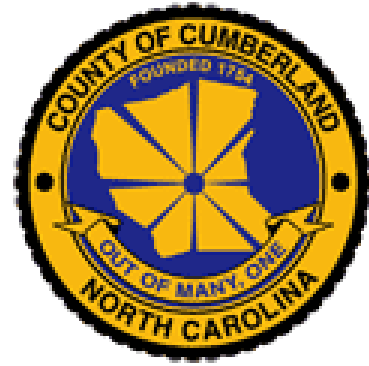




Co-location Needs Assessment and Feasibility Study

FINAL REPORT

SUBMITTED FEBRUARY 2016 TO:
CITY OF FAYETTEVILLE AND CUMBERLAND COUNTY, NORTH CAROLINA



MissionCriticalPartners

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EXECUTIVE SUMMARY

Mission Critical Partners, Inc. is pleased to present the results of the Co-location Needs Assessment and Feasibility Study to the City of Fayetteville (Fayetteville or City) and Cumberland County (County). The primary goals of the co-location feasibility study were to determine operational and financial feasibility and provide space programming and assessments of potential sites¹ for a new co-located facility. Subsequent recommendations can be found throughout this report.

The county is served by three public safety answering points (PSAPs or 9-1-1 centers) operated independently by Fayetteville, Cumberland County, and Fort Bragg². Fayetteville Communications (9-1-1) and Cumberland County Emergency Communications Center (9-1-1) are both professional operations that take great pride in their respective centers. Both are challenged with space needs in their unique way and there is little to no additional expansion capabilities in the current environments.

Both 9-1-1 centers are primary PSAPs, providing, together, call handling and dispatch services for four law enforcement agencies, one career and eighteen contracted fire departments, emergency medical services (EMS), and animal control after-hours and on weekends.

Fayetteville 9-1-1 has an authorized strength of 65 employees, while Cumberland County 9-1-1 has an authorized strength of 42 employees. Both 9-1-1 centers have experienced telecommunicator vacancies in the past, and Fayetteville 9-1-1's 24 percent vacancy rate in the fall of 2015 was critical. However, at this time, the authorized telecommunicator strength of each 9-1-1 center is appropriate for their respective call and incident volumes. The supervisory spans of control are higher than best practice, yet telecommunicators in each 9-1-1 center work in a single location, and within two primary focus areas: call take and dispatch. Both centers also have experienced staff that are able to provide direction to newer telecommunicators when the need arises.

Fayetteville 9-1-1 has 15 console workstations, five of which support call taking only and ten of which support both call taking and dispatch functionality; there is a sixteenth position in the emergency operations center (EOC). Cumberland County 9-1-1 has ten console workstations, all of which support both call taking and dispatch functionality.

The existing technology systems in use at Fayetteville 9-1-1 and Cumberland County 9-1-1 are good products that provide a viable base for their migration, or similar product, into a new co-located facility. The City and County have already made a significant achievement in the shared services arena with the computer aided dispatch (CAD) system. As the City and County are not ready for full consolidation, Mission Critical Partners believes the next logical steps in the evolution of 9-1-1 operations in the

¹ SCHRADERGROUP architecture's report, which includes the programming study, threat assessments, building layouts and elevation alternatives, is provided under separate cover.

² Fort Bragg requested not to be a part of this initiative. As such, references to the 9-1-1 centers refers only to Fayetteville and Cumberland County. Any reference to Fort Bragg will be direct.



county are to expand the shared services model and transition operations to a newly constructed co-located 9 1-1 center.

Mission Critical Partners recommends that the City and County pursue the construction and implementation of a co-located Fayetteville–Cumberland County 9-1-1 Emergency Communications Center. There are advantages, disadvantages, and risks to a co-location initiative.

Advantages	Disadvantages	Risks
• Improved efficiencies in operations • Streamlined information flow • Improved situational awareness of activities • Improved efficiencies of shared systems, • Improved disaster response and recovery • Recovery of much needed space in City Hall and the Sheriff's Office facilities • Possible reduction in maintenance costs for use of shared systems versus maintaining individual systems • Ability to face the technology and operational challenges of NG9-1-1 • Possible precursor to full consolidation in the future	• Perceived loss of control of operations and functions • Increased operational costs for a new facility • Disparities in organizational policies, such as human resources • Supporting administrative entity for the facility may be perceived as jurisdiction with control • Not one true decision-making authority	• Inability to agree on site location and building design parameters and function • Inability to agree on a cost-sharing model • Inability to fully address disparities • Breakdown in open and honest communications between City and County administrative personnel • Inability to secure funding for construction • Loss of key staff through the transition

Many of the identified risks can likely be mitigated through the development of a strong governance committee and project team that can develop a working relationship built on mutual respect, trust, honesty, and integrity—all of which are necessary to see the co-location initiative to fruition and realize a seamless system of information flow.

There are essentially three types of boards or committees that could be established to represent Fayetteville and Cumberland County and the respective agencies: an executive board/committee, an advisory board/committee, or a steering committee. A hierarchal relationship may also be established between two or among all three.



Mission Critical Partners recommends the formal development of an Executive Steering Committee, with membership reflecting the partnership between the City and County, with representation from both organizations' executive-level staff, legal, finance, procurement, and facilities, as well as representation from the public safety community.

In a co-located environment, Fayetteville 9-1-1 and Cumberland County 9-1-1 must provide equitable, efficient, and effective service to all law enforcement, fire, and EMS user agencies based on the dispatch plans for each agency. To do this, the 9-1-1 centers must be cushioned from the impact of political changes to the greatest extent possible. To this end, and as the co-located environment nears reality, Mission Critical Partners recommends the establishment of a 9-1-1 Advisory Committee with oversight and decision-making authority for the shared services and facility, and input for operational parameters. Mission Critical Partners recommends the 9-1-1 Advisory Committee be a sub-committee of the Steering Committee.

In a co-located environment, the operating cost of delivering 9-1-1 services will remain with the respective organization. That is, both Fayetteville 9-1-1 and Cumberland County 9-1-1 will maintain independent operating budgets. There is not anticipated to be any reduction in the operating budgets for either 9-1-1 center by co-locating operations.

Finding the proper cost sharing model that meets both governments' organizational needs is critical to the success of co-location. Several models are feasible for cost sharing of a new facility and subsequent future operating costs:

- Population-based
- Per 9-1-1 call received
- Square footage split
- Straight split

Each model could work for a new co-located facility, but because of the complexities, detailed discussions should be held between key stakeholders to determine the best model for Fayetteville and Cumberland County.

With clear understanding and communications of the financial obligations of each governmental organization before construction begins, a co-located 9-1-1 center can be successful in providing critical services while improving operations.

The City and County should be commended for taking the steps to commission this study and having the foresight to recognize that improvements can be made for the delivery of emergency services to their constituents. Mission Critical Partners stands ready to assist Fayetteville and Cumberland County in making their vision a reality.



1. BACKGROUND

The city of Fayetteville is the county seat of Cumberland County, which is located in southeast North Carolina. The city encompasses approximately 91 square miles of the county's 658 square miles. According to U.S. Census Bureau estimates for 2014, Cumberland County's population was approximately 326,328; of this population, 203,948 are estimated to reside within the city limits of Fayetteville.³ The Fort Bragg Military Reservation is partially located within Fayetteville and Cumberland County.

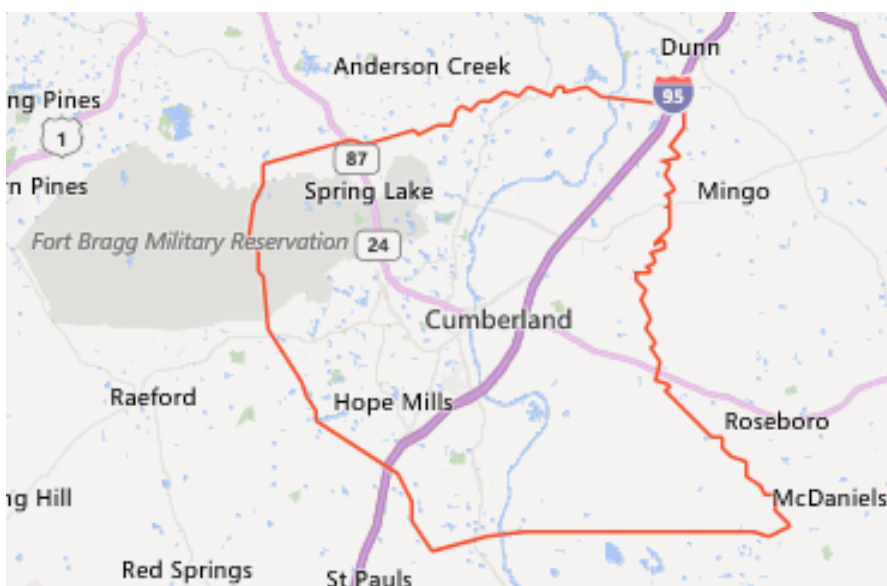


Figure 1: Map of Cumberland County

The county is served by three PSAPs operated independently by Fayetteville, Cumberland County, and Fort Bragg.

Mission Critical Partners conducted site interviews with key PSAP personnel from both the City and County, finding staff of both organizations to be professional and with a strong desire to improve operational efficiencies of 9-1-1 within the county as a whole for citizens and first responders.



Figure 2: Map of Fayetteville

³ <http://www.census.gov/quickfacts/table/PST045215/3722920,37051,37,00>



Mission Critical Partners was tasked with making a recommendation regarding the co-location of Fayetteville's and Cumberland County's 9-1-1 operations. While considering the co-locations, it is important to understand the various differences between consolidation, co-location, and shared services. *9-1-1 Magazine* published an article in June 2011 that provides good information on types of PSAP consolidation.

Full consolidation: All existing dispatch services are moved to a single dispatch center with a single management structure. A consolidated center requires diverse centers to be brought together under one management team with common operating platforms. While full consolidation often has the largest start up costs (initial investment) it typically provides the greatest long-term cost savings.

A consolidated center offers many advantages:

- *employs common electrical, HVAC, and emergency power subsystems*
- *employees may be cross-trained*
- *employee schedules may be combined for added personnel efficiency*
- *flexible arrangements may amplify the commonalties in fire and medical dispatch.*
- *better interagency information sharing*
- *elimination of duplicate services*
- *opportunities to pool financial resources to fund system upgrades*
- *increased ability to communicate between agencies*
- *more efficient dispatch collaboration for fire and EMS*
- *potentially, a more cost effective overall solution*

Several technical issues that must be addressed with a full consolidation: 911 equipment, administrative telephones, Computer Aided Dispatch (CAD), Records Management System (RMS), and recording equipment. The 911 equipment must be sized for the consolidated dispatch operation. The telephone workstations themselves must also accommodate the larger number of 911 and non-911 lines.

A single CAD ... operating platform for the consolidated 911 operation is a necessity. Any new CAD must feed multiple records management systems. This single CAD must be able to upload into the various records management systems and be sophisticated enough to handle the call volume and dispatch functions. A consolidated center requires a single recording system capable of handling the consolidated load. These factors necessarily limit the number of CAD vendors, RMS vendors, and equipment vendors available because smaller vendors are not able to handle the increased capacity [sic]

Co-located consolidation: In this scenario, multiple dispatch centers are moved to the same physical location, but maintain separate operations. Often, this type of consolidation will bring together all of the agencies into one center located in the same



building. The different operations share some of the infrastructure costs, but they remain separate in their dispatch responsibilities. This type of configuration is often driven by diverse dispatch needs in the individual communities.

In a scenario where 911 centers are co-located with separate operations, there is the potential (though not the requirement) to share some common equipment, such as the CAD system, RMS and radio equipment and maintain multiple 911 switches. The CAD and recorder systems in this scenario may also remain separate. The most challenging issues, however, usually involve personnel: parallel staffing for each agency, with multiple, separate schedules, pay scales, leave policies, and supervisors may prove inefficient.

Shared services: *The major services are shared among multiple agencies. Typically, this includes the CAD, 911 Customer Premise Equipment (CPE) Automatic Number Identification / Automatic Location Identification (ANI/ALI), logging recording, Geographic Information System (GIS) mapping, and possibly the RMS system. In some cases, it may also be preferable to share radio system resources. In this scenario, critical systems are maintained in a single location, and all dispatch centers access them via an IP network. This environment requires redundant, reliable high-speed connectivity between the shared services location and each dispatch center.*

Additionally, the agencies may agree to use a common CAD, RMS and radio console vendor. In this type of shared services environment, many of the dispatch centers may maintain their own CAD and RMS servers but choose a configuration that facilitates a common operating picture, which enables them to see all emergency response assets. A key advantage of this approach is the opportunity to share equipment costs and to reduce purchase and maintenance costs. In addition, shared technical support may increase interoperability and operational awareness.

One disadvantage of the shared services consolidation may be duplication of personnel and management, but our experience is that personal preferences and political realities may not support consolidation beyond this shared services approach⁴

While long-term full consolidation of all PSAP functions in Cumberland County may be achievable, both the City and County believe co-location of PSAP operations with some shared services is the most desirable option at this time. A new facility will allow for co-location with shared services that will meet the requirements of both 9-1-1 centers and should improve operational inefficiencies that currently exist with personnel physically located in separate facilities.

The PSAPs currently demonstrate the success of shared services through the use of a single CAD system. In 2012, the City of Fayetteville and Cumberland County recognized the improved efficiency

⁴ <http://www.9-1-1magazine.com/AECOM-Consolidated-Dispatch-Centers>



that could be achieved through a single OSS/ SunGard CAD software solution. Sharing a CAD system allows the two centers to seamlessly share data that can be critical to protecting the lives of the citizens and responders in Fayetteville and Cumberland County. As both centers utilize International Academy of Emergency Dispatch (IAED) protocols, the shared CAD system enabled the elimination of 9-1-1 call transfers between the two centers—an industry best practice. Through mutual understanding and cooperation, Fayetteville 9-1-1 and Cumberland County 9-1-1 began entering calls for service for the other center when the situation warranted.

Several benefits are realized by both 9-1-1 centers utilizing the same CAD system:

- Eliminates duplication of efforts of call entry as a call is entered once, even if both City and County resources must be dispatched
- Eliminates call transfer, which allows the incident to start sooner, allowing emergency responders to be dispatched quicker
- Reduces the potential to lose the call in transfer due to technical or human error
- May reduce caller stress knowing the person with whom they are speaking is able to help to provide assistance without transfer
- Improves customer service
- Most importantly, provides for quicker emergency response

This serves as a precedence to shared services in Fayetteville and Cumberland County.

This spirit of cooperation between the two 9-1-1 centers has led to other opportunities for shared services, such as training resources, 9-1-1 call overflow handling, etc. These services and others could be significantly enhanced with a co-located Fayetteville–Cumberland County 9-1-1 Emergency Communications Center.

2. 9-1-1 IN NORTH CAROLINA

In 1989, the Public Safety Telephone Act (North Carolina General Statute Chapter 62A) became law and recognized 9-1-1 as the toll-free number for the public to reach emergency services within the state. The Act defines a PSAP as “[t]he public safety agency that receives an incoming 911 call and dispatches appropriate public safety agencies to respond to the call.”⁵ The Act further defines a Primary PSAP as “[t]he first point of reception of a 911 call by a public safety answering point.”⁶ Both Fayetteville and Cumberland County are primary PSAPs for their respective jurisdictions.

All counties in North Carolina provide enhanced 9-1-1 (E9-1-1) and wireless Phase I and Phase II services.

⁵ http://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByChapter/Chapter_62a.html

⁶ Ibid.



Both PSAPs receive automatic number identification (ANI) and automatic location identification (ALI) information for all wireline calls placed to 9-1-1. Wireline 9-1-1 calls originate from a subscriber's telephone through the serving telephone central office. The central office routes the call through a selective router and completes the call to the appropriate primary PSAP based on the calling party's phone number and associated street address, which is linked to an emergency service number (ESN). Dedicated 9-1-1 centralized automatic message accounting (CAMA) trunks provide connectivity between the tandem switch (selective router) and the respective communications center. The PSAPs provide voice communications with the 9-1-1 caller. The phone number originating the 9-1-1 call and the caller's location are displayed at the answering PSAP. The caller's originating phone number is used to retrieve the caller's location information from ALI databases.

For 9-1-1 wireless calls, PSAPs that are Federal Communications Commission (FCC) Phase I-compliant receive the caller's wireless number and the address of the tower transmitting the call. PSAPs that are FCC Phase II-compliant receive the caller's wireless number and location, based on global positioning system (GPS) information transmitted to the PSAP from the wireless service provider (WSP). Fayetteville and Cumberland County are wireless Phase II-compliant.

Delivery of wireless 9-1-1 calls to the PSAPs is accomplished utilizing network facilities provided by CenturyLink, the local exchange carrier (LEC), and the different WSPs. The routing of a wireless 9-1-1 call is more complicated than that of a wireline 9-1-1 call, as the subscriber may be mobile and the technology still in place today to route a wireless 9-1-1 call is somewhat limited.

A wireless 9-1-1 call originates from a subscriber's device and is transmitted via a radio signal over the wireless carrier's network to a base station/antenna located at one of the respective carrier's tower sites. The base station sends the 9-1-1 call to the WSP's mobile switching center (MSC) for proper call processing. The MSC uses a service-control-point database to assign an emergency service routing key (ESRK) number based on the tower site from which the call originated. A primary PSAP designation is assigned to each ESRK in the database. From the MSC, the 9-1-1 call is connected to one of CenturyLink's tandem/selective routers within the telephone network. The call is then routed from the tandem switch (or selective router) and passed to the appropriate PSAP via the same dedicated CAMA trunks used for wireline calls.



PART 1—OPERATIONS AND STAFFING

3. STANDARDS AND ACCREDITING ORGANIZATIONS

Communications centers (also referred to as PSAPs or 9-1-1 centers) throughout the country adopt and use industry standards and best practices to assure the effectiveness of the agency and that the best possible service is provided to citizens and first responders. Measurable standards create an objective view of 9-1-1 operations and provide for consistent interactions with the public and first responders.

Standards and best practices most often used in 9-1-1 communications centers are from the Association of Public-Safety Communications Officials-International (APCO) and the National Emergency Number Association (NENA). Also used often are the National Fire Protection Association (NFPA) standards, specifically 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, and 1061, *Professional Qualifications for Public Safety Telecommunications Personnel*; and standards from the Commission on Accreditation for Law Enforcement Agencies (CALEA), particularly *Standards for Public Safety Communications Agencies*. APCO, NENA, and NFPA are each an American National Standards Institute (ANSI)-accredited standards development organization (SDO).

3.1. STANDARDS ORGANIZATIONS

APCO “is the world’s oldest and largest organization of public safety communications professionals and supports the largest U.S. membership base of any public safety association. It serves the needs of public safety communications practitioners worldwide – and the welfare of the general public as a whole – by providing complete expertise, professional development, technical assistance, advocacy and outreach.”⁷ APCO has undertaken many projects over the years. Two notable projects are Project 25 (P25), the development of standards for digital telecommunications technology, and Project 33, development of a telecommunicator training standard. In Project 33, APCO collaborated with NENA “to evaluate what type of standardized training programs (if any) each state had. The information gathered helped APCO build the foundation for the National Public Safety Telecommunicator Training Standard, which is the minimum standard used today.”⁸

NENA, a non-profit corporation, is dedicated to fostering “the technological advancement, availability and implementation of a universal emergency telephone number system.”⁹ NENA has several topic-specific committees that develop recommended 9-1-1 center model recommendations/standards and other operational information documents. NENA model recommendations/standards give 9-1-1 centers the tools they need to maintain a consistent level of service and work in relation to their peers in neighboring counties and states.

⁷ <https://www.apcointl.org/about-apco.html>

⁸ <https://www.apcointl.org/about-apco/apco-projects.html>

⁹ <http://www.nena.or-g/?page=Mission>



NENA 56-005, *9-1-1 Call Answering Standard*, states, “Ninety percent (90%) of all 9-1-1 calls arriving at the Public Safety Answering Point (PSAP) shall be answered within ten (10) seconds during the busy hour (the hour each day with the greatest call volume, as defined in the NENA Master Glossary 00-001). Ninety-five (95%) of all 9-1-1 calls should be answered within twenty (20) seconds.”¹⁰

While NENA defines the call answering priority, NENA does not define further call processing times.

NFPA has higher standards for call processing. NFPA, also a non-profit organization, is “devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission.”¹¹ NFPA 1221, Section 7.4.1 states, “Ninety-five percent of alarms^[12] received on emergency lines shall be answered within 15 seconds, and 99 percent of alarms shall be answered within 40 seconds.”¹³ There is speculation within the industry that NENA may align its call answering standard with NFPA’s in the future.

NFPA further defines call processing times, which begin when the call is answered and end when dispatch starts. Section 7.4.2 states, “With the exception of the call types identified in 7.4.2.2, 90 percent of emergency alarm processing shall be completed within 64 seconds, and 95 percent of alarm processing shall be completed within 106 seconds.”¹⁴

Section 7.4.2.2 states, “Emergency alarm processing for the following call types shall be completed within 90 seconds 90 percent of the time and within 120 seconds 99 percent of the time:

- (1) Calls requiring emergency medical dispatch questioning and pre-arrival medical instructions
- (2) Calls requiring language translation
- (3) Calls requiring the use of a TTY/TDD^[15] device or audio/video relay services
- (4) Calls of criminal activity that require information vital to emergency responder safety prior to dispatching units
- (5) Hazardous material incidents
- (6) Technical rescue
- (7) Calls that require determining the location of the alarm due to insufficient information
- (8) Calls received by text message”¹⁶

¹⁰ http://c.ymcdn.com/sites/www.nena.org/resource/collection/ABEAA8F5-82F4-4531-AE4A-0AC5B2774E72/NENA_56-005_9-1-1_Call_Answering_Standard.pdf, page 8 of 12.

¹¹ <http://www.nfpa.org/about-nfpa>

¹² NFPA 1221 defines an alarm as “a signal or message from a person or device indicating the existence of an emergency or other situation that requires action by an emergency response agency.”

¹³ <http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=1221>

¹⁴ Ibid.

¹⁵ Teletypewriter/Telecommunications Device for the Deaf

¹⁶ <http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=1221>



NFPA does not address law enforcement call processing and dispatching times, allowing the jurisdictions to establish time frames for dispatch in accordance with respective standard operating procedures (SOPs).

3.2. ACCREDITING ORGANIZATIONS

Standards are the cornerstone of accreditation for public safety agencies. While NENA, APCO, and NFPA are not accrediting bodies, CALEA, the Commission on Fire Accreditation International (CFAI), and the Commission on Accreditation of Ambulance Services (CAAS) are, as is IAED for entities utilizing the Academies' protocols. Only CALEA and IAED accredit communications centers.

CALEA, a “credentialing authority through the joint efforts of law enforcement's major executive associations”¹⁷ accredits law enforcement agencies and 9-1-1 communications centers. CALEA standards define what needs to be done, not how agencies are to accomplish it. CALEA's “accreditation program provides public safety agencies an opportunity to voluntarily demonstrate that they meet an established set of professional standards which:

- Require an agency to develop a comprehensive, well thought out, uniform set of written directives. This is one of the most successful methods for reaching administrative and operational goals, while also providing direction to personnel.
- Provide the necessary reports and analyses a CEO needs to make fact-based, informed management decisions.
- Require a preparedness program be put in place—so an agency is ready to address natural or man-made critical incidents.
- Are a means for developing or improving upon an agency's relationship with the community.
- Strengthen an agency's accountability, both within the agency and the community, through a continuum of standards that clearly define authority, performance, and responsibilities.
- Can limit an agency's liability and risk exposure because it demonstrates that internationally recognized standards for law enforcement have been met, as verified by a team of independent outside CALEA-trained assessors.
- Facilitates an agency's pursuit of professional excellence.”¹⁸

The Fayetteville Police Department and the Cumberland County Sheriff's Office are both an accredited agency through CALEA.

CFAI administers the Center for Public Safety Excellence's (CPSE's) accreditation program for fire and emergency service organizations. CPSE, a non-profit corporation, “promotes the continuous quality improvement of fire and emergency service agencies that serve communities worldwide by providing training and career resource information...CPSE supports and encourages agencies and personnel to

¹⁷ <http://www.calea.org/content/commission>

¹⁸ Ibid.



meet international performance standards through various programs and the work of two commissions...”¹⁹

Fayetteville Fire/Emergency Management, Fort Bragg Fire and Emergency Services, and Stoney Point Volunteer Fire Department are accredited agencies through CFAI.

CAAS is “an independent Commission that established a comprehensive series of standards for the ambulance service industry.”²⁰ CAAS standards are “designed to help increase operational efficiency and decrease risk and liability across the entire spectrum of the organization.”²¹ While CAAS does not accredit communications centers, Section 204 of the standards addresses communications centers, stating, “[e]fficient call taking, effective resource deployment, and continuous communications capabilities are required to maintain an effective EMS agency.”²² There are seven applicable areas:

- 204.01 Policies and Procedures
- 204.02 Contingency Plans
- 204.03 Preventive Maintenance
- 204.04 Training
- 204.05 Licensure
- 204.06 Communications Inter-Agency Dialogue
- 204.07 Communications Performance Improvement

Cumberland County EMS of Cape Fear Valley Health, Fayetteville, is an accredited agency through CAAS.

“IAED is a non-profit standard-setting organization promoting safe and effective emergency dispatch services world-wide. Comprised of three allied Academies for medical, fire and police dispatching, the IAED supports first-responder related research, unified protocol application, legislation for emergency call center regulation, and strengthening the emergency dispatch community through education, certification, and accreditation.”²³ Entities that utilize IAED’s internally recognized protocols can apply to become an Accredited Center for Excellence (ACE).

Accreditation is a voluntary path that many first responder agencies pursue. With agencies within Fayetteville and Cumberland County accredited, the communications centers are required to meet or exceed the applicable standards of the respective accrediting body.

¹⁹ <http://www.publicsafetyexcellence.org/about-cpse/cpse-mission-goals.aspx>

²⁰ <http://www.caas.org/>

²¹ <http://www.caas.org/benefits>

²² <http://www.caas.org/caas-standards/content-summaries>

²³ <http://www.emergencydispatch.org/>



4. ORGANIZATIONAL STRUCTURES

4.1. FAYETTEVILLE

Fayetteville 9-1-1 is a division of the City of Fayetteville Police Department. Fayetteville 9-1-1 has an authorized strength of 65 employees:

- Communications Manager (1)
- Support Staff (5)
 - Training Supervisor
 - Radio Technician
 - 911 Coordinator
 - Training Specialist
 - QA Specialist
- Shift Supervisors (4 – one per shift)
- Telecommunicators (55)
 - Telecommunicator II (36)
 - Telecommunicator I (19)

While the authorized strength is 65, Fayetteville 9-1-1 had 13 telecommunicator vacancies—almost 24 percent—during the analysis period for this report. Some vacancies have since been filled.

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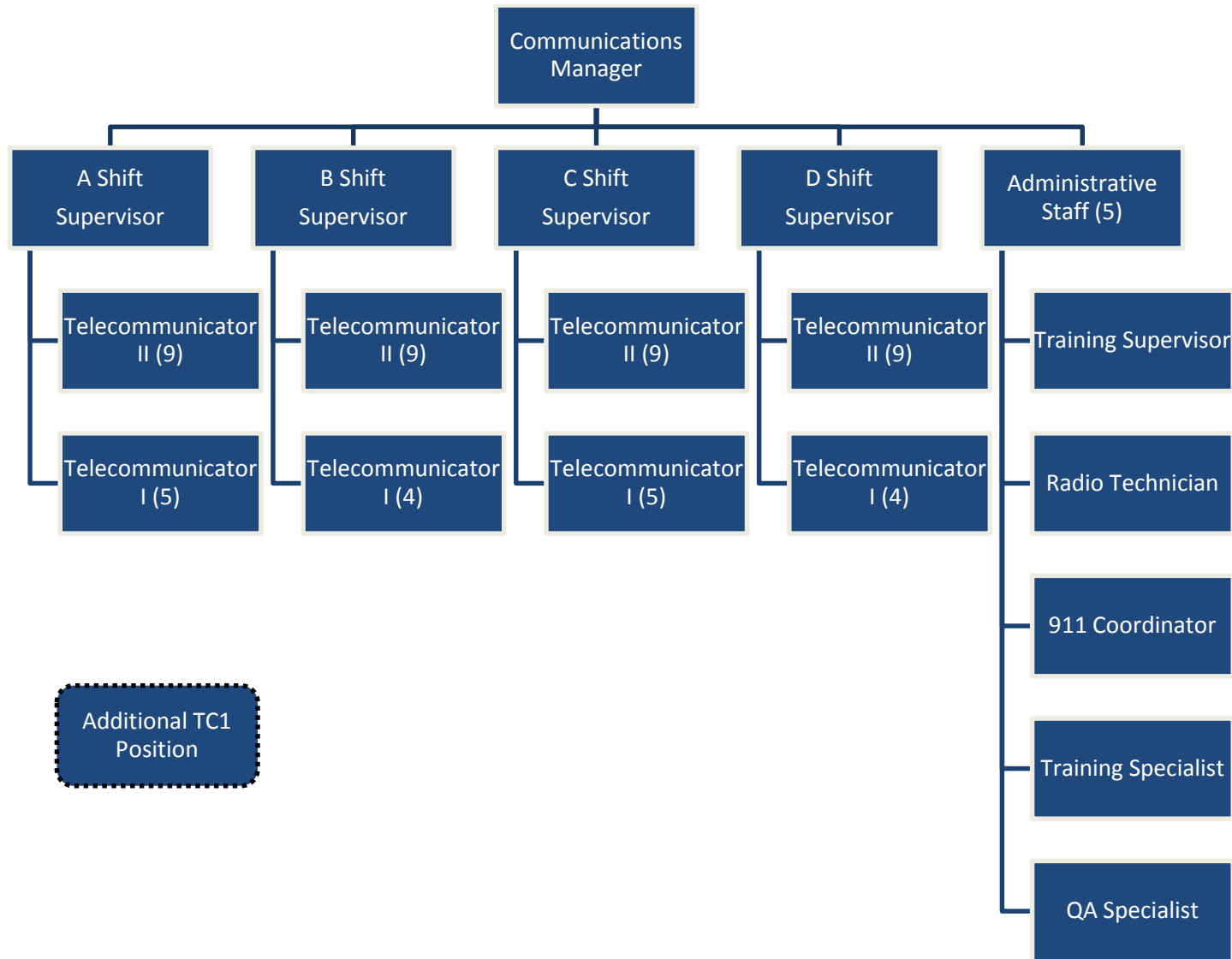


Figure 3: Fayetteville 9-1-1 Center Organizational Chart



Fayetteville 9-1-1 operates four 12-hour shifts that are responsible for coverage 24 hours a day, 7 days a week, 365 days a year. Day shift is 0700–1900 (7:00 a.m. to 7:00 p.m.) and night shift is 1900–0700 (7:00 p.m. to 7:00 a.m.). Shift supervisors and telecommunicators work two days on, two days off; three days on, two days off; two days on, three days off. Every other weekend is a 3-day weekend. Shift supervisors and telecommunicators rotate days and nights every 12 weeks. Telecommunicators are allotted two 15-minute breaks per shift. Support staff work typical Monday–Friday hours, adjusting as needs dictate.

Starting salaries for personnel are as follows:

- Communications Manager – \$68,158
- Training Supervisor – \$40,689
- QA Specialist – \$40,689
- Training Specialist – \$37,675
- 911 Coordinator – \$37,675
- Shift Supervisors – \$43,944
- Telecommunicator 2 – \$31,793
- Telecommunicator 1 – \$28,000

City of Fayetteville employees accrue holiday time for later use.

Fayetteville 9-1-1 is located in Fayetteville City Hall. The space allocated for the 9-1-1 center itself is sufficient for current operations. However, the 9-1-1 center is challenged with space for support staff and support operations. The small EOC, located adjacent to the 9-1-1 center, for all practical purposes has been reallocated as the training room, but is not sufficient to support the comprehensive training needs of modern 9-1-1 center operations. Fayetteville 9-1-1 shares breakroom and restroom facilities with other employees of City Hall.

4.2. CUMBERLAND COUNTY

Cumberland County Emergency Services has responsibility for Emergency Management and the Emergency Communications Center (9-1-1). Emergency Services is overseen by a Director, with assistance from a Deputy Director and six emergency management support staff. Emergency services is supported by a 911 Coordinator, CAD Administrator, and GIS Specialist.

Cumberland County 9-1-1 has an authorized strength of 42 employees:

- Telecommunications Manager (1)
- 911 Professional Standards Coordinator (1)
- Shift Supervisors (4 – one per shift)
- 9-1-1 Trainers (2)
- Telecommunicators (34)

During the analysis period for this report, Cumberland County 9-1-1 had two vacancies.

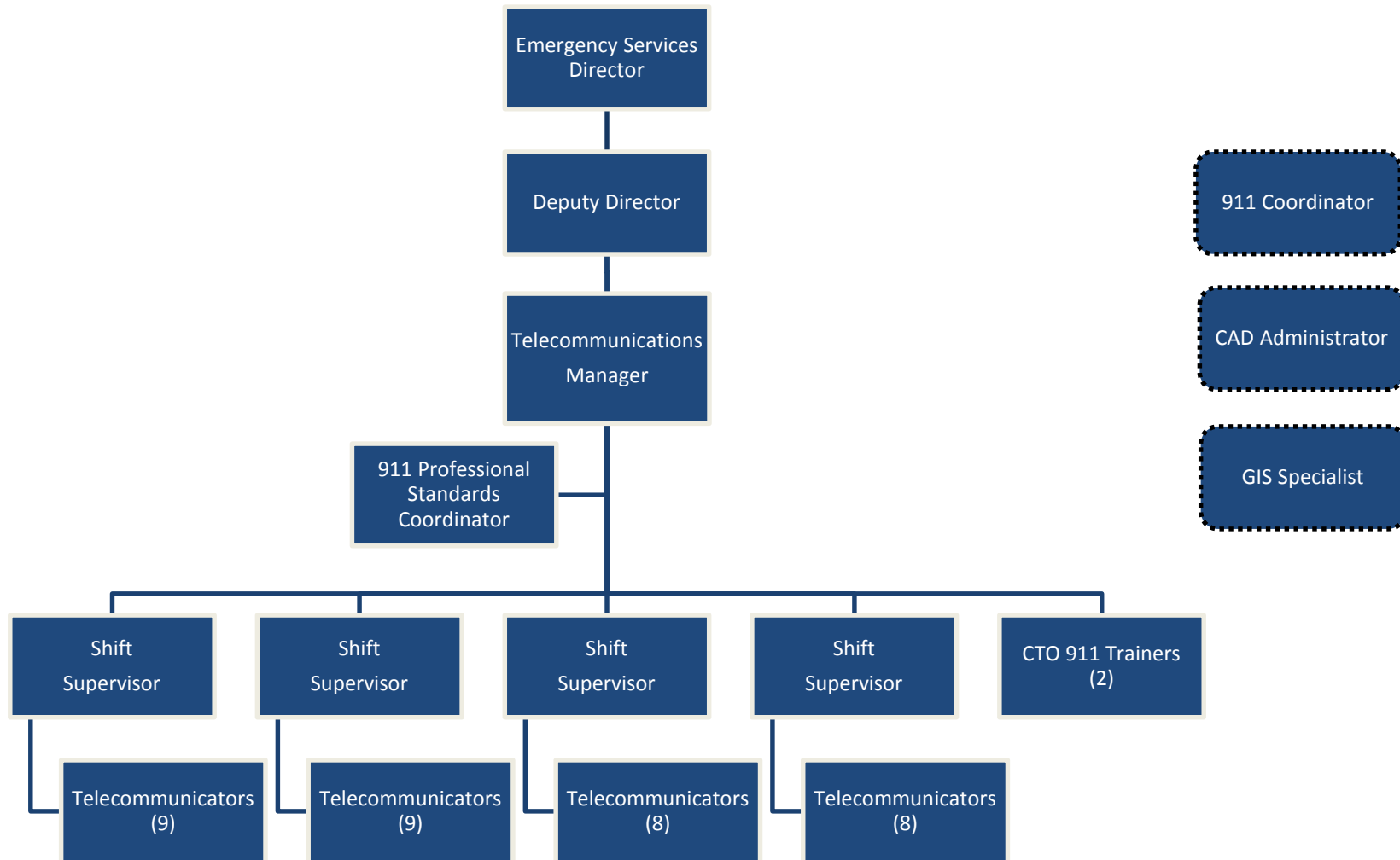


Figure 4: Cumberland County 9-1-1 Center Organizational Chart



Cumberland County 9-1-1 operates four 12-hour shifts that are responsible for coverage 24 hours a day, 7 days a week, 365 days a year. Day shift is 0700–1900 (7:00 a.m. to 7:00 p.m.) and night shift is 1900–0700 (7:00 p.m. to 7:00 a.m.). Shift supervisors and telecommunicators work two days on, two days off; three days on, two days off; two days on, three days off. Every other weekend is a 3-day weekend. Telecommunicators are allotted one 30-minute meal, taken at the console, and two 10-minute breaks per shift. Support staff work typical Monday–Friday hours, adjusting as needs dictate.

Starting salaries for personnel are as follows:

- Telecommunications Manager – \$43,035
- 911 Professional Standards – \$39,318
- Shift Supervisors – \$37,580
- 9-1-1 Trainers – \$32,731
- Telecommunicators – \$31,267

Cumberland County follows the State of North Carolina holiday schedule. Employees are paid holiday time, rather than accruing hours for later use.

Cumberland County 9-1-1 is located in the Cumberland County Sheriff's Office building. The space allocated for the 9-1-1 center is inadequate to support current operations. The workstation layout does not support efficient operations. Staff should be commended for making the best of the current facility and proving they can be efficient in the current center. Additional space is needed.

4.3. RECOMMENDATIONS

There are primarily three disparities that have the potential to create morale issues in a co-located environment: salaries, breaks, and holiday leave accrual versus pay. Some issues can likely be addressed, others may simply be a City or County policy that will remain.

Fayetteville and Cumberland County are aware of the inequalities in telecommunicator and supervisor salaries, and are already working to address this. However, there are operational differences between the two 9-1-1 centers that may warrant differences in pay. For example, Cumberland County 9-1-1 telecommunicators dispatch EMS, whereas Fayetteville 9-1-1 does not. Cumberland County 9-1-1 also has responsibility for 18 different contracted fire departments, all with volunteer personnel, which requires different dispatch parameters than a career department. Yet Fayetteville 9-1-1 is the busier of the two 9-1-1 centers with greater call and incident volumes. While Mission Critical Partners commends the action to reduce the discrepancy, consideration should be given to the operational parameters that will remain and a determination made as to what is fair considering the respective operational responsibilities.

The second disparity is breaks. As the breaks are paid, Mission Critical Partners recommends an agreement be reached before co-location on how breaks and/or meals are to be handled. There will be



a perception of unequal treatment if personnel from Cumberland County get an additional 30 minutes, particularly when the workload is greater for Fayetteville 9-1-1.

The third disparity is holiday time and leave accrual. As these are jurisdictional policies, there will continue to be a disparity in a co-located environment.

These issues are likely to surface (or resurface) in a co-located environment. Ensuring they have at least been considered, and addressed where possible, will make the future transition much easier.

5. OPERATIONAL CONFIGURATIONS

5.1. FAYETTEVILLE

Fayetteville 9-1-1 has call take and dispatch responsibilities for the Fayetteville Police Department and Fayetteville Fire Department. Fayetteville 9-1-1 operates in a horizontal configuration, i.e., there is a division of responsibilities between the call take and dispatch functions. In a horizontal center, dispatch is not delayed while information is gathered from the caller. There are dedicated call takers with responsibility only for answering incoming calls.

Fayetteville 9-1-1 has 15 console workstations, five of which support call taking only and ten of which support both call taking and dispatch functionality. There is a sixteenth position in the EOC that is used for training and overflow, when needed. At a minimum, four law enforcement positions (three dispatch, one administrative), two fire positions (dispatch, tactical), and three call take positions must be staffed 24 hours a day, 7 days a week. Ideally four to five call take positions would be staffed. A supervisor is also on-duty.

In 2014, Fayetteville 9-1-1 processed over 255,000 9-1-1 calls and over 654,000 ten-digit incoming and outgoing calls. The center was responsible for a total law enforcement incident volume of 307,679 and a total fire incident volume of 29,404, and processed over 784,500 National Crime Information Center (NCIC)/Division of Criminal Information (DCI) and local database transactions. Data was collected during the third quarter of 2015, and 2015 totals were not available. However, data through the third quarter was on track to be similar to 2014 numbers.

NENA's call answering standard is 90 percent of all 9-1-1 calls arriving at the PSAP shall be answered within 10 seconds during the busy hour and 95 percent of all 9-1-1 calls answered within 20 seconds. NFPA has higher standards for call processing – 95 percent of calls received on emergency lines shall be answered within 15 seconds, and 99 percent of alarms shall be answered within 40 seconds. Fayetteville 9-1-1 meets NFPA's call answering standard.

On average it takes Fayetteville 9-1-1 telecommunicators 133 seconds (2 minutes 13 seconds) to process (pickup to disconnect) a 9-1-1 call and 61 seconds to process an administrative call.



Fayetteville 9-1-1 uses Emergency Police Dispatch (EPD), Emergency Fire Dispatch (EFD), and Emergency Medical Dispatch (EMD) protocols from IAED to process incoming calls for service. (See section 6.3, Protocol Usage, for additional information.) Police and fire incidents are dispatched based on respective agency guidelines. While Fayetteville 9-1-1 does not dispatch EMS, callers requesting medical assistance are processed by Fayetteville 9-1-1, rather than being transferred to Cumberland County 9-1-1. The shared CAD system between Fayetteville 9-1-1 and Cumberland County 9-1-1 allows either agency to process calls for service without the need to transfer callers.

5.2. CUMBERLAND COUNTY

Cumberland County 9-1-1 has call take and dispatch responsibilities for the Cumberland County Sheriff's Office, Spring Lake Police Department, Hope Mills Police Department, Cumberland County EMS, and 21 fire stations (contracted for dispatch services). Cumberland County 9-1-1 is responsible for animal control after-hours and on weekends.

Table 1: Cumberland County Fire Stations

Cumberland County Fire Stations	
Beaver Dam Stations 26 and 27	Hope Mills Station 21
Bethany Station 12	Pearces Mill Station 3
Cotton Station 4	Spring Lake Station 22
Cumberland Road Station 5	Stedman Station 23
Eastover Station 1	Stoney Point Stations 13 and 19
Godwin-Falcon Station 17	Vander Stations 2 and 8
Gray's Creek Station 18	Wade Station 16
Gray's Creek Station 24	Westarea Stations 15, 20, and 25

Cumberland County 9-1-1 also operates in a horizontal configuration.

Cumberland County 9-1-1 has ten console workstations, all of which support both call taking and dispatch functionality. Four positions are dedicated to law enforcement. One position serves as the main channel for the Sheriff's Office. One position is responsible for the Hope Mills Police Department and Sheriff's Office detectives, and serves as a backup to the Sheriff's Office main channel. One position is responsible for the Spring Lake Police Department and Sheriff's Office school resource officers, and serves as a backup to the Hope Mills Police Department. The fourth position is dedicated to civil responsibilities. There is one fire position, which serves as a backup for EMS. There is one EMS position, which serves as a backup for fire. There are three call take positions. A supervisor is also on-duty, with monitoring capabilities for all channels.

In 2014, Cumberland County 9-1-1 processed over 143,000 9-1-1 calls and over 337,000 ten-digit incoming and outgoing calls. The center was responsible for a total law enforcement incident volume of 226,755, a total fire incident volume of 15,526, and a total EMS incident volume of 66,061. Data was



collected during the third quarter of 2015, and 2015 totals were not available. However, data through the third quarter was on track to be similar to 2014 numbers.

NENA's call answering standard is 90 percent of all 9-1-1 calls arriving at the PSAP shall be answered within 10 seconds during the busy hour and 95 percent of all 9-1-1 calls answered within 20 seconds. NFPA has higher standards for call processing – 95 percent of calls received on emergency lines shall be answered within 15 seconds, and 99 percent of alarms shall be answered within 40 seconds. Cumberland County 9-1-1 meets NFPA's call answering standard.

Cumberland County 9-1-1 uses EPD, EFD, and EMD protocols from IAED to process incoming calls for service. (See section 6.3, Protocol Usage, for additional information.) Police and fire incidents are dispatched based on respective agency guidelines. The shared CAD system between Fayetteville 9-1-1 and Cumberland County 9-1-1 allows either agency to process calls for service without the need to transfer callers.

5.3. PROTOCOL USAGE

IAED defines a protocol as “a highly-defined procedure placed into a reference system...designed to lead the calltaker through a predictable, repeatable, and verifiable process for a specific situation.”²⁴ “Protocols have become an integral part of modern day, emergency dispatch operations. Protocols reduce variance, ensure a continuity of care, reduce liability, standardize response decisions, and provide a basis for performance measurement and quality improvement efforts.”²⁵

Protocols involve a set of scripted questions designed to elicit as much information from the caller as possible.²⁶ At case entry, essential information is gathered in a standardized format, including the address of the incident, the caller's phone number and name, and the problem. Once the problem or “Chief Complaint” has been identified, questioning continues to help assess scene safety, prioritize the response, select appropriate instructions for the caller, and provide pertinent information for responders. The questions are designed to be asked verbatim and in order. Where the answer is obvious, questions may be skipped. Post-dispatch instructions are designed to ensure responders' and the caller's safety. If necessary, pre-arrival instructions—potentially life-saving, scripted instructions—are provided.

While the protocols determine prioritization of the calls for service based on the caller's response to the questions, such as Delta, Charlie or Bravo, first responder agencies determine their respective response parameters, such as lights and sirens (hot) or routine (cold, non-emergency), how many units

²⁴ The National Academies of Emergency Dispatch® (2011) *Emergency Telecommunicator Course Manual*, Edition 3. Salt Lake City, Utah: Priority Press.

²⁵ <http://www.9-1-1magazine.com/Patterson-Protocols-0804>

²⁶ While there are numerous vendors for dispatch protocols, the terminology and information referenced is from Priority Dispatch; other vendors may have slightly differing terms and sequencing. This is just intended to provide an example.



to send to which types of calls, etc. Most EMS and fire responses are fairly standardized, such as advanced life support (ALS) or a full run order for a residential fire. However, significant differences are often seen among law enforcement agencies, regardless of whether scripted protocols are in use. For example, one law enforcement agency may not hold any calls for service, regardless of the nature, dispatching as soon as possible to any available unit. Another law enforcement agency may provide different response parameters based on the nature; for example, holding an incident that happened two days ago, but was just reported, for a unit that is assigned to that area, rather than assigning to a unit across town.

In Cumberland County and Fayetteville, response parameters differ per law enforcement agency.

5.4. RECOMMENDATIONS

Fayetteville 9-1-1 has 15 console workstations and Cumberland County 9-1-1 has ten console workstations. Mission Critical Partners recommends 30 console workstations in a co-located environment. The additional five workstations would be allocated to support future growth and monitoring of trainees.

In a co-located environment, operations of the two 9-1-1 centers remain distinct; yet there is an opportunity to share additional resources similar to those of the CAD system. In a co-located environment, these shared systems will continue to be in operation. While the 9-1-1 trunks may continue to remain separated by jurisdiction, Mission Critical Partners recommends consideration be given to shared 9-1-1 call taker resources. Any available call taker should be able to answer a 9-1-1 call, regardless of where it originates. Currently, when a 9-1-1 call is answered in either center, it is handled by the respective call taker regardless of the jurisdiction. In a co-located environment, it should not matter that a 9-1-1 call is coming in on a City 9-1-1 trunk or a County 9-1-1 trunk, the next available call taker should answer the call. While both centers currently meet NFPA's call answering standard, sharing call taking resources may further allow both 9-1-1 centers to improve call answering times.

As 9-1-1 call volume is not equal between the two 9-1-1 centers, the potential exists for an unbalanced workload. It is true that the workload is unbalanced in current operations, but it becomes noticeable when all telecommunicators are working in the same space. It may be possible that all 9-1-1 trunks for the City are ringing, but the County trunks are not. If call take resources are not shared, there may be call takers that are idle but cannot answer the call because it is on a City 9-1-1 trunk, and vice versa. This has the potential to degrade the service provided to the citizens and might create morale problems. However, the use of shared call taker resources will also require oversight as the potential exists for some telecommunicators to "take advantage" of a larger pool to answer 9-1-1 calls. While the integrity of the telecommunicators has not come under question, it is important to realize it could happen. Regular communications between Fayetteville 9-1-1 and Cumberland County 9-1-1 management is critical to addressing these types of concerns before they become an issue. Before the City and County embark on collaborative staff arrangements, Mission Critical Partners recommends the pay and break issues discussed previously have been addressed. These issues are likely to surface (or resurface) in a co-located environment.



If the City and County decide to share call taker resources, it should be memorialized in an intergovernmental agreement (IGA) or memorandum of understanding/agreement (MOU/MOA), detailing the specifics of what is expected of the telecommunicators and supervisory personnel. Mission Critical Partners recommends that the shared call take resource be limited to 9-1-1 calls only. Calls received on non-emergency (administrative) lines should be handled by the respective jurisdiction.

Regardless of a decision to share or not share call taker resources, staffing will not be affected. Fayetteville 9-1-1 and Cumberland County 9-1-1 will each need to staff the call take positions as if they were in separate centers. The sharing of resources should not be seen as an opportunity to allow additional staff time off; leave should continue to be handled in accordance with established policies.

In addition, Mission Critical Partners recommends the development of a law enforcement working group, prior to co-location, to review dispatch parameters, with the goal to streamline operational processes where possible. Mission Critical Partners is not advocating that the law enforcement agencies change their response protocols, but to come together with 9-1-1 center personnel to determine how response protocols affect operations and perhaps reduce the disparities. Technology may also allow for dispatch response parameters to be built into the CAD system for respective agencies to assist telecommunicators in their response to callers.

While the focus of this report is the co-location of 9-1-1 operations, other opportunities exist to enable the seamless flow of information in areas outside 9-1-1 operations. Currently, Cumberland County is responsible for animal control after-hours and on weekends. Animal Control “enforces all state and local laws pertaining to the ownership, regulation and control of dogs, cats, and other animals within the County. The department is responsible for picking up stray animals, livestock, exotic animals as well as nuisance wildlife and rabid animals.”²⁷ Animal Control officers respond throughout the county, including the city of Fayetteville. Animal Control officers are responsible for investigating all animal bites in accordance with North Carolina law. As such, there is often a need for dialogue with the 9-1-1 centers. Mission Critical Partners recommends that consideration be given to allocating one of the console workstations for the Animal Control communicator, with access to the CAD system. By providing access to the CAD system, Animal Control can become an integral part of the call take operations, eliminating the need for caller transfers and providing situational awareness to all involved. Co-locating an Animal Control communicator with 9-1-1 operations provides an opportunity to improve both animal control and public safety response.

²⁷ http://www.co.cumberland.nc.us/animal_control.aspx



6. STAFFING

Communications centers across the country continue to struggle with staffing shortages. Tenured employees are retiring; others just leave for any number of reasons – shift work, the hours, child care issues, stress, and better pay in the private sector. While generally there is not a lack of applicants for open positions, the often stringent job qualifications (i.e., background checks, drug usage) knock many out, as do the lengthy application processes; it is not unusual for many law enforcement communications centers to have processes that take upwards of six months from application to start date. Thus communications centers often find themselves with a revolving door for staff; unfortunately many are not able to fill the vacancies before more staff leave, creating an even larger gap. Both Fayetteville 9-1-1 and Cumberland County 9-1-1 have experienced staffing shortages in recent years.

To verify appropriate staffing and/or determine staffing needs, call centers and 9-1-1 centers use calculations based on call volume and workload. APCO and NENA have developed tools based on the Erlang C²⁸ calculator, coupled with statistical calculations that take into consideration other PSAP data (e.g., leave usage). PSAP data is measured and used as a basis for projecting the number of call take, dispatch, and supervisory staff required to adequately handle call and incident volumes.

In 2010, NENA implemented a Communications Center Staffing Tool in concert with the Center Manager Certification Program. The staffing tool, partially based on NENA Standard 54-501A, is a formalized system that takes into account call volume and other PSAP-specific data, such as incident volume and leave, to calculate staffing needs. Mission Critical Partners uses this NENA staffing tool, coupled with Erlang C calculations, to project staffing requirements.

The NENA staffing tool calculates many factors, including available work hours, utilization, and turnover rates, which are then used with call and/or incident data to determine staffing. Available work hours are the number of hours a telecommunicator (call takers and dispatchers) is available to work during the course of a year. There are many sub-factors to this calculation, including leave usage; i.e., any time that the employee is away from their assigned duties. This time includes vacation, holiday, sick, and personal leave; training; military leave; and other activities.

In 2014, Fayetteville 9-1-1 telecommunicators used in excess of 10,800 total hours of leave; this averages approximately six and one-half weeks of leave per person. In 2014, Cumberland County 9-1-1 telecommunicators used in excess of 7,245 total hours of leave; this averages approximately five weeks of leave per person.²⁹ This does not imply that each person used the respective leave; some may have used less, some may have used more. This is the average per person.

²⁸ The Erlang C calculator is a tool in the public safety industry utilized to assist emergency communications centers in determining call taker staffing needs.

²⁹ Staff work 12-hour shifts, with a 36-hour work week followed by a 48-hour work week. Averages are based on a 40-hour work week as time taken off varies based on the work week and time taken off.



Utilization is a subjective number, but is designed to provide an estimate of the time per shift that a telecommunicator should be busy providing call handling and dispatching services. Breaks and meals are subtracted from the shift length, as is time spent doing other work-related activities, such as filing paperwork or decompressing after a stressful incident. Fayetteville 9-1-1 telecommunicators are allotted two 15-minute breaks and one 30-minute meal break. Cumberland County 9-1-1 telecommunicators are allotted two 10-minute breaks and one 30-minute meal break, which is taken at the console. Fayetteville 9-1-1 and Cumberland County 9-1-1 have utilization rates of 96 percent and 93 percent, respectively. This is exceptional and demonstrates that telecommunicators do not have extraneous duties that detract from their call take and dispatch responsibilities.

Turnover is also calculated. Data is collected for three years and includes the highest number of employees for a given year and the number of staff that left voluntarily or involuntarily. The result is the attrition rate. Between 2012 and 2014, Fayetteville 9-1-1's average attrition rate was 19.61 percent. The attrition rate has decreased since 2012 when it was 25.49 percent; 2014 saw an attrition rate of 15.69 percent. Between 2012 and 2014, Cumberland County 9-1-1's average attrition rate was estimated to be 19.44 percent, and may have been as high as 36.11 percent in 2014.³⁰

Calculations for workload and position coverage must also take performance metrics into account. Performance metrics measure the operational efficiency of a PSAP against targeted goals and established standards. Mission Critical Partners uses performance metrics and national standards to ascertain how staff utilization may be positively or negatively impacting PSAP operations. The most common metric involves the average time it takes a PSAP to answer its incoming emergency calls. PSAPs typically try to align their call answering goals to either NENA or NFPA standards. As mentioned previously, both Fayetteville 9-1-1 and Cumberland County 9-1-1 meet NFPA standards.

6.1. FAYETTEVILLE

Taking all factors into consideration with the current configuration of the 9-1-1 center, and to continue to meet NFPA standards for call answering, Fayetteville 9-1-1's authorized telecommunicator strength is appropriate, and staffing will be adequate for current call and incident volumes when vacancies are filled.

6.2. CUMBERLAND COUNTY

Taking all factors into consideration with the current configuration of the 9-1-1 center, and to continue to meet NFPA standards for call answering, Cumberland County 9-1-1's authorized telecommunicator strength is appropriate, and staffing will be adequate for current call and incident volumes when vacancies are filled.

³⁰ Cumberland County 9-1-1 does not track the number of new hires that failed to complete the probationary period or experienced employees that left. From comments in leave usage records from 2014, Mission Critical Partners was able to determine that ten staff separated from the division that year.



6.3. RECOMMENDATIONS

At this time, the *authorized* telecommunicator strength of each 9-1-1 center is appropriate for their respective call and incident volumes. Both centers have experienced vacancies in the past, and Fayetteville 9-1-1's 24 percent vacancy rate in the fall of 2015 was critical. Fayetteville 9-1-1 cannot continue to sustain such a deficit in staff as operations will ultimately be affected.

In a co-located environment, each 9-1-1 center will maintain their own staffing levels, with the exception of emergencies. This means that the City and County will continue their respective hiring practices as a joint hiring process is prohibited. Mission Critical Partners recommends that, where possible, the City and County establish the same standards and processes for hiring telecommunicators. This will ensure that staff working in the co-located environment have passed the same tests and interviews, have undergone similar processes, and had the same level of background checks, etc. Often, personnel working for a law enforcement agency undergo a more rigorous background check than those working for other agencies. While this may be difficult to align, it will ensure all newly hired telecommunicators in a co-located environment have met the same requirements for employment.

Mission Critical Partners recommends that a staffing study be conducted annually for both 9-1-1 centers to ensure authorized strength is appropriate based on then current call and incident volumes, as well as personnel factors, such as leave usage. If adjustments need to be made to authorized strength for either or both 9-1-1 centers, the City and County, respectively, can make preparations for additional staff during their planning and budgeting processes.

Mission Critical Partners recommends consideration be given to collaborative staffing where possible. In a co-located environment, there may be more opportunities for collaborative staffing positions, such as in training or quality assurance (QA). Collaborative staffing will improve efficiency and may be viewed positively by the North Carolina 911 Board. Current telecommunicators or supervisors should be allowed to apply for any open positions, which could potentially create vacancies in the 9-1-1 centers. As such, it is imperative that the City and County determine administrative support roles prior to the transition to a co-located facility. This will allow time for all positions to be filled, and not at the expense of the 9-1-1 centers.

7. SUPERVISION

The Technical Committee on Public Emergency Service Communication prepared the latest edition of NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems* (Edition 2016). Chapter 7 sets forth the standards for PSAP operations; Section 1 of Chapter 7 addresses management.

NFPA 1221, 7.1.1 states, "All system operations shall be under the control of a manager, director, or supervisor of the jurisdiction served by the system."



7.1.3 states, “Personnel in supervisory roles shall receive supervisory training as defined by the AHJ.” (AHJ is defined as the Authority Having Jurisdiction.)

7.1.4 states, “The AHJ shall be responsible for initial and ongoing training in supervisory skills of personnel in supervisory roles.”

Section 3 of Chapter 7 addresses staffing.

NFPA 1221, 7.3.4 states, “Supervision shall be provided when more than two telecommunicators are on duty.”

Annex A of NFPA 1221 provides further explanation. A.7.3.4 states, “The supervisor position(s) in the communications center are provided in addition to the telecommunicators *[sic]* positions. Although supervisory personnel are intended to be available for problem solving, the supervisor position is permitted to be a working position.”

7.3.4.1 states, “Supervision shall be provided by personnel located within the communications center who are familiar with the operations and procedures of the communications center.”

7.3.4.2 states, “The supervisor shall be allowed to provide short-term relief coverage for a telecommunicator, provided that the telecommunicator does not leave the communications center and is available for immediate recall as defined in the policies and procedures of the AHJ.”

The *Standards for Public Safety Communications Agencies* (SPSCA), established jointly by CALEA and APCO, does not specifically address staffing or supervision in a PSAP. However, both sets of standards reference utilizing Incident Command System (ICS) protocols. (CALEA Standard 46.1.2 and SPSCA Standard 7.1.2 are mandatory for accreditation.)

The Department of Homeland Security (DHS), coordinating with federal, state, and local governments established the National Incident Management System (NIMS). ICS falls under the Command and Management element of NIMS. ICS represents best practices and is the standard for emergency management across the country. ICS requires a supervisor when there are between three and seven persons performing similar functions. (The optimal span of control is five.) A manageable span of control allows supervisors to supervise and control their subordinates, while allowing for efficient communications between all parties.

While NFPA standards and ICS require dedicated supervisory personnel, there are in-house considerations as well:

- Provides coordination and direction during major emergency incidents
- Is available for problem solving
- Is readily able to identify areas for growth among subordinates
- Has the ability to document employees’ performance for annual/periodic reviews



- Provides a more narrow scope of supervision when implementing new policies and procedures
- Provides more supervision for diversified, complex tasks
- Is able to stay current with technological changes/advancements
- Provides guidance to new employees who have less training and experience
- Provides greater knowledge of laws, procedures, and administrative processes
- Is able to focus on the operations of the 9-1-1 center as a whole
- Is able to focus on customer service to the public and subscriber agencies
- Allows for improved communications with management, subordinates, and subscriber agencies
- Spends more time with subordinates individually, on a daily basis
- Allows for operational efficiency
- Is able to identify areas for remedial training, counseling or discipline, when appropriate
- Is able to address issues upon occurrence, not after the fact
- Is able to set priorities
- Allows for delegation of tasks/responsibilities

Understanding how a PSAP performs as compared to national standards, such as call answering, is valuable information, but it is only part of the puzzle. 9-1-1 center directors and/or managers must be able to identify whether goals and objectives are being met, as well as identify issues at the onset. While many challenges can be attributed to staff shortages, some issues are not as intuitively obvious. As such, appropriate and focused supervision of operational personnel is critical.

Fayetteville 9-1-1 and Cumberland County 9-1-1 each have four supervisory positions, with one supervisor assigned to each shift.

7.1. RECOMMENDATIONS

Best practice suggests a span of control as three to seven, with five being optimal. In Fayetteville, one supervisor is assigned per shift, who could have responsibility for up to 14 people when fully staffed with no absences. In Cumberland County, one supervisor is assigned per shift, who could have responsibility for up to nine people when fully staffed with no absences. While these spans of control are higher than best practices and not necessarily ideal for Fayetteville 9-1-1, telecommunicators work in a single location, and within two primary focus areas: call take and dispatch. Both centers have experienced staff that are also able to provide direction to newer telecommunicators when the need arises.

However, Mission Critical Partners recommends that the City consider increasing its shift supervisor complement by two, for a total of six shift supervisors, when telecommunicator positions are fully staffed. Mission Critical Partners recommends that one additional shift supervisor work a “power shift” between A and B shifts, while the second additional shift supervisor works a “power shift” between C and D shifts. This will provide additional supervisory oversight during times of peak call and incident



volumes. If authorized telecommunicator strength increases in the future, consideration will need to be given to a total supervisory complement of eight, or two per shift, to align with best practices.

While Cumberland County 9-1-1 also exceeds the best practice span of control, it is marginal. Cumberland County 9-1-1's call and incident volumes are not as great as Fayetteville 9-1-1's, and telecommunicators also work in closer quarters, all of which make supervisory oversight somewhat easier. However, if authorized telecommunicator strength increases in the future, consideration will need to be given to increasing the supervisory complement to more closely align with best practices.

In a co-located environment, where two shifts are on-duty at one time (one City and one County operating from a singular location), there are additional considerations. Each 9-1-1 center could continue to operate as they do currently, with a respective supervisor only responsible for their telecommunicators. Or supervisors could be cross-trained and provide oversight to any telecommunicator. The configuration of the primary focus areas provides an opportunity for concentrated supervisory oversight in a co-located environment, when applied correctly. One supervisor could be specifically assigned to the call take area and one to the dispatch area. While this would require cross-training on the part of the supervisors, it diminishes the lines of City | County.

Other operational decisions will also affect this. If the City and County decide to share 9-1-1 call taking resources, supervisory personnel will need to be able to provide oversight to all call takers, not just their own. For example, if 9-1-1 lines are ringing and are not being answered, a Cumberland County 9-1-1 supervisor may need to direct a Fayetteville 9-1-1 telecommunicator to answer the phone. While the integrity of the telecommunicators has not come under question, this is a real scenario that could play out in a co-located environment.

Any decisions regarding supervisory personnel's authority for staff other than theirs will need to be memorialized in any governance agreement. If a decision is made to expand supervisor's authority, supervisors, as well as telecommunicators, will require training on the new expectations to ensure boundaries are not overstepped and that favoritism does not have a role.

7.1.1. Leadership Development

Staff are often promoted to a supervisory position because they were good, if not great, telecommunicators. They are then trained and/or mentored to manage administrative duties and daily tasks associated with the respective job description. While management responsibilities need to be taught, leadership skills also need to be developed. Leaders must be able to motivate people and unite their team. While the supervisory positions must be respected based on their seniority (management), gaining a person's cooperation and respect towards their work is crucial, and often leads to respecting the person, not just the position.

The North Carolina Justice Academy offers a 24-hour Telecommunicator Supervisor Training course. The course goal is "to provide the participant with knowledge and skills required to



effectively supervise personnel in an emergency communications center.”³¹ At the completion of the course, “students will be able to:

- Avoid liability problems arising from employment practices.
- Determine and utilize motivational incentives to improve or cause high performance.
- Demonstrate supervising for results skills dealing with work performance and work habit problems.
- Identify the important attributes of documentation and how to effectively use it.
- Utilize identified competencies of a leader to address factors in high performance by employees.
- Lead others through concepts of empowerment and transformation.”³²

APCO offers Communications Center Supervisor training; this course can be taken online (five weeks) or in person (three days). There are no recertification requirements. Topics include the following:

- Telecommunications Supervisor Role
- Liability Issues for Supervisors
- Policies, Procedures and Directives
- Communication Skills
- Self-Assessment
- Employee Evaluation and Motivation³³

There are numerous organizations that also offer leadership training, but may not have the 9-1-1 background of these.

Mission Critical Partners recommends the City and County continue to ensure that supervisory-level staff take advantage of professional development opportunities to become better leaders. Continued leadership development provides an avenue for the enhancement of knowledge, competencies, and skills. This results in increased learning, achievement of goals, improved performance, and often personal satisfaction. When possible, leadership training opportunities should be offered to senior telecommunicators who may wish to pursue promotional opportunities in the future.

David Witt, a researcher with The Ken Blanchard Companies who studies employee engagement and the impact that leadership practices have on employee retention, well-being, and productivity, said, “...we’ve been looking at the connection between leadership practices, employee work passion, customer devotion, and an organization’s bottom line. What we’ve found is that there is a clear connection between the quality of an organization’s leadership practices—as perceived by employees—and subsequent intentions by employees to stay with an organization, perform at a high

³¹ <http://ncja.ncdoj.gov/2232.aspx>

³² Ibid.

³³

https://apconetforum.org/eweb/DynamicPage.aspx?site=APCOInst&webcode=APCOTrainingCourseDetail&evt_key=CAAF4833-5ADF-4EC8-8254-DF920FF1087E



level, and apply discretionary effort.”³⁴ The challenge for both Fayetteville 9-1-1 and Cumberland County 9-1-1 will be finding the time to ensure supervisors are actively engaged in developing their skills.

8. TRAINING

Training is defined as “a process by which someone is taught the skills that are needed for an art, profession, or job.”³⁵ Training is essentially provided in four arenas:

- New hire training
- Refresher/continuing education training
- Update training, such as for technology/equipment or changes in policies and procedures
- Promotional opportunity training

In 9-1-1, call taker and dispatch training and standards vary across the country, and often within a state. In August 2012, NENA Government Affairs Staff published a State by State Training Standards Overview³⁶; North Carolina was not included.

In 1998, North Carolina passed mandatory training requirements for law enforcement telecommunicators. In accordance with Administrative Code Title 12-10B, the state’s Sheriff’s Training and Standards Commission governs the mandate. The 48-hour Telecommunicator Training Certification Course is mandatory for all telecommunicators working under the direction of a sheriff; however, certification is optional for agencies not under the direction of a sheriff. Training is facilitated by the North Carolina Justice Academy.

The course goals are “to present the basic standard operating procedures for telecommunicators and to develop the role and responsibilities of the emergency service telecommunicator.”³⁷ Upon completion of the course, students will be able to:

- Define the role and explain the characteristics of the professional telecommunicator; stress and the telecommunicator; and the telecommunicator’s code of ethics.
- Identify and demonstrate the general operation of the major equipment components of a modern telecommunications service center.
- List and identify the major information resources available to assist in the practice of telecommunications.

³⁴ <http://www.kenblanchard.com/Leading-Research/Ignite-Newsletter/October-2013>

³⁵ <http://www.merriam-webster.com/dictionary/training>

³⁶

http://legis.wisconsin.gov/lc/committees/study/2012/911/files/aug16_nena_State%20by%20State%20Training%20Requirements.pdf

³⁷ <http://ncja.ncdoj.gov/2222.aspx>



- Differentiate between the organization, general operational practices, terminology and common service requests associated with law enforcement, fire and emergency medical services, and the North Carolina Division of Emergency Management.
- Identify, explain and demonstrate common call reception, prioritization and resource allocation practices associated with everyday telecommunications.
- Identify and explain the aspects of civil liability for the professional telecommunicator.
- Identify, explain and demonstrate basic radio broadcast techniques associated with emergency telecommunications.
- Demonstrate basic telecommunications training skills in a structured telecommunications training practicum.³⁸

Once certified, telecommunicators are required to complete 16 hours of in-service training annually; some topics are deemed mandatory.

Aside from this, North Carolina has no telecommunicator training standards. The North Carolina 911 Board has undertaken this initiative and is in the process of crafting legislation for minimum telecommunicator training within the state. No further information is known at this time.

APCO's *Minimum Training Standards for Public Safety Telecommunicators*, APCO ANS 3.103.2-2015, "identifies minimum training requirements for both new and veteran Public Safety Telecommunicators. This position is typically tasked with receiving, processing, transmitting, and conveying public safety information to dispatchers, law enforcement officers, firefighters, emergency medical and emergency management personnel. This document seeks to define training in certain knowledge and skills for the Agency to provide to Telecommunicators."³⁹

IAED offers an Emergency Telecommunicator (ETC) Certification course that aligns with APCO's training standards. The 40-hour course covers the following topics:

- Roles and Responsibilities of the Emergency Telecommunicator
- Emergency Telecommunication Technologies
- Telecommunication Essentials
- Interpersonal Communication
- Caller Management
- Police Call Classification
- Fire Call Classification
- Medical Call Classification
- Man-Made and Natural Catastrophic Events
- Radio Broadcast Procedures
- Legal Aspects of Public Safety Communication

³⁸ Ibid.

³⁹ <https://www.apcointl.org/doc/911-resources/apco-standards/75-minimum-training-standards-for-public-safety-telecommunicators/file.html>, page 2 of 37.



- Quality Improvement
- Stress Management

CALEA's *Standards for Public Safety Communications Agencies* has a chapter devoted to training, which addresses administration, academies (for those that operate a training academy), and training itself.

Fayetteville 9-1-1 and Cumberland County 9-1-1 already collaborate on classroom training whenever possible. Both centers teach IAED's ETC course as well as EMD, EFD, and EPD protocols. Upon the completion and successful passing of the exams, certification is received in each area.

Although on-the-job (OTJ) training varies for each center based on the respective disciplines for which they dispatch, certified training officers or other tenured telecommunicators conduct training. OTJ training for both 9-1-1 centers involves CAD-based training with guidance from the assigned communications training officer (CTO), shadowing, observations, coaching, and mentoring.

IAED requires recertification every two years for EMD, EFD, and EPD. For only one certification, 24 hours of continuing education is required every two years. For those with more than one certification, as is the case for both Fayetteville 9-1-1 and Cumberland County 9-1-1, a sliding scale is applicable. A combination of all three protocols has a requirement for 48 hours of continuing education every two years. EMD recertification (and initial certification) also requires cardio pulmonary resuscitation (CPR) certification.

IAED provides the following guidance for continuing education programs:

Your agency's CDE Program should be organized around the training and responsibilities of the dispatchers and meet the following specific objectives:

- 1. Developing a better understanding of telecommunications and the emergency dispatcher's roles and responsibilities*
- 2. Enhancing on-line skills in Pre-arrival Instructions and in all emergency telephone procedures within the practice of emergency dispatch*
- 3. Improving skills in the use and application of all component parts of the Priority Dispatch System® (PDS) including interrogation and prioritization*
- 4. Providing opportunities for discussion, skill practice, and critique of skill performance⁴⁰*

IAED also provides a list of continuing education approved categories, as well as examples.

Both Fayetteville 9-1-1 and Cumberland County 9-1-1 currently provide continuing education for their telecommunicators in accordance with best practices and IAED certification requirements.

⁴⁰ <http://www.emergencydispatch.org/CDE>



8.1. RECOMMENDATIONS

Training is essential to maintaining the knowledge and skills to efficiently and effectively work in a 9-1-1 center. There are many benefits of training, including the following:

- Improved employee morale and job satisfaction, which can lead to greater contributions to organizational success and creates the potential for less absenteeism and reduced turnover
- Less supervision as staff are well-acquainted with job responsibilities and expectations
- Fewer errors as staff are more proficient
- Improved efficiency and quality performance
- Risk management when human resources topics are included, such as ethics, diversity, human relations, and sexual harassment

Fayetteville and Cumberland 9-1-1 centers have already established a shared training program that works well for the agencies. Currently though, both Fayetteville 9-1-1 and Cumberland County 9-1-1 maintain individual records for their staff and oversee all respective recertification requirements. In a co-located environment, this is a duplication of effort. Resources can be more readily shared in a formalized, structured environment. As such, Mission Critical Partners recommends that the shared training program become more formalized when co-location is achieved. Mission Critical Partners recommends the creation of a shared training/QA⁴¹ coordinator or supervisor position, dependent on identified responsibilities and support staff allocations. The formalized training program and training/QA coordinator/supervisor position would need to be addressed in any governance agreement between the City and County to identify fiscal and personnel responsibilities. Ideally this position would have oversight for the training supervisor, training specialist, and QA specialist (Fayetteville 9-1-1) and the 9-1-1 trainers (Cumberland County 9-1-1), but this may not be practical as the training/QA coordinator/supervisor will be an employee of one of the agencies with potential oversight of staff from both the City and County. However, a well-developed governance agreement should be able to address any concerns the organizations may have. The potential exists for this shared program to continue to be very successful. If a shared coordinator/supervisor position is created, the training supervisor position (Fayetteville 9-1-1) may not be necessary and could be transitioned to an additional training specialist.

Mission Critical Partners recommends that OTJ training continue to be a function of the respective 9-1-1 center. As each center completes daily observation reports (DORs) for trainees, Mission Critical Partners recommends the use of a singular DOR to ensure consistency within a co-located center. This will ensure that each trainee is evaluated on the same set of performance parameters.

⁴¹ QA is discussed in section 9.



9. QUALITY ASSURANCE

When providing emergency dispatch, adherence to the structured protocol becomes critically important. “This is especially true for agencies that provide some measure of post-dispatch and/or pre-arrival instructions to callers, directing the caller to actively do something to stabilize a patient or begin to mitigate an emergency before the arrival of the dispatched first responders. Evaluating performance and compliance with protocols and procedures becomes as necessary as the provision of the protocol itself, since doing so incorrectly could wind up harming the patient or exposing the agency to liability.”⁴²

A QA/QI program is an essential component of 9-1-1 communications processes as it can improve the level of service provided to citizens, and is a best practice to improve overall PSAP performance. APCO provides the following definitions:

Quality Assurance (QA): All actions taken to ensure that standards and procedures are adhered to and that delivered products or services meet performance requirements.^[43]

Quality Assurance and Improvement Program: An on-going program providing at a minimum, the random case review evaluating emergency dispatch performance, feedback of protocol compliance, commendation, retraining and remediation as appropriate, and submission of compliance data to the Agency.

*Quality Assurance / Improvement Process: A formal assessment process by which actual performance, behavior, and outcomes are compared against established standards to ensure compliance, consistency, and accuracy in the delivery of quality service.*⁴⁴

APCO’s *Minimum Training Standards for Public Safety Telecommunicators*, APCO ANS⁴⁵ 3.103.2-2015, further states, “[t]he Agency shall provide the Telecommunicator with an overview of its quality assurance and/or quality improvement process(es) used to recognize excellence, identify areas needing improvement, and ensure performance measures are met.”⁴⁶

In April 2015, APCO and NENA published their *Standard for the Establishment of a Quality Assurance and Quality Improvement Program for Public Safety Answering Points* (APCO/NENA ANS 1.107.1.2015). The QA/QI process is designed to measure “the quality and performance of the service provided. This process includes, but is not limited to, the following criteria:

⁴² <http://www.9-1-1magazine.com/The-Numbers-Game/>

⁴³ Institute for Telecommunications Services, the research and engineering branch of National Telecommunications and Information Administration a part of the U.S Department of Commerce.

⁴⁴ <https://www.apcointl.org/doc/911-resources/apco-standards/75-minimum-training-standards-for-public-safety-telecommunicators/file.html>, sections 1.2.21 – 1.2.23, page 14 of 37.

⁴⁵ American National Standard

⁴⁶ <https://www.apcointl.org/doc/911-resources/apco-standards/75-minimum-training-standards-for-public-safety-telecommunicators/file.html>, section 2.2.16, pages 16 and 17 of 37.



- Analysis of performance trends;
- Compliance to protocols and standard operating procedures;
- Customer Service;
- Optimizing the use of agency resources;
- Overall performance of each employee; and
- Reviewing the operation as a whole⁴⁷

The standard further states that “PSAP agencies shall, in the normal course of business, review at least 2% of all calls for service. Where the 2% factor would not apply or be overly burdensome due to low or excessively high call volumes, agencies must decide on realistic levels of case review.”⁴⁸

IAED has established minimum case (call) review rules for agencies using the Academies’ protocols:

- “Agencies whose call volume is between 43,333 and 500,000 will be required to audit a percentage ranging between 3% and 1% ...
- Agencies whose call volume is below 43,333 will be required to audit 1,300 cases (25 per week)
- Agencies whose call volume is below 1,300 will be required to audit 100% of their cases
- Agencies whose call volume is above 500,000 will be required to audit 1% of their cases”⁴⁹

The minimum review rules for call volume apply to those incidents handled through protocol usage, which eliminates those calls that are self-initiated, for example.

CALEA’s *Standards for Public Safety Communications Agencies*, section 6.1.5, states:

- A written directive establishes a quality assurance program, and includes at a minimum:*
- a. documented quality checks of employees’ call handling and dispatch performance;*
 - b. frequency and quantity of quality checks;*
 - c. process for telecommunicator feedback; and*
 - d. management reporting and review process.*

Commentary adds that the “quality checks should cover all aspects of the employee’s performance to ensure compliance with agency directives...” This is a mandatory standard for agencies seeking accreditation.

NFPA 1221 section 7.7 states, “Communications centers shall establish a quality assurance/improvement program to ensure the consistency and effectiveness of alarm processing.” Explanatory material in Annex A states, “The purpose of the quality assurance program is to follow up

⁴⁷ https://c.ymcdn.com/sites/www.nena.org/resource/resmgr/Standards/APCO-NENA_ANS_1.107.1.2015_Q.pdf, section 5.4.1, page 23 of 80.

⁴⁸ Ibid., section 5.3.1.2, page 22 of 80.

⁴⁹ <http://www.emergencydispatch.org/AccredCalculator>



and review calls with communications center employees, improve procedures, and make the corrections needed to improve service and response. Generally accepted statistical methods should be used when selecting calls for review.”

Currently Cumberland County 9-1-1 supervisors conduct ten QA/QI reviews per week, while Fayetteville 9-1-1 has a QA specialist responsible for QA/QI reviews. As both 9-1-1 centers utilize IAED protocols, IAED review rules must be met. As both 9-1-1 centers’ call volumes are below 500,000, a sliding scale⁵⁰ is used. For example, an incident volume of 300,000 for Cumberland County 9-1-1 yields an audit percentage of 1.876 percent or 5,628 audits annually / 108 audits weekly. An incident volume of 310,000 for Fayetteville 9-1-1 yields an audit percentage of 1.832 percent or 5,680 audits annually / 109 audits weekly. It is unlikely that the number of audits required is consistently conducted due to other job responsibilities and time constraints.

9.1. RECOMMENDATIONS

A well-developed and defined QA program ensures consistency of operations and identifies problems and corrective actions to resolve the issues. In today’s 9-1-1 environment, having a QA program is the recognized standard of care. Through a QA program, calls are reviewed, feedback on performance is provided, and compliance with policies, procedures, standards, and best practices is ensured.

“Each call assessment should reflect the collective effort of the agency to efficiently, accurately, reliably answer calls – not as scrutiny of individual performance.”⁵¹

Gaps in employee knowledge, consistency, or procedures are likely to be uncovered through a uniform, objective QA evaluation process, which will ultimately provide opportunities for improvement.

Mission Critical Partners recommends the development of a shared QA/QI program when co-location is achieved. As noted above, Mission Critical Partners recommends the creation of a shared training/QA coordinator or supervisor position. The formalized QA/QI program and training/QA coordinator or supervisor position would need to be addressed in any governance agreement between the City and County to identify fiscal and personnel responsibilities. A well-developed governance agreement should be able to address any concerns the organizations may have regarding oversight responsibilities. If a shared coordinator/supervisor position is not created, a QA supervisor position may be necessary, dependent on identified responsibilities and support staff allocations.

All responsibility for evaluating calls and dispatches, and reviewing with employees, should be assigned to QA/QI program personnel, removing supervisors from the process. Employees often construe meetings with supervisors as negative, even though that is not the intent. A peer-to-peer review is better accepted. In addition, supervisory staff have operational responsibilities that demand their time and energy; removing QA reviews with employees allows supervisors to focus on their primary

⁵⁰ <http://www.emergencydispatch.org/AccredCalculator>

⁵¹ <http://www.powerphone.com/2013/11/qa-call-assessment-one-for-all-not-all-for-one/>



responsibilities. This does not imply that supervisors are not aware of the outcomes or of any issues, just that they are not responsible for reviewing the calls with employees.

From past experience, one person, on average, can review ten structured protocol calls in a standard work day, which includes time for review with telecommunicators. In this environment, not all calls are reviewed with staff members; primarily those with issues or “above and beyonds.” However, each employee should have at least monthly contact with a QA reviewer. Mission Critical Partners recommends a complement of two to three full-time QA positions. Currently, Fayetteville 9-1-1 has a QA specialist, while supervisors are responsible for QA in Cumberland County 9-1-1. This recommendation then requires two additional positions, which are over and above the current authorized telecommunicator positions. These staff positions would also review radio dispatches and radio traffic. These staff positions can be supported by training personnel as time allows. Ideally, these positions would report to the training/QA coordinator.

A formalized QA/QI program will demonstrate the City’s and County’s commitment to accountability and quality service in handling emergency calls for service.

10. STANDARD OPERATING PROCEDURES

SOPs are a critical component of a communications center’s operations as they serve to reduce the possibility of human error and provide guidelines for employees to follow. SOPs create consistency in the internal and external functions of the communications center, which is paramount when dealing with callers and emergency services personnel. The more consistent the process or procedure is from person to person, the less chance there will be for problems or issues with quality.

Well-developed SOPs provide the following:

- Guidance – provides information/direction during the course of one’s assigned duties
- Protection – provides liability protection if followed
- Accountability – to acknowledge responsibility to the public and organizations served
- Expectations – provides employees with what the organization expects of them
- Training – provides a basis for knowledge of organizational structure, operation, maintenance, etc.

SOPs also provide a method of communication. As improvements are made to operations or operational or technical processes, SOPs are updated and each update requires new training. This provides a method to communicate the process changes to all employees.

SOPs also ensure a communications center can meet the expectations of first responder agencies. SOPs can be developed to ensure a communications center’s policies and procedures align with responder agencies’ while considering the requirements and limitations of the center itself.



Both Fayetteville and Cumberland County have SOPs or standard operating guidelines (SOGs) for use within their respective center.

10.1. RECOMMENDATIONS

Mission Critical Partners recommends the development of a working group, prior to co-location, to review both agencies' SOPs and streamline operational processes where possible. This would not affect individual responder agency procedures, but rather those policies and procedures that would affect supervisors and telecommunicators in a co-located environment, such as call answering priorities, supervisory responsibilities, and relief for meals. The working group should include equal representation from both Fayetteville and Cumberland County. Representatives could include the 9-1-1 coordinators, supervisory personnel, training officers, and/or telecommunicators from both agencies. Care should be given not to create such a large working group that it becomes ineffective and achieving goals impossible.

Consideration should be given to policies and procedures in the areas of administrative, operations, and facilities. As the supporting entities remain the same (City and County), changes will likely not be needed in the area of human resources. Table 2 provides a list of suggested content that could be applicable to a co-located center. The 9-1-1 centers are encouraged to expand this list.

Table 2: Suggested SOP Content

Administrative	
Mission Statement	Internal/External Correspondence
Code of Ethics	Media Contacts/Press Releases
Organizational Structures	Release of Recordings
Organizational Charts	FCC/Radio Operation
Training Parameters	Dress Code
Roles and Authority	Computer/Internet Use
Agency Files	Lost or Damaged Property
Complaints	
Operations	
General Rules	Environmental Health
Answering Procedures	Emergency Management
Protocol Usage	Radio Communications
Protocol Suspension	Paging
Street/Road Closings	Emergency Media Notification
Premise Information	Radio System Operations
Exigent Circumstances	Records Management
Telematics Calls	Internal Notifications
Language Line	Severe Weather
Emergency Services for the Deaf	Repossessions
Manual Operations	Incident Cancellation Requests



Mobilization of Personnel	Burning Bans
Major Emergency Incidents	Scene Safety
Critical Incidents	Special Events
Homeland Security	
Facilities	
Security	Alternate Power Sources
Visitors	Equipment Malfunction Notifications
Facility Maintenance	Radio System Failure
Emergency Evacuation of PSAP	Emergency Operations

10.1.1. SMART

SMART is an acronym used to describe how objectives should be set. Originally SMART was used in setting personal performance goals or for project management, yet the concept can also be applied to SOPs, which are used to guide actions. While there is no true consensus as to what the acronym letters stand for, a general acceptance is as follows:

- Specific
- Measurable
- Achievable
- Realistic
- Time

An individual standard should specify what needs to be achieved, be able to be measured as to whether the standard is met, be achievable, be realistic (can the standard be met with the resources available), and describe a time frame. Time will not need to be specified in each SOP. Some SOPs may require annual reports, weekly tests, or occur on a daily basis. “Time” can also mean trackable, tangible, or traceable.

The SMART approach is a test to be carried out after writing a standard to test its validity; it is not an order to be followed or a constraint to be applied when developing goals or objectives. While not all standards will fit this mold, following this model leaves little doubt as to what is expected.



PART 2—TECHNOLOGY AND EQUIPMENT

11. TECHNICAL ASSESSMENT

The existing systems in use at Fayetteville 9-1-1 and Cumberland County 9-1-1 are good products that provide a viable base for their migration, or similar product, into a new co-located facility.

11.1. GENERAL OBSERVATIONS

11.1.1. *Fayetteville*

Workstation console furniture is from Evans. Each workstation, depending on the position, in the 9-1-1 center has four to eight ~24-inch monitors to view customer premise equipment (CPE), CAD system, and radio system information. Workstations are fed power and communications cabling distribution through a raised floor. While each workstation has individual environmental controls, the 9-1-1 center itself experiences heat issues. The use of supplemental air is often needed to assist the cooling system.

There are several large format (~42-inch) wall-mounted monitors in the 9-1-1 center for news and television (TV) programming via cable television (CATV) connection. A few positions monitor closed-circuit TV (CCTV) building surveillance feeds. In the current configuration, not all monitors can be seen. Some workstations are located such that telecommunicators' backs are to the monitors.



Figure 5: View of Consoles

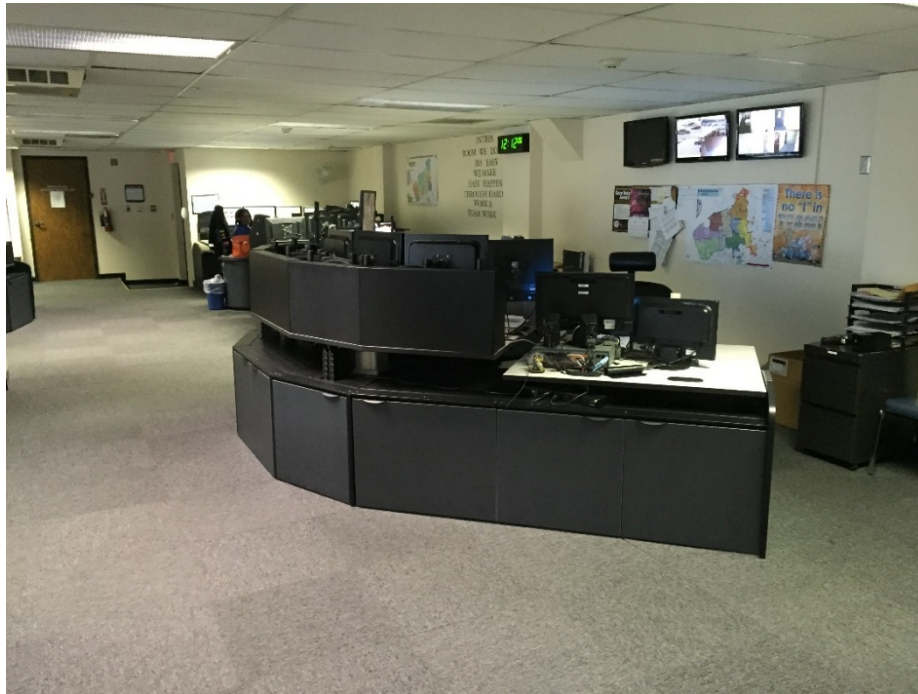


Figure 6: View of Supervisor's Console

Power is supplied through a 50 kilovolt-ampere (kVA) Liebert® Npower™ uninterruptible power supply (UPS). The Liebert® UPS unit in the 9-1-1 center equipment room supports common equipment and workstations. The UPS is backed up by the building's emergency generator, which is not dedicated to the 9-1-1 center.

A Spectracom NetClock provides network time synchronization for the 9-1-1 center.

11.1.2. Cumberland County

Workstation console furniture is from Russell Bassett. Each workstation, depending on the position, in the 9-1-1 center has six to eight ~24-inch monitors to view CPE, CAD system, and radio system information. Workstations are fed power and communications cabling distribution through a raised floor. Each workstation has individual environmental controls.

There are several large format (~42-inch) wall-mounted monitors in the 9-1-1 center for news and TV programming via CATV connection. In the current configuration, not all monitors can be seen. Some workstations are located such that telecommunicators' backs are to the monitors.



Figure 7: View of Console Workstation



Figure 8: View of Console Workstation (2)



Power is supplied through a 40 kVA APC Symmetra UPS. The Symmetra UPS unit in the 9-1-1 center equipment room supports common equipment and workstations. The UPS is backed up by the building's Cummins emergency generator, which is not dedicated to the 9-1-1 center.

A Spectracom NetClock provides network time synchronization for the 9-1-1 center.

11.1.3. Recommendations

Fayetteville 9-1-1 has 15 console workstations, five of which support call taking only and ten of which support both call taking and dispatch functionality; there is a sixteenth position in the EOC. Cumberland County 9-1-1 has ten console workstations, all of which support both call taking and dispatch functionality.

Mission Critical Partners recommends 30 console workstations in a co-located environment. The additional five workstations would be allocated to support future growth and training.

11.2. CUSTOMER PREMISES EQUIPMENT

11.2.1. Fayetteville

The City recently converted from Intrado's Positron VIPER CPE system to the CenturyLink One i3 solution, manufactured by Intrado. The new solution is a hosted system that provides enhanced call taking efficiencies, high availability, automatic call distribution (ACD), and remote deployment capabilities. The cloud-based service provides users with the same or similar services as an on-site server-based application. The new system is Next Generation 9-1-1 (NG9-1-1)-compatible.

This new system provides call accounting information through Emergency Call Tracking System (ECaTS) software utilized by the State of North Carolina⁵². It also provides ANI and ALI data for use by the call takers and the Intrado's Positron management information system (MIS) solution.

The City has 15 licensed call taker positions. These positions are interfaced with a dedicated computer equipped with a headset, Genovation 24-button keyboard, and a supervisor plug-in port.

The City has seven 9-1-1 trunks and three administrative lines.

11.2.2. Cumberland County

The County currently uses Intrado's Positron VIPER CPE system, yet has plans to convert to the CenturyLink One i3 solution.

⁵² The North Carolina 911 Board (911 Board), through an agreement with Direct Technology, provides ECaTS to each primary PSAP in the state. The 911 Board uses this system to verify compliance with standards.



The County has ten licensed positions on the VIPER system. These positions are interfaced with a dedicated computer equipped with a headset, Genovation 24-button keyboard, and a supervisor plug-in port.

The County has twelve 9-1-1 trunks (six wireless and six wireline) and ten administrative lines.

11.2.3. Recommendations

Based on identified staffing needs, the City will still require a minimum of 15 workstations and the County will still require a minimum of 10 workstations. Each workstation currently supports 9-1-1 call taking, although not all support radio. In a co-located environment, the CPE solution should be configured to support 9-1-1 call taking at each workstation.

Providing text-to-9-1-1 service is often considered the first step toward NG9-1-1. Increasingly, wireless and voice over Internet Protocol (VoIP) subscribers expect that the PSAPs that serve them are capable of providing this life-saving service. Neither Fayetteville 9-1-1 nor Cumberland County 9-1-1 provide this service. Mission Critical Partners recommends that both Fayetteville 9-1-1 and Cumberland County 9-1-1 take the necessary steps now to deploy a text-to-9-1-1 capability. Mission Critical Partners recommends contracting with a cloud-based service (via Internet access) from Intrado with a backup stand-alone computer on-site. This establishes the ability to receive texts, without utilizing existing 9-1-1 trunks, at a relatively low cost. As a backup, additional circuits may be installed and dedicated for text-to-9-1-1 service.

In a co-located environment, it is expected that both Fayetteville 9-1-1 and Cumberland County 9-1-1 will continue to utilize the same CPE. Based on recent and expected implementation, this will likely be the CenturyLink One i3 solution. As such, there should be little impact to staff operations. Proper planning will be necessary, however, to ensure proper configurations of the CPE to maximize efficiencies of a co-located center.

Mission Critical Partners recommends that a 9-1-1 trunk utilization study be conducted on a regular basis to ensure adequate trunking is in place to support the call volume.

11.3. COMPUTER AIDED DISPATCH

In March 2012, Fayetteville and Cumberland County entered into an MOU that allows both 9-1-1 centers to operate on a shared CAD system. The current CAD system is from SunGard, which operates OSSI software version 15.1.

Cumberland County Information Technology (IT) is responsible for maintaining the CAD system environment. Cumberland County also has responsibility for the accuracy of CAD software and maps in the training and live CAD environment. Fayetteville IT is responsible for maintaining a current records management system (RMS) environment to facilitate compatibility with the CAD system.



Fayetteville IT supports all network issues within Fayetteville 9-1-1 and provides updates to Cumberland County IT as needed.

All updates require prior approval from the CAD Steering Committee and are implemented in the training environment to allow for testing prior to being promoted to the live system.

The MOU will continue until terminated by either party. The terminating party has to provide a minimum of 18 months notification of intent to terminate to allow for funding allocation. The City and County agreed to seek ways to maintain service levels to the community in the event the MOU is terminated.

11.3.1. *Fayetteville and Cumberland County*

Fayetteville 9-1-1 and Cumberland County 9-1-1 have 20 and 15 CAD licenses, respectively.

The CAD system interfaces with SunGard's RMS, an OSSSI geographical information system (GIS), FIREHOUSE reporting software, IAED's ProQA software, and NCIC/DCI.

While 9-1-1 center staff reported some technology support issues with City and County IT staff, staff are overall satisfied with the functionality and features of the current CAD system.

11.3.2. *Recommendations*

Mission Critical Partners has no recommendations regarding the shared CAD system, although additional licenses will likely be needed in a co-located center, especially if administrative support personnel increase. There is concern, however, regarding the technology support received from the IT departments. Whether the issues are real or perceived, this should be addressed prior to transitioning to a co-located environment. Shared, dedicated IT support is discussed in section 14, Technology Support.

11.4. LOGGING RECORDER

11.4.1. *Fayetteville*

Fayetteville 9-1-1 uses a 120-channel Eventide NexLog 740 logging recorder from Carolina Recording. Phone and radio communications, as well as screen captures, are recorded. Fayetteville 9-1-1 is satisfied with the functionality and features of the recording system.

11.4.2. *Cumberland County*

Cumberland County 9-1-1 uses a 96-channel Inform V6 logging recorder from Nice Systems. Phone and radio communications are recorded. While the Inform V6 is capable of screen-captures, the County's system is not configured for it. Cumberland County 9-1-1 is satisfied with the functionality and features of the recording system.



11.4.3. Recommendations

In a co-located environment, a single logging recorder system is preferable. Mission Critical Partners recommends that Fayetteville 9-1-1 and Cumberland County 9-1-1 review the two systems in use, as well as other products if desired, to select a single vendor solution. The system should be NG9-1-1-compatible. In addition to current features, the system should allow geofence search capabilities and provide enhanced reporting and call evaluation functions, instant recall, advanced analytics, and flexible archive capabilities.

11.5. GEOGRAPHIC INFORMATION SYSTEM

11.5.1. Fayetteville and Cumberland County

Cumberland County GIS provides all GIS data layers for 9-1-1 operations through the OSSI software. Cumberland County GIS utilizes the Environmental Services Research Incorporated (Esri) ArcGIS software platform.

11.5.2. Recommendations

While today's 9-1-1 centers use GIS data for call handling and dispatching, in an NG9-1-1 system, GIS data is used for location validation and routing of emergency calls to the proper PSAP, and is used to locate wireless 9-1-1 callers. GIS data becomes the core database in NG9-1-1. While GIS data may be "good enough" to meet the demands of call handling and dispatch, the quality and demands of GIS data greatly increase in NG9-1-1.

High quality, current, accurate, and standardized GIS data is vital to NG9-1-1. NENA has developed many GIS-related standards and best practices as a result. NENA 02-014, *GIS Data Collection & Maintenance*, which is currently being updated, provides "PSAP management, vendors, and other interested parties necessary guidelines for collecting and maintaining GIS data."⁵³ High-level testing of available GIS data is addressed in NENA 02-010, *Standard Data Formats for 9-1-1 Data Exchange & GIS Mapping*. Esri database creation and maintenance should include conformance to NENA 02-010, if it does not already.

The NENA standard is a 98 percent match rate between GIS, Master Street Address Guide (MSAG), and ALI databases before using GIS data in a NG9-1-1 system.⁵⁴ Having GIS, MSAG, and ALI datasets in agreement is crucial to providing telecommunicators with the information they need to correctly verify the location of a caller, understand where units are available for dispatch, and provide efficient emergency response. Comparing GIS data to the MSAG and ALI data uncovers discrepancies between the databases. These discrepancies may be used to determine data quality issues. Discrepancies

⁵³ <http://www.nena.org/?page=gisdatacollection>

⁵⁴ Reference NENA 71-501, Synchronizing Geographic Information System Databases with MSAG & ALI, Version 1.1, September 8, 2009 at: https://www.nena.org/?page=synch_gis_msag_ali



uncovered in GIS, MSAG, and ALI data will influence the proper display of call locations on CAD system map displays. NENA 71-501, *Synchronizing Geographic Information System Databases with MSAG & ALI*, walks one through the synchronization process and should be used as a guide to develop a plan for regularly executing the synchronization and comparison process.

NENA has other standards and best practices directly related to GIS data requirements in NG9-1-1 under development. These include *NG9-1-1 GIS Data Model*⁵⁵; NENA-STA-005.1-201X⁵⁶, *Provisioning and Maintenance of GIS Data to ECRF/LVF*; and the next revision of *Detailed Functional and Interface Standards for the NENA i3*, to be renumbered as NENA-STA-010⁵⁷.

Mission Critical Partners recommends that Cumberland County confirm that the GIS data is compliant with NENA standards and best practices and is verified through routine synchronization and audits.

11.6. MASS NOTIFICATION SYSTEM

11.6.1. Fayetteville

The Fayetteville Police Department uses Reverse 911® marketed by Airbus DS Communications to notify residents in a defined geographic area during emergency incident. Fayetteville 9-1-1 does not use a reverse notification system.

11.6.2. Cumberland County

Cumberland County uses CodeRED service by Emergency Communications Network for reverse notification. CodeRED is a high-speed, web-based, emergency and mass notification system. The service allows a 9-1-1 center to send phone calls, text messages, emails, and social media messages through the public safety alerting application, CodeRED Mobile Alert. The system can also integrate with IP-based devices such as digital signs. CodeRED is a Software as a Service (SaaS) solution, and does not require individual agencies to purchase or lease hardware or phone lines to access the system.

11.6.3. Recommendations

While mass notification systems may not see extensive use, they do serve a valuable purpose. Mass notification systems were used in critical incidents such as the Sandy Hook School shooting, the Boston Marathon bombings, and the Charleston AME Church shooting. Mass notification systems can also be used to notify residents of severe weather and the need to evacuate a particular area.

⁵⁵ <http://www.nena.org/?page=NG911GISDataModel>

⁵⁶ <https://www.nena.org/news/238115/NENA-ECRFLVF-Standards-Available-for-2nd-Public-Review-and-Comment.htm>

⁵⁷ http://www.nena.org/?page=i3_Stage3



The major forces driving this market are the growing need for public safety, increasing awareness for emergency communication solutions, requisite for business continuity, and the trend towards mobility is rising. Hence, the adoption of mass notification solutions is increasing. Also, the enterprises are expected to follow business continuity and disaster recovery and public safety compliance standards which are boosting the sales of mass notification solutions. Most of the enterprises across different verticals are actively formulating policies and procedures to ensure operational safety and minimizing loss of life and loss of property in case of emergencies.⁵⁸

Mission Critical Partners recommends that a reverse 9-1-1-type mass notification system is available within the co-located environment, particularly as Fort Bragg is partially located in Cumberland County. As Cumberland County already uses CodeRED, Mission Critical Partners recommends this system remain. The Fayetteville Police Department can continue to utilize Reverse 911® for its own purposes.

11.7. CONNECTIVITY

11.7.1. Fayetteville

Fayetteville 9-1-1 is supported by Fayetteville IT. The IT department provides connectivity to cloud-based services and standard administrative applications.

Fayetteville 9-1-1 has Internet services provided by City IT through a state contract.

A dark fiber connection from the Public Works Commission to the Cumberland County 9-1-1 provides connectivity for shared services such as the CAD system.

CenturyLink serves as the LEC and provides connectivity via a multi-protocol label switching (MPLS) circuit as part of the CenturyLink One i3 solution.

11.7.2. Cumberland County

Cumberland County 9-1-1 is supported by County IT. The IT department provides connectivity to cloud-based services and standard administrative applications. According to staff, County IT has difficulty providing the required amount of support for mission-critical operations, resulting in non-IT personnel, such as the 911 Director, performing support.

Cumberland County 9-1-1 has Internet services provided by County IT through a state contract.

A dark fiber connection from the Public Works Commission to Fayetteville 9-1-1 provides connectivity for shared services such as the CAD system.

⁵⁸ <http://www.marketsandmarkets.com/PressReleases/mass-notification.asp>



CenturyLink currently provides all CAMA trunks for 9-1-1 call delivery. Cumberland County is in the process of transitioning to the CenturyLink One i3 solution. CAMA trunks will be replaced with CenturyLink MPLS circuits for connectivity.

11.7.3. Recommendations

Services to a new co-located facility should be constructed in diverse and redundant paths. This should include connectivity to City IT and County IT, the backup 9-1-1 center, the Internet, radio towers, and all cloud-based services. The preferred method of communicating would be through fiber-optic cabling. A partnership between the City and the County, and possibly neighboring PSAPs would allow for increased redundancy and alternate pathways for resiliency.

Mission Critical Partners recommends the continued use of the Public Works Commission's fiber network for connectivity. Further investigation is required to discover all available commercial fiber providers able to meet diverse and redundant connectivity options.

Sharing of all communications media will provide additional pathways, allowing the co-located facility to overcome any failures of connectivity components.

In the long-term, expanding the fiber connectivity will become important and a necessary step towards the implementation of NG9-1-1. Regardless of whether the fiber-optic cable is owned or leased, it is imperative that such a capability is implemented or the full potential of NG9-1-1 will not be realized.

A fiber-optic connection to the backup facility would allow for seamless failover should the primary location be taken out of service, or to overflow in the event of increased demand. The fiber connection would also provide a level of performance that is equal to the primary co-located facility, with degradation.

Fayetteville 9-1-1 and Cumberland County 9-1-1 have expressed the desire for the 9-1-1 trunking configuration in a co-located facility to remain as it is today; trunking separated by jurisdiction. Utilizing available technology and proper configuration, telecommunicators in a co-located environment could answer any incoming 9-1-1 trunk line, if this is the direction the centers chose to go. Fayetteville 9-1-1 and Cumberland County 9-1-1 are encouraged to completely explore all impacts when configuring CPE equipment to maximize the efficiency of the telecommunicators in the call taking configuration.



12. TECHNOLOGY SUPPORT

Fayetteville 9-1-1 and Cumberland County 9-1-1 staff both expressed concerns with the current technology support of their mission-critical applications. Currently, City IT supports all technology for Fayetteville 9-1-1 with the exception of the CAD software. County IT supports all technology for Cumberland County 9-1-1, including the CAD software for both 9-1-1 centers. Often staff from the 9-1-1 centers' find themselves supporting the technology that is used in their respective center because of the highly specialized nature of the applications and technology.

Technology is and will continue to be a key component to the success of any 9-1-1 operation. Each technology system in use in a 9-1-1 center provides a critical lifesaving function to support emergency response. The technology must remain operational 24 hours a day, 7 days a week. Often, general IT support is not available to meet the demands of 9-1-1 center operations. It has become a common trend among larger 9-1-1 centers to employ full-time technology staff to support 9-1-1 operations. This allows technology staff to specialize in the equipment associated with a 9-1-1 center, such as NG9-1-1 applications. This specialization promotes improving operational efficiency through the use of technology.

Mission Critical Partners recommends the development of a shared 9-1-1 IT program when co-location is achieved. The formalized 9-1-1 IT program would need to be addressed in any governance agreement between the City and County to identify fiscal and personnel responsibilities. The 9-1-1 IT staff could be charged with support of the network, CPE, CAD system, and radio systems, to name a few, depending on their area of expertise. IT staff's skills may need to be developed over time. A shared 9-1-1 IT program will maximize investment and reduce the workload for both City IT and County IT.

13. RADIO CONSOLE SYSTEMS

Fayetteville and Cumberland County operate disparate radio systems. Fayetteville 9-1-1 operates on an 800 megahertz (MHz) core from the City of Durham, which was turned up in the fall of 2015. Cumberland County 9-1-1 operates on the State's 800 MHz Voice Interoperability Plan for Emergency Responders (VIPER) system. Both systems are Project 25⁵⁹ (P25)-compliant. Both 9-1-1 centers operate Motorola MCC7500 radio consoles.

13.1. CONSOLE SYSTEM CONFIGURATION

The MCC7500 console systems in place at Fayetteville 9-1-1 and Cumberland County 9-1-1 are recent upgrades and should be migrated to a new co-located facility.

⁵⁹ P25 is a suite of standards from APCO for interoperable digital two-way radio communications.



The radio systems in Fayetteville and Cumberland County have a technical limitation that allows each system to have a direct, proprietary wireline connection to a single radio system. Due to this limitation, there are two viable options for radio consoles at the co-located facility to allow console connectivity from both console systems to both radio systems: a single console system using a console sub-system interface (CSSI) or migration of both console systems. If both console systems are migrated to the co-located center, CSSI could still be implemented on one or both systems to provide additional functionality on secondary networks.

CSSI provides a standards-based connection between the P25 radio systems and offers additional functionality when compared to over-the-air solutions that are currently in use. The CSSI product offered by Motorola supports the following features:

- Console Priority
- Clear or Encrypted Group Calls
- Push-to-talk (PTT) Identification (ID) Display
- Emergency Alarm
- Emergency Group Call
- Emergency Cancel
- Phase 1 Frequency Division Multiple Access⁶⁰ (FDMA) and Phase 2 Time Division Multiple Access⁶¹ (TDMA) Group Call
- Phase 1 FDMA and Phase 2 TDMA Unit-to-Unit Call
- Announcement Group Call
- Call Alert

Perhaps the most important feature provided by the CSSI is console priority, providing console positions higher priority than subscribers on the system. If a console and a subscriber try to key up the same talk group simultaneously, the console would receive the PTT request.

CSSI has limitations when compared to a direct, proprietary connection. Unit-to-unit calls and call alert features would only be available between radios on the home system and the consoles. Also, the following features are not supported over the CSSI from Motorola:

- Radio Inhibit – Disables a radio believed to be improperly operating on the network. This feature can be performed at the network management terminal.
- Status Update – Reports the specific radio site to which a radio is affiliated. This feature can be performed at the network management terminal.
- Radio Unit Monitor – Remote keying of a user radio upon request from a dispatch operator to listen to activity at the user location.

⁶⁰ FDMA is a channel access method that gives users an individual allocation of one or several frequency bands. FDMA coordinates access between multiple users. [https://en.wikipedia.org/wiki/Frequency-division_multiple_access](https://en.wikipedia.org/wiki/Frequency_division_multiple_access)

⁶¹ TDMA is also a channel access method. TDMA allows several users to share the same frequency channel by dividing the signal into different time slots. https://en.wikipedia.org/wiki/Time_division_multiple_access



- Dynamic Dual-Mode Talkgroups (supported, but not recommended by Motorola) – Supports talkgroups that can dynamically switch between P25 Phase I and P25 Phase II. Both Fayetteville and Cumberland County operate P25 Phase I systems, and therefore this feature is not needed.

To Mission Critical Partners' knowledge, none of these features are utilized by either Fayetteville or Cumberland County.

13.1.1. Single Console System with CSSI

In a single console system, one of the two radio systems would need to be selected for the direct, proprietary wireline connection. This system would be considered the “home” radio system by both Fayetteville 9-1-1 and Cumberland County 9-1-1 radio console positions. The CSSI-connected radio system would be designated as the CSSI system.

Depending on which system is chosen as the home system, CSSI system functionality would be gained for one of the 9-1-1 centers. However, functionality could be lost for the other 9-1-1 center on what is currently their home system. As noted above, there appear to be no known features utilized by Fayetteville or Cumberland County that would be lost.

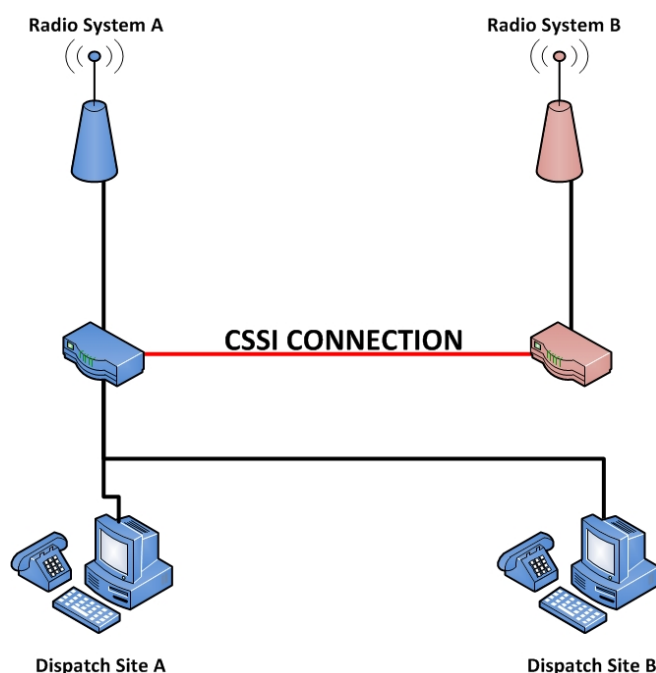


Figure 9: Single Console System with CSSI



In the example in figure 9, radio system “A” is chosen as the home system. Dispatch site “A” would maintain their proprietary wireline interface to radio system “A” and would gain CSSI functions on radio system “B.” Dispatch site “B” would gain the benefits of a proprietary wireline interface on radio system “A,” but would lose functionality with the CSSI connection to system “B.”

13.1.2. Migration of Both Console Systems

The migration of both console systems would entail co-locating both radio console systems in the co-located facility and moving the termination points of the existing fiber connections to the new facility. This option would provide both 9-1-1 centers the same console functionality in place today. The cost to relocate both radio console systems is estimated at \$250,000, not including the new radio consoles that would be needed for the additional workstations that are recommended.

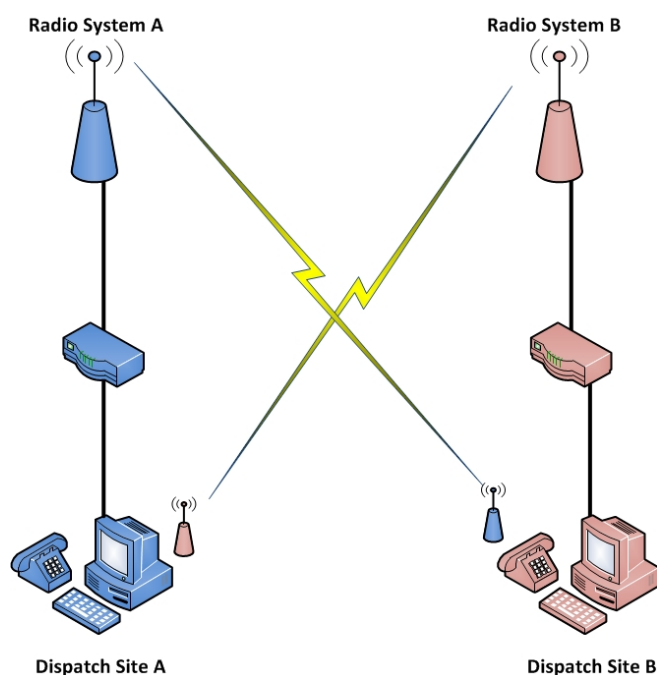


Figure 10: Maintaining Two Console Systems

Fayetteville 9-1-1 currently operates on the VIPER system with portable radios, while Cumberland County 9-1-1 currently operates on Fayetteville’s system with control stations. The current control stations and portables used to talk across systems would also need to be maintained. Figure 10 depicts the two-radio console system configuration, using over-the-air means to talk across radio systems.

This configuration would limit the ability of the two radio console systems to provide backup dispatch capabilities for the other. In the event of a radio console system failure, the other system would lack a true console integration, with operators dispatching from a subscriber device over the air.



Mission Critical Partners recommends that a new antenna system for Cumberland County 9-1-1 control stations is implemented at the co-located facility to ensure the control stations achieve reliable over-the-air communications. The cost for a new antenna system is estimated at \$50,000.

Mission Critical Partners also recommends the construction of a 100-foot tower at the co-located facility to provide appropriate mounting locations for control station antennas as well as Auxiliary Communications Services (ACS) equipment. The tower provides additional vertical spacing between antennas, minimizing interference. The estimated cost for a 100-foot self-supporting tower is \$100,000.

The tower and foundation should be designed according to Telecommunications Industry Association (TIA)/Electronic Industries Alliance (EIA)-222-G standard. Expected current loading should be accounted for in the design along with anticipated future loading. If future loading is unknown, a growth factor of 50 percent additional loading should be used. The tower should be constructed of high-strength, hot-dipped galvanized steel and assembled according to manufacturer's guidelines. The tower should be grounded according to best industry practices, such as Motorola R56®, *Standards and Guidelines for Communication Sites*. A cable ladder and ice bridge should be installed at the time of tower construction.

Pre-construction work for the tower should be started as soon as commitment to constructing the new facility is made. A 1-A survey of the site should be conducted to determine exact placement of a tower. The results of the 1-A survey can be used to start Federal Aviation Administration (FAA) and environmental study work. A core boring and the resultant geotechnical report at the site can be provided to vendors during the procurement process, resulting in an accurate foundation design early in the process and minimizing unexpected costs.

Coverage should be tested inside the co-located facility for the portable radios used by Fayetteville 9-1-1 telecommunicators to access the VIPER system.

13.1.3. Two Console Systems with CSSI

Both agencies would gain console features on neighboring radio systems with the implementation of CSSI in the two-radio console system configuration. One of the more important features would be console priority. CSSI connections would not be dependent on over-the-air coverage, but would rely on a wireline connection to neighboring systems.

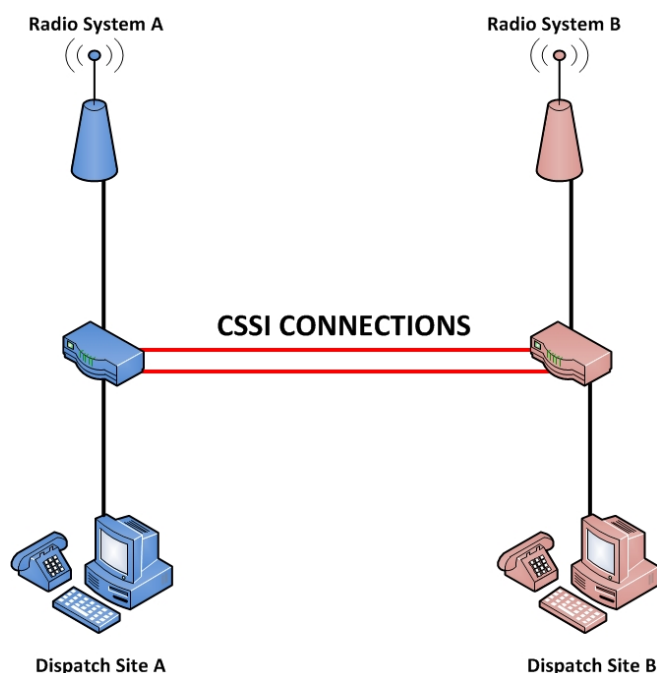


Figure 11: Two Console Systems with CSSI

Existing connectivity between each radio console system and its respective radio system could be used to provide the CSSI connection. Exact bandwidth requirements would need to be provided by the manager of each radio system. Depending on the bandwidth required, the capacity of the Ethernet connections may need to be increased.

The CSSI 8000 offered by Motorola provides for 24 talk paths on the neighboring radio system. This exceeds the present interoperability needs of both 9-1-1 centers. Each 9-1-1 center would need to implement its own CSSI connection. The cost for implementation of a single CSSI connection is \$75,000. This cost is in addition to the previously listed costs for relocation, tower, and antenna systems, which would be incurred regardless of CSSI implementation.

13.2. CONSOLE WIRELINE CONNECTIVITY

Fayetteville 9-1-1 currently connects to the Durham core via a fiber connection. Mission Critical Partners recommends this fiber connection is replicated at the co-located facility.

Cumberland County currently connects to the VIPER system core via a leased Ethernet connection. The North Carolina State Highway Patrol, which manages the VIPER system, does not allow connection to the system via microwave. As a result, Mission Critical Partners recommends that the existing leased Ethernet connection is replicated at the co-located facility.



13.3. RECOMMENDATIONS

Mission Critical Partners recommends implementing CSSI connections while maintaining each console system. This solution allows each radio console system to maintain current operations on its primary radio system, while improving console functionality on the neighboring radio system. CSSI connections will also enable the two radio console systems to be better suited to serve as a redundant backup for the other.

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PART 3—FACILITY NEEDS

14. FACILITY REQUIREMENTS

The shared CAD system demonstrates the ability and willingness of the City and County to partner and collaborate in a way to best serve the community at large. Continuation and expansion of collaborative efforts will enable more shared services opportunities.

A new facility should be designed and built with a “last building standing” mindset. This means that the construction of each system can withstand any anticipated natural or man-made event, including disruption of utilities and services. A new 9-1-1 facility design should also include redundant and diverse systems to maximize fault-tolerance and resiliency. Mission Critical Partners recommends early investigation into the availability of a secondary power feed from an alternate power grid.

NG9-1-1 technology enables the sharing of resources, data, systems, and information across municipal, county, regional, and state boundaries. The integrity of an NG9-1-1 system requires agencies to consistently follow best practices and comply with applicable standards. Mission Critical Partners recommends alignment with NENA standards and best practices, particularly those related to i3 architecture, which provides the technological foundation for NG9-1-1 services.

The ability to share communications infrastructure is one of the first steps to deploying NG9-1-1 technology. Key strategic elements for implementing NG9-1-1 include the following:

- Emergency Services Internet Protocol (IP) network (ESInet) development and implementation
- Standards-based approach
- IP-capable PSAPs
- Geographic-based routing and database integration
- NG9-1-1-capable applications
- Convergence of networks and systems to implement system-of-systems
- Best practices approach

The average life cycle of emergency communications equipment and software is three to five years. Given this, it is important to remember that the design and construction period of this project may extend past the expected life of the existing equipment. New versions of, or upgraded equipment will be investigated as the project progresses in order to provide the state-of-the-art technology that a facility like this requires. The correct amount of time for this investigation would be calculated by working backwards from the anticipated move in date, minus the training time, minus the installation and testing time, minus the procurement processing time.

As the design effort moves forward, all support systems and spaces need to be planned to provide the highest level of redundancy and diversity. The mission-critical systems in 9-1-1 centers need to be fully



functional 24 hours a day, 7 days a week, with little downtime. Any unscheduled downtime can negatively affect performance.

The ability for telecommunicators and supervisors to have a good vantage point of wall-mounted informational monitors is critical. In addition to correct viewing angles, heights, and distances, the ability to control and change the images as needs arise will make those images more valuable. Images and information should also be available in administrative offices, situation rooms, training rooms, etc.

Workstation console layout should allow telecommunicators uncluttered and easy access to all 9-1-1 systems, while allowing support staff access to the equipment and cabling needed to keep them functioning at their peak performance. Mission Critical Partners recommends 30 console workstations in the operations area of a co-located facility.

A facility feasibility assessment is a critical process in determining support space requirements for a co-located emergency communications center. SCHRADERGROUP architecture conducted a programming exercise to determine the space requirements for a new facility. SCHRADERGROUP architecture also reviewed three candidate sites provided by the City and County as potential locations and conducted threat assessments for each.

SCHRADERGROUP architecture's report, which includes the programming study, threat assessments, building layouts and elevation alternatives, is provided under separate cover.

15. BACKUP CAPABILITY

The 2013 session of the General Assembly of North Carolina introduced amendments to General Statute 62A, Public Safety Telephone Service and Wireless Telephone Service, to include provisions for a backup PSAP (Senate Bill 797). Appendix A contains a copy of Senate Bill 797.

§ 62A-40, Definitions, adds 'Back-up PSAP.' Text is as follows: *"Back-up PSAP. – The capability to operate as part of the 911 System and all other features of its associated primary PSAP. The term includes a back-up PSAP that receives 911 calls only when they are transferred from the primary PSAP or on an alternate routing basis when calls cannot be completed to the primary PSAP."*

§ 62A-42(a)(1), Powers and duties of the 911 Board, was rewritten to include *"ensure individual PSAP plans incorporate a back-up PSAP..."* § 62A-42(a)(4) states, *"To establish policies and procedures to fund advisory services and training for PSAPs, to set operating standards for PSAPs, and back-up PSAPs and to provide funds..."*

§ 62A-46(a), Fund distribution to PSAPs, was amended to include the following: *"The Board may reduce, suspend, or terminate distributions under this subsection if a PSAP does not comply with the requirements of this Article."*



§ 62A-46(e)(4a) was added and states, “A PSAP must have a plan and means for 911 call-taking in the event 911 calls cannot be received and processed in the primary PSAP. The plan must identify the alternative capability of taking the redirected 911 calls. This subdivision does not require a PSAP to construct an alternative facility to serve as a back-up PSAP.”

The General Assembly ratified the bill on July 3, 2014; the bill was approved on July 9, 2014. Changes to the Act are effective when the Act becomes law and apply to 9-1-1 fund distributions made on or after July 1, 2016.

In essence, all primary PSAPs are mandated to have a functioning backup PSAP that can perform the same tasks and duties as the primary. The North Carolina 911 Board has stated in its operating standards that the backup PSAP, when staffed, shall be capable of performing the emergency functions performed at the primary. The backup PSAP shall be separated geographically from the primary PSAP at a distance that ensures the survivability of the alternate center.

Today, Fayetteville 9-1-1 and Cumberland County 9-1-1 have independent backup and evacuation plans. Because the two 9-1-1 centers are physically located in different facilities, they are able to provide support to each other during an evacuation. In a co-located facility, if evacuation is necessary, both 9-1-1 centers would need to evacuate simultaneously.

There is the potential for natural and man-made disasters to threaten a co-located 9-1-1 center in Cumberland County. There is no location on which a new facility could be sited that is completely immune to threats. The critical nature of the 9-1-1 services provided by City and County requires that appropriate contingency planning be in place to ensure continuity of operations in the event the co-located center requires evacuation.

15.1. RECOMMENDATIONS

The City and County will need to consider their next course of action regarding a backup center and complying with general statute. Mission Critical Partners recommends that as part of the co-location and construction of the new facility, a comprehensive emergency contingency plan be developed to serve both 9-1-1 centers. Management staff from both 9-1-1 centers have experience developing their respective plans and should collaborate on a plan for the co-located center.

Fayetteville and Cumberland County would be prudent to consider the development of a backup facility while design and construction of a new co-located facility is underway. Equipment, such as workstation furniture, that is in use today, but will be procured new for the co-located center, could be repurposed for the backup center if useful life remains.

NENA-INF-017.2-2015, *Communications Center/PSAP Disaster and Contingency Plans Model Recommendation*,⁶² provides guidance for developing a backup plan along with considerations for the

⁶² https://c.ymcdn.com/sites/www.nena.org/resource/resmgr/Standards/NENA-INF-017.2.2015_Disaster.pdf



backup center. NENA recommends that the backup center be adequate to meet the basic needs of the 9-1-1 system, but does not have to be a mirror image of the primary communications center.

Fayetteville and Cumberland County staff have noted that the vacated Godwin-Falcon Fire Department, located at 7739 Godwin Falcon Road is a potential site for a backup center. While Mission Critical Partners was not commissioned to evaluate locations for a backup PSAP facility, generally buildings that were constructed as public use facilities offer potential to be converted to a backup facility.

When determining the location for the back-up facility, considerations should be made for the following:

- Location – The facility should be an adequate distance from the primary communications center so that localized emergencies will not affect both locations at the same time.
- Will the center be a hot-standby site? – That is, will the backup center be at an operational readiness state at all times or will it need to be set up upon activation, or can it be a multi-use facility that can be activated as the backup 9-1-1 center in the time of need.
- Access to telephone network – Are there adequate telephone trunking facilities to support the backup center?
- Access to network infrastructure – Is there a high-speed data network to support voice and data network needs?
- Commercial power access – Is there adequate commercial power to support a 24 hours a day, multi-day operation?
- Security of the facility – The facility must have adequate security when operating as the 9-1-1 center.

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PART 4—GOVERNANCE

16. GOVERNANCE

A simple definition of governance is “the way that a city, company, etc., is controlled by the people who run it.”⁶³ “Governance structures...provide a foundation for public safety entities to collaborate, plan, and make decisions on strategies and operations that mutually support the investment, sustainment, and advancement of communications-related initiatives.”⁶⁴

In 2015, SAFECOM and the National Council of Statewide Interoperability Coordinators (NCSWIC) published the *Emergency Communications Governance Guide for State, Local, Tribal, and Territorial Emergency Communications Officials*⁶⁵. While the Governance Guide is focused on interoperability and emergency communications (land mobile radio, broadband, 9-1-1/NG9-1-1, and alerts and warnings), there are characteristics that are applicable to governance of 9-1-1 centers, whether consolidated or co-located.

Effective governance structures are designed to operate in a collaborative manner with input from stakeholders across multiple disciplines, emergency communications functions, levels of government, and nongovernmental entities. Such structures allow for greater understanding and evaluation of existing communications capabilities such as plans, procedures, and equipment; identification of communications gaps; and development and implementation of a coordinated vision and plan to address and prioritize resources, investments, and staffing.

The following characteristics, attributes, and activities are typical of effective governance structures:

- *Documented Authority: Establish formally with either an Executive Order or Legislation.*
- *Balanced Representation: Align needs and priorities across various stakeholders that have a role in or are impacted by communications-related initiatives.*
- *Properly-sized Membership: Determine appropriately sized membership that maintains inclusiveness while permitting a quorum to be met regularly.*
- *Accountability: Determine whether stated roles, responsibilities, and membership requirements are met routinely.*
- *Active Membership: Provide multiple means to participate in meetings (i.e., in-person, videoconference, and teleconference) while advancing information sharing and transparency by disseminating meeting minutes to members.*

⁶³ <http://www.merriam-webster.com/dictionary/governance>

⁶⁴ http://www.dhs.gov/sites/default/files/publications/2015%20Governance%20Guide_Master_508c%20Final.pdf, page 9 of 51.

⁶⁵ http://www.dhs.gov/sites/default/files/publications/2015%20Governance%20Guide_Master_508c%20Final.pdf



- *Meeting Frequency: Maintain consistent meeting cadence. Members should collectively determine where meetings will be held and include consistent or alternating meeting location to increase attendance and participation depending on the size of the state or jurisdiction and residency of members.*
- *Scalable and Agile: Able to respond to changes in the emergency communications landscape.*
- *Rules of Engagement: Manage internal and jurisdictional differences (e.g., “checking egos at the door” and working toward common, universally beneficial goals).*
- *Transparent and Responsive: Maintain an open and transparent forum to promote greater stakeholder buy-in.*
- *Funding and Sustainment: Identify sustainable funding for existing and future emergency communications priorities.⁶⁶*

There are essentially three types of boards or committees that could be established to represent Fayetteville and Cumberland County and the respective agencies: an executive board/committee, an advisory board/committee, or a steering committee. A hierarchical relationship may also be established between two or among all three.

An executive board/committee typically is formal, with full decision-making authority, and is the responsible entity. The roles of the board members are spelled out in by-laws, as are how member elections are held, and members removed. Members of the board are accountable to the stakeholders, in this case the public and responder agencies, for the performance of the 9-1-1 centers. The board may be responsible for approving the 9-1-1 centers’ budgets. The board is intended to represent the best interests of the 9-1-1 centers, and may make strategic planning decisions.

An advisory board/committee is informal and is created on behalf of the 9-1-1 centers. This governance model focuses on the board’s supportive role as one of providing strategic advice to management. Members of the board have no accountability for the performance of the 9-1-1 centers; only the quality of advice. An advisory board can make decisions, if so empowered, whereas an advisory committee generally has no decision-making authority. The informal nature of an advisory board gives greater flexibility in structure and management.

A steering committee is a body of high-level advisors tasked with governing an organization and providing it with guidance and direction. A steering committee is often responsible for creating working groups and choosing the right experts to complete a project or program. A steering committee provides guidance on strategic direction and can set overall operational parameters. A steering committee assists in operations-based decision-making. A steering committee can make policy decisions that affect operations as a whole, as well as provide budget reviews. Authority and responsibility fall between that of an executive board and an advisory board.

⁶⁶ Ibid., page 11 of 51.



In a co-located environment, both 9-1-1 centers remain as separate departments or divisions within their respective government structure. Staff continue to report to the same position within their organizational structure as they do today. This structure maintains the operational integrity of each center, yet may also make it more difficult to accomplish goals and objectives. Overall operational parameters of the center will need to be considered before changes are made, and any requisite approval processes followed. The autonomy limits the governance structures for the co-located environment to one of joint decision-making and oversight for only the facility and shared services, such as the equipment (e.g., CAD system, logging recorder) and any shared staffing arrangements (e.g., IT support, training/QA).

Both the City and County, independently, will continue to be the authorities for all administrative services (payroll and human resources) and support services (budget and finance, legal, and risk management) for their respective 9-1-1 center. That said, a supporting entity (primary responsible organization), with responsibility for accounts payable, accounts receivable, facility maintenance (cleaning, upkeep), etc., is needed for facility ownership, shared equipment ownership, and to employ shared staff.

“Governance bodies bring together multiple disciplines and jurisdictions to address common goals and objectives to improve emergency communications. As such, an MOU/MOA helps stakeholders establish the partnerships and authority needed to achieve an effective governance structure for public safety operable and interoperable communications. An MOU/MOA is important because it defines the responsibilities of each party in an agreement, provides the scope and authority of the agreement, clarifies terms, and outlines compliance issues.”⁶⁷

“An MOU is important because it defines the responsibilities of each party in an agreement, provides the scope and authority of the agreement, clarifies terms and outlines compliance issues.”⁶⁸ An IGA (or MOU/MOA) should establish the following:

- Span of authority and control for any board/committee
- Funding mechanisms, contribution percentages, board/committee authority, and a method for updating it or changing it as needed
 - Budget approval process for 9-1-1 centers
 - Establishment of reserve accounts to pay for critical systems replacements
- Administrative responsibilities for accounts payable and receivable
- Maintenance responsibilities for the facility
- Process for jurisdictional or agency complaint resolution and input
- Procurement processes and administrative responsibilities
- Ownership of technology purchased jointly

⁶⁷ Ibid., page 19 of 51.

⁶⁸

<http://www.dhs.gov/sites/default/files/publications/Writing%20Guide%20for%20a%20Memorandum%20of%20Understanding.pdf>, page 13 of 16.



- SOP approval process for shared services
- Agreed-upon service levels to be provided, including any shared call taker resources
- Development of any shared staffing positions (IT support, training/QA)
- Span of authority for shared staffing positions
- Span of authority for supervisory oversight of co-located 9-1-1 centers
- Length of the agreement
- Withdrawal process and time requirements

The success of a co-location initiative will be in part be dependent on a well-thought out and well-written IGA or MOU/MOA.

16.1. RECOMMENDATIONS

“Governance structures provide the framework in which stakeholders can collaborate and make decisions that represent a common objective.”⁶⁹ To be successful in meeting goals and objectives, direction and leadership are necessary, with a balance towards internal operations and external expectations. In a co-located environment, the appearance of past allegiances and/or hidden agendas can undermine trust. A well-defined governance structure can assure a united front and a cohesive team approach moving forward.

Mission Critical Partners recommends the formal development of an Executive Steering Committee. The Steering Committee’s membership should reflect the partnership between the City and County, with representation from executive-level staff, legal, finance, procurement, and facilities, as well as representation from the public safety community. Other representatives can be brought in as needed, such as human resources.

The Executive Steering Committee would be responsible for the following:

- Oversight of strategic goals and any strategy modifications
- Reviewing co-location facility status updates, including issues and risks
- Monitoring achievement of major program milestones
- Directing resources to accomplish goals
- Providing leadership and support for the co-location initiative
- Supporting the co-location project and project components by communicating the vision and working to reduce barriers and mitigating risk
- Facilitating jurisdictional and interdepartmental collaboration
- Providing issue resolution across agencies
- Reviewing and approving the overall co-location procurement strategy
- Managing fiscal and political issues
- Ensuring the availability of funds

⁶⁹ http://www.dhs.gov/sites/default/files/publications/interoperability_continuum_brochure_2.pdf, page 2 of 5.



The beginning of this committee has already been established for this feasibility study.

In a co-located environment, Fayetteville 9-1-1 and Cumberland County 9-1-1 must provide equitable, efficient, and effective service to all law enforcement, fire, and EMS user agencies based on the dispatch plans for each agency. To do this, the 9-1-1 centers must be cushioned from the impact of political changes to the greatest extent possible.

To this end, and as the co-located environment nears reality, Mission Critical Partners recommends the establishment of a 9-1-1 Advisory Committee with oversight and decision-making authority for the shared services and facility, and input for operational parameters. Mission Critical Partners recommends the 9-1-1 Advisory Committee be a sub-committee of the Steering Committee. As the facility and co-location initiative is a joint venture between the City and County, decisions will still be necessary at the Executive Steering Committee-level after co-location is achieved, although the frequency will be greatly reduced.

9-1-1 Advisory Committee members should be high-level executives (chiefs or their representatives) of key stakeholder groups, with authority to make decisions on behalf of their agencies. “[T]he particular character and makeup of a governance group should reflect the institutional culture, needs, and specific challenges of the population it represents...it is critical that membership is committed to a unified vision that benefits the public safety community, not individual members. A successful governance model relies heavily on the diversity of skills and background within its membership.”⁷⁰

The 9-1-1 Advisory Committee would be responsible for the following:

- Setting long-term goals and strategies in support of the strategic direction and vision
- Setting priorities for funding and technology initiatives
- Making budget requests on behalf of the co-located 9-1-1 centers
- Ensuring consistency and coordination in support of the directors (managers)
- Resolving issues brought before the committee
- Providing guidance and direction on leveraging technology
- Providing guidance and direction on operational policy changes
- Assisting the Steering Committee in managing fiscal and political issues

A supporting entity will also be required for the facility, shared equipment, and shared staff with responsibility for accounts payable and receivable, facility maintenance, etc. While it may be possible to create a separate administrative structure (authority), it would be cost prohibitive to establish the infrastructure necessary, as it would mean on-going costs added to capital and operational costs for the co-located facility. Both the City and County have the capabilities and infrastructure already in place. Mission Critical Partners recommends that whichever entity provides these services, compensation for the services is determined and agreed upon, and is memorialized within the IGA (MOU/MOA). Mission Critical Partners recommends that particular attention is given to the following in an IGA:

⁷⁰ Ibid., page 28 of 51.



- Governance structure
- Funding model
- Supervisory oversight
- Shared services and resources (training, QA, IT support)
- Shared technology (essentially everything in facility)
- Change management, both operationally and technically
- Problem resolution with appeals process
- Facility administration

This will ensure a balance of fairness is achieved during co-located operations.

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PART 5—FINANCIAL FEASIBILITY

17. FINANCIAL FEASIBILITY

Fayetteville 9-1-1 and Cumberland County 9-1-1 have shared cost of the CAD system for several years. According to staff, the cost-sharing model for the CAD system serves both organizations well. However, in a co-located environment, cost sharing will prove to be much more complex. In a new facility, the City and County will share the facility and the technology infrastructure. Even though all 9-1-1 calls will be answered from the same operational floor, the two 9-1-1 centers will remain independent agencies of their respective government (i.e., Fayetteville or Cumberland County). The organizational structures of both 9-1-1 centers are different and the requirements for administrative space in a new building will vary. Determining a fair and equitable model to share the capital and operating costs may be challenging, but is achievable.

Many complexities will be identified during the life of the project and construction. Some of the complexities that must be considered for cost sharing are listed below.

- This study recommends a total of 30 operator workstations on the operations floor. To ensure the most efficient operation possible and optimize the sharing of resources, the recommended layout of the center will allow any Fayetteville 9-1-1 or Cumberland County 9-1-1 telecommunicator to operate any position. As such, the 9-1-1 center equipment and space would be shared equally between the City and County, yet one organization may staff fewer positions than the other.
- Because training tends to be conducted jointly, the training space will be shared, but at times may be needed for other purposes that can create inequitable usage times.
- Cumberland County 9-1-1 is a division of Cumberland County Emergency Services, which also includes County Fire Marshal and Emergency Management operations. While it is logical that the entire Emergency Services organization locate to a new facility, this space allocation is not a direct function of 9-1-1 operations. Consideration must be made to ensure the fair distribution of costs directly attributed to either the City or County.
- A backup data center for Fayetteville's Public Works Commission has been proposed to be located in the new facility. Consideration must be made to ensure the fair distribution of costs directly attributed to the Public Works Commission, if the data center becomes reality.

In a co-located environment, the operating cost of delivering 9-1-1 services will remain with the respective organization. That is, both Fayetteville 9-1-1 and Cumberland County 9-1-1 will maintain independent operating budgets. There is not anticipated to be any reduction in the operating budgets for either 9-1-1 center by co-locating operations.

There is currently a disparity in staff salary between the 9-1-1 centers, even though the essential duties of the positions are similar. The City and County are aware of the inequalities in telecommunicator and



supervisor salaries, and are already working to address this. However, there are operational differences between the two 9-1-1 centers that may warrant differences in pay. Consideration should be given to the operational parameters that will remain and a determination made as to what is fair considering the respective operational responsibilities. Any alignment of salaries between Fayetteville 9-1-1 and Cumberland County 9-1-1 may increase personnel budgets, as will additional staff positions.

Mission Critical Partners has recommended consideration be given to shared dedicated IT support for 9-1-1 operations and shared training and QA programs. Shared staffing resources will have operational cost impacts and should be included in the cost sharing between the City and County.

Finding the proper model that meets both governments' organizational needs is critical to the success of co-location. Several models are feasible for cost sharing of a new facility and subsequent future operating costs. Examples of funding models include the following:

- Population-based: The percentage of population that is served by the answering 9-1-1 center equates to the percentage of financial responsibility.
- Per 9-1-1 call received: The budget is divided by the combined total of 9-1-1 calls answered by each 9-1-1 center in the previous year to determine a cost per call. The financial responsibility would then be allocated based on the number of 9-1-1 calls received by each 9-1-1 center.
- Square footage split: The total square footage of the building is divided by the budget to determine a cost per square foot. An agreed upon formula must be used to determine how many square feet are used by City and County, respectively; keeping in mind that many spaces are shared. Financial responsibility is then based upon the square footage used.
- Straight split: The City and County equally split the cost.

Each model could work for a new co-located facility, but because of the complexities, detailed discussions should be held between key stakeholders to determine the best model for Fayetteville and Cumberland County. With clear understanding and communications of the financial obligations of each governmental organization before construction begins, a co-located 9-1-1 center can be successful in providing critical services while improving operations.

Initial technology costs for a co-located facility are estimated to be \$6,512,210.94. Appendix B, Technology Costs, provides a breakdown. Based on the North Carolina 911 Board's approved expenditure list, many of the capital purchases may be funded through 911 Fund balances. A list of eligible 9-1-1 fee expenditures may be found in Appendix C.



18. GRANT FUNDING

The North Carolina 911 Board recently opened applications for the 2016 PSAP Grant program. According to the North Carolina 911 Board website, three types of grant programs are available to primary PSAPs.

Consolidation - A consolidation project involves combining one or more PSAPs with a primary PSAP with an integrated management structure that serves the same populations and jurisdictions previously served by offering grant funding for both PSAP costs authorized under G.S. 62A-46(c) and costs not authorized under G.S. 62A-46(c) to include construction costs.

Individual PSAP Enhancement/Replacement - Provide funding to primary PSAPs for projects designed to replace or upgrade E-911 equipment and services that are out of service, without vendor support, technically outdated, or can no longer perform at an established minimum functional standard to sustain an acceptable level of service to the public. Also to provide funding to primary PSAPs for projects designed to strengthen, broaden or increase the current E-911 operations through equipment, PSAP staff development, or service beyond that PSAP's current capabilities, or the relocation costs of primary PSAPs, including costs not authorized under G.S. 62A-46(c) and construction costs.

Regional Initiative Enhancement/Replacement - Regional initiatives are regional approaches which provide for shared use of the components that support E-911, such as equipment, resources, and/or co-location of technology. Such initiatives comprise projects involving two or more primary PSAPs.⁷¹

Mission Critical Partners believes that the co-location of Fayetteville 9-1-1 and Cumberland County 9-1-1, with the shared use of technology, would meet the Regional Initiative program. Mission Critical Partners' experience shows that the North Carolina 911 Board encourages consolidation of PSAPs; however, the co-location discussed in this report certainly supports the shared use of components that both the City and County use to provide 9-1-1 services to their respective communities. Sharing as many resources as possible in the new operational environment will be important to improving the chances of receiving grant reward.

Very few federal grant programs are available to assist with construction of emergency communications centers. In the past, DHS, through the Federal Emergency Management Agency, offered an Emergency Operations Center Grant program to assist with the construction of EOCs. However, Mission Critical Partners is not aware of a grant award by DHS for a new emergency operations or communications center in several years.

Both the City and County should engage state and federal officials to attempt to gain funds from other sources that would be at their disposal for the benefit of their constituents.

⁷¹ <https://www.nc911.nc.gov/PSAPs/GrantAppDefault.asp>



Mission Critical Partners recommends that the City and County submit a joint application to the North Carolina 911 Board for consideration of funding for the new co-located emergency communications center. Grant submittal requires an executed MOU, funding decisions, as well as technology quotes from vendors (if technology is requested). A grant application should detail the strong level of cooperation between both jurisdictions and 9-1-1 centers and demonstrate how the shared CAD system has already been successful for Fayetteville 9-1-1 and Cumberland County 9-1-1.

The City and County should be aware that over the past several years, North Carolina 911 grant funds have become much more competitive. Funds are also limited, yet requests continue to rise. During the 2015 grant cycle, 23 grant submittals were received. Only three grants were awarded; two consolidation initiatives and one regional initiative. Each grantee was also a Tier 1 County, as designated by the North Carolina Department of Commerce. Cumberland County is designated Tier 2.

Mission Critical Partners recommends the City and County jointly develop a plan for alternate funding in the event a grant submittal is not successful.

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PART 6—CONCLUSION

19. OPERATIONAL FEASIBILITY

The City and County should be commended for taking the steps to commission this study and having the foresight to recognize that improvements can be made for the delivery of emergency services to their constituents.

Fayetteville 9-1-1 and Cumberland County 9-1-1 are both professional operations that take great pride in their respective centers. Both are challenged with space needs in their unique way and there is little to no expansion capabilities in the current environments.

The North Carolina 911 Board encourages PSAP consolidation whenever possible, but in many communities consolidation faces political and fiscal hurdles and challenges. The City and County have already made a significant achievement in the shared services arena with the CAD system. As the City and County are not ready for full consolidation, Mission Critical Partners believes the next logical steps in the evolution of 9-1-1 operations in the county are to expand the shared services model and transition operations to a newly constructed co-located 9 1-1 center.

Co-located 9-1-1 operations have the opportunity to provide benefits to both the City and County.

- Improved efficiencies in operations by allowing call takers to share 9-1-1 answering responsibilities, regardless of incoming trunks
- Streamlined information flow
- Improved situational awareness of activities throughout the county
 - For example, if the Sheriff's Office is searching for a suspect, the information can be immediately shared with the police department because the telecommunicators are located in the same operations area
- Improved efficiencies of shared systems, such as CAD, backup generators, phone systems, and other technology
- Improved QA/QI program that can improve operations for both 9-1-1 centers
- Improved disaster response and recovery through a properly designed EOC with access to the co-located 9-1-1 centers
- Recovery of much needed space in City Hall and the Sheriff's Office facilities with the transition of the 9-1-1 centers to another facility
- Possible reduction in maintenance costs for use of shared systems versus maintaining individual systems
- Ability to face the technology and operational challenges of NG9-1-1
- Future opportunities to invite Fort Bragg to participate in the co-located environment
- Possible precursor to full consolidation in the future

While there are advantages to co-location, there are also disadvantages.

- Perceived loss of control of operations and functions that are shared



- Increased operational cost for a new facility
- Disparities in organizational policies, such as human resources (salary, hiring processes, grievance processes, leave, etc.)
- Supporting administrative entity for the facility may be perceived as jurisdiction with control
- Not one true decision-making authority; City and County will both have to weigh-in on parameters that can be perceived to affect operations and morale

In addition to the above, there are also risks to a co-location initiative.

- Inability to agree on site location and building design parameters and function
- Inability to agree on a cost-sharing model
- Inability to fully address 9-1-1 center disparities, creating significant morale issues in the telecommunicators
- Breakdown in open and honest communications between City and County administrative personnel
- Inability to secure funding for construction
- Loss of key staff through the transition

Staff are paramount to the success of such a comprehensive and complex project as this co-location. Fayetteville and Cumberland County have dedicated and knowledgeable staff who are proud of the organizations for which they work. The cooperation that has been demonstrated between the staff of both organizations during the development of this report is noteworthy. The advantages of a co-location initiative can be realized with the strengths of the dedicated staff members who will directly contribute to the success of a co-located 9-1-1 center.

Fundamental changes in operations will create excitement; but the excitement may become overshadowed by the identified risks. Staff may be apprehensive about changes that will be inevitable during the implementation and continued operation of a co-located 9-1-1 center. Experience shows that open and direct lines of communication during all phases of such a project can lessen the fear of change.

Mission Critical Partners recommends that the City and County pursue the construction and implementation of a co-located Fayetteville–Cumberland County 9-1-1 Emergency Communications Center. The City and County should prioritize the risks and determine those that are controllable, those that must be mitigated, and those that must be accepted. For example, the loss of key personnel may have to be accepted, unless it can be mitigated through compensation or another factor. The more quickly a risk can be validated, the more quickly the risk can be lessened, but will still be a risk. Many of the identified risks can likely be mitigated through the development of a strong Executive Steering Committee and project team that can develop a working relationship built on mutual respect, trust, honesty, and integrity—all of which are necessary to see the co-location initiative to fruition and realize a seamless system of information flow.



Appendix A—Senate Bill 797

Senate Bill 797 may be found on the following pages.

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**GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2013**

**SESSION LAW 2014-66
SENATE BILL 797**

AN ACT TO AMEND THE DUTIES OF THE 911 BOARD RELATING TO PUBLIC SAFETY ANSWERING POINTS, AS RECOMMENDED BY THE JOINT LEGISLATIVE OVERSIGHT COMMITTEE ON INFORMATION TECHNOLOGY, AND TO CLARIFY THE COLLECTION AUTHORITY OF THE DEPARTMENT OF REVENUE FOR THE 911 FEE ON PREPAID WIRELESS.

The General Assembly of North Carolina enacts:

SECTION 1.1. G.S. 62A-40 is amended by adding a new subdivision to read:

"(4a) Back-up PSAP. – The capability to operate as part of the 911 System and all other features of its associated primary PSAP. The term includes a back-up PSAP that receives 911 calls only when they are transferred from the primary PSAP or on an alternate routing basis when calls cannot be completed to the primary PSAP."

SECTION 1.2. G.S. 62A-42(a) reads as rewritten:

"(a) Duties. – The 911 Board has the following powers and duties:

(1) To develop the 911 State Plan. In developing and updating the plan, the 911 Board must monitor trends in voice communications service technology and in enhanced 911 service technology, investigate and incorporate GIS mapping and other resources into the plan, ensure individual PSAP plans incorporate a back-up PSAP, and formulate strategies for the efficient and effective delivery of enhanced 911 service.

...

(4) To establish policies and procedures to fund advisory services and training for PSAPs, to set operating standards for PSAPs, and back-up PSAPs and to provide funds in accordance with these policies, procedures, and standards.

...."

SECTION 1.3. G.S. 62A-46 reads as rewritten:

"§ 62A-46. Fund distribution to PSAPs.

(a) Monthly Distribution. – The 911 Board must make monthly distributions to primary PSAPs from the amount allocated to the 911 Fund for PSAPs. A PSAP is not eligible for a distribution under this section unless it complies with the requirements of this Article, provides enhanced 911 ~~service~~ service, and received distributions from the 911 Board in the 2008-2009 fiscal year. The Board may reduce, suspend, or terminate distributions under this subsection if a PSAP does not comply with the requirements of this Article. The Board must comply with all of the following:

- (1) Administration. – The Board must notify PSAPs of the estimated distributions no later than December 31 of each year. The Board must determine actual distributions no later than June 1 of each year. The Board must determine a method for establishing distributions that is equitable and sustainable and that ensures distributions for eligible operating costs and anticipated increases for all funded PSAPs. The Board must establish a formula to determine each PSAP's base amount. The formula must be determined and published to PSAPs in the first quarter of the fiscal year preceding the fiscal year in which the formula is used. The Board may not change the funding formula for the base amount more than once every year.
- (2) Reports. – The Board must report to the Joint Legislative Commission on Governmental Operations and the Revenue Laws Study Committee within



45 days of a change in the funding formula. The report must contain a description of the differences in the old and new formulas and the projected distributions to each PSAP from the new formula.

- (3) Formula. – The funding formula established by the Board must consider all of the following:
- a. The population of the area served by a PSAP.
 - b. PSAP reports and budgets, disbursement histories, and historical costs.
 - c. PSAP operations, 911 technologies used by the PSAP, compliance with operating standards of the 911 Board, level of service a PSAP delivers dispatching fire, emergency medical services, law enforcement, and Emergency Medical Dispatch.
 - d. The tier designation of the county in which the PSAP is located as designated in G.S. 143B-437.08.
 - e. Any interlocal government funding agreement between a primary PSAP and a secondary PSAP, if the secondary PSAP was in existence as of June 1, 2010, receives funding under the agreement, and is within the service area of the primary PSAP.
 - f. Any other information the Board considers relevant.
- (4) Additional distributions. – In the first quarter of the Board's fiscal year, the Board must determine whether payments to PSAPs during the preceding fiscal year exceeded or were less than the eligible costs incurred by each PSAP during the fiscal year. If a PSAP receives less than its eligible costs in any fiscal year, the Board may increase a PSAP's distribution in the following fiscal year above the base amount as determined by the formula to meet the estimated eligible costs of the PSAP as determined by the Board. The Board may not distribute less than the base amount to each PSAP except as provided in subsection (b1) of this section. The Board must provide a procedure for a PSAP to request a reconsideration of its distribution or eligible expenses.

...

(c) Use of Funds. – A PSAP that receives a distribution from the 911 Fund may not use the amount received to pay for the lease or purchase of real estate, cosmetic remodeling of emergency dispatch centers, hiring or compensating telecommunicators, or the purchase of mobile communications vehicles, ambulances, fire engines, or other emergency vehicles. Distributions received by a PSAP may be used only to pay for the following:

- (1) The lease, purchase, or maintenance of:
- a. Emergency telephone equipment, including necessary computer hardware, software, and database provisioning.
 - b. Addressing.
 - c. Telecommunicator furniture.
 - d. Dispatch equipment located exclusively within a building where a PSAP or back-up PSAP is located, excluding the costs of base station transmitters, towers, microwave links, and antennae used to dispatch emergency call information from the ~~PSAP-PSAP or back-up PSAP~~.
- (1a) The nonrecurring costs of establishing a 911 system.
- (2) Expenditures for in-State training of 911 personnel regarding the maintenance and operation of the 911 system. Allowable training expenses include the cost of transportation, lodging, instructors, certifications, improvement programs, quality assurance training, training associated with call taking, and emergency medical, fire, or law enforcement procedures, and training specific to managing a PSAP or supervising PSAP staff. Training outside the State is not an eligible expenditure unless the training is unavailable in the State or the PSAP documents that the training costs are less if received out-of-state. Training specific to the receipt of 911 calls is allowed only for intake and related call taking quality assurance and improvement. Instructor certification costs and course required prerequisites, including physicals, psychological exams, and drug testing, are not allowable expenditures.

- (3) Charges associated with the service supplier's 911 service and other service supplier recurring charges. The PSAP providing 911 service is responsible to the voice communications service provider for all 911 installation, service, equipment, operation, and maintenance charges owed to the voice communications service provider. A PSAP may contract with a voice communications service provider on terms agreed to by the PSAP and the provider.

...

(e) Compliance. – A PSAP, or the governing entity of a PSAP, must comply with all of the following in order to receive a distribution under this section:

- (1) A county or municipality that has one or more PSAPs must submit in writing to the 911 Board information that identifies the PSAPs in the manner required by the FCC Order.
- (2) A participating PSAP must annually submit to the 911 Board a copy of its governing agency's proposed or approved budget detailing the revenues and expenditures associated with the operation of the PSAP. The PSAP budget must identify revenues and expenditures for eligible expense reimbursements as provided in this Article and rules adopted by the 911 Board.
- (3) A PSAP must be included in its governing entity's annual audit required under the Local Government Budget and Fiscal Control Act. The Local Government Commission must provide a copy of each audit of a local government entity with a participating PSAP to the 911 Board.
- (4) A PSAP must comply with all requests by the 911 Board for financial information related to the operation of the PSAP.
- (4a) A PSAP must have a plan and means for 911 call-taking in the event 911 calls cannot be received and processed in the primary PSAP. The plan must identify the alternative capability of taking the redirected 911 calls. This subdivision does not require a PSAP to construct an alternative facility to serve as a back-up PSAP.
- (5) A primary PSAP must comply with the rules, policies, procedures, and operating standards for primary PSAPs adopted by the 911 Board.

...."

SECTION 1.4. Sections 1.1 through 1.4 of this act are effective when this act becomes law and apply to distributions made on or after July 1, 2016.

SECTION 2.1. G.S. 62A-54(c) reads as rewritten:

"(c) Administration. – Administration, auditing, requests for review, making returns, collection of tax debts, promulgation of rules and regulations by the Secretary of Revenue, additional taxes and liens, assessments, refunds, and penalty provisions of Article 9 of Chapter 105 of the General Statutes apply to the collection of the 911 service charge for prepaid wireless telecommunications service. An audit of the collection of the 911 service charge for prepaid wireless telecommunications service shall only be conducted in connection with an audit of the taxes imposed by Article 5 of Chapter 105 of the General Statutes. Underpayments shall be subject to the same interest rate as imposed for taxes under G.S. 105-241.21. Overpayments shall be subject to the same interest rate as imposed for taxes under G.S. 105-241.21(c)(2). Excessive and erroneous collections of the service charge will be subject to G.S. 105-164.11. The Department of Revenue shall establish procedures for a seller of prepaid wireless telecommunications service to document that a sale is not a retail transaction, and the procedures established shall substantially coincide with the procedures for documenting a sale for resale transaction under G.S. 105-164.28. The Secretary of Revenue may retain the costs of collection from the remittances received under subsection (b) of this section, not to exceed five hundred thousand dollars (\$500,000) a year of the total 911 service charges for prepaid wireless telecommunications service remitted to the Department. Within 45 days of the end of each month in which 911 service charges for prepaid wireless telecommunications service are remitted to the Department, the Secretary of Revenue shall transfer the total 911 service charges remitted to the Department less the costs of collection to the 911 Fund established under G.S. 62A-44."

SECTION 2.2. Section 8 of S.L. 2011-122, as amended by Section 52 of S.L. 2013-414, is repealed.

SECTION 2.3. Notwithstanding G.S. 62A-54(c), the Department may retain six hundred and forty thousand dollars (\$640,000) of the 911 fee service charges for prepaid wireless telecommunications service remitted to the Department in the 2014-2015 fiscal year.

SECTION 2.4. Sections 2.1 through 2.4 of this act become effective July 1, 2014. The remainder of this act is effective when it becomes law.

In the General Assembly read three times and ratified this the 3rd day of July, 2014.

s/ Andrew C. Brock
Presiding Officer of the Senate

s/ Thom Tillis
Speaker of the House of Representatives

s/ Pat McCrory
Governor

Approved 4:00 p.m. this 9th day of July, 2014



Appendix B—Estimated Technology Costs

The table below provides budgetary costing for technology infrastructure for the co-located 9-1-1 center.

Description	Estimated Cost	Notes
Workstation Furniture	\$716,400.00	
CPE	\$75,000.00	CenturyLink Hosted solution will require move cost but not new capital purchase.
Logger/Recorder (Enterprise)	\$350,010.00	
Desktop Computers	\$108,000.00	For communications operations only
Network Equipment	\$124,500.00	
Synchronized Clock System	\$20,669.00	
Radio Antenna System	\$50,000.00	
Radio Consoles	\$2,880,000.00	Consideration must be made whether to move this equipment for reuse at the new center or if the equipment will be moved to the back-up center and new equipment purchased for the new center.
CSSI Console Connections	\$150,000.00	
Amateur Radio Emergency Services (ARES) Equipment	\$12,000.00	
Computer Aided Dispatch (CAD)	\$50,000.00	Since the recommendation is to maintain existing CAD system, this cost is for the re-location of the equipment. Any server replacement would be required through the existing MOU between the city and county.
Satellite Phones	\$12,000.00	
Admin Telephone System	\$97,500.00	
Audio/Video (A/V) Systems	\$325,000.00	
Access Control/Intrusion Detection/CCTV	\$120,550.00	
Telecom Service Access - Telephone, Community Access Television (CATV), Internet	\$50,000.00	
Communications Tower	\$100,000.00	
Telecom Structured Cable	\$291,260.50	
Sub-total	\$5,532,889.50	
Contingency 10%	\$553,288.95	



Description	Estimated Cost	Notes
Sales Tax 7%	\$426,032.49	
911 Technology/Systems Budgetary Estimate	\$6,512,210.94	



Appendix C—Eligible 9-1-1 Fee Expenditures

Eligible 9-1-1 fee expenditures, approved by the North Carolina 911 Board, are described below.⁷² Information is current as of June 19, 2015. Mission Critical Partners recommends the Board website be visited prior to expenditure to ensure accuracy. The Board should also be contacted for questions regarding expenditures not listed.

Phone Systems:

- 9-1-1 trunks and one administrative line per answering position
- Telephone sets used to answer 9-1-1 calls, including CPE equipment, headsets, monitors, keyboards, mouse and servers used exclusively for telephone sets⁷³
- TDD/TTY
- ACD systems, whether facility-based or premise-based
- Interpretive services (e.g., Language Line or Omni Lingual)
- Service provider selective routing and ALI provisioning charges
- Data connection for the sole purpose of collecting call information for analysis⁷⁴

Furniture:

- Cabinets, tables, or desks that hold eligible 9-1-1 equipment
- Telecommunicator chairs

Software:

- CAD system modules that are part of the call taking process only; some CAD systems will include additional modules that are not a part of the 9-1-1 process and are not eligible
- GIS software used to create and display the base map showing street centerlines
- GIS layers developed specifically for 9-1-1 addressing functions
- Voice logging recorder software
- Management Information System (MIS) software for 9-1-1 phone systems
- Time synchronization device software
- Law enforcement, fire and medical call taking protocols including software and flip-cards
- QA software for the training program of law enforcement, fire and medical call taking protocols
- ALI database software

⁷²

<https://www.nc911.nc.gov/pdf/Funding%20Committee/Elegible%20Expenditure%20Lists/2015/06192015%20Approved%20Use%20of%20Fund%20List.pdf>

⁷³ When servers host both 911 eligible and ineligible applications, only the percentage of the cost of the server representing the 911 eligible use is allowable.

⁷⁴ If connection is shared with non-eligible 9-1-1 devices, then only a percentage of the eligible 9-1-1 cost is eligible.



- Radio console software that is part of the 9-1-1 process; some radio console software will include additional modules that are not a part of the 9-1-1 process and are not eligible
- Console Audio Box (CAB) software
- Paging software including licensing costs to interface or integrate with CAD or licensing cost to establish a web-based paging function in substitution for paging through CAD; excludes costs for use of such software or functions by first responders
- CAD-to-CAD interface software
- Automated digital voice dispatching software
- Message switch software that allows for voiceless dispatch, status updates, and mobile-to-CAD messaging, including CAD licensing costs for mobile computer terminals, smartphones and tablets; some message switch software may include additional modules that are not a part of the 9-1-1 process and are not eligible

Hardware:

- Servers used exclusively for telephone, CAD, voice logging recorder, GIS, paging, console/alias database management, radio console network switching, and radio console software systems, including monitor, keyboard, and mouse
- Computer work stations used exclusively for telephone, CAD, voice logging recorder, GIS, and radio console software systems, including monitor, keyboard, mouse, microphones, speakers, headset jacks, footswitches, and CAB
- Time synchronization devices
- UPS for only 9-1-1-related equipment; if a UPS serves more than 9-1-1 equipment, only a percentage of the total cost is allowable
- Emergency power generator serving the 9-1-1 center; if a generator serves more than the 9-1-1 center, only a percentage of the total cost is allowable
- Radio network switching equipment used exclusively for 9-1-1 centers' radio dispatch consoles
- Fax modem for rip and runs
- Printers
- Radio console Ethernet switch
- Radio console access router
- Backup storage equipment for 9-1-1 database systems
- Mobile message switch
- Paging interface with CAD system
- Alpha/Numeric pager tone generator
- Radio consolette, configured for exclusive use at the dispatcher work station for dispatcher operation to perform dispatch function when there is no traditional console installed at the workstation
- Handheld GPS devices that are used strictly for 9-1-1 addressing; must meet or exceed the requirements of "Mapping Grade GPS Receiver" as defined in the Global Positioning



System (GPS) Data Collection and Documentation Standards established by the North Carolina Geographic Information Coordinating Council

Training:

- Individual class registration for maintenance and operation of the 9-1-1 system and specific 9-1-1 intake and related call taking training, managing of a PSAP and supervising PSAP staff
- Out-of-state training if the class is not offered in North Carolina six months prior to or six months after the scheduled out-of-state class
- Allowable travel expenses not exceeding local government or North Carolina per diem rates

Support Functions (Implemental Functions)

- Maintenance, database provisioning, and addressing functions costs implemental to receiving and utilizing voice and data and maintenance costs of dispatch equipment located exclusively within a building where a 9-1-1 center is located