TN Department of Commerce & Insurance | Tennessee Emergency Communications Board

Strategic Plan

FINAL REPORT

SUBMITTED MAY 2017 TO:
Tennessee Emergency Communications Board

MissionCriticalPartners
502 N. Carroll Avenue, Suite 120 | Southlake, TX 76092 | 888.8.MCP.911 or 888.862.7911 | www.MCP911.com

TABLE OF CONTENTS

EXECUTIVE SUMMARY

As a recognized industry leader[1] in Next Generation 9-1-1 (NG9-1-1) implementation, the Tennessee Emergency Communications Board (TECB or Board) determined that at this point in its NG9-1-1 migration the State needs a strategic plan, i.e., a document that will provide the State with direction and actionable goals. The TECB's industry leadership has positioned the state with a foundational Emergency Services Internet Protocol (IP) Network (ESInet) and a transitional IP-based call-routing solution. The 100 Emergency Communications Districts (ECDs) are at varying levels of deployment with a majority receiving calls with a direct IP solution. This is important to the Strategic Plan as this capability lays the groundwork for which new features and functional elements can be deployed.

In 2016, with the understanding that a strategic plan was needed, the TECB launched several key initiatives to gather the ECDs' input. These came in the form of a Web-based satisfaction survey and a series of regional stakeholder meetings. These processes provided the TECB with direct input from the ECDs enabling the development of this Strategic Plan (Plan), one that encompasses the needs of stakeholders across the state. The Strategic Plan contains broad recommendations across five core areas: Planning and Policy, Technology, Communication, Training, and Funding. Program success will be found when initiatives from all five areas are being executed sufficiently.

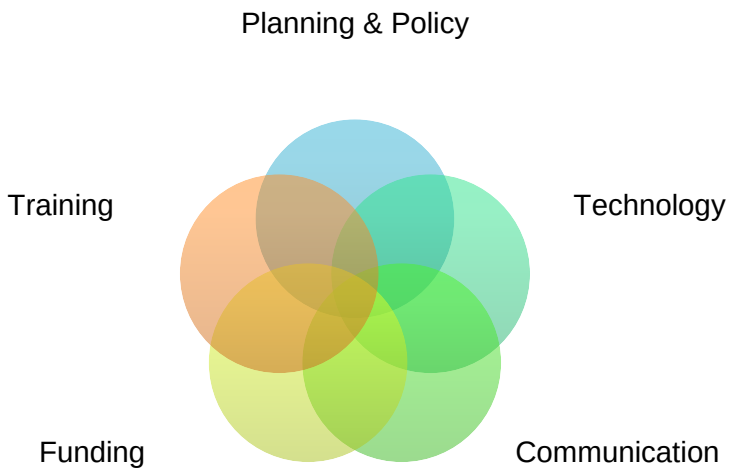


Figure 1: Five Core Strategic Areas of Focus

Based on overall program successes, the TECB has developed a strong relationship with its ECDs and continues to reap the benefits of a well-managed program. To date, the TECB has received positive

[1] In 2017, the TECB was the recipient of two industry awards in recognition of its leadership in NG9-1-1 implementation: the NG9-1-1 Institute's Outstanding 911 Call Center/Program Award and the Industry Council on Emergency Response Technologies' (iCERT) Leading the Way Award.

feedback on its technology roadmap, the Board's collaborative approach with the ECDs, and its training initiatives. The recommendations in this Strategic Plan align with the TECB's and ECDs' dedication to providing excellent 9-1-1 service and will advance its upward trajectory.

The technology strategic initiatives focus on three primary areas: enhancing redundancy and resiliency, enabling statewide interoperability, and integrating supplemental data. By focusing on these three areas, the ECDs will be afforded the opportunity to provide more efficient and effective service. Improved redundancy and resiliency will ensure calls are delivered even when the network is impaired. Offerings such as hosted call handling, satellite network access and integration with the State's First Responder Network Authority (FirstNet) project will provide new capabilities that will provide ECDs with flexibility that will represent a new paradigm in public safety answering point (PSAP) operations. Meanwhile, supplemental data and alternative access to 9-1-1 service, such as enabling end users to send text messages to 9-1-1, will change dramatically the way in which telecommunicators operate with new means of communication and new data sets to make judgment calls.

All of this points to the need for the TECB and ECDs to continue improving communications and training opportunities. The Strategic Plan outlines recommendations to the TECB for continuing communications practices and suggests ways in which to add new means of communication with the ECDs. Tasks such as increased communication and clarity regarding NG9-1-1 technology implementations will increase stakeholder knowledge and awareness. Meanwhile, regular anonymous satisfaction surveys will provide the TECB with a formal opportunity for checking in with the TECB, staff and ECDs to ensure that the TECB's performance and execution of the strategic initiatives continue to meet the emergency communications needs of the State.

Over the last couple of years, the TECB has increased State-sponsored training opportunities for the ECDs and their staff. The ECDs are eager to engage in these opportunities and this desire will grow as new technologies bring new complexities to the workplace. The establishment of minimum training requirements will provide for a baseline, ubiquitous end-user experience across the state. With minimum training requirements, the State can establish a professional 9-1-1 telecommunicator certification—an important element of a professional development program.

The Strategic Plan should become a regular part of the TECB's operation. Milestones, performance, outputs and outcomes should be measured. Additionally, a cost study of the TECB's initiatives will ensure that they will have the proper funding to meet the established deadlines. The status of the strategic initiatives should be communicated regularly to the Board and ECDs. Annual review of its contents will ensure that the Strategic Plan remains relevant to the current operating environment. With a stable funding model and dedication to executing these best practices, the TECB will further advance its commitment to industry leadership in using technology to save more lives.

1. APPROACH

The TECB's executive leadership identified the critical need for a strategic plan that could serve as a guiding document for current initiatives and a roadmap for future endeavors. Planning discussions with the TECB staff confirmed that the plan must be built on a strong foundational understanding of the 9 1 1 ecosystem in Tennessee.

To ensure this understanding, Mission Critical Partners, Inc. (MCP), TECB's NG9-1-1 subject matter expert (SME), was directed to develop and distribute a satisfaction survey to stakeholders identified by the TECB. The survey included three separate, but closely aligned surveys to gauge the level of satisfaction among three key stakeholder groups: the Board, the TECB staff, and the ECDs. As the first step in identifying the level of stakeholder satisfaction about the Board's current initiatives, the survey gauged the responsiveness and professionalism of the TECB staff, and the future of 9-1-1 service in the State of Tennessee (State). Between May 31—June 21, 2016, the three groups of stakeholders completed the satisfaction survey. The survey had an exceptionally high participation rate: 100 percent of TECB Board members and staff participated, and 75 percent of the ECDs participated.

In October 2016, MCP's experts facilitated three regional meetings at central locations in each of the Grand Divisions to share the results of the survey and further explore the themes identified across the survey responses. These meetings helped provide additional ECD insights, opinions, and recommendations regarding TECB policies, communications, funding, training and NG9-1-1 technology.

After defining the data themes from the survey and the three regional meetings, MCP conducted a facilitated session with the TECB staff in January 2017 to share the overlapping themes and to validate the strategic priorities identified through the collected data.

2. STRATEGY

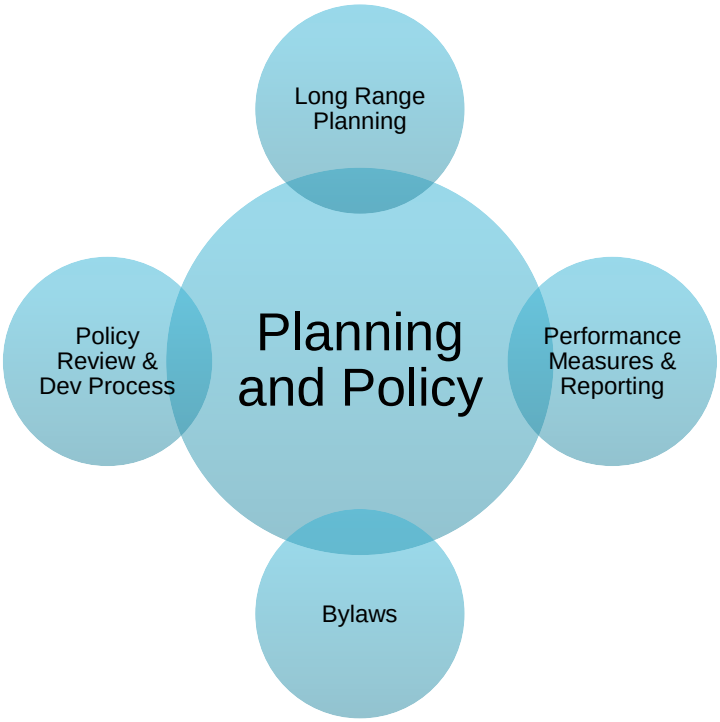
The foundation of the TECB Strategic Plan is rooted in the data collected through the satisfaction survey and the facilitated sessions with the ECDs and the TECB staff. After reviewing the feedback received through the survey and sessions and evaluating the data, MCP identified the recurring patterns, or themes, in the comments shared by stakeholders. MCP used these data themes, in conjunction with its industry expertise, to organize strategic priorities and initiatives into the following five categories: Policy and Planning, Technology, Communication, Training and Funding.

The TECB staff then developed the following proposed core values that align with both stakeholder input and with MCP's recommended initiatives addressed later in this Strategic Plan.

The recommended TECB mission and core values are as follows:

Figure 2: TECB Mission and Core Values

3. PLANNING AND POLICY



3.1. LONG RANGE PLANNING

The TECB already has embraced the value of a strategic roadmap, recognizing how essential it is to the successful execution of its initiatives and achievement of its goals. For the TECB, long-range strategic planning will drive the organization forward into the next generation of 9-1-1 services, while responding to the needs of the public and ECDs across the state.

Capturing the ECD's perspective in the TECB's survey was the first step in long-term planning. That input helped the Board and TECB staff formulate a plan of action to address issues and concerns. That plan of action led to facilitated, information-gathering sessions throughout the State and the development of core value statements. The core value statements simultaneously set the baseline and set the bar for identifying and pursuing initiatives and actionable strategies that align with the TECB's beliefs and mission. A strategic roadmap consists of many smaller segments of actions and pursuits that contribute to the higher-level objective. The TECB is interconnecting these segments in order to succeed in its mission. Each strategic segment helps build a cohesive program and all are aligned to achieve the goals of the organization.

MCP recommends that the TECB continue down its current path in establishing an annual process for evaluating current objectives and considering adjustments for continued long-range strategic planning.

3.2. PERFORMANCE MEASURES AND PROGRESS REPORTING

The Board and the State's 9-1-1 stakeholders have provided input into a strategic planning process, generating goals, initiatives, and priorities, all culminating in this TECB Strategic Plan. To remain successful, performance around these initiatives must be regularly measured. Performance measurement is the ongoing monitoring and reporting of program accomplishments, particularly progress towards pre-established goals. Performance measures usually speak to the process (how activities are conducted), outputs (the services or products delivered because of the initiative), and the outcomes (the results of the initiative or actions).

The Strategic Map, found in Appendix B, is a tool designed to help the TECB track and monitor progress of strategic goals and initiatives, and ensure they align with the Board's mission and values. The Strategic Map offers a structure for sharing progress with the Board—perhaps monthly or quarterly—and updating members on progress made in implementing initiatives and achieving identified goals.

3.3. BYLAWS

Annual review of the TECB's governing documents will assist the organization in maintaining alignment between its bylaws, core values, program initiatives, and budget. For example, in preparation for the Board meetings held annually in February, the TECB staff may undertake a review of its primary governing documents and processes. The staff then would present these findings and/or recommendations to the Board for consideration of approval. This would provide three months of corrective action by TECB staff prior to the final Board meeting of the fiscal year, held annually in May.

At that time, the Board could take a vote on adopting final recommendations prior to the new fiscal year.

MCP recommends that TECB executive leadership share any proposed changes to the governance processes with the Board for consideration.

3.4. POLICY REVIEW AND DEVELOPMENT PROCESS

MCP recommends that the TECB adopt a formal policy review and development process. Currently, TECB policy development is discussed in Section VI: Committees of the TECB bylaws where a Policy Advisory Committee (PAC) is established.

> ***C. Policy Advisory Committee.*** *The Policy Advisory Committee shall be composed of no less than five (5) members and no more than twelve (12) members duly appointed by the Board in accordance with these bylaws. Members of the Policy Advisory Committee may include local government officials, consumers, 911 service users, law enforcement personnel, firefighting personnel, emergency medical services personnel and other appropriate individuals with knowledge and training sufficient to provide the Board with information and recommendations regarding 911 policy*.

Policy needs and concepts are identified and vetted by the PAC. Subgroups may be established by the PAC to develop the specific policy deemed necessary and appropriate for the TECB or its ECDs. Subgroups may be augmented by SMEs determined to be helpful to the development of a specific policy.

For consistency, MCP recommends that a policy format is established and each written policy follow this presentation:

- Number
  - Policies are numbered sequentially
- Title
  - A policy title shall describe the main concept that policy covers or addresses
- Purpose
  - A purpose statement describes the identified need for the policy and what the policy addresses
- Policy
  - The policy statement/text is a more comprehensive description of the policy itself. The statement/text should define any terms, identify to whom or what the policy applies, describe the specific application of the policy, and provide any other information that should be known to the reader to fully comprehend the policy's requirements.
- Effective Date
  - An effective date when the policy shall become enforceable shall be noted

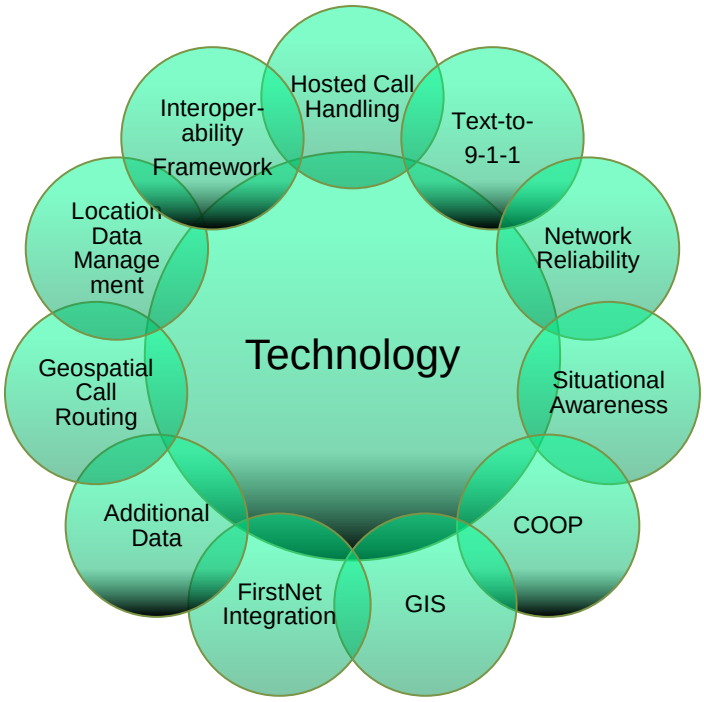
- Supersedes
    - If a policy supersedes or replaces an existing policy, that should be noted at the end of the policy. Include the policy number and title of the superseded policy.

ECD leadership, Board members or TECB staff may propose ideas for new policies to the Board by use of the Proposed Policy Form found in Appendix C. The proposer should complete the form and submit it to the TECB Executive Director or his/her designee. The TECB's Executive Director then would place the proposed policy idea on the next Board meeting agenda for consideration. If the Board determines the proposal has merit and advances the goals and mission of the TECB, the proposal would then be assigned to the PAC for their consideration and possible development. The PAC would have three options when determining the validity of a proposed policy. They could:

- Accept the proposal for development assignment
- Deny the proposal
- Refer the proposal back to the proposer for more information or further development of the issue

If the PAC determines the proposed policy idea does not support the TECB's mission and mandate, or if it does not align with the Board's core values and guiding principles, the PAC then would be responsible for formally communicating the rejection of the policy proposal to its proposer, with detailed reasoning for such action, as soon as practical. The proposer may request an opportunity to address the TECB at a future Board meeting to present their arguments to overturn the PAC's rejection of the policy proposal. The Board also may choose to hear alternative arguments from the PAC if it deems appropriate to do so.

4. TECHNOLOGY



Looking forward there are several strategic technological advances and improvements to existing systems that should be considered for implementation in the TECB's five-year plan. Priority must be given, first and foremost, to any incomplete initiatives within the current NG9-1-1 over NetTN program framework. The proposed strategic objectives may, in some cases, overlap the existing strategic work currently underway; however, there may be barriers to the integration of some features until all of Stages 2 and 3 of the current plan are executed.

The TECB should focus on the initiatives currently underway while overlaying the five-year plan. The Strategic Plan provides a significant platform roadmap, from which the TECB can continue in its upward trajectory in addressing key emerging technologies and shoring-up areas where operational elements can provide more value than currently observed. It is important to note that current NG9-1-1 services contracts will play an important role in executing the plan and amendments to the contracts should be viewed as an opportunity to secure long-term stability of the strategic objectives. In the following section, several key focus areas are outlined for translating the TECB's core values into technology assets to further its vision.

4.1. IMPROVE REDUNDANCY AND RELIABILITY IN NG9-1-1 NETWORK

A key tenet for improving the redundancy and reliability of the NG9-1-1 network is that all PSAPs must have redundant access to the core nodes, and the network is the foundation that must operate seamlessly. For this to be achieved, MCP recommends that the following key areas be addressed:

4.1.1. Network Uptime and Resiliency

As observed over the last five years, many PSAPs have experienced multiple events where a circuit bounces or there is a failure in the last-mile connectivity. To drive compliance with the Service Level Agreement (SLA) for service uptime, MCP recommends that the TECB commission a study of historical circuit uptime, on an individual circuit basis, and establish a plan to measure monthly circuit availability against existing SLAs. Once areas of concern are identified, issues may be prioritized and monitoring may be focused on areas of concern for future trending. This will enable the TECB to establish specific vendor directives based on empirical data to accomplish the desired circuit stability. Data-driven directives tied to SLAs will result in improvements to network provider facilities and contribute to achieving the goal of improved uptime and network resiliency.

4.1.2. Last Mile Facility Improvements

The NetTN network has a robust core network infrastructure; however, as the network physically extends from the facilities in Nashville, Knoxville, Memphis, and Chattanooga, the stability of the network degrades. Public-safety-grade networks require 99.999 percent availability to meet the needs of their customers. Currently, the network is experiencing less than public-safety-grade level of service due to limitations in last-mile connectivity to the State's PSAPs. This issue may be improved by enhancing last-mile provider facilities and improving last-mile diversity.

4.1.3. Path Diversity

At the conclusion of Stage 3, the legacy selective routing solution and Centralized Automated Message Accounting (CAMA) trunks will be decommissioned and no longer be available to the PSAPs as a diverse path for call routing when NetTN NG9-1-1 services are unavailable or over capacity. This imminent change to the network design increases the need for the ECDs and PSAPs to have assurances for resilient and uninterrupted call delivery. In many cases, physically diverse routes to the PSAP are not technically feasible and/or present significant additional cost for the construction of path-diverse facilities to establish last-mile diversity from separate end-office locations.

Several considerations for accomplishing diversity include:

- Non-terrestrial call paths through satellite network connectivity to the PSAP recently was pilot-tested on the NetTN network and proven successful during fair weather. While this appears to provide a viable option, the cost for satellite service may present a challenge. Commercial wireless service providers may provide alternate (and less expensive) solutions that should be evaluated.

- Redundant fiber is available in some geographic locations. The cost and willingness of the NetTN provider to utilize these assets should be explored.
- Long-Term Evolution (LTE) wireless network connectivity to brick-and-mortar PSAPs[2] or mobile PSAPs that have been equipped to process NG9-1-1 call traffic during continuity-of-operations events.

Given the cost to deliver diverse and redundant connectivity to all PSAPs with NetTN connectivity, MCP recommends that the TECB prioritize PSAPs that should be built out with path diversity. While this task is not simple, the existing diversity limitations, population and call volume of PSAPs are considerations that may be taken for determining not only which centers receive the diverse routes, but also in deciding where to deploy those assets first. One strategy for some ECDs to consider is to consolidate operations where multiple PSAPs exist within the same ECD, as well as merging operations across multiple ECDs. This likely will provide cost savings that could be used to pay for redundant and diverse network connectivity. Ultimately, path diversity may not be able to be implemented uniformly across all 100 ECDs. Significant planning and facilities mapping are required to determine the most cost-effective solution for network redundancy and diversity for each PSAP.

4.2. HOSTED CALL HANDLING

Offering a services-based, call-handling solution hosted in the network cores is one of the most significant opportunities to enhance PSAP operations in Tennessee. A services-based, hosted call-handling solution provides economies of scale, leveraging buying power to reduce cost. In addition to cost savings, the operational model becomes simplified for maintenance where common core components facilitate a more consistent maintenance model and ongoing support for PSAPs that leverage the offering. Procurement, implementation, education, and cost requirements need to be addressed upfront to streamline the rollout of such an offering.

As a centralized solution managed in the core, hosted call handling enables new features to be deployed efficiently, resulting in a model where the potential exists that every PSAP can support common features across the State. The challenge of the centralized solution is that careful consideration will need to be given to the integration of administrative lines and 10-digit emergency lines to maximize functionality and survivability while managing bandwidth and costs.

Finally, one additional benefit to offering a hosted call-handling solution is that it lays a foundation for enhanced interoperability across the state. PSAPs using the platform then could achieve true interoperability with the implementation of a hosted/shared computer-aided dispatch (CAD) system or through the implementation of a CAD-to-CAD solution. When combined with the future capabilities promised by FirstNet, the combination of technologies will enable significant advancement in resolving the long-standing operational limitations of alternate routing calls to neighboring jurisdictions.

[2] Johnston County, North Carolina successfully deployed LTE as a tertiary network path for their NG9-1-1 network in 2014

As with any significant change or addition to the TECB's NG9-1-1 service offering, MCP recommends creating a communication and education strategy to aid in adoption of the hosted call-handling solution. A comprehensive communication and education plan should focus on the capabilities that the solution will provide and highlight the forward-looking interoperability functions and cost efficiencies. Such a plan ultimately will play a significant role in improving the likelihood of widespread acceptance by the ECDs. The plan should include proactive outreach and include a comprehensive social media campaign, technical committees, Web-hosted presentations, and regional roadshows to explain the solution benefits and its role in the overall vision of NG9-1-1 in the State.

4.3. TEXT-TO-9-1-1

While hosted call-handling presents operational enhancement with long-term cost savings, the introduction of Text-to-9-1-1 service using Message Session Relay Protocol (MSRP) over the network is a significant benefit for the citizens of Tennessee, especially those from the deaf and hard-of-hearing community. Text-to-9-1-1 provides direct and equal access to all citizens and has become an expectation from the public. An effort is currently underway to perform a Text-to-9-1-1 pilot test with services integrated in NetTN. The TECB's immediate priority is to develop a thorough deployment plan and communicate its contents to the ECDs and public safety leaders across the state. Interoperability assessments, call-handling system technical requirements, training, and policies are key elements to such a plan. While Text-to-9-1-1 service is ultimately the responsibility of the ECDs, the TECB is in a position to provide leadership in developing a comprehensive implementation plan for the Board and ECDs to consider as this mission-critical technology is rolled out.

4.4. SITUATIONAL AWARENESS

Currently, the TECB's NG9-1-1 vendors are the only entities with visibility into system health and performance of the State's ESInet. The Comtech network operations center (NOC) has visibility, using direct monitoring systems of the PSAP's edge router, while AT&T monitors the network and PSAP hardware. The TECB and the ECDs are limited in their view of the system without direct real-time or near-real-time view of network status. Both vendors are in the process of providing dashboard solutions that meet many of the State's requested features; however, neither fully deliver what is desired from a single platform due to access constraints, limited contract deliverables, and their respective isolated areas of focus. Further, comprehensive awareness of PSAP up/down status is non-existent. Many of the TECB's desired features are available from a technology perspective; however, integration of the vendors' respective areas of support into a common monitoring tool may require compromise by one or both vendors at the request of the TECB. The alternative would be the implementation and use of two disparate tools—a less-than-optimal solution for the TECB and the ECDs.

4.4.1. ECaTS MIS/Dashboard

AT&T offers the Emergency Call Tracking System (ECaTS) as a management information systems (MIS) reporting solution. ECaTS provides a metrics dashboard that includes core network reporting and PSAP availability reporting. Core network reporting offers value in that it provides management with

visibility into system health and performance in areas such as call volumes and summaries of key performance indicators. In additional to call detail reporting, ECaTS provides Text-to-9-1-1 metrics, which will become increasingly important as the TECB integrates this service into the network. PSAP-level reporting will provide important intelligence metrics such as time to answer, call duration, and other performance-related indicators, which provide for enhanced training and operational improvement opportunities for the ECDs.

4.4.2. Comtech Executive Dashboard

The Comtech Executive Dashboard is designed to provide red/yellow/green light depiction of current PSAP status driven by incident management and available alarms within the NetTN environment. This solution will supplement the core network reporting available in ECaTS, by providing a visible indicator available to not only the TECB, but also the ECDs throughout the State. In addition to visible indicators, which aid in alerting ECDs of down and potential alternate-routing scenarios, the Comtech Executive Dashboard also serves to provide incident management visibility to stakeholders by displaying open tickets the Comtech NOC is actively monitoring.

The goal of monitoring integration is to provide a homogenous integrated view to the executive leadership at both the State and District level. Consideration will need to be made as to the level of detail that will be provided for the ECDs across the State. An evaluation will need to be conducted to determine how broad of a view will be provided to a region, with the possibility of providing the statewide view. There are pros and cons that will need to be assessed and a decision made on dashboard distribution. In conclusion, both situational views present value to the public safety leadership across the State; however, the recommended approach is to drive AT&T to provide linked access to ECaTS from the Comtech Portal, or the inverse, in order to provide a unified view of all available information for a simplified user experience.

4.5. CONTINUITY OF OPERATIONS PLANNING (COOP) ENHANCEMENTS

Continuity of Operations Planning (COOP) is a critical function for emergency operations. In the wake of natural and manmade disasters in recent years, the public safety community has learned many valuable lessons regarding the importance of having a comprehensive plan of action for continuity of operations and disaster recovery (DR). The environments in which we operate are constantly evolving; therefore, our plans to mitigate the impact of potential disasters and support the public before, during, and after an incident also must evolve as new information and threats present themselves.

The Federal Emergency Management Agency (FEMA) model for contingency and disaster planning outlines four phases of planning: Mitigation, Preparedness, Response, and Recovery. In addition to incorporation of FEMA best practices, the National Emergency Number Association (NENA) also provides robust guides for preparing COOP plans. The Tennessee public safety community is acutely aware of these needs within its day-to-day operations; however, the unique role the TECB plays in leadership presents an opportunity to expand and provide greater overarching support in times of need

at the local ECD level. As such, MCP recommends the TECB take several steps to enhance existing COOPs, locally and at the State level.

4.5.1. Audit

MCP recommends regularly scheduled reviews of local and State COOP plans, including analysis of each ECD's alternate-routing plans. The COOP plans should ensure that the appropriate intergovernmental agency agreements, such as memorandum of understanding (MOU) and mutual-aid agreements, are in place where needed and appropriately documented. MCP recommends that a copy of the plan and any supporting documentation (Alternate Routing, MOU, and Interagency Agreements) be stored electronically at the State for reference and audit. The centralized storage and audit capability will provide assurances that formal documentation is in place for supporting operations in emergency situations, so that the public safety professionals can focus on their mission and not be distracted by arduous paperwork.

4.5.2. Communications Tools

In conjunction with the COOP Audit recommendation, MCP recommends that COOP plans consider the inclusion of a NOC and associated communications tools. These systems will assist in providing seamless communications during the most critical times in which they are needed. Two statewide communications tools are currently available. The NOC has outlined plans for integration of the xMatters tool—a commercial off-the-shelf (COTS) business continuity tool with configurable parameters—to improve methods of communication including: mass emails, texts, and calls with pre-recorded messages. Similarly, the TECB has access to the ReadyOP tool. ReadyOP is a scalable Web-based tool designed to support effective communications within an organization or unified command structure. The tool allows for multiple methods of information dissemination and aids incident response through data and information sharing. Each tool adds value and flexibility to COOP strategies leveraged by the TECB; however, documentation is needed that clearly delineates the appropriate use of each tool. This will provide the public safety officials with well-defined roles and responsibilities for the use of each tool during COOP exercises, while enabling operational excellence during times of crisis.

4.5.3. NetTN Integration Plan for Mobile PSAPs

The existence of mobile PSAPs throughout the state is sporadic, with many operating on disparate technologies within the units, which is further complicated by their lack of access to NetTN. Notwithstanding these challenges, having these assets in the State presents a great opportunity. Currently, the TECB funds direct access for ECDs and their corresponding PSAPs to connect to NetTN. However, the ECDs' mobile PSAPs do not have an interface with NetTN in the event of an emergency or disaster that calls for evacuation, unless the vehicle is located directly adjacent to the host PSAP, a scenario that likely would be useless in a disaster situation. Therefore, two NetTN non-terrestrial connectivity options should be considered: LTE wireless and/or mobile satellite access. LTE service initially may be provided via commercial providers; however, the mid-to-long-term strategy should focus on integration with FirstNet's LTE network for security, reliability and general efficiency.

MCP recommends that the TECB perform an assessment of ECDs with mobile PSAPs that are furnished with i3-enabled call-handling equipment. This information will provide the TECB with data for assessing LTE coverage in and around those ECDs. For regions lacking mobile PSAPs, the TECB may choose to allocate funds for a general-use mobile PSAP(s) to support ECDs that have encountered, or have a high likelihood of encountering, natural and manmade disasters. Mobile PSAPs can leverage the benefits of hosted call handling in the core, providing feature-rich functionality in a flexible environment and at a reduced cost as compared with a traditional model. The satellite network/FirstNet access option provides the same benefits, but with the added flexibility of accessing NetTN virtually at any location in the continental United States. The power of satellite-connected mobile PSAPs is exponential when combined with CAD-to-CAD and FirstNet integration, as this combined versatility provides the opportunity to serve any ECD in the State.

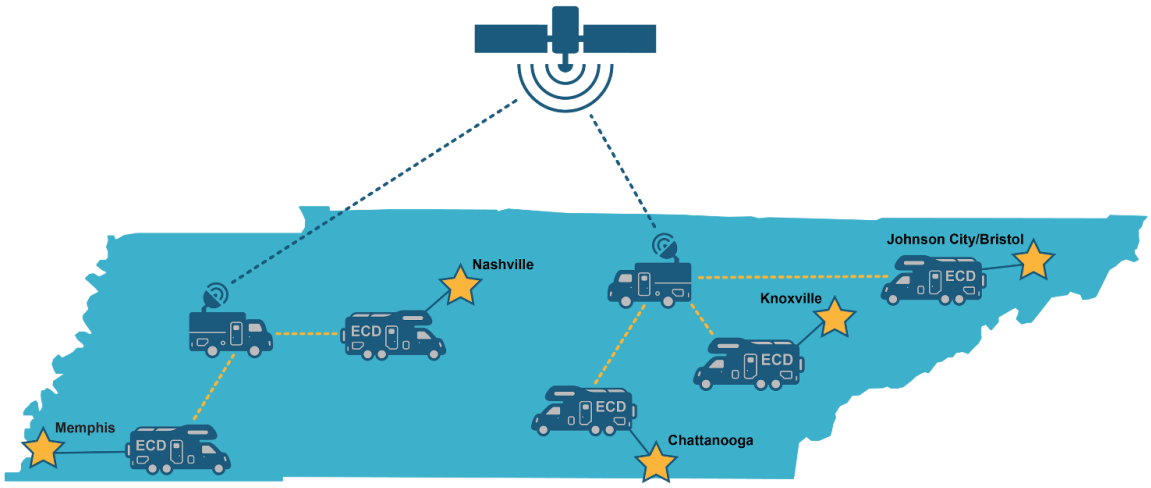


Figure 3: Internetworked Mobile PSAP Concept

4.6. GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Geographic Information System (GIS) data is one of the foundational elements for NENA i3 call-routing solutions and, as such, Tennessee continues to provide the model for other agencies in outlining consistent and cohesive GIS data management processes. To maintain its position of industry leadership, the integration of NENA's civic location data exchange format (CLDXF) standards to Spatial Interface (SI) functions is encouraged. Compliance with these standards will help facilitate interstate communications with neighboring NG9-1-1 solutions as they are deployed. Furthermore, this integration will aid in the implementation of additional NG9-1-1 services that rely on spatial data moving forward.

4.6.1. Ongoing Data Maintenance

With the support of the TECB, the ECDs have made significant strides in establishing operational processes for maintaining a high level of synchronization between their master street address guide (MSAG), automatic location identification (ALI) and GIS data sets. This task has been driven by the

migration to the State's new ALI platform; however, ongoing data maintenance will be required after the migration is complete as a matter of daily operations. Jurisdictions will assume a more significant primary role in resolving errors within the ALI and GIS data moving forward. MCP recommends that the TECB establish a statewide policy for maintaining GIS quality metrics, e.g., 98 percent match between road centerlines and ALI address points. The statewide policy should define the ECD and originating service provider's (OSP) requirements for resolving data errors within designated time requirements, to ensure successful data management operations.

4.7. FIRSTNET INTEGRATION

Since the initiation of the NG9-1-1 over NetTN program, FirstNet has moved from simply being a concept to a bona fide entity that now has made a vendor award.[3] With a similar mandate of interconnecting public safety communications using IP-based, broadband-enabled networks, the Nationwide Public Safety Broadband Network (NPSBN) will serve as the communications link between the PSAP and first responders, as well as the intercommunication path between first responders. Both initiatives are on a similar, parallel course of implementation; however, there is an opportunity to identify synergies of the two networks and how they may interface with each other—in some cases, where common assets may be utilized by both networks. By leveraging the existing NetTN infrastructure, integration of the State's FirstNet initiative with NG9-1-1 could provide potential efficiencies in shared fiber backbone, cybersecurity functions, and Additional Data Repositories (ADR), as a few examples. This level of integration would simplify the flow of information between the two networks, thus reducing the barrier to interconnection and implementation. This concept is not without challenges and potentially stretches the boundaries of the TECB mandate; however, the long-term benefits to public safety and the State could be immense. Therefore, it is recommended that the TECB leverage its recognized industry leadership in NG9-1-1 implementation and be actively engaged in the planning and execution of the State's FirstNet initiatives to advocate for the integration of the two networks.[4] The opportunity presented by an integrated NG9-1-1 and FirstNet network would provide Tennessee with a universal public safety communications platform providing end-to-end services from citizen to PSAP to the first responder.

4.8. ADDITIONAL DATA INTEGRATION

The NENA i3 standard provides for the introduction of supplemental data to 9-1-1 operations via an ADR. Additional Data provides supplemental information about the call, the caller, and/or the location of a caller. While supplemental data has been around for several years,[5] its deployment typically has been done through a Web browser served by an Internet connection. The State's ECDs will benefit from having a standards-based integration with ADR providers. Such a solution would provide for secure data retrieval with the ability to integrate Additional Data into the call-handling user interface. When

[3] http://about.att.com/story/firstnet_selects_att_to_build_network_supporting_first_responders.html
[4] In 2017, the TECB was the recipient of two industry awards in recognition of its leadership in NG9-1-1 implementation: the NG9-1-1 Institute's Outstanding 911 Call Center/Program Award and the Industry Council on Emergency Response Technologies' (iCERT) Leading the Way Award.
[5] Smart 911 has been deployed in Davidson County since 2013.

combined with the hosted call-handling initiative, the ECDs will be enabled with a ubiquitous, advanced NG9-1-1 experience.

Technology providers, such as RapidSOS with their NG911 Clearinghouse and Rave Mobile Safety with their Smart911 application, have solutions to deliver Additional Data through i3 interfaces. These technology providers also are breaking down barriers to entry by partnering with equipment manufacturers to provide integrated user interfaces for the ADR technologies with call-handling, CAD, mapping and other systems. Additional Data is housed in several sources and provided by a device/user agent, ADR/Identity Searchable(IS)-ADR, or location information server (LIS). Leveraging available assets for Additional Data promises to provide fundamental improvements in the quantity and types of data available to telecommunicators to improve efficiencies and effectiveness of emergency response.

4.9. GEOSPATIAL CALL ROUTING

Geospatial call routing represents a paradigm shift in how calls are routed across the State. The ECDs have accomplished a significant step in enabling this functionality with the aforementioned GIS data maintenance processes and their resulting GIS data integrity and quality; however, a key element to its availability lies within the NG9-1-1 services contract. MCP recommends that the TECB pursue the inclusion of standards-based, geospatial call routing in the next NetTN contract or via a contract amendment. Incorporation of geospatial call routing is another means to not only leverage the statewide GIS dataset, but also to improve call-routing accuracy.

4.9.1. Policy Routing Rules

NENA i3 standards provide for Policy Routing Rules which may be customized by the 911 Authority to affect changes to their call routing. Like Geospatial Call Routing, MCP recommends that Policy Routing Rules be included in the NetTN contract. Policy Routing Rules should be made available for view in a Web browser and be reviewed by ECDs and the TECB Technical Chair on a regular basis to ensure that all parties are aware of system provisioning and any potential conflicts with individual ECD operations are mitigated. Examples of potential conflicts which could arise after the rules are established include staffing variances, changes to mutual aid relationships, and PSAP leadership changes.

Additionally, MCP recommends that the TECB establish best practices for conducting regularly scheduled reviews of existing alternate routing plans, e.g., annual audits. These would include review of each PSAP's Overflow, Disaster, and Maintenance plans. It is recommended that these reviews occur after major provisioning changes are made, in addition to regularly scheduled audits.

4.10. LOCATION DATA MANAGEMENT SOLUTIONS

The TECB and the NG9-1-1 Over NetTN program teams have spent significant time and effort building a transitional ALI solution in the State. It is designed to leverage the significant capital investment in GIS data and provide more control to the ECDs over their location information. As the State prepares to migrate to this new platform, it is time to begin looking toward future enhancements to the database management solution.

4.10.1. Location Validation Function (LVF)

The new ALI model that currently is being implemented is a transitional solution that will serve the TECB and ECDs in the immediate future; however, the solution should have a longer-term roadmap to ensure that Tennessee remains a leader in emerging NG9-1-1 technologies. Implementing the Location Validation Function (LVF) is the logical means to achieve that goal. Historically, this option has been discussed and relegated due to the Next Generation Core Services (NGCS) provider's inability to support the solution and unwillingness to adjust business processes necessary to support the integration. The LVF will leverage the full power of the GIS data by substantially reducing the complication of "shoe horning" the data to fit a legacy derivative of an MSAG. The TECB and ECDs have a strong GIS program that has achieved many of the fundamental requirements to support the LVF. This functionality can be integrated with legacy OSPs through a Location Database (LDB), providing OSPs with a transitional interface. Meanwhile the ECDs will benefit from the migration to standards-based location validation of its GIS data.

4.10.2. Location Information Server (LIS)

The LVF will pave the way for OSPs and 9-1-1 service providers to implement LIS providing the State with a path towards an end-to-end NENA i3 solution. Both LIS and LVF can be integrated into the current multivendor solution model or a single-provider model due to the flexibility of the framework provided in the NENA standards.

4.11. INTEROPERABILITY FRAMEWORK

4.11.1. Intrastate Interoperability Framework

In alignment with the vision of seamless statewide public safety operations, the TECB has the opportunity to lead the State in identifying the interoperability opportunities that will be afforded as future technologies are deployed. The introduction of the hosted call-handling solution, FirstNet and the integration of mobile PSAPs together offer the potential to drastically improve the landscape of mutual-aid response throughout the state. Communication of this vision is encouraged at conferences, newsletters, Tennessee NENA (TENA) meetings, and other informal gatherings. Such communication should be viewed as an opportunity to reinforce interoperability at the local, regional, and state levels. Encouraging neighboring ECDs to implement common or interoperable technology will increase capabilities and produce positive outcomes resulting from existing, new and expanded mutual-aid

agreements. Coordinated system procurement and planning will improve regional situational awareness and lead to reduced costs related to ECD backup facilities.

4.11.2. Interstate Interoperability Framework

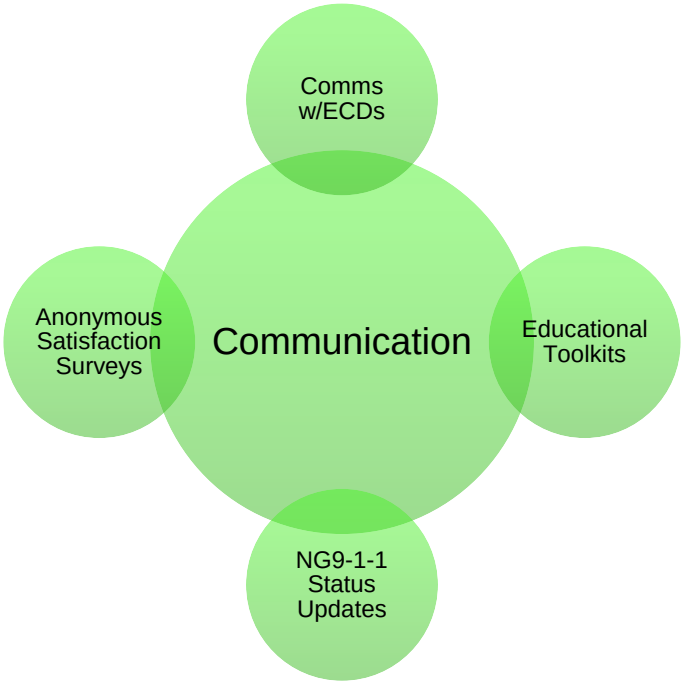
Since its inception, the foundational concept has been established that NG9-1-1 represents a network of networks; therefore, timing is appropriate for the TECB to begin planning for interstate interoperability. Geographically, at least three bordering states have begun the planning and/or implementation processes for ESInets (Kentucky, North Carolina, and Alabama), with others inevitably following suit. As surrounding states begin to tear down legacy infrastructure, there will be a need to establish connectivity with those new ESInets to enable transfer capabilities with bordering PSAPs. There are many considerations that should be evaluated leading up to enabling such capabilities. Even though integration is likely years away, now is the time to begin having discussions and establishing agreements that outline responsibilities and establish expectations for data sharing. The National 911 Program has taken the lead on establishing the baseline for these types of engagement by developing the Interstate Playbook.[6] MCP recommends that the TECB build upon the groundwork established by the Interstate Playbook to establish a plan that is customized to the needs of the State.

4.12. TECHNICAL STRATEGY SUMMARY

The TECB has built a solid NG9-1-1 foundation upon which new features and emerging technologies can be integrated. Through the implementation of this technical strategic plan, the TECB and ECDs within the State will begin to leverage the full power and benefit of NGCS deployed over the statewide ESInet. The continued overlay of new call-routing and location data technologies will improve access to data for telecommunicators and first responders, which will strengthen situational awareness and provide for more efficient operations. The TECB has a well-established tradition of being industry leaders in the adoption of NG9-1-1 technologies. With the implementation of the strategic actions outlined within this document, the TECB will maintain its position as the NG9-1-1 leader for the nation to follow.

[6] https://www.911.gov/docs/NG911-Interstate-Playbook-FINAL-111516.pdf

5. COMMUNICATION



5.1. COMMUNICATION WITH THE EMERGENCY COMMUNICATION DISTRICTS

MCP recommends that the TECB increase and improve communication with the ECDs. When the Board and TECB staff engage with and inform stakeholders about the initiatives and efforts underway at the State level, the likelihood for stakeholder support, initiative adoption, and success increases exponentially. Stakeholders who feel included in decision-making processes and understand the issues at play (pros and cons, operational impact, etc.) traditionally demonstrate an increased sense of ownership and stake in a successful outcome. MCP recommends that the Board and TECB staff increase and improve communication with the ECDs in the following ways:

- Simplify technical information when communicating so that it is easy to understand
- Increase one-on-one personal contact with PSAPs through site visits and face-to-face meetings, providing ECDs, the Board and the TECB staff with opportunities to meet each other and better understand operations and relevant issues
- Continue to distribute an informative newsletter that includes topics of interest and increases the collective 9-1-1 knowledge within the ECDs
- Conduct an anonymous satisfaction survey every other year to gauge the level of approval and satisfaction with TECB leadership, initiatives, and staff support
- At least two weeks prior to TECB Board meetings, send a detailed agenda to the ECDs in advance, along with a short fact sheet that concisely summarizes and explains the key points of any complicated, legal, or impactful agenda items. This fact sheet will enable the ECDs to decipher the importance of agenda items so that they can determine the necessity of travel for attending a Board meeting in person.

- Provide a live stream of the TECB Board meetings to ensure that the most geographically dispersed stakeholders are still able to listen and observe the meetings in a timely manner, without incurring the expenses and time commitment of travel

The challenge will be making the time for increased outreach while operating with the current level of staff resources. The TECB will need to ensure that staffing levels are adequate for accommodating an increased workload.

5.2. EDUCATIONAL TOOLKITS

It is not uncommon for the public and elected decision-makers to demonstrate a lack of understanding about the day-to-day activities and operations within a PSAP. The public rarely encounters 9-1-1 services until the number is dialed and critical emergency services are needed. The public assumes that 9-1-1 is a dependable service, fully capable of deploying assistance during the worst moments. These can be dangerous assumptions. When elected officials don't understand the staffing, training, funding, and technology struggles within a PSAP, critical maintenance and operational improvements can be labeled as frivolous, jeopardizing critical funding.

While the TECB must exhibit neutrality as a State-level agency, it can also empower and support local leaders within the ECDs by providing tools that help them to effectively inform and educate their local officials about the mission-critical services their PSAP provides. MCP recommends that the TECB develop an educational "toolkit" to be posted to the TECB website. Such a toolkit could include resources like white papers, short videos, or infographics, which locals could customize themselves to address their individual needs. These outreach/communications pieces would enable the ECDs to tailor the documentation to educate local officials about the importance of stable funding for 9-1-1 services, while providing a consistent theme across the state.

5.3. REGULAR NG9-1-1 TRANSITION STATUS UPDATES

MCP recommends that the TECB provide regular stakeholder updates on the progress of the NG9-1-1 transition. These updates should include a timeline, milestones, and responsibilities for all concerned (State, ECDs, vendors, etc.). These communications are important for a successful and smooth statewide transition to NG9-1-1. While Grand Division stakeholder meetings revealed overwhelming support for the transition to NG9-1-1, each Division raised its need to better understand how the transition would unfold, what they would be expected to do, and associated deadlines. This Strategic Plan, which includes a detailed section on technology and the NG9-1-1 transition, is the critical first step in establishing that desired timeline and accompanying milestones. Establishing expectations, roles and responsibilities for each group of stakeholders will aid in smoothing the transition.

5.4. ANONYMOUS SATISFACTION SURVEY

Anonymous satisfaction surveys offer a variety of benefits:

- Indicate to stakeholders that their opinions are important and valuable to leadership
- Help uncover issues that may not be apparent
- Clarify stakeholder priorities for leadership
- Provides stakeholders with a chance to be honest without the fear of retribution and provides leaders with honest, truthful feedback about stakeholder opinions and feelings

While it can be a time-consuming effort, MCP recommends conducting a satisfaction survey every other year. This practice establishes the TECB as a two-way communicator with its stakeholders and provides the Board with an opportunity to measure progress and performance against the baseline data collected through the 2016 survey.

6. TRAINING

At each strategic planning stakeholder touchpoint, the ECDs, TECB staff members, and the Board all praised the latest training opportunities presented by the Board. Simultaneously, they expressed the need for more in-depth and varied training for 9-1-1 professionals serving in all positions within the PSAP—from the telecommunicators to management. Stakeholders also expressed the same desire for increased training for ECD leaders, the Board and the TECB staff. Because a comprehensive training program is crucial for long-term success, especially in a period of transition to NG9-1-1, MCP

recommends that the Board provide additional opportunities for training and professional growth and development.

6.1. TRAINING STANDARDS

MCP recommends that the State develops minimum training requirements for 9-1-1 telecommunicators and seek to establish a professional 9-1-1 telecommunicator certification standard statewide.

Across the country, many states are working to establish minimum training requirements for 9-1-1 telecommunicators. This is part of a larger movement designed to improve quality of service to citizens while professionalizing the industry. These standards protect PSAPs, establish baseline qualifications for telecommunicators, and help to further formalize and recognize their role in the State.

In May 2016, the Board established the Training Advisory Committee (TAC) to review State-level 9-1-1 training and explore how to establish a common level of response in telecommunicator service across Tennessee. These actions align closely with the needs expressed by stakeholders in both the satisfaction survey and the outreach meetings held in October 2016. The Board is well-positioned to meet the needs of the stakeholders and create a more robust and standardized approach to 9-1-1 call-handling.

In 2016, the National 911 Program facilitated development of *Recommended Minimum Training Guidelines for the Telecommunicator,*[7] which offers baseline recommendations for establishing minimum training requirements in each state.

Later that year, the *Tennessee Minimum Training Standards Comparison* was completed to identify the gaps between the recommended minimum training guidelines and the training already in place in the State. Training topics that could be beneficial can be found in Table 2 below:

Table 1: Suggested Training Topics

Category	Possible Training Topics
Roles and Responsibilities	• Introduction, Mission, Terminology • Ethics, Professionalism, Values, Personal Conduct, Image
Legal Concepts	• Liability, Confidentiality, Negligence, Duty Documentation, Freedom of Information Act (FOIA), Recording, and Records Retention • Privacy Laws
Interpersonal Communications	• Information Processing, Communication Cycle • Problem Solving, Critical Thinking

[7] https://www.911.gov/pdf/Recommended_Minimum_Training_Guidelines_for_the_9-1-1_Telecommunicator_FINAL_May_19_2016.pdf

Category	Possible Training Topics
Emergency Communications Technology	• Telephony Technologies (e.g., PBX/MLTS/VoIP) • NG9-1-1 • Text to 9-1-1 • Telematics • Computerized Mapping/GIS • Mobile Data Systems, Automatic Vehicle Location (AVL); Paging and Alarms • Call Transfers, Alternate and Default Routing • Mass Notification • Security Breaches and Cybersecurity Threats
Call Processing	• Managing Specialty Calls • Aircraft/Rail Incidents/Marine • Missing/Exploited/Trafficked Persons • Fire Service Overview • Fire Service Dispatching • EMS Overview • EMS Call Dispatching • Structured Call-Taking Protocols and Standards Overview • Law Enforcement Overview • Law Enforcement Dispatching • Responder-Initiated Calls • Special-Needs Callers
Emergency Management	• Introduction to Incident Command System (ICS) • Emergency Management Roles and Responsibilities • Mutual-Aid/Telecommunicator Emergency Response Taskforce (TERT)
Radio Communications	• Radio Technology and Equipment
Stress Management	• Definition, Causation and Identification
Quality Assurance	• Quality Assurance (QA)/Quality Control (QC)/ Quality Improvement (QI) • Daily Observation Reports (DOR)/Skills Performance Testing/Performance Standards • Identify Trends from QA to Address in Continuing Education/In-Service for QI
On-the-Job Training	• Interagency Networks and Databases • National Law Enforcement Telecommunications System (NLETS) • Media/Information Dissemination • Geography/GIS • Documentation, FOIA Requirements, Recording, and Records Retention • Call-Tracing and Records-Retrieval Procedures • Records Management Systems (RMS) • Roles of Federal Government Resources

MCP recommends that the Board continues to review the gap analysis completed in the *Tennessee Minimum Training Standards Comparison* and presented to the TAC in 2016 to close the gaps and institute minimum training requirements.

6.2. PROFESSIONAL DEVELOPMENT

In addition to establishing minimum training requirements, MCP recommends that the TECB help ECDs create a tool that identifies pathways to career advancement. Identifying professional milestones and pathways to advancement helps telecommunicators know the requirements and steps to take to be eligible for management and executive leadership roles in their districts and within the State. Per survey results, the Board should consider creating management training and finance/budgeting courses to help ECDs run more smoothly.

6.3. TRAINING TOPICS

Per requests from stakeholders statewide, MCP recommends that, at a minimum, the Board provide training in the following areas: dispatch, management, and instruction on finance and budgeting. In addition to these requests, other national topics that may be useful for telecommunicators in Tennessee include: NG9-1-1, GIS, and cybersecurity.

6.4. BARRIERS TO SUCCESS

There are barriers to the successful implementation of a training plan. These may include: the cost of training, ability to backfill centers when staff attend training, travel expenses, challenge of making time to complete training, willingness to change, and disengaged learners. MCP recommends the following tactics to minimize these risks:

- Online Courses
    - Provide the opportunity for both real-time and on-demand training without the time and costs of travel, as well as the challenge of coordinating schedules
- Course Curriculum
    - Ensure courses align with the needs of the targeted audience and are relevant to the current industry environment. Identifying topics and offering courses based on student feedback is imperative.
- Student Engagement
    - Engage students using modes of instruction that work for visual, auditory or kinesthetic learners

MCP recommends that the TAC identify additional barriers to success for the training program, and develop recommendations for mitigating the risks.

7. FUNDING STABILITY

The strategic objectives outlined in this plan will provide increased value to the State; however, implementation requires a level of financial investment. As the Board considers implementation of these initiatives, MCP recommends that the Board conduct a cost study to estimate the financial impact of the Strategic Plan's recommended initiatives. The cost study would reveal the need for the ECDs to have a stable funding model that is supported by state legislation, and provide the ECDs with data that can be used to urge their elected officials to consider 9-1-1 fee adjustments to fund the comprehensive implementation of the Strategic Plan initiatives.

8. TIMELINE AND MILESTONES

Appendix A contains a summary of the 38 recommendations pertaining to Planning and Policy, Technology, Communication, Training, and Funding found throughout this document. Each recommendation has a suggested year of implementation. MCP recommends that the Board create milestones at the time that a particular recommendation is being planned for implementation. This will enable the TECB to establish milestones that are realistic and achievable based on the current workload and operating environment.

9. STRATEGIC PLAN MAINTENANCE

All successful organizations must adapt to change. Recognizing a changing 9-1-1 landscape, MCP recommends that on an annual basis the TECB staff review the Strategic Plan for the following reasons:

1. To ensure its relevance to the current operating environment
2. To ensure proper alignment with the Board's mission and values
3. To ensure that short- and long-term priorities are being met
4. To ensure initiative timelines still apply
5. To determine whether performance measurements need to be changed

10. CONCLUSION

The Strategic Plan contains recommendations that advance the TECB's mission to improve access to the lifesaving power of 9-1-1. The five core areas of the plan interconnect and success will be found when all five areas are properly addressed.

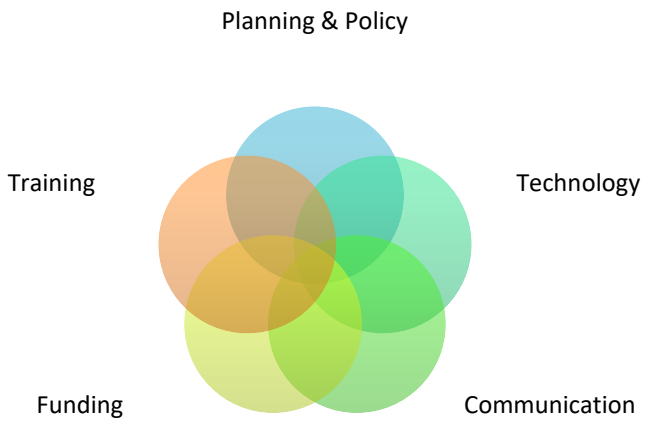


Figure 4: Five Core Strategic Areas of Focus

The Strategic Plan establishes formal practices that enable collaboration with ECDs, further developing the growing partnership. Many initiatives are to occur annually, while others will require multiple years to complete; however, the value that they will bring to the ECDs and the citizens they serve has great promise. Seamless statewide interoperability is a lofty, yet realistic goal that would transform emergency response in the state. The first step toward this goal was made more than five years ago when the TECB launched the NG9-1-1 over NetTN project. The strategic technology initiatives build upon that foundation and provide direction to the end goal. The complexities and costs of implementing these initiatives cannot be overlooked; however, thorough planning and disciplined execution will provide the TECB with the means to address these challenges through each step in its journey.

APPENDIX A: SUMMARY TABLE OF RECOMMENDATIONS

#	Recommendation	Year of Implementation
PLANNING AND POLICY		
1	The TECB Strategic Plan should be reviewed on an annual basis to ensure relevancy with current issues and that the framework can be utilized for annual project planning and budgeting	All
2	The Board should be provided periodic updates using the Strategic Map Report or a similar set of documentation, that provides concise status on the TECB's initiatives	All
3	Changes to the governance processes deemed necessary be proposed to the Board for consideration by the executive leadership of the TECB	All
4	Milestones should be developed at the time that a recommendation is being planned for implementation	All
5	The TECB should adopt a formal policy review and development process	2017
6	A policy format should be established and each written policy should contain a unique number, title, purpose, policy, effective date, and a description if the policy supersedes or replaces an existing policy	2017
TECHNOLOGY		
7	Collaborate with the State's FirstNet team for network convergence	All
8	The TECB should establish best practices for conducting regularly scheduled reviews of existing alternate-routing plans, e.g., annual audits. These would include review of each PSAP's overflow, disaster, and maintenance plans. It is recommended that these reviews occur after major provisioning changes are made, in addition to regularly scheduled audits.	All
9	The TECB should commission a study of historical circuit uptime, on an individual circuit basis, and establish a plan to measure monthly circuit availability against existing SLAs	2017
10	The TECB should establish a statewide policy for maintaining GIS quality metrics, e.g., 98 percent match between road centerlines and ALI address points. The statewide policy should define the ECD and OSP requirements for resolving data errors within designated time requirements, to ensure successful data management operations.	2017
11	The TECB should create a communication and education strategy to aid adoption of the hosted call-handling solution	2017
12	The TECB should drive AT&T to provide linked access to ECaTS from the Comtech portal, or the inverse, providing a unified view to all available information for a simplified user experience	2017
13	The TECB should perform regularly scheduled reviews of local and state COOPs, including analysis of each ECD's alternate-routing plans	2018
14	A copy of each ECD's COOP and any supporting documentation (Alternate Routing, MOU, and Interagency Agreements) should be stored electronically at the State for reference and audit	2018

#	Recommendation	Year of Implementation
15	COOPs should consider including a NOC and associated communications tools	2018
16	The TECB should perform an assessment of ECDs with mobile PSAPs that are furnished with i3-enabled call-handling equipment	2018
17	The TECB should integrate the NG9-1-1 over NetTN solution with Additional Data solution providers	2018
18	The TECB should prioritize PSAPs that should be built-out with path diversity	2018
19	The TECB should be actively engaged in the planning and execution of the State's FirstNet initiatives to advocate for the integration of the two networks	2018
20	The TECB should pursue the inclusion of standards-based, geospatial call routing in the next NetTN contract, or via a contract amendment	2019
21	Policy routing rules should be included in the NetTN contract	2019
22	The TECB should deploy new location data services such as LVF and LIS	2020
23	The TECB should establish an interstate interoperability plan that is customized to the needs of the State of Tennessee	2021
COMMUNICATION		
24	The TECB should increase and improve communication with the ECDs	All
25	The TECB should simplify technical information when communicating so that it is easy to understand	All
26	The TECB should increase one-on-one personal contact with PSAPs through site visits and face-to-face meetings, providing ECDs, the Board, and the TECB staff with opportunities to meet each other and better understand operations and relevant issues	All
27	The TECB should continue to distribute an informative newsletter that includes topics of interest and increases the collective 911 knowledge within the ECDs	All
28	At least two weeks prior to TECB Board meetings, a detailed agenda should be sent to the ECDs in advance, along with a short fact sheet that concisely summarizes and explains the key points of any complicated, legal, or impactful agenda items. This fact sheet will enable the ECDs to decipher the importance of agenda items so that they can determine the necessity of travel for attending a Board meeting in person.	All
29	The TECB should provide a live stream of Board meetings to ensure that the most geographically dispersed stakeholders are still able to listen and observe the meetings in a timely manner, without incurring the expenses and time commitment of travel	All
30	The TECB should provide regular stakeholder updates on the progress of the NG9-1-1 transition. These updates should include a timeline, milestones, and responsibilities for all concerned (State, ECDs, vendors, etc.)	All

#	Recommendation	Year of Implementation
31	The TECB should conduct an anonymous satisfaction survey every other year to gauge the level of approval and satisfaction with TECB leadership, initiatives, and staff support	Even Years
32	The TECB should develop an educational "toolkit" to be posted to the TECB website. Such a toolkit could include resources like white papers, short videos, or infographics, which locals could customize themselves to address their individual needs	2017
TRAINING		
33	The TECB should develop online courses to provide the opportunity for both real-time and on-demand training without the time and costs of travel, as well as the challenge of coordinating schedules	All
34	The TECB should ensure that course curriculum aligns with the needs of the targeted audience, and that courses are relevant to the current industry environment. Identifying topics and offering courses based on student feedback is imperative.	All
35	The TECB should offer a variety of course delivery models to enable student engagement, whether they are visual, auditory or kinesthetic learners	All
36	The TAC should be responsible for identifying barriers to success for the training program, as well as developing recommendations for mitigating the risks	All
37	The TECB should establish a professional development and career pathway	2019
FUNDING		
38	The TECB should authorize a cost study to estimate the financial impact of the Strategic Plan's tasks and milestones	2017

APPENDIX B: STRATEGIC MAP

A) Program	B) Strategy	C) Priority	D) Guiding Principle Alignment	E) Assignment	F) Budget Approved	G.) % Budget Expended	H.) Timeline	I.) % Strategy Complete	J.) Project Status
Program #1	Description of the program strategy(s) from section X of the Strategic Plan	This is the level of priority assigned to the functional strategy from the Strategic Plan; in most cases this priority does not change during the course of the Strategic Plan.	This identifies the Guiding Principle which this strategy addresses and supports. It can be expressed by either referring to the GP # such as 2.3.1, 2.3.2, or 2.3.3 or by spelling out the Guiding Principle. This method reinforces how the program supports the Guiding Principles.	Staff member who has primary responsibility for accomplishing or making sure that others accomplish the objective	Funds associated with this strategy Figure must match the annual budget amount	Monthly update to the amount of the budget expended for this strategy	Using terms from the Strategic Plan (Current State, 2-3 years, or 4-5 years) a strategy is given a timeline	With each updated report this % will change as more and more of the project is completed and the strategy is closer to accomplishment	3/15/17-brief narrative on the current status of the project. This text would be added to each month as a report to the Board on progress toward the goal and as an update on the current activities to achieve the objective. 4/15/17-brief narrative is updated monthly on the current status of the project as a report to the Board. Staff members are responsible for getting

A) Program	B) Strategy	C) Priority	D) Guiding Principle Alignment	E) Assignment	F) Budget Approved	G.) % Budget Expended	H.) Timeline	I.) % Strategy Complete	J.) Project Status
									updated information to the Director for preparation of the report to the Board. 5/15/17- Ongoing narrative report updates until the end/accomplishment of the project objective
Program #2									
Program #3									
Program #4									
Program #5									

How to Use the Strategic Map

The TECB Strategic Map is the method used to track and monitor progress of the adopted program strategies intended to achieve the mission through that program. The Strategic Map also illustrates the program alignment with the guiding principles, associated budget information, anticipated timeline for completion, and the current status of project completion. This status is to be updated monthly on a scheduled developed by the TECB Executive Director to provide updated information to the Board on achievement of the organization's goals.

- Column "B" STRATEGY
  - Once the program strategies have been adopted in the Strategic Plan, those can be transferred to Column B for each of the functional areas. There will be as many lines under each core function as there are strategies outlined in the Strategic Plan.

- Column "C" PRIORITY
  - This is the level of priority assigned to the functional strategy from the Strategic Plan

- Column "D" GUIDING PRINCIPLE ALIGNMENT
  - This identifies the guiding principle that this strategy addresses and supports. It can be expressed by either referring to the guiding principle # such as 2.3.1, 2.3.2, or 2.3.3, or by spelling out the guiding principle. This method reinforces how the program supports the Guiding Principles.

- Column "E" ASSIGNMENT
  - This column will identify the staff member(s) having primary responsibility for accomplishing, or making sure that others accomplish, the objective/task

- Column "F" BUDGET APPROVED
  - Budgeted funds associated with this strategy should be recorded here. This amount should be correlated with the related line item in the TECB annual budget.

- Column "G" % BUDGET EXPENDED
  - This entry will be updated monthly as project funds are expended, so that the administrative leadership and the Board can relate the project completion status with the budget expended on the project

- Column "H" TIMELINE
  - This column can be completed by using timeline terms from the Strategic Plan—such as current state, 2-3 years, and 4-5 years—for each strategy

- Column “I” % STRATEGY COMPLETE
    - Each month this portion of the Strategic Map should be updated as a report on the percent (%) the project is completed. The timeline may change each month as more and more progress is achieved toward strategy accomplishment.

- Column “J” % PROJECT STATUS
    - A brief narrative on the current status of the project is anticipated in this column. Updated text would be added to each month as a report to the Board on progress toward the goal, and as an update on the current activities to achieve the objective.

APPENDIX C: PROPOSED POLICY FORM

PROPOSER:	
DATE OF SUBMISSION:	
POLICY TITLE:	
POLICY DESCRIPTION:	
HOW THE PROPOSED POLICY ALIGNS WITH TECB GOALS, GUIDING PRINCIPLES, OBJECTIVES, OR PROJECT:	
DATE REVIEWED BY EXECUTIVE DIRECTOR:	
DATE PRESENTED TO THE BOARD:	
DATE REFERRED TO PAC:	
RESOLUTION OF THE PAC:	