Chapter 8

Artificial Intelligence

The Role of AI in Addressing Public Safety Staffing Shortages

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How AI is Mitigating Staffing Pressures in Emergency Communication Centers

Public-safety agencies, especially emergency communications centers (ECCs), face severe staffing shortages, and artificial intelligence (AI) and machine learning are emerging as a key tool to reduce call volume, speed call processing, and improve telecommunicator performance. Embedded AI capabilities are rapidly entering mission-critical systems to transform public safety by enabling automation, decision support, and multimodal analysis. However, reliability issues, cultural distrust, and the absence of clear governance hinder adoption. Agencies need standards, oversight frameworks, and improved data management to use AI advancements safely and effectively.

The Integration of Embedded AI in Mission-Critical Systems

Public-safety agencies, especially emergency communication centers (ECCs), continue to struggle with persistent staffing shortages that increase workloads, slow call processing, and heighten burnout. AI is emerging as a critical tool to mitigate these pressures. Early deployments focus on intercepting and triaging nonemergency calls, reducing the burden on telecommunicators, while advanced transcription and real-time language translation are improving accuracy and lowering cognitive load. Beyond call handling, AI is increasingly used to enhance telecommunicator performance through automated quality assurance, rapid post-call evaluation, and emerging voice-analysis tools that can signal stress, fatigue, or potential burnout.

A major shift in the past year is the transition from standalone AI products to AI embedded directly within mission-critical systems such as CAD and call-handling platforms. Embedded capabilities — like predictive search, automated summaries, and voice-activated workflows — are accelerating adoption because they require little integration work from agencies. At the same time, AI enabled automation and decision-support functions are transforming operational awareness, enabling pattern detection, resource deployment, and multimodal analysis of audio recordings, video footage, and sensor data.

Despite rapid progress, reliability challenges — such as hallucinations, bias, and inconsistent performance — remain significant barriers. Cultural resistance, public skepticism, and the absence of clear standards or governance frameworks further complicate implementation. Developing oversight, transparency practices, and improved data management will be essential as AI integration accelerates across the public-safety landscape. Allowing agencies to leverage AI to improve public safety through operations.

What Are the Key Opportunities for AI in Public Safety?

AI Can Ease the Impact of Staffing Shortages – Public-safety agencies across the country continue to grapple with severe and persistent staffing shortages. ECCs remain particularly vulnerable, as vacancies among telecommunicators increase call-processing times, drive burnout, and degrade service levels. AI presents some of the most promising opportunities to relieve this pressure — although progress has been slower than many anticipated.

- AI technology is being used in some ECCs to intercept, classify, and triage nonemergency calls before they reach a human telecommunicator. This can significantly reduce call volume and free personnel to focus on higher-priority incidents.
- Transcription and real-time language translation capabilities have advanced substantially in the last year and are being leveraged to lessen the cognitive burden on telecommunicators, reduce call-processing times and improve service delivery, and eliminate errors.

AI Can Improve Telecommunicator Performance and Well-being – An equally important opportunity lies in AI's ability to boost human performance in high-stress, time-critical environments. AI-supported performance tools — particularly in the areas of quality assurance, training, and call analysis — already are making measurable strides, even if adoption remains slower than anticipated.

- AI can be used to evaluate every call shortly after completion, providing immediate feedback to telecommunicators and enabling training that is better aligned with real deficiencies.
- Though still at a nascent stage, AI can be used to perform telecommunicator voice analysis (tone, cadence, inflection) to flag potential burnout, cognitive overload, and indicators of an impending meltdown.

AI is Being Embedded into Existing Systems – A year ago, agencies tended to view AI as a standalone technology —something they would "buy" as a dedicated tool, like transcription software or a separate analytics engine. Today, however, AI is no longer purchased as a product. It has become an embedded capability

woven into the systems and software ECCs already rely on every day. This shift is transformational.

- Examples include AI-powered search and query features inside CAD systems; embedded transcription within call-handling platforms; voice-activated commands for navigating databases; summaries automatically generated from call or incident data; and predictive prompts that help dispatchers or call-takers surface relevant information faster.
- Historically, ECCs avoided deploying standalone AI tools because they required budget authorization and workflow redesign, i.e., telecommunicators don't want to deal with yet another attention-sapping screen or application. In contrast, embedded AI arrives pre-integrated, with most of the technical work done by the system vendor.

AI-Powered Automation and Decision Support – AI is rapidly reshaping how public-safety agencies, and justice organizations process information and make decisions, to enhance speed, accuracy, safety, and situational awareness. At the same time, agencies are discovering that advanced automation and machine learning does not replace human judgment — rather, it amplifies it, enabling personnel to make faster, more informed decisions in high-stakes environments.

- AI's ability to detect patterns across billions of data points enables automated identification of emerging threats or complex situations more quickly than humans can.
- AI's multimodal capabilities — integrating text, audio, images, and video — enable robust decision support for ECC personnel and field responders, e.g., interpreting live surveillance footage or drone feeds to identify hazards or analyzing "alert-rich" environments (alarms, sensors, body-worn cameras) for decision-making cues.

What Are the Main Challenges of Implementing AI in Public Safety?

AI Reliability a Major Obstacle — Reliability is one of the most significant obstacles preventing public-safety agencies from fully embracing AI. These issues fall into several interconnected categories: accuracy, hallucinations, bias, reasoning limitations, prediction-driven behavior, and inconsistent performance across tasks. Each of these reliability shortcomings introduces risks that are unacceptable in environments where consequences can include delayed response, misdirected resources, legal exposure, or public mistrust.

- Up to 25 percent of AI responses may be incorrect, misleading, or entirely fabricated, depending on the use case. This is highly problematic because a single incorrect output could influence dispatching decisions, prioritization, or interpretations of critical information. Data bias, though improving, is a significant factor.
- AI models predict, but don't "think." They can replicate patterns but cannot replicate human reasoning; they struggle with multi-step logical deductions, and they may fail basic relationship or context inferences that a human would consider trivial.

Cultural and Trust Barriers Hinder AI Adoption – While technical issues such as hallucinations and data quality pose quantifiable risks, human concerns — ranging from fear of job loss to skepticism about fairness — are far more difficult to overcome. They slow adoption, limit pilot success, and shape agency attitudes toward AI integration.

- Many public-safety professionals — especially veteran staff members — do not understand how AI works, what its limitations are, or how it produces results.
- Public-safety professionals are trained to avoid mistakes because errors can cost lives or lead to legal consequences. This makes them inherently skeptical of AI.
- Another factor that fuels skepticism concerns the current AI financial model, which is unsustainable — what happens when a 911 center depends on an AI tool and its vendor goes bankrupt?

Lack of Governance a Risk for AI in Public Safety – While AI adoption is accelerating across the public-safety sector, the development of standards, policies, and operational guardrails has not kept pace. Agencies are experimenting with AI tools — sometimes intentionally, sometimes because AI has been silently embedded into the software they already use — but most do so without fully developed guidelines or governance structures. This gap increases organizational risk, slows adoption, and undermines trust.

- Unlike long-standing areas such as computer-aided dispatch (CAD) and call-handling, there are no consensus standards for using AI in the public-safety environment.
- AI requires human oversight and likely always will, but no framework exists for this purpose. Lacking defined oversight best practices increases liability risk and erodes staff confidence. Similarly, transparency requirements are not defined across the sector, e.g., agencies lack standards for explaining how AI reached conclusions.

Key AI Trends to Watch in Public Safety

AI is Addressing Staffing Shortages in Public Safety – Public-safety agencies, especially ECCs, are facing severe staffing shortages, and AI is increasingly being used to offset these gaps.

AI Tools Enhance Telecommunicator Performance and Well-Being – AI is expanding beyond call filtering to tools that directly support human operators.

AI Features Embedded in Mission-Critical Systems – Instead of buying standalone AI products, emergency services agencies now receive AI features embedded within systems they already use.

AI Advances Automation and Decision-Making – AI is rapidly reshaping operational decision-making. Increasingly, it is being perceived not as a replacement for human judgment but as a tool that amplifies speed, accuracy, and context in mission-critical environments.