PREPARING FOR TECHNOLOGICAL TRANSFORMATION IN EMERGENCY COMMUNICATIONS CENTERS (ECCs)

BACKGROUND

As Emergency Communications Centers (ECCs) transition to Next Generation 911 (NG911), maintaining operational and resilient emergency communications remains imperative. Innovative technologies are emerging to improve emergency operations for telecommunicators and ECCs alike.

ECC managers should consider emerging technologies that supplement and complement their center's operational workflow to address telecommunicator and first responder situational awareness, real-time quality information, resource allocation, and risk management. Some of these technologies can assist with emergency services call volumes, improve 911 accessibility, and optimize life-saving response times. These technologies may require technical training for telecommunicators to prepare for the additional responsibilities.

STAFFING TOOLS AND TECHNOLOGIES

ECC staffing challenges existed prior to the transition to NG911. This technological transition brings a notable opportunity to further address the longstanding industry concerns regarding staffing, retention, and recruitment for the operational needs of ECCs. Reduced budgets, job satisfaction, and the unique nature of the workforce following the Coronavirus 2019 (COVID-19) pandemic has exacerbated a pre-existing staffing crisis in many centers.

The Association of Public-Safety Communications Officials' (APCO) research-based initiative, Project Retains, highlights the nature and extent of staffing and retention issues in ECCs. Findings suggested the strongest predictor of a high retention rate is to have all positions fully staffed. ECCs are transitioning from traditional staffing practices and pivoting to using emerging tools and technologies (Figure 1: Staffing Tools and Technologies) to assist them in addressing an industry-wide staffing crisis. ECCs or municipalities should review job descriptions and consider a work study or cost analysis for employee pay and benefits.

Recruitment and Retention

ECCs continue to compete with industries for well-qualified personnel to address the staffing gaps. ECCs must consider the potential skills, knowledge, and abilities of qualified applicants to prepare for enhanced technologies. Some ECCs are offering cadet programs to encourage career interest and provide a unique opportunity to experience telecommunications prior to employment

- National Emergency Number Association (NENA) Communications Center Staffing Tool
- NENA Communications Center Staffing Workshop
- APCO Project Retains
- National 911 Program Telecommunicator Job Reclassification Toolkit
- Massachusetts State Police Cadet Program
- Longview, Washington Cadet Program
- Tazewell, Virginia Cadet Program

Career Development and Advancement

Traditional cross-training and continuing education for telecommunicators can lead to career success, higher pay, and benefits.[1] Train-the-trainer programs, promotional opportunities, job shadowing, and succession planning are key components to ensuring ECCs are building skillsets, promoting career satisfaction and growth, and preparing for the future

- Workforce Framework for Cybersecurity (NICE Framework)
- APCO Agency Training Program Certification
- NENA Emergency Number Professional Certification
- APCO Registered Public Safety Leader Program
- NENA Center Manager Certification Program
- Recommended Minimum Training Guidelines for Telecommunicators Project
- APCO Certified Public-Safety Executive Program

Health and Wellness

Using emerging digital health and wellness software programs and applications can assist ECCs in educating employees on wellness, conducting physical health assessments, creating peer-to-peer networks, assisting in locating mental health professionals, and encouraging behavior changes with incentives and rewards for participation. Creating a culture of health and safety with support from others may help prevent burnout and overuse of unscheduled time off

- NENA Protect the Wellbeing of 911 Professionals
- NENA Peer Support Team Development, Implementation, and Oversight
- FirstNet Health and Wellness Coalition

Figure 1: Staffing Tools and Technologies

SERVICE DELIVERY TOOLS AND TECHNOLOGIES

Some ECCs are using smart technology, artificial intelligence (AI), remote access, the Internet of Things (IoT), and integrated cloud technology to deliver critical services during any emergency and to assist telecommunicators in their day-to-day operations. Supplemented by new tools and technology, telecommunicators can answer, process, and dispatch calls for service with greater efficiency. The use of emerging technologies (Figure 2: Service Delivery Tools and Technologies) may relieve the pressure placed on telecommunicators due to high call volumes and evolving, efficient call delivery methods, benefiting the telecommunicator and the public.

Artificial Intelligence and Data Analytics

Some ECCs are using AI to assist with staffing shortages, call handling, and quality assurance by using keywords to process emergency and non-emergency calls. AI is also being incorporated into systems to provide language translation for text-to-911 messages

- CISA 2022-2026 Strategic Technology Roadmap
- Executive Order 13960 Promoting the Use of Trustworthy Artificial Intelligence

Remote Telecommunicators

Remote dispatch is attracting interest, especially following the COVID-19 pandemic, using the unique, interconnected features of NG911

- NENA Virtual PSAP Management
- CISA Responding to a Pandemic: Technology Considerations for PSAPs

Geo-location

Utilizing geo-location devices for assistive, accessibility, and medical alert devices can assist in prevention of the loss of life in at-risk communities. Additionally, accurate location-based call routing can reduce call transfers

- NENA 3D Geographic Information Systems (GIS) for E911 and NG911
- SAFECOM/NCSWIC GIS Lifecycle Best Practices Guide for NG911

Situational Awareness

Receipt of critical incident information prior to first responders arriving on-scene is now possible through technologies such as telematics, unmanned aircraft systems (UAS), and IoT devices

- SAFECOM/NCSWIC NG911 Incident-Related Imagery Impacts 101
- SAFECOM/NCSWIC Unmanned Aircraft Systems - Critical Infrastructure
- APCO Recommended Best Practices for PSAPs When Processing Vehicle Telematics Calls From Telematics Service Providers
- NENA Automatic Collision Notification and Vehicle Telematics Technical Information Document (TID)

Data Sharing

ECCs are exploring data sharing technologies, including computer-aided dispatch (CAD)-to-CAD interoperability initiatives to improve emergency response

- APCO Interoperability Standards
- NENA NG911 Emergency Incident Data Object (EIDO)
- APCO Automated Secure Alarm Protocol to PSAP
- CISA Approach for Developing an Interoperable Information Sharing Framework
- National Emergency Communications Plan (NECP)

Cloud Adoption

The interconnected and cloud-based nature of new capabilities allows for increased access and distribution of data to other agencies. Resiliency and redundancy within ECCs is benefited by cloud technologies providing the ability to improve service delivery and perform system updates virtually

- State of California Governor's Office of Emergency Services Cloud Based CPE
- CISA Cloud Security Technical Reference Architecture
- CISA Security Guidance for 5G Cloud Infrastructures

Figure 2: Service Delivery Tools and Technologies

WHAT'S NEXT?

Technological developments will continue to transform public safety communications. These transformations could help ECCs improve situational awareness for telecommunicators, supplement staffing, and support health and wellness for personnel. ECCs should consider researching and implementing technologies to help improve employee satisfaction and ECC operations. Engaging in strong technological lifecycle planning can ensure that technology adoption is bolstered by appropriate governance, standard operating procedures, training and exercises, testing and evaluation, and cybersecurity risk assessments. These technologies and their lifecycle planning require sustainable funding to support their use and evolution. Lastly, while these technologies have the potential to bring tremendous value, the goal should be to deploy standards-based technologies that integrate into the 911 workflow, follow best practices, and conform to state and local regulations and statutes.

For more information on this and other cybersecurity initiatives, contact ng911wg@cisa.dhs.gov or visit cisa.gov/safecom/next-generation-911.

Endnotes

1 ECCs can find information about training for telecommunicators in the *Establishing and Expanding a Public Safety Telecommunicator Training Program*.