (RPCs). Twenty-six ECDs have been formed and operate under the authority of Health and Safety Code Chapter 772. Twenty-six municipalities and one county that are recognized as ECDs in Health and Safety Code § 771.001(3)(A) operate 9-1-1 systems that are independent of the state's system. 9-1-1 service in the incorporated portion of Dallas County is provided by ECDs, or pursuant to the North Central Texas Council of Governments' Regional 9-1-1 Plan. 9-1-1 service in the unincorporated portion of Dallas County is provided by Dallas County.

<sup>13</sup> FCC TFOPA Final Report page 140, available at [https://apps.fcc.gov/edocs\\_public/attachmatch/DA-16-178A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DA-16-178A1.pdf).



## PUBLIC SAFETY MIGRATION STEPS TO NG9-1-1



The CSEC has identified stages of transition to accommodate the incremental implementation of the CSEC State-level Enterprise Geospatial Database Management System (EGDMS) (e.g., GIS Data), CSEC State-level ESInet, and IP PSAPs. The CSEC has identified two additional stages of its transition which are to interconnect IP PSAPs and Regional ESInets; and traffic migration and decommission legacy systems, Each stage will require a significant level of effort, with differing sets of stakeholders and varying levels of involvement.

The five stages of the CSEC program transition are as follows:

### Stage One: CSEC State-level EGDMS

Deployment of the CSEC State-level EGDMS, with geospatial data and base maps established for the participating RPC 9-1-1 programs, from which updates will be provided to CSEC State-level ESInet components, and regional ESInet components, as authorized.

This stage also includes the deployment of a 9-1-1 Database Management System with legacy and NG9-1-1 location validation functionality; essentially, an Automatic Location Information (ALI) database management system with Location Validation Function (LVF) capabilities, and including Location Database (LDB) (collectively, ALI-LVF).

### Stage Two: CSEC State-level ESInet

Deployment of the CSEC State-level ESInet with Legacy Network Gateways and NG9-1-1 Core Services (i.e., Border Control Function, Emergency Services Routing





Proxy with Policy Routing Functions, and Emergency Call Routing Function) to serve interconnected PSAPs. This stage also includes activities to operationalize the CSEC State-level ESInet.

The RPCs in the CSEC program will determine if they will obtain services directly from the CSEC State-level ESInet so that services and capacity may be planned and implemented appropriately. If RPCs do not obtain services directly from the CSEC State-level ESInet, they may choose to obtain them from other Regional ESInets, or by planning, implementing and deploying their own ESInet. Through economies of scale and the buying power of the state, the CSEC and RPCs have the opportunity to minimize transitional costs and maintain positive outcomes with maximum fiscal responsibility.

**Stage Three: IP PSAPs**

Implementation of capabilities to support IP based connectivity to a regional ESInet.

It is critical that all PSAPs in the CSEC State 9-1-1 program have IP connectivity to a regional network. It reflects the transition of legacy PSAP and network technology to the CSEC State-level ESInet and NG9-1-1 core services. This will be accomplished through the implementation of host-remote 9-1-1 call handling equipment where the remotes are connected to the host via IP connectivity.

**Stage Four: Interconnect IP PSAPs and Regional ESInets**

Interconnect the IP PSAPs and Regional ESInets choosing to receive NG9-1-1 Core Services either directly or indirectly from the CSEC State-level ESInet.

Interwork the CSEC State-level ESInet and regional ESInets with NG9-1-1 Core Services by developing IP network interconnection points, and network-to-network interfaces for call delivery, call transfer, provision of database updates, and implementation of authoritative GIS databases.

**Stage Five: Traffic Migration and Decommission legacy systems**

Traffic migration will be achieved on a PSAP by PSAP basis, for every switch that delivers 9-1-1 call traffic in a PSAP's service area. Traffic migration may commence when IP PSAPs are interconnected to the CSEC State-level ESInet.

Decommission legacy systems, such as legacy selective routers and the 9-1-1 ALI database. This phase may also include the decommissioning of the LNGs and changes at the CSPs as they transition their networks to support NG9-1-1.



## • TRANSITION STATUS

For many 9-1-1 Entities the transition has already begun, with deployment of regional ESInets and core functions in various degrees of completion.

### CSEC STATE 9-1-1 PROGRAM

The CSEC and RPCs have begun the implementation of the foundational elements of transition simultaneously, not sequentially. The following status update includes activity during fiscal years (FY) 2014 – 2016 and is reflective of the Transitional Stages 1 – 3 in the previous section.

#### *GIS Data Preparation*

CSEC implemented its CSEC State-level EGDMs for the preparation, coalescing and provisioning of 9-1-1 GIS data to relevant components that provide NG9-1-1 core services; and a 9-1-1 Database Management System, with legacy and NG9-1-1 location validation functionality. Transition has begun to the new 9-1-1 Database Management System that will enable legacy PSAPs to receive the caller's location information as ALL; and NG9-1-1 PSAPs to receive the caller's location information with the call.

Participating RPC PSAPs will transition to the new system upon request, and when GIS data reaches the established accuracy threshold of 98%.

#### *CSEC State-level ESInet*

The CSEC ESInet Project was originally planned in three phases over three biennia in order to coincide with the Legislative funding cycles. The funding for the first phase was appropriated in FY 2015. The CSEC procured contracts for the following according to the project plan for Phase I.

- Project Charter and Plan
- ESInet Security Policy Development
- Functional and Technical Requirements
- Draft RFI for i3 ESInet Components
- Procurement of ESInet components
- Communications Plan and Connections Newsletter
- ESInet Governance Model
- 9-1-1 Call Handling Strategy
- Test Lab Projects and Services to ensure interoperability
- Data Center Services
- Network Design for CSEC State-level ESInet (Phase II)

The second phase of the ESInet Project is anticipated to take up to four years to complete. This is a longer period of time than was originally anticipated due to CSEC



staff's more in depth understanding of the complexities of the project, and taking into consideration the time it actually takes to procure and contract. Phase II was also lengthened out of an abundance of caution to ensure that a fully redundant NG9-1-1 system and IP networks are put in place so that current 9-1-1 service is not in jeopardy of being denigrated. CSEC staff originally planned to utilize the existing IP network that delivers 9-1-1 location information to all of the CSEC/RPC PSAPs as one of the two IP networks that comprise the CSEC State-level ESInet. However, during early planning stages this course of action was eliminated to protect and maintain the system's current capabilities of delivering location information to the PSAPs. Instead, the existing IP network is being leveraged to deliver the first NG9-1-1 application of Text-to-9-1-1 to the RPC PSAPs. As such, Phase II has been expanded to include the procurement and implementation of the second IP network of the CSEC State-level ESInet to ensure the requisite and robust reliability and security for NG9-1-1 service.

CSEC has adopted an owner-operator model for implementing the CSEC State-level ESInet and provisioning NG9-1-1 service. CSEC's strategy is to engage with multiple service providers having a variety of capabilities and competencies, integrate their services, and manage the day-to-day delivery of services. This access to best of breed providers in each service area is known as multisourcing. The CSEC will issue three procurement solicitations and contract for the following in FY 2016 - 2017:

- System Integration services to put the CSEC State-level ESInet and NG9-1-1 applications in place to serve the participating 9-1-1 Entities;
- Origination Access ESInet services for the ingress of all 9-1-1 calls from communication service providers into the CSEC State-level ESInet; and,
- Multisourcing Services Integrator (MSI) for managing service providers to deliver end-to-end service outcomes to the RPCs and their PSAPs once the ESInet is in place.

### *IP PSAPs*

Twenty-one of the twenty-two RPCs in the CSEC program have implemented or partially implemented regional connectivity between 285 of the 300 PSAPs in the CSEC State 9-1-1 program area, thereby creating regional ESInets that will facilitate and simplify future connectivity to the CSEC State-level ESInet. The CSEC and RPCs plan to have completed regional IP PSAP connectivity by the end of FY 2017.

Funding appropriated for 9-1-1 equipment replacement has been used by the RPCs to procure and deploy IP capable and NG9-1-1 ready PSAP equipment at all of the PSAP. Future upgrades for certain features and functionalities will be identified as technology matures and the CSEC State-level ESInet is implemented.



## • TRANSITION RISKS

The transition risks identified are as follows:

**Funding** - Inadequate and unpredictable levels of funding are a direct risk to the CSEC State 9-1-1 program's transition to NG9-1-1. To mitigate this risk, the CSEC State-level ESInet implementation has been planned in phases to align with the state's biennial appropriated funding cycles, and CSEC will continue to seek the necessary funding through the Legislative Appropriation Request process. However, if the Legislature fails to appropriate sufficient funding, the pace of implementation and transition could slow significantly. Longer transition time would result in increased costs of support dual systems at the same time, as lost opportunity costs. Sufficient service fee and equalization surcharge revenue is collected from the public and remitted to the state to support the current system and the transition to NG9-1-1, but only if it is appropriated. In previous biennia, not all of this dedicated revenue has been appropriated to the CSEC for 9-1-1 programs. This practice has resulted in significant balances in these dedicated fund accounts. In addition to the revenue projected to be collected in the FY 2018 – 2019 biennium, there will be a balance of approximately \$164,000,000 in the balance at the end of FY 2017.

**Evolving standards** – NG9-1-1 standards continue to evolve with many fundamental elements requiring future work. Until the standards for these elements are defined, vendors' solutions will vary and future releases will be required. This may have an impact on total cost. The varying levels of completion on standards may also have an impact on vendor interoperability, which could lead to delays or limitations on feature functionality, especially in the deployment of i3 event logging.

These risks can be minimized by gaining a thorough understanding of which standards are complete, in development, and how those under development may have downstream impacts on vendors' solutions. This knowledge will enable CSEC to, develop a set of realistic expectations on feature functionality available in the marketplace today and expected for the near term; and develop a feature functionality roadmap with identified risks that could impact its rollout. The work done by the USDOT's National 9-1-1 Program, specifically the *NG9-1-1 Standards Identification and Review*<sup>14</sup> document should be leveraged for this effort. CSEC and the 9-1-1 Entities should also monitor i3 standards development through their ongoing awareness of or participation in NENA committees and work being done by standards and best practices organizations included in the National 9-1-1 Program review.

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<sup>14</sup> See <http://911.gov/pdf/NG911-StandardsIdentificationAnalysis-jan2014.pdf>.



**System host locations** - Hosting systems in PSAPs will not enable the operation of remote virtual PSAPs if critical systems are located in PSAP facilities, especially when PSAPs must be evacuated or are impacted by a disaster.

The greatest level of system availability and solution resiliency will be attained by hosting 9-1-1 databases and NG9-1-1 Core Services in redundant, geo-diverse data centers. Tier III and Tier IV data centers are typically only found in major metropolitan areas, such as Dallas, Austin, San Antonio, and Houston (DASH). It is anticipated that identifying data center facilities outside of the DASH cities will be difficult.

In general, the CSEC State-level ESInet design may mitigate risks associated with distance for PSAPs that are directly connected to it as follows:

- Carrier diversity between PSAP and system host site to ensure carrier level network issues do not impact availability.
- Network facility diversity through the use of terrestrial and non-terrestrial (e.g., microwave, wireless, etc.) network paths between PSAP and system host site to ensure resiliency.
- Path diversity between PSAP and system host site to ensure that disruption or failure does not impact 100% of traffic.

**Legacy Network Gateway (LNG) connectivity** - The LNG(s) may be deployed in data center facilities hundreds of miles away from Communication Service Provider (CSP) switches, unlike a legacy selective router that is a couple dozen miles away from CSPs switches. The distance can result in three risks:

1. high cost for the delivery of mileage sensitive legacy trunks to the LNG;
2. the greater the point-to-point legacy circuits distance, the higher the risk of the circuit being cut; and
3. the greater the distance between the CSP's switch and LNG, the less likely the CSP would be willing to rehome their trunks from the legacy selective router.

To mitigate this risk, the LNG's Protocol Interworking Function (PIF) may be deployed at local points of interconnection (POIs), ideally at the central offices where legacy selective routers reside. The PIF would convert the calls from legacy to IP locally; and deliver the IP calls over redundant, carrier diverse multi-protocol label switched (MPLS) networks to the facilities that host the LNG's NG Interworking Function (NIF) and Location Interworking Function (LIF). This risk mitigation strategy offers greater resiliency due to the intrinsic characteristics of MPLS networks; and is only mileage sensitive from the CSP's switch to the local POIs.

**Communication Service Provider (CSP) traffic migration to ESInets** - CSPs are constrained from splitting traffic from a switch that serves multiple PSAPs using different 9-1-1 system service providers (legacy and NG911). The result is long delays in



migrating originating traffic to ESInets, and increases the risk for incurring legacy selective routing fees on top of the costs for the new NG9-1-1 system.

To mitigate this risk, synchronized migrations that focus on cutting over all traffic from CSP switches in a region should eliminate the need for CSP switches to be interconnected with legacy selective routers and the LNG's PIF for any extended period of time; and minimize CSPs trunking costs.

Another risk-mitigation technique is to offer CSPs the option of ingressing Session Initiation Protocol (SIP) calls directly into the LNG, as many CSPs would like to decommission legacy trunks.

Lastly, CSEC must collaborate with the Texas Public Utility Commission (PUC) to ensure that the PUC is aware of the requirements put upon CSPs for interconnecting with the CSEC State-level ESInet; and identify potential roadblocks early in the design process.

**Network-to-Network Interfaces** – The interconnection of the CSEC State-level ESInet with regional ESInet will require close collaboration between network engineering resources from the interconnecting parties to ensure: proper security protocols are implemented for all end points on a network; QoS markings are honored; virtual private network tunnels are allowed; and other such activities. Operationally, the two interconnecting network operators will need to agree upon standard operating procedures for the purpose of troubleshooting, trouble ticket management, network operations center-to-network operations center (NOC-to-NOC) communications, and service level agreements.

The risk to optimal implementation may be mitigated by developing and establishing security and operational standards. The Commission's Emergency Communication Advisory Committee (ECAC) has identified interoperability and interconnectivity as a priority policy issue to be developed during the FY 2018 – 2019 biennium.

**Geospatial/GIS data management** – GIS data management is a cornerstone of NG9-1-1. 9-1-1 Entities need resources that are proficient in geospatial data management and maintenance, and knowledgeable about address data management. Where in-house expertise is unavailable, 9-1-1 Entities will have to outsource this function or acquire staff with this skill set. 9-1-1 Entities may be reluctant to do so without an immediate return on their investment in the form of call routing changes by the Emergency Call Routing Function (ECRF)/Location Validation Function (LVF) and Policy Routing Function (PRF).

Stakeholder education on the importance of geospatial data management and its direct impact on the service PSAPs provide to their communities is the best means of minimizing this risk. The education should provide hands-on examples of how legacy



data is managed and routing is performed today; and how geospatial data will be managed and geo-spatial boundaries will impact call routing in the future i3 environment. The Commission's ECAC has identified GIS Data standards review and revisions as a priority policy issue to be further developed during the FY 2018 – 2019 biennium. Additionally, the ECAC has identified outreach and awareness as a priority issue to be addressed, specifically related to providing resources to educate 9-1-1 Entities on the importance of geospatial data management.

**Availability of broadband** – The rural areas of the state have difficulty acquiring broadband facilities for their PSAPs, let alone carrier-diverse broadband facilities. While not optimal, these geographically remote PSAPs may be able to obtain multiple MPLS T-1s over existing copper facilities, bonded to replicate higher bandwidth to provide sufficient capacity to carry voice and Text-to-911 SMS data, including location information.

**CSEC resources** – CSEC will be responsible for the implementation, operation and security of the CSEC State-level ESInet. However, CSEC is currently limited to 25 full time employees, staffed mostly to administer grant funds for two programs, one of which is the 9-1-1 Program. CSEC does not currently own or operate any information technology (IT) infrastructure in the provisioning of 9-1-1 service. While CSEC has staff with project management, 9-1-1 subject matter expertise and IT skills and abilities, it is geared towards scope of work development for a limited number of procurements and program projects; and addressing technical and operational issues with vendors, RPCs and CSPs (and their agents). CSEC will require additional resources in order to implement and operate the CSEC State-level ESInet for maximum health and security.

For the purposes of implementing the CSEC State-level ESInet, the CSEC will need to procure contracts for technical assistance for the procurement and integration of system components, functions and services in a multi-supplier environment; and development of operational and technical guidelines and requirements that govern the state-level subsystem during the course of the transition and evolution.

## • TRANSITION TIMELINE

Timing of the transition of the CSEC State 9-1-1 program to NG9-1-1 service is significantly dependent on the appropriation of funds. The CSEC's *Agency Strategic Plan – Fiscal Years 2017-21*<sup>15</sup> includes a high-level, phased timeline of NG9-1-1 development, tied to biennial funding cycles:

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<sup>15</sup> On April 27, 2016, the Commission accepted and approved the Agency Strategic Plan for submission to the Legislative Budget Board (LBB) and Governor's Office of Budget, Planning and Policy (GOBPP) division by no later than June 24, 2016.



FY 2015 (Phase I: complete)

- NG9-1-1 Geospatial Data Initiative
  - Enterprise Geospatial Database Management Services (EGDMS) – Implementation
  - 9-1-1 Database Management System – Procurement
- CSEC State-level ESInet (Phase I) – Procurement
- Regional ESInets – Procurement and Implementation

FY 2016 – 2017 (Phase II: in progress)

- NG9-1-1 Geospatial Data Initiative
  - 9-1-1 Database Management System - Implementation (FY 2016)
- CSEC State-level ESInet (Phase II) – Procurement & Implementation (FY 2016 - 2017)
- Regional ESInets – Procurement, Implementation and Maintenance

FY 2018 – 2019 (Phase II: planned)

- CSEC State-level ESInet (Phase II) – Implementation & System Operationalization (FY 2018 - 2019)
- Traffic Migration - Commencement (FY 2019)
- Regional ESInets – Procurement, Implementation and Maintenance (FY 2019)
- Implement Text to 9-1-1 (FY 2018 – 2019)

FY 2020 – 2021 (Phase III: projected)

- CSEC State-level (Phase III) – Procurement, Implementation & System Operationalization (FY 2020 – 2021)
- Completion of traffic migration – Completion (FY2021)
- Completion of integration of participating RPC PSAPs into the CSEC State-level ESInet (FY 2021)
- Regional ESInets fully functional and interconnected to CSEC State-level ESInet (FY 2021)
- Legacy 9-1-1 Systems – Decommissioned (FY 2021)





- METHOD OF FINANCE (MOF)

- CURRENT MOF

The current MoF for the CSEC State 9-1-1 program, operated by the RPCs and administered by CSEC, consists of three emergency service fees and one surcharge<sup>16</sup> that follow:

**911 Service Fee (Wireline/VoIP)**

This fee is collected by CSPs, monthly, for each local exchange access line or equivalent local exchange access line as defined in CSEC Rule 255.4.<sup>17</sup> This fee collected from the CSEC State 9-1-1 program areas is currently set by CSEC at the maximum allowable \$0.50 per line or equivalent per month and is remitted to the Comptroller for deposit in the 9-1-1 Service Fee Account 5050.

This fee varies in areas in which 9-1-1 service is provided by an Emergency Communication District (ECD) as defined in Health and Safety Code Section 771.001(3), and in Health and Safety Code Chapter 772.

**9-1-1 Service Fee for Wireless Telecommunications Connections**

This fee is imposed according to statute at a rate of \$0.50 per month for each wireless telecommunications connection; it is remitted to the Comptroller and initially deposited into a trust fund account. A wireless telecommunications connection means any voice-capable wireless communication mobile station that is provided to a customer by a wireless service provider. Each month CSEC distributes, to each ECD that does not participate in the CSEC State 9-1-1 program, a portion of the total amount collected; this portion is proportional to the population of the area served by the district in relation to the population of the state. The remaining money collected is deposited to the CSEC 9-1-1 Services Fee Account 5050.

**Prepaid Wireless 9-1-1 Service Fee**

This fee is collected by the seller from the consumer at the time of each retail transaction of prepaid wireless telecommunications service for use in Texas and is remitted to the Comptroller. “Prepaid wireless telecommunications service” means a mobile telecommunications service that is paid for in advance and allows a person to access 9-1-1 emergency communications services. Any person who sells prepaid wireless telecommunications services, or who uses their own prepaid wireless telecommunications services, must collect and remit the fee. The rate is 2 percent of

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<sup>16</sup> <http://www.csec.texas.gov/fees-a-surcharge>.

<sup>17</sup> [Title 1, Part 12 Tex. Admin. Code § 255.4](#).



the purchase price of each prepaid wireless telecommunications service purchased in person, by telephone, over the Internet, or by any other method. The fee is collected, deposited and distributed in the same manner as the 9-1-1 Service Fee for Wireless Telecommunications Connections.

### **Equalization Surcharge**

This fee is imposed on each local exchange access line, equivalent local exchange access line or wireless telecommunications connection—but not a connection that constitutes prepaid wireless telecommunications service. The fee is set by CSEC, currently at \$0.06, for each local exchange access line, equivalent local exchange access line or wireless telecommunications connection, and is remitted to the Comptroller and held in CSEC’s Equalization Surcharge Account 5007.

Per Texas Health and Safety Code Section 771.072,<sup>18</sup> up to 40 percent of the equalization surcharge can be allocated to the RPCs, with the remainder being periodically allocated to fund grants that support the state’s poison control centers. This fee may also be allocated to ECDs.

Although the existing legislation allows the equalization surcharge to be set at a maximum rate of \$0.10 for each access line, Section 771.0725 states:

The commission shall establish the rate for the equalization surcharge imposed under Section 771.072 for each state fiscal biennium in an amount that ensures the aggregate of the anticipated surcharges collected from all customers for the following 12 months does not exceed the aggregate of the surcharges collected from all customers during the preceding 12 months.<sup>19</sup>

As a result, the surcharge is designed to be revenue neutral, and surcharge revenue cannot be enhanced by increasing the rate.

## **• MOF OPTIONS FOR NG9-1-1**

Below are MoF options for the planning, design, implementation, and maintenance of the CSEC State-level ESInet:

### **9-1-1 Service Fee Revenue**

As the largest source of funding for 9-1-1, it is logical to contemplate the use of 9-1-1 service fee revenue to finance the implementation and subsequent operation of the state-level subsystem. CSEC’s enabling legislation, Health and Safety Code 771.071(f) states: “The commission shall distribute money appropriated to the commission from

<sup>18</sup> <http://www.statutes.legis.state.tx.us/Docs/HS/htm/HS.771.htm#771.072>.

<sup>19</sup> <http://www.statutes.legis.state.tx.us/Docs/HS/htm/HS.771.htm#771.0725>.



the 9-1-1 services fee fund to regional planning commissions for use in providing 9-1-1 services as provided by contracts executed under Section 771.078.”

Health and Safety Code 771.079(c) states: “... money in the account may be appropriated only to the commission for planning, development, provision, or enhancement of the effectiveness of 9-1-1 service or for contracts with regional planning commissions for 9-1-1 service, including for the purposes of:

- 1) maintaining 9-1-1 service levels while providing for a transition to a system capable of addressing newer technologies and capable of addressing other needs;
- 2) planning and deploying statewide, regional, and local emergency network systems; and
- 3) updating geospatial mapping technologies.”

### **Equalization Surcharge**

Health and Safety Code 771.072(d) states:

[N]ot more than 40 percent of the amount derived from the application of the surcharge shall be allocated to regional planning commissions or other public agencies designated by the regional planning commissions for use in carrying out the regional plans provided for by this chapter. The allocations to the regional planning commissions are not required to be equal, but should be made to carry out the policy of this chapter to implement 9-1-1 service statewide. Money collected under this section may be allocated to an emergency communication district regardless of whether the district is participating in the applicable regional plan.

The enabling legislation provides authority to CSEC to use Equalization Surcharge to finance the implementation and subsequent operation of the CSEC State-level ESInet.

Health and Safety Code Section 771.072(f) states:

The comptroller shall deposit the surcharges and any prior balances in accounts in the general revenue fund in the state treasury until they are allocated to regional planning commissions, other 9-1-1 jurisdictions, and regional poison control centers in accordance with this section. From those accounts, the amount necessary for the commission to fund approved plans of regional planning commissions and regional poison control centers ***and to carry out its duties under this chapter shall be appropriated to the commission.***”

(Emphasis added.)



The equalization surcharge is paid by all telecommunications users in the State, except prepaid wireless users, and may be allocated to 9-1-1 Entities regardless of type.

### **Appropriated Receipts**

Appropriated receipts are “fees and other revenue collected for services performed by a state agency which are usually appropriated to the agency to help recover the agency’s cost of providing the services.”<sup>20</sup>

The CSEC State-level ESInet may eventually support all areas of the state, including ECDs that may choose to receive services directly from the CSEC State-level ESInet. CSEC could recover the costs incurred in providing access to the CSEC State-level ESInet from the ECDs. This would require an ongoing methodology for establishing the value received, as well as allocating and collecting reimbursement for services from the ECDs.

### **Future Funding Mechanisms**

With the rapid and ever increasing advent of new communications technologies, current approaches that simply assess fees on end-use devices, access lines, or as a percentage of the costs for services, administered largely by traditional communication service providers, may no longer be effective, efficient or sufficient.

CSEC and the 9-1-1 Entities face challenges in fitting emergency communication services into existing funding mechanisms. Prepaid wireless, Voice over Internet Protocol (VoIP) technologies of the fixed and nomadic varieties, as well as mobile broadband and other Over the Top (OTT) wireless and internet data services (including 9-1-1 applications) have all raised such challenges. Today, revenues from 9-1-1 fees imposed on wireline services continue to decrease as more households, approximately 47%, cut the cord and shift to wireless-only voice service.<sup>21</sup> These new technologies and service allows some carriers to gain a competitive edge by avoiding paying an equitable share of 9-1-1 support. Any technology or services capable of accessing the 9-1-1 system should contribute its fair share to operate the legacy 9-1-1 systems and also to assist in the build-out of ESInets and NG9-1-1 systems.

Policy makers at all levels will need to consider certain 9-1-1 policy principles, and to propose sustainable and technology-neutral funding solutions. NENA’s *Funding 9-1-1 Into the Next Generation*<sup>22</sup> points out that NG9-1-1 will reflect a system of system comprised of shared networks, databases and application environments that will have

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<sup>20</sup> Senate Research Center, Austin Texas, Budget 101, *A Guide to the Budget Process in Texas*, (2013), 52.

[http://www.senate.state.tx.us/SRC/pdf/Budget101WebsiteSecured\\_2013.pdf](http://www.senate.state.tx.us/SRC/pdf/Budget101WebsiteSecured_2013.pdf)

<sup>21</sup> FCC TFOPA Final Report page 153, available at:

[https://transition.fcc.gov/pshs/911/TFOPA/TFOPA\\_FINALReport\\_012916.pdf](https://transition.fcc.gov/pshs/911/TFOPA/TFOPA_FINALReport_012916.pdf).

<sup>22</sup> NENA Funding 9-1-1 Into the Next Generation, available at:

<https://c.yecd.com/sites/www.nena.org/resource/resmgr/NGPP/NGFundingReport.pdf>.



both traditional and new types of 9-1-1 costs. The new NG9-1-1 environment will be more complex but also more conducive to sharing of costs and financial obligations. Guiding policy principles for a state funding mechanism should be:

- Predictable and stable;
- Based on consumer's ability to request emergency services;
- Reasonable, equitable and non-discriminatory;
- Assessed on all services that can access NG9-1-1 systems;
- Technologically and competitively neutral;
- Designed to assure fees can only be used to support 9-1-1 systems;
- Designed to assure fair and equitable allocation of the funds collected to provide service to those who pay the fees;
- Designed to assure the revenues collected are sufficient to address transitional, provisioning and ongoing operational costs;
- Clearly identified and accountable; and
- Clear enough to avoid complicating the intergovernmental sharing environment they support.<sup>23</sup>

## • POLICIES & STANDARDS

### THE COMMISSION

The Commission is an agency of the State of Texas and the state's authority on emergency communications. The Commission oversees and administers the CSEC State 9-1-1 program under which the establishment and operation of 9-1-1 is provided by Regional Planning Commissions participating in the program. The mission of the CSEC is to preserve and enhance public safety and health in Texas through reliable access to emergency communications services.

The Commission consists of 12 members representing various public and private sector interests. Five members are appointed by the Governor, one each from the governing body of an RPC, 772 ECD, Municipal ECD, County, and one member to represent the general public. Two members each are appointed by the Lieutenant Governor and the Speaker of the House to represent the general public. Three members are ex-officio, non-voting members named in statute, representing the Texas Public Utility Commission, Department of State Health Services, and Department of Information Resources.

### EMERGENCY COMMUNICATIONS ADVISORY COMMITTEE (ECAC)

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<sup>23</sup> FCC TFOPA Final Report page 154.



The 82<sup>nd</sup> Texas Legislature enacted Health and Safety Code Section 771.0511 authorizing: “[t]he Commission, with the assistance of an advisory committee [ECAC], may coordinate the development, implementation, and management of an interconnected, state-level emergency services Internet Protocol network.” [The CSEC State-level ESInet]:

*“(A) is used for communications between and among public safety answering points and other entities that support or are supported by public safety answering points in providing emergency call handling and response; and  
(B) will be a part of the Texas Next Generation Emergency Communications System.”<sup>24</sup>*

CSEC’s enabling statute requires it to establish policy and oversee agency involvement in the development and implementation of the CSEC State-level ESInet, and to define and delineate the roles and responsibilities of the Commission, the ECAC, and the Executive Director. By resolution, it is the Commission’s policy that the development and implementation of the CSEC State-level ESInet will be done on a cooperative basis with the state’s 9-1-1 Entities. The Commission’s role is to make policy, provide strategic direction, and exercise oversight of the CSEC State-level ESInet, and to authorize and delegate to its Executive Director the responsibility to implement and manage the CSEC State-level ESInet.

The ECAC was created by Commission Rule 252.8 as an advisory committee in accordance with Government Code Chapter 2110.<sup>25</sup> Per this rule, the Commission shall ensure that each ECAC member has the appropriate training, experience and knowledge in 9-1-1 systems and network management to assist in the implementation and operation of a complex network.

The ECAC members are appointed by the Commission and include, at a minimum, the following:

- the Executive Director of the Commission or designee as an ex-officio, non-voting member;
- two RPC representatives;
- two Municipal ECD representatives; and
- two 772 ECD representatives.
- No two members may be from the same 9-1-1 Entity.
- The Commission may amend the composition of the ECAC to reflect and include emergency services other than 9-1-1 service.

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<sup>24</sup> Health and Safety Code § 771.0511(a)(2) – (b).

<sup>25</sup> [Title 1, Part 12 Tex. Admin. Code § 252.8.](#)



In appointing members to the Committee, the Commission consults with the RPCs and ECDs. RPCs may designate responsibility for consulting with the Commission to the Texas Association of Regional Councils. ECDs, defined in Health and Safety Code §771.001(3)(A) and (B), may designate responsibility for consulting with the Commission to MECDA and the Texas 9-1-1 Alliance, respectively.

It is the responsibility of the ECAC to advise the Commission on policy matters regarding the establishment and management of the CSEC State-level ESInet; and, provide for 9-1-1 Entity collaboration on the management of the CSEC State-level ESInet, collective decision-making, and assurance that the requirements of the 9-1-1 Entities are met. The ECAC may also assist the Commission by establishing sub-committees, comprised of the state's subject matter experts with involvement from a cross-section of the state's PSAP and 9-1-1 community, to execute the NG9-1-1 Master Plan, enabling the vision to become a reality. CSEC staff may need to acquire services for technical assistance to facilitate this effort.

#### Accomplishments and Work to Date

During the FY 2014 – 2015 biennium, the ECAC developed and recommended several policies and standards to the Commission. The following ECAC recommended policies and standards were adopted by the Commission in February 2015. However, as the Texas NG9-1-1 environment develops, policies and standards will need to be reviewed and revised as more information and knowledge is gained through implementation.

- Relevant Standards for CSEC State-level ESInet Design, Implementation, and Operations (March 2015)
- CSEC State-level ESInet Security Policy (March 2015)
- CSEC NG9-1-1 GIS Data Standard (March 2015)

#### Planning & Development of Future Policies and Standards

The ECAC has identified and prioritized the following policy issues to consider, develop and/or recommend to the Commission during the FY 2018 – 2019 biennium. These policy issues reflect the current and planned Texas NG9-1-1 environment that will consist of multiple interconnected ESInets, including the CSEC State-level ESInet and Regional ESInets that are owned and operated by 9-1-1 Entities, as well as vendor provided ESInet service offerings.

##### *1. Interoperability and Interconnectivity*

According to the FCC Task Force on Optimal PSAP Architecture (TFOPA) Report (January 2016), “[t]hose responsible for NG9-1-1 systems deployment should be looking for ways to drive network interconnection across their jurisdiction and, where



possible and necessary, with other jurisdictions.”<sup>26</sup> The ECAC will take a similar approach to developing and recommending policies and standards to the Commission that will foster and support interconnectivity and interoperability between the ESInets that do, or will, exist in Texas. Specifically, the ECAC plans to:

- Develop a technical requirements document that defines network protocols, specifies standards-based interfaces, and security requirements for the interworking between and among ESInets. The document may also define a security audit process, network reporting requirements, and operational procedures. Special attention to be given to operational requirements that will break down into interoperability standards and policies, such as call transfers, resolution of misroutes, and telco rate centers.
- Develop a technical document that defines the requirements for the Communication Service Providers that will connect to the CSEC State-level ESInet.
- Review the CSEC State-level ESInet Network Standard for potential revisions and updates. These standards were recommended by ECAC and adopted by the Commission (February 2015) for the design, implementation, and operations of the CSEC State-level ESInet. The NENA standards listed below have been revised, are undergoing review, and will need to be updated accordingly:
  - NENA Detailed Functional and Interface Standards for the NENA i3 Solution
  - NENA NG9-1-1 Additional Data Standard
- Review the CSEC State-level ESInet Security Policy for potential revisions and updates.
- Identify the demarcations of responsibilities and liabilities for the CSEC State-level ESInet in terms of the current legal and regulatory environment. While demarcation responsibilities and liabilities may vary somewhat by different deployment models and approaches, there may also be commonalities as well. Considerations should be given for demarcations on the following:
  - Timing – When do the Texas PUC rules need to be amended and the PUC made aware of potential changes to better reflect and support the Texas NG9-1-1 Environment?
  - Documentation – Documentation, diagrams, and emergency operations plans, to provide as much detail as possible. While high-level general rules are good, detailed specifics are important, too, similar to a well written contract or interconnection agreement.

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<sup>26</sup> FCC TFOPA Final Report page 181.





- Confidentiality Demarcations – What can be shared as public information without violating federal and state laws? Careful consideration will need determining and maintaining the confidentiality of health and personal information that may transverse the CSEC State-level ESInet.
- Public Information and Non-Disclosure Agreement Demarcations – Basic interconnection information should be publicly available to some extent, if it does not endanger safety and security.

## 2. *GIS Data*

The state's 9-1-1 Entities will be responsible for maintaining their jurisdiction's 9-1-1 GIS data, and provisioning that data in a standard way to those NG9-1-1 core elements like the ECRF/LVF serving their geographic area. That will require cooperative and structured working relationships with those authoritative sources of that data, and the operating entities responsible for the core functions involved. Interoperability will be essential to ensure that the data is provisioned appropriately, and, that border and other potentially interactive needs are addressed.

- CSEC NG9-1-1 GIS Data Standard to be revised. In its review and revision, the ECAC will consider the following;
  - Align with NENA GIS Data Model for NG9-1-1
  - Standards for the provisioning and maintenance of GIS data to ECRF/LVF
  - Accommodate EGDMS & ALI/LVF work to date
  - Requirement for VPCs to use ALI/LVF
  - Forest Guide in anticipation of there being more than one LVF operating in Texas
  - Placement of WPH1 data to enable location based routing.

## 3. *Outreach & Awareness*

The ECAC membership is reflective of the 9-1-1 Entities and must support all of the entities in planning, implementing and operating in the Texas NG9-1-1 Environment. Specifically, smaller entities may not have the technical expertise, personnel or funding resources to support the decisions they must make as the 9-1-1 legacy system is retired and replaced by NG9-1-1. To this end, the ECAC will develop information and materials for purposes of outreach and awareness that will help guide smaller 9-1-1 entities through decisions that must be made to transition to NG9-1-1. Such information will focus on general decision points, as well as the importance of the role of GIS in ESInet and NG9-1-1.

- Resources to educate the 9-1-1 local decision makers on NG9-1-1 basics, the importance of transitioning to NG9-1-1, and planning steps to be taken, such as:
  - Identify those that can support the transition to NG9-1-1.



- Encourage attendance in National Emergency Number Association (NENA) conferences, such as 9-1-1 Goes to Washington.
- Provide documentation outlining the key points of NG9-1-1:
  - Industry trends
  - The current 9-1-1 process
  - Current 9-1-1 limitations
  - Public expectations
  - NG9-1-1 funding challenges
  - NG9-1-1 PSAP benefits
  - Documentation specific to officials in the state of Texas
  - Documentation specific to federal legislative officials and the media
- Tools and resources to guide 9-1-1 Entities – particularly smaller entities – through the decision making process and help them in their planning should they choose to utilize services the CSEC State-level ESInet, such as:
  - Documentation outlining steps to take from beginning to implementation
  - Types of services that may be outsourced for transitioning
  - Timelines
  - Alternative ESInets for consideration
- Resources to educate 9-1-1 Entities on the importance of geospatial data management. ECAC recommendations should recognize the following:
  - Maintain core processes at the local level while integrating with the CSEC State-level ESInet standards and requirements.
  - Local spatial managers require the resources to build processes and create local infrastructure for interfacing with the CSEC State-level ESInet geospatial schema.
  - Focus on address points to ensure a higher precision in routing and maximize ROI and improve customer satisfaction.
  - Capturing ambient information, such as schools, fuel depots, chemical stores, etc. can improve safety and understanding of surrounding area in chaotic situations. Budget/Project prioritization by locales with limited resources in the upcoming budget years is necessary to further the NG 9-1-1 objectives; may include foregoing or postponing other projects.
  - Inter-local integration whereby larger locales are geospatial leaders and can provide the infrastructure resources and data management to seamlessly connect with the CSEC State-level ESInet; inter-local integration agreements would be required

#### 4. 9-1-1 Applications



The FCC's TFOPA Report summarizes the issues with 9-1-1 applications and proposes an approach to taking advantage of their innovation while at the same time protecting 9-1-1 service. ECAC may look to the TFOPA report, which says:

Rather than allowing emergency calls to be placed from arbitrary applications, calls connecting to the ESInet typically require interconnection agreements to be in place, with the service provider directing calls to the ESInet being accountable to some extent for the authenticity and the validity of information provided with the call. In order to enable deployment of emergency mobile applications, applications providers could be allowed to act as "service providers". While this imposes a hurdle on the development of new emergency services applications, it also offers a way to limit damage from rogue applications. The balance between the ease of access and mitigation of attack or destructive impacts becomes a matter of policy and cybersecurity.<sup>27</sup>

The ECAC will consider and develop recommendations to the Commission to:

- Establish a strategy to address mobile innovation affecting 9-1-1 services.

## • SYSTEM MANAGEMENT AND OPERATIONS OF CSEC STATE-LEVEL ESINET

The Texas NG9-1-1 System will be comprised of interconnected and interoperable NG9-1-1 systems of local, regional, and state emergency services networks with multiple vendors/solutions deployed across the state. The CSEC State-level ESInet will provide NG9-1-1 services directly and indirectly. Direct services will be provided to those entities that subscribe to CSEC State-level ESInet services. Indirect services will be available to provide region-to-region ESInet interoperability facilitated by the CSEC State-level ESInet's functional elements. Outside of the CSEC State-level ESInet, interoperability may also be provided via region-to-region interconnectivity. The Texas NG9-1-1 System will be a more comprehensive emergency communications system with enhanced capabilities that allows for greater situational intelligence than today's 9-1-1 system. NG9-1-1 services are expected to expand beyond the 9-1-1 services of today and require higher levels of interaction and coordinated response among Texas 9-1-1 stakeholders both vertically and horizontally.

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<sup>27</sup> *Id.* at 108.



## • MULTISOURCING SERVICES INTEGRATOR (MSI)

Rather than relying on a single provider for all services and components, CSEC's strategy to delivering NG9-1-1 services is to engage with multiple service providers with a variety of service capabilities and delivery competencies, integrate their services, and manage the day-to-day delivery of services to reach service goals required for reliable, robust and secure NG9-1-1 service. This access to best-of-breed providers in each service area is known as multisourcing.

It is important to note that individual services cannot ensure the optimal health and security of the CSEC State-level ESInet's multisourced ecosystem, or the delivery of 9-1-1 calls to the appropriate PSAP, with Automatic Number Identification (ANI) and accurate Automatic Location Identification (ALI), thereby enabling PSAPs to provide quality 9-1-1 service.

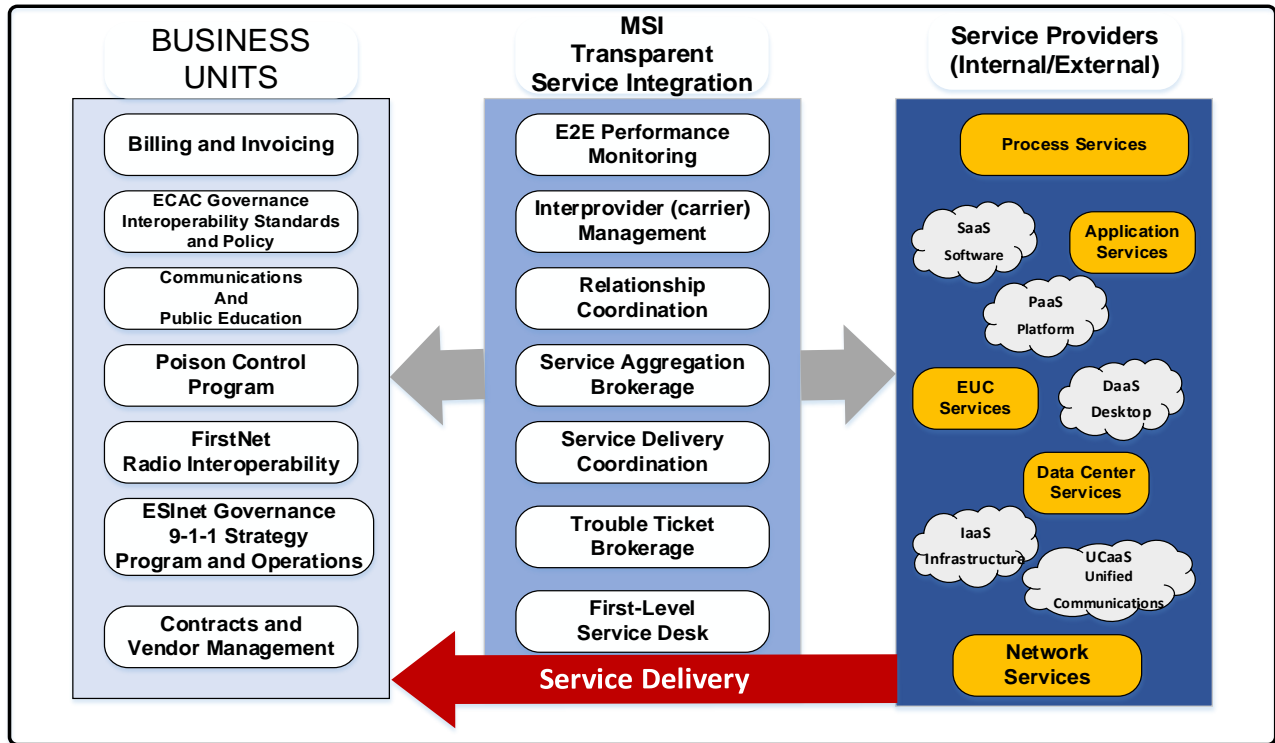
CSEC and most 9-1-1 Entities do not have the resources or experience to coordinate and integrate multiple service providers into a common service management framework that delivers Information Technologies (IT) services, 9-1-1 business process services, business processes associated with other emergency services, and performs the function of service aggregation brokerage. As such, CSEC's strategy is to engage the services of a highly qualified MSI.

The role of the MSI is to focus on managing service providers to deliver end-to-end (E2E) service outcomes consistently, in line with the service level agreements (SLAs) established in the contracts negotiated with the service providers. The MSI will utilize operating level agreements (OLAs) to establish provider roles and responsibilities in managing the CSEC State-level ESInet's multisourced ecosystem, ensure handoffs work well, and service providers collaborate on the dynamic delivery of seamless E2E outcomes. The success or failure of outsourcing relationships is dependent on the quality of the E2E service, as defined by the relevant statement of work (SOW) and OLAs.

The key operational elements of the MSI for the CSEC State-level ESInet is depicted in the modified version of Gartner's *MSI – Transparent Service Integration* diagram below:<sup>28</sup>

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<sup>28</sup> *Research Roundup for the MSI-SIAM Role*, Gartner (July 23, 2015).



### MSI BENEFITS AND CHALLENGES

The benefits of using an effective MSI includes:

- Enables CSEC staff to focus on its strategic responsibilities instead of becoming an integrator of services.
- Cost predictability and perhaps financial savings.
- Predictable service excellence and improvements.
- Reduced risk through E2E performance monitoring and reporting
- Accountability through SLAs & OLAs
- Availability of new features and functionalities via governance as opposed to waiting on managed services provider to provide.

The challenges of using an MSI include the following:

- Level of control delegated to the MSI.
- Developing effective co-management contract constructs and specifying E2E service levels aligned to 9-1-1 business outcomes through OLAs.
- Developing effective price structures and penalties to drive team-based behaviors in the CSEC State-level ESInet ecosystem.
- Establishment of an effective governance that outlines the details of basic governance mechanisms and its utilization to streamline operations.



**MSI SELECTION**

It is imperative that CSEC selects and contracts with the most effective MSI, in order to realize the benefits and meet the challenges of engaging an MSI. This means the scope of the MSI role must be encapsulated into a dedicated SOW to reflect the collaborative and coordinating nature of the role. Furthermore, the MSI’s role must be referenced in each service provider’s SOW.

According to Gartner:

*The MSI needs a sound multivendor service management framework based on a tripod of tools including the “communication” (ITIL V3 or ISO2000), IT service management (ITSM) and quality management (for example, Six Sigma or Lean) to manage providers effectively.<sup>29</sup>*

Gartner’s three groups of criteria for evaluating and selecting a MSI are provided in the table below:

<b>Track Record in Multisourced Environment</b>	<b>Ability to Integrate Operations at First-Level Help Desk</b>	<b>Ability to Deliver and Manage an End-to-End Service</b>
Experienced in managing multiple vendors	Industrial-strength help desk	End-to-end service delivery quality
Service management framework	Supports multivendor service portfolio/catalog	Collaborative service management of multiple providers
Quality management framework		Understanding of business objectives
Value-added governance frameworks and Operating-Level Agreement templates		Workable governance frameworks

**• CSEC STATE-LEVEL ESINET GOVERNANCE MODEL**

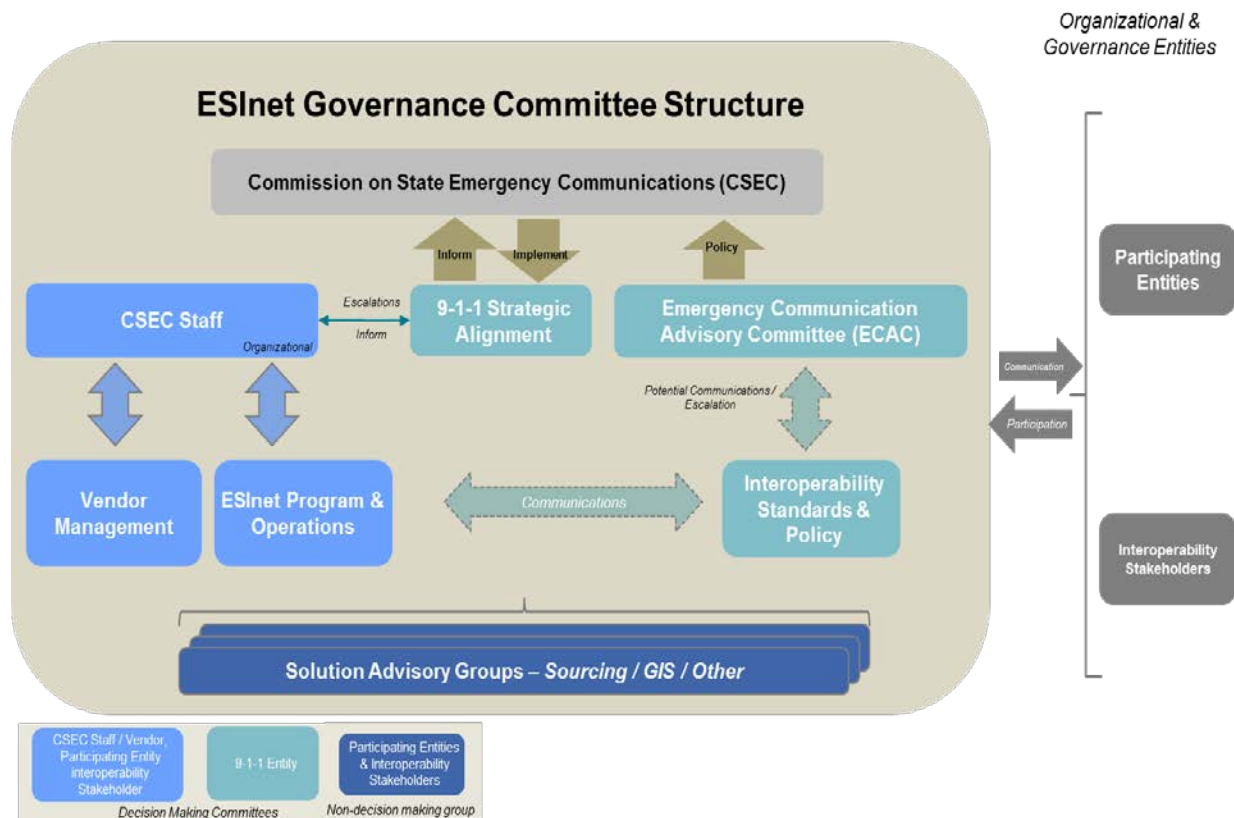
The MSI must be integrated into the governance framework of the CSEC State-level ESInet, as management of day-to-day delivery across all providers is critical to operational excellence.

<sup>29</sup> *Differentiate Between MSI Offerings for Better End-To-End Service*, Analyst(s): Jim Longwood, Gilbert van der Heiden; Gartner, Inc. | G00249250 – July 2013.



On February 10, 2016, the CSEC adopted a Governance Handbook for the CSEC State-level ESInet that reflects CSEC’s approach of an owner-operator model. Whereas Enhanced 9-1-1 infrastructure are owned and operated by incumbent local exchange carriers and services provisioned as tariffs and/or managed services, ownership of the CSEC State-level ESInet is shared amongst Participating Entities<sup>30</sup> (i.e., member owners of the CSEC State-level ESInet). The model was developed collaboratively with RPC representatives (including the 2 RPC representatives who serve on the ECAC) and CSEC staff.

The model is a set of defined interactions, expectations, decisions, roles and processes that guide the governance of the development and the operation of the ensuing CSEC State-level ESInet. The model is designed to facilitate effective resolution of issues and enable strategic decision making; and established to ensure all 9-1-1 Entities have access and an opportunity to participate in the ongoing governance model through its Committees and Solution Advisory Groups. The CSEC State-level ESInet Governance Committee and Solution Advisory Group structure is depicted in the figure below:



<sup>30</sup> As defined in the CSEC’s State-level ESInet Governance Handbook, section 1.2, a Participating Entity is an RPC or other 9-1-1 Entity that utilizes the services of the CSEC State-level ESInet.



## • RESOURCE SHARING

NG9-1-1 increases the opportunity for PSAPs to share resources and to cooperate and collaborate at multiple levels with potentially greater economic technical efficiencies. NG9-1-1 technology has the potential to assist 9-1-1 Entities develop shared or regional models. Texas 9-1-1 Entities have begun exploring how they can best coordinate activities and share resources. NG9-1-1 moves away from the legacy systems to an environment in which sharing and synergy become the norm among local, regional or state connected PSAPs.

## • SHARED INFRASTRUCTURE

Sharing infrastructure and services enables 9-1-1 Entities and PSAPs to share functional elements that meet the needs of individual PSAPs or other types of emergency communication systems. In a shared environment, NG9-1-1 Core Services (ESRP, ECRF, BCF, DNS and Logging) can be implemented and operated on either a single ESInet or multiple interconnected ESInets. The FCC TFOPA<sup>31</sup> report provides a great deal of detail on this subject, and identifies the advantages and disadvantages of resource sharing:

### **Advantages**

- NG9-1-1 Core services and management administration costs are spread across multiple 9-1-1 Entities for a single NG9-1-1 core service system, lessening the impact on local funding.
- Common procedures are established.
- Makes access structure for originating service providers simpler than lower level implementation choices.
- More directly supports interoperability due to common architecture and procedures.
- Involves planned multi-level governance arrangements.
- May make cybersecurity and physical security simpler.

### **Challenges**

- Survivability is potentially affected by limited geo-diversity of service

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<sup>31</sup> FCC TFOPA Final Report pages 118, 119, at [https://apps.fcc.gov/edocs\\_public/attachmatch/DA-16-178A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DA-16-178A1.pdf)





- Requires planned multi-level governance agreements
- Involves potential political issues and changes
- May require new legal arrangements related to governance and funding
- Requires specific plans for implementation of ESInet-to-ESInet connectivity to support interoperability

## • SHARED INFORMATION

The Commission's Emergency Communications Committee (ECAC) has identified and prioritized outreach and education as a priority for the FY 2018 – 2019 biennium. Specifically, smaller 9-1-1 Entities may not have the technical expertise and personnel or funding resources to support the decisions they must make as the 9-1-1 legacy system is retired and replaced by NG9-1-1. Information and materials are needed to help guide 9-1-1 Entities through decision that must be made to transition to NG9-1-1. Such information will focus on general decisions points, as well as the importance of the role of GIS in ESInets and NG9-1-1. The ECAC will develop:

- Resources to educate the 9-1-1 local decision makers on NG9-1-1 basics, the importance of transitioning to NG9-1-1 and planning steps to be taken.
- Tools and resources to guide 9-1-1 Entities through the decision making process and help them in planning.
- Resources to educate 9-1-1 Entities about the importance of GIS data development and management in the NG9-1-1 environment.

Additional details are listed in Section 5, Policies and Standards, in this document.

## • PUBLIC EDUCATION

With the assistance of the Commission's ECAC and the NG9-1-1 Educator Network, CSEC will facilitate and coordinate public education efforts with 9-1-1 Entities to identify the key message to the public and deliver that in a timely and effective manner. The phased deployment of NG9-1-1 will require the general public to be aware of where, when, what and how NG9-1-1 services are available. New communications options for the elderly, deaf and hard of hearing, disabled, and non-English speaking populations will also need to be addressed in the effort to manage the public's expectation.



The implementation of NG9-1-1 technology will require significant training, retraining and recurring supplemental training and education through the transition into the end state of the technology implementation. This training will be for PSAP and 9-1-1 Entities, and operations personnel, and should also include personnel from those public safety agencies that receive services from the PSAP.

Comprehensive outreach and education for both 9-1-1 stakeholders and the public is critical to the effectiveness and overall acceptance of all aspects of NG9-1-1. The PSAPs, the public safety community, and their governmental entities must fully communicate the challenges, the needs and requirements of the envisioned transition including the identification of adequate capital and sustainment funding of the transitional and end state NG9-1-1 technology implementation.

During the current biennium, CSEC has delivered consistent messages to various stakeholders including informational items on NG9-1-1 such as brochures, newsletters, news articles, video blogs and social media posts. These messages provide key information on the process and reinforcement regarding the transition to NG9-1-1. Stakeholder groups include the public, the PSAPs and RPC staff, as well as state and local elected officials.

#### NG9-1-1 EDUCATOR NETWORK

In an effort to facilitate communications and feedback from stakeholders, CSEC created the Next Generation 9-1-1 Educator Network. The network is responsible for sharing and disseminating information to government entities, PSAPs, the public and other stakeholders within their region and surrounding regions. Their mission is to enhance centralized communication efforts through their knowledge and connections with their local networks.

Currently, six RPC representatives participate in the CSEC NG9-1-1 Educator Group, but over time this group may expand to include more 9-1-1 Entities that want to get involved. The current representatives and the areas covered are:

- North Central Texas Council of Governments represents:
  - Heart of Texas Council of Governments
  - North Central Texas Council of Governments
  - Texoma Council of Governments
- Golden Crescent Regional Planning Commission represents:
  - Coastal Bend Council of Governments
  - Golden Crescent Regional Planning Commission
  - Lower Rio Grande Development Council
  - South Texas Development Council/City of Laredo



- Permian Basin Regional Planning Commission represents:
  - Middle Rio Grande Development Council
  - Permian Basic Regional Planning Commission
  - Rio Grande Council of Governments
- Deep East Texas Council of Governments represents:
  - Ark-Tex Council of Governments
  - Brazos Valley Council of Governments
  - Deep East Texas Council of Governments
  - East Texas Council of Governments
  - South East Texas Regional Planning Commission
- Panhandle Regional Planning Commission represents:
  - Nortex Regional Planning Commission
  - Panhandle Regional Planning Commission
  - South Plains Association of Governments
- Concho Valley Council of Governments represents:
  - Alamo Area Council of Governments
  - Central Texas Council of Governments
  - Concho Valley Council of Governments
  - West Central Texas Council of Governments

CSEC has and will continue to utilize the NG9-1-1 Educator Network as a resource to help deliver messages to stakeholders and in turn, receive input and feedback from them. The NG9-1-1 Educator Network has and will continue to play a pivotal role by providing feedback through:

- Email and informal conversations
- Meetings and conference calls
- Surveys
- Focus groups and workshops
- Social Media and Video Blogs

By leveraging social media for this project, such as Facebook, Twitter, LinkedIn and YouTube, CSEC continues to deliver key messages in a resourceful way. The collaboration of the NG9-1-1 Educator Network and project staff has helped to refine the tactical execution of this strategy by taking resources provided by CSEC and distributing them to stakeholders within the community. Effective communications with stakeholders will help in deployment of the new system by providing context to the changes being made and to help with user adoption of the new system.



Messages shared include knowledge of the ESInet project and the NG9-1-1 system, belief that the new system will be better than the current system, and that everyone's interests are represented and taken into consideration.

Through education and resources provided by CSEC regarding the CSEC State-level ESInet, knowledge and understanding will increase over time. This will lead to preparation and readiness levels by the time the CSEC State-level ESInet is implemented. The goal is to continue providing key messages to the NG9-1-1 Educator Network Group during every step of the process so that they can then provide these key messages to stakeholders in their region and surrounding regions.

CSEC will continue to create video blogs, newsletters and provide workshops in an effort to keep all entities informed and prepared for the transition to NG9-1-1. It is an end goal to create NG9-1-1 Public Service Announcements (PSA) and a corresponding toolkit for RPCs to utilize in their educational efforts of their staff and stakeholders. CSEC will utilize brochures, PSAs and social media to help inform the public of changes to the 9-1-1 system. Newsletters, video blogs and workshops will be utilized to educate the RPCs and their PSAPs. CSEC will utilize video blogs, news articles, and newsletters to help inform legislators and judges of the changes to 9-1-1.

## • SUPPORTING RADIO COMMUNICATIONS INTEROPERABILITY

CSEC works with the Governor's Office of Homeland Security, as well as the Texas Department of Public Safety's (DPS) Statewide Interoperability Coordinator (SWIC) and the Texas Public Safety Broadband Program (TxPSBP), to support needs of statewide communications interoperability among public safety agencies (e.g., police, fire, emergency medical services) and other service agencies (e.g., public works, transportation, and hospitals). The Statewide Interoperable Communications Plan (SCIP) defines communications interoperability as the ability of public safety agencies (e.g., police, fire, emergency medical services) and service agencies (e.g., public works, transportation, and hospitals) to talk within and across agencies and jurisdictions via radio and associated communications systems, exchanging voice, data and/or video with one another on demand, in real time, when needed, and when authorized.

The Texas Statewide Interoperability Governance Body, originally known as the Texas Radio Coalition, was chartered to develop the original SCIP and has shaped



interoperable Land Mobile Radio (LMR) and training efforts in Texas for many years. With the recent focus on interoperable data networks and to keep the focus relevant, the name was changed to the Texas Interoperable Communications Coalition (TxICC). The CSEC serves in an advisory capacity on the TxICC.

The Texas “System of 24 Regional P25 Voice Communications Systems” is being built at the regional level utilizing the regional framework of the 24 Council of Governments and two U.S. Department of Homeland Security -designated Urban Areas of Houston, and Dallas/Fort Worth/Arlington (these three areas operate as a single metro urban area by planning and collaborating on the strategic implementation of regional communications systems infrastructure. The same approach is being used by CSEC and the 75 9-1-1 Entities for the transition to the Texas NG9-1-1 System.

## • RADIO OVER INTERNET PROTOCOL

The CSEC and DPS intend to leverage the CSEC State-level ESInet to support long-haul radio communications interoperability with Radio over Internet Protocol (RoIP). RoIP is similar to VoIP, but augments two-way radio communications rather than telephone calls. From the user's point of view, it is essentially VoIP with Push-To-Talk. With RoIP, at least one node of a network is a radio (or a radio with an IP interface device) connected via IP to other nodes in the radio network.

RoIP will be implemented using secure Virtual Private Network (VPN) tunnels on the CSEC State-level ESInet to transport long-haul radio traffic between the IP interfaces of state, regional and local radio communications systems. The VPN keeps the radio traffic from intervening with 9-1-1 traffic (and vice versa) to ensure guaranteed access for both forms of traffic during an emergency. This enables a straight forward cost allocation for the radio VPN. It also enables the management and operation of collective IP-enabled network infrastructure including the radio VPN as a whole, resulting in operational and cost savings.

## • NG9-1-1 AND FIRSTNET

NG9-1-1 and FirstNet represent the two halves of the public’s request for service and the public safety response.

- NG9-1-1 is a standards-based, all-IP emergency communications infrastructure enabling voice and multimedia communications between a 9-1-1 caller and a PSAP. NG9-1-1 is designed to provide access to emergency services from all connected communication sources.



- FirstNet network will provide the vital network connectivity between the PSAP and the first responders enabling the real time delivery of videos, photos and other high-speed data.

FirstNet is an independent authority within the U.S. Department of Commerce's National Telecommunications and Information Administration. FirstNet is governed by a 15-member Board composed of representatives from public safety; local, state and federal government; and the wireless industry. Signed into law on February 22, 2012, the Middle Class Tax Relief and Job Creation Act created FirstNet. The law gives FirstNet the duty to ensure the building, deployment and operation of the first high-speed, nationwide wireless broadband network dedicated to public safety personnel and first responders. The public safety community fought hard to fulfill the 9/11 Commission's recommendation and encouraged Congress to pass legislation establishing a dedicated, reliable network for advanced data communications nationwide. During emergencies, public safety personnel need true priority access and preemption, which are not available on commercial networks.

The FirstNet network is intended to improve citizen and responder safety and increase the efficiency and effectiveness of emergency response through cutting edge broadband communications. Public safety personnel using the FirstNet network will be able to share applications, access databases, and provide better informed responses to incidents through integrated communications. FirstNet's goal is to provide public safety-grade reliability and nationwide coverage so all public safety personnel and first responders can count on the network when they are on the job. FirstNet plans to create a nationwide standard of service while affording localized customization and control. When the FirstNet network launches, it will provide mission-critical, high-speed data services to supplement the voice capabilities of today's Land Mobile Radio (LMR) networks. Initially, the FirstNet network will be used for sending data, video, images and text. The FirstNet network will also carry location information and eventually support streaming video. FirstNet plans to offer cellular voice communications such as Voice over Long Term Evolution (VoLTE) or other alternatives.

NG9-1-1 and the FirstNet network are two separate but interconnected systems, both sharing critical information to first responders. The convergence of the NG9-1-1 networks and the FirstNet network at the PSAP will dramatically enhance public safety communications from the time a call originates from the public on the NG9-1-1 network to the PSAP, through the FirstNet network to the first responders. NG9-1-1 and the FirstNet network share common interests such as Cyber Security, Location Accuracy, the Validation and Use of Applications, Identity Management, and Network Coverage. As FirstNet develops a seamless and secure broadband communications network it will



be responsible for ensuring that it interoperates and interconnects with NG9-1-1 networks.

## • TEXAS PUBLIC SAFETY BROADBAND PROGRAM & FIRSTNET

The TxPSBP was formed within the Texas DPS and charged with the planning and coordination of activities for the Texas portion of the FirstNet. TxPSBP is responsible for preparing Texas and its numerous and diverse stakeholders for the successful implementation of the NPSBN through the following activities:

- Outreach & Education
- Requirements gathering
- Data collection
- Memorandums of Understanding (MOUs) development
- Statewide Communications Interoperability Plan (SCIP) revisions

### CONSULTATION MEETING

FirstNet and TxPSBP are currently working together to plan a dedicated public safety broadband network. On February 11 and 12, 2015, 142 representatives from Texas public safety disciplines; local, regional, state, and federal governments; two tribes; and seven other states attended the Texas Initial Consultation Meeting with FirstNet. The purpose of the meeting was to provide an opportunity for the Texas public safety community to have a direct dialogue with FirstNet to discuss wireless broadband communication needs, ask questions, and learn more about FirstNet's plans to implement a dedicated nationwide public safety broadband network. The CSEC, Texas 9-1-1 Alliance and the Texas Municipal Emergency Communications District Association participated in the meeting and provided an update on the status of NG9-1-1 in Texas.

### STATE DECISION ON FIRSTNET PLANS

Members of the FirstNet outreach and design teams will work closely with the TxPSBP to develop and deliver a network deployment plan to meet their needs. FirstNet will then provide the Governor with a notice of the completion of the request for proposal process; the details of the proposed plan; and the funding level for the state. Upon receipt of the plan, the Governor will have 90 days to choose whether to participate in the plan provided by FirstNet or conduct its own deployment of a radio access network. If a Governor decides to opt out, the state will be required to notify FirstNet, NTIA, and the FCC. After providing the notification, the Governor has 180 days to develop and complete requests for proposals for the construction, maintenance and operation of its own system within the State. The State is required to submit an alternative plan to the



FCC that is interoperable with the NPSBN and complies with the minimum technical interoperability requirements under the Act.

#### NEXT STEPS

FirstNet has issued a Request for Proposals (RFP) for services to build and provide the nationwide broadband network. Once a contract is established, FirstNet will begin developing state plans for each of the states to consider. Responses to the RFP are due May 31, 2016 and contract award is anticipated by November 1, 2016.

## • ACTIVITIES TO DATE

The following events and activities occurred in reverse chronological order, since the initial release of the Master Plan in 2009:

#### **FISCAL YEARS 2014-2015**

#### **CSEC requested and was appropriated funds and implemented two NG9-1-1 projects:**

##### NG9-1-1 Geospatial Database Project

This project implements two database management systems:

1. A state-level EGDMS with data management services to coalesce federated geospatial data sourced from 9-1-1 Entities, perform quality control, and provision the validated data to NG9-1-1 system components; and
2. An Automatic Location Identification (ALI) database management system with NG9-1-1 location validation capabilities with services for ALI data management, ALI delivery, and NG9-1-1 location validation utilizing geospatial data provisioned by the state-level EGDMS.

##### State-level Digital 9-1-1 Network Project

Also referred to as the CSEC State-level ESInet Project (ESInet Project), the ESInet Project - Phase I objectives were:

1. Deploy NENA i3 compliant media gateway(s) to aggregate SMS text sessions between multiple Text Control Centers (TCCs) and PSAPs; provide for text sessions to be handled at the PSAPs as legacy TTY, web portal, or integrated into the PSAP equipment; and facilitate the transfer of text sessions between PSAPs using different interfaces;
2. Leverage and upgrade the newly implemented AT&T-provided Multi-Protocol Label Switching (MPLS) network, currently used for the delivery of Automatic Location Identification (ALI) in the CSEC State 9-1-1 program, to serve as the





CSEC State-level ESInet, and ingress Communications Service Providers 9-1-1 call traffic;

3. Perform upgrades to the network connections and PSAP equipment, as applicable, to enable the 80 selected PSAPs to accept the delivery of all 9-1-1 call types using NENA i3 compliant core applications, without affecting the ability of the PSAPs not selected for the Project, to request and receive ALI; and
4. Identify and/or develop the necessary NG-1-1 technical requirements and IT policies and procedures to enable the ESInet Project.

During the course of the ESInet Project - Phase I, two of the project objectives were modified as follows:

**Objective 2:** to ingress Communications Service Providers' Text-to-9-1-1 call traffic, and continue to deliver ALI.

**Objective 3:** to plan for the implementation of the CSEC State-level ESInet, consisting of two separate networks, to enable 80 PSAPs to accept the delivery of all 9-1-1 call types using NENA i3 compliant core applications, without affecting the ability of the PSAPs not selected for the Project, to request and receive ALI.

The foregoing mean that the AT&T-provided MPLS network, used for the delivery of ALI and Text-to-9-1-1 call traffic, will be decommissioned upon the traffic migration of all PSAPs in the CSEC State 9-1-1 program to the CSEC State-level ESInet.

**Several 9-1-1 Entities implemented regional ESInets in various degrees of completion.**

**Efforts to complete National Emergency Number Association (NENA) i3<sup>32</sup> and related standards progressed.**

### **Certification**

To interconnect with other CSPs in the state, the CSEC became a certificated local exchange carrier. The Public Utility Commission has recognized the authority of several of the governmental and 9-1-1 entities to become "certificated" for specific purposes, including 9-1-1 service.

**The ECAC developed and recommended several policies and standards.**

The following ECAC recommended policies and standards were adopted by the Commission in February 2015. However, as the Texas NG9-1-1 environment develops,

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<sup>32</sup> The NENA i3 standard describes the network, components, and interfaces required to establish NG 9-1-1 service.



policies and standards will need to be reviewed and revised as more information and knowledge is gained through implementation.

- Relevant Standards for CSEC State-level ESInet Design, Implementation, and Operations (March 2015)
- CSEC State-level ESInet Security Policy (March 2015)
- CSEC NG9-1-1 GIS Data Standard (March 2015)

### **FISCAL YEARS 2012-2013**

#### **Emergency Communications Advisory Committee (ECAC) was authorized in statute.**

Upon the recommendation of the Sunset Advisory Commission<sup>33</sup>, the 82<sup>nd</sup> legislature enacted legislation (Health and Safety Code § 771.0511<sup>34</sup>) authorizing CSEC, with the assistance of an advisory committee, to “coordinate the development, implementation, and management of an interconnected, state-level emergency services Internet Protocol network [CSEC State-level ESInet]... The commission shall establish policy and oversee agency involvement in the development and implementation of the [CSEC State-level ESInet].” The CSEC State-level ESInet “will be a part of the Texas Next Generation Emergency Communications Network.”

#### **CSEC adopted Rule 252.8 to establish the Emergency Communications Advisory Committee composed of stakeholders, under Government Code Chapter 2110.**

The ECAC’s tasks are to:

1. Advise CSEC on matters regarding the establishment and management of the CSEC State-level ESInet; and
2. Provide for 9-1-1 Entity collaboration on the management of the CSEC State-level ESInet, collective decision-making, and assurance that the requirements of the 9-1-1 Entities are met.

### **Fiscal Years 2010-2011**

#### **CSEC State-level ESInet Pilot Project**

CSEC initiated a pilot project using a onetime grant under the ENHANCE Act, awarded to Texas by the National Highway Traffic Safety Administration. The pilot implemented the following:

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<sup>33</sup> See: <https://www.sunset.texas.gov/reviews-and-reports/agencies/commission-state-emergency-communications-csec>

<sup>34</sup> <http://www.statutes.legis.state.tx.us/Docs/HS/htm/HS.771.htm>



1. A limited feature CSEC State-level ESInet that interconnected IP capable PSAPs and allowed for the receipt and delivery of traditional wireline calls via a Legacy Network Gateway; and
2. A state-level Enterprise Geospatial Database Management System (EGDMS) that coalesced and provisioned 9-1-1 geospatial data to the CSEC State-level ESInet.

The limited CSEC State-level ESInet and EGDMS were shut down upon completion of the pilot.

The experience of CSEC's pilot project may be leveraged to assist 9-1-1 Entities that are planning, or contemplating, development of regional ESInets. The CSEC ESInet Installation Project Plan is provided as a tool for ESInet planning and development, and can be found at

[http://csec.texas.gov/images/Next\\_Gen/CSEC\\_ESInet\\_Project\\_Plan\\_V8\\_Final.pdf](http://csec.texas.gov/images/Next_Gen/CSEC_ESInet_Project_Plan_V8_Final.pdf).

While risks vary from project to project, access to the risk-management experience and lessons learned in a similar project would be beneficial. The risk-management plan in the document could serve as a template for developing similar plans for other ESInets.



# GLOSSARY OF TERMS

<b>The following are commonly used Acronyms</b>	
<i>Acronym</i>	<i>Description</i>
ALI	Automatic Location Identification
BCF	Border Control Function
CIDB	Customer Information database
CPE	Customer Premises Equipment
DBITS	Deliverables-based IT services
DIR	Department of Information
E9-1-1	Enhanced 9-1-1
ECD	Emergency Communication District
ECRF	Emergency Call Routing Function
EGDMS	Enterprise Geospatial Database Management System
ESInet	Emergency Services IP-Enabled Network
ESRP	Emergency Services Routing Proxy
FCC	Federal Communications Commission
FY	Fiscal Year
GIS	Geographic Information Systems
i3	Functional and Interface Standards for Next Generation 9-1-1 Version 1.0 (i3) NENA 08-002
ICA	Interconnection Agreements
IdAM	Identity and Access Management
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPsec	Internet Protocol Security
IPv6	Internet Protocol version 6
IT	Information Technology



<b>The following are commonly used Acronyms</b>	
LAR	Legislative Appropriation Request
LDB	Location Database
LIF	Location Interworking Function
LIS	Location Information Server
LoST	Location to Service Translation
LVF	Location Validation Function
MoF	Method of Finance
MPLS	Multi-Protocol Label Switching
NIF	NG Interworking Function
NENA	National Emergency Number Association
NG9-1-1	Next Generation 9-1-1
NGCS	Next Generation Core Services (including core functions <i>i.e.</i> , BCF, ESRP with PRF, ECRF)
NG-SEC	Security for Next Generation 9-1-1 Standard Version 1 (NG-SEC) NENA 75-001
P25	Project 25 (formerly APCO Project 25)
PIDF-LO	Presence Information Data Format – Location Objects
PIF	Protocol Interworking Function
PII	Personally Identifiable Information
POI	Points of Interconnection
PRF	Policy Routing Function
PSAP	Public Safety Answering Point or Primary Public Safety Answering Point
PUC	Public Utility Commission
QoS	Quality of Service
RITA	Research and Innovative Technology Administration
RoIP	Radio over Internet Protocol
RPC	Regional Planning Commission

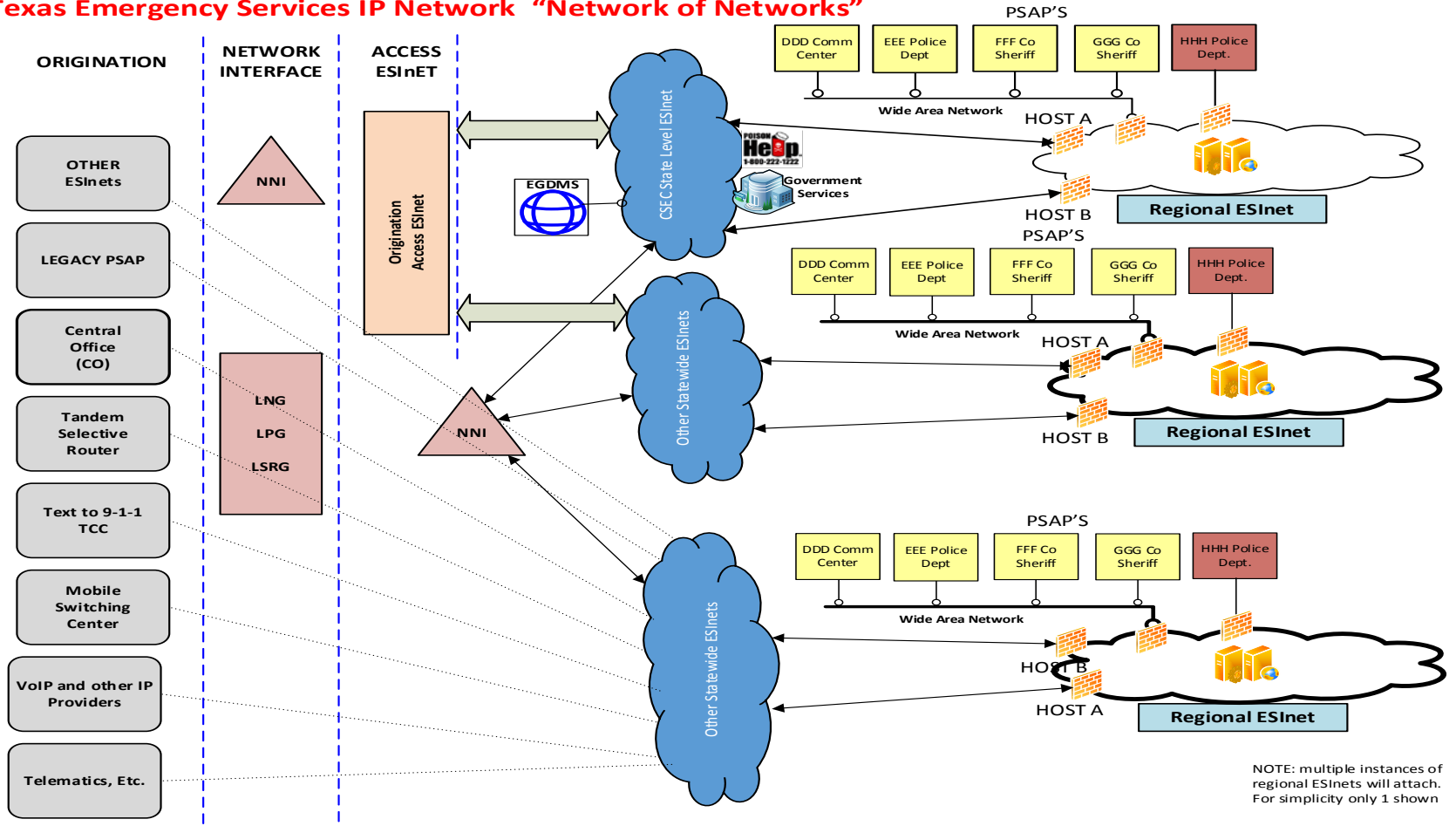


<b>The following are commonly used Acronyms</b>	
SaaS	Software as a Service
SCIP	Statewide Communications Interoperability Plan
SDO	Standards Development Organization
SIF	Spatial Information Function
SIP	Session Initiation Protocol
SLA	Service Level Agreements
TTY/TDD	Teletype/Telecommunications Device for the Deaf
URI	Uniform Resource Identifier
URN	Uniform Resource Name
USDOT	U.S. Department of Transportation
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network



# FIGURE 1 – TEXAS NG9-1-1 SYSTEM AND ESINET VISION

## Texas Emergency Services IP Network “Network of Networks”





Next Generation 9-1-1 Master Plan