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Seven Ways AI is Transforming 911 Emergency Response

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Artificial Intelligence (AI) is no longer a futuristic concept in emergency communications—it is actively shaping how 911 centres operate, helping dispatchers prioritise calls, automate tedious tasks, and free up critical time for higher-value activities. In a field where every second counts, AI is emerging as a partner that enhances both operational efficiency and the quality of emergency response. From reducing telecommunicator workloads to improving call-handling accuracy, the potential is transformative.

Emergency communications centres (ECCs) face persistent challenges: staffing shortages, high turnover, surging call volumes, and limited time for coaching and quality assurance (QA). It can take a full year to train a telecommunicator to operate unsupervised, and the average call-taker handles over 2,400 calls annually. Burnout is rampant, with 75% of centers reporting high levels, and national turnover rates hovering around 30%—sometimes as high as 40%. As centres become busier, QA and coaching are often the first functions to suffer. Supervisors spend hours tracking down call recordings to reconstruct incidents, pulling Computer-Aided Dispatch (CAD) records, locating calls for QA, and trying to provide meaningful feedback amid the pressure of high call volumes.

AI offers a solution to these operational pressures. A recent *AI in Emergency Communications Benchmark Study conducted by NiCE* drew over two hundred respondents from six countries, revealing how AI is currently being adopted in ECCs and the ways it is improving operations. The survey suggests that AI-powered transcription is gaining traction as a tool to reduce workloads, improve call-handling accuracy, and support QA and incident reconstruction processes.

Why AI Matters Now: Insights from the NiCE Benchmark Study

The NiCE survey underscored several key trends. QA tops the list of AI use cases, with 60% of respondents wanting to use AI to automatically score calls. Roughly half hoped AI could reduce supervisors' workloads by automating administrative tasks and providing coaching tips for training staff.

Other high-priority use cases included keyword searches to find and categorize recorded calls, real-time sentiment analysis to identify critical

situations, on-the-spot assistance for call-takers, and predictive analytics to anticipate surges in call volume.

AI-powered transcription emerged as a particularly valuable capability. Over 75% of professionals suggested they'd be interested in leveraging real-time alerts for high-risk calls—such as suicides or shootings—allowing supervisors to respond and intervene as needed, immediately. Keyword searching, live monitoring, reduced manual note-taking, and tagging high-risk calls for focused QA were also highlighted as top uses.

While only 15% of centres surveyed have fully implemented AI transcription to date, an additional 10% plan to adopt it within a year, and over half are exploring it for future use.

The survey also highlighted a growing interest in leveraging AI for incident reconstruction. Approximately 68% of respondents wanted to search voice recordings using CAD data such as incident IDs (a capability available today without AI), but 58% also expressed interest in keyword-based searches to streamline reconstruction workflows. Generative AI for automated call summaries, CAD timeline generation, and stress detection in voice analysis were additional areas of strong interest.

AI adoption in QA is still emerging. While 78% of centres rely solely on manual QA processes, 12% have implemented partial automation of QA (with human oversight), and an additional 6% are actively implementing AI-powered QA today. Most centres favour a hybrid approach where AI flags and pre-scores calls, allowing supervisors to review and validate results.

Concerns about AI adoption remain, particularly regarding budget constraints, accuracy, data security, and integration with legacy systems. Yet the overall momentum is strong, with over half of centres either using AI in some capacity or planning to implement it within a few years. Nearly 7% reported no significant barriers to adoption, indicating readiness and openness to leveraging AI for improved emergency communications.

With these survey insights in mind, let's explore seven ways that AI is transforming 911 emergency response today.

#1 – 100% Call Transcription: Turning Words into Actionable Insights

AI-powered transcription is revolutionizing the foundation of emergency response. In ECCs, callers often speak hurriedly in stressful, noisy environments, and dispatchers must capture critical information while coordinating first responders. AI transcription converts spoken conversations into structured, searchable text, unlocking insights that were previously inaccessible.

Modern AI transcription tools, like those evaluated in the NiCE study, are designed to handle the complexities of emergency calls, including talk-over, interruptions, and background noise. Accuracy rates exceed 95% for critical details such as names, addresses, and descriptions. By transcribing every call segment automatically, supervisors can identify high-priority incidents for QA, streamline coaching, and reduce time spent manually reviewing audio.

Accurate transcription of every call does more than preserve records; it enhances decision-making. Supervisors can determine whether callers received timely assistance, assess telecommunicator performance, and pinpoint opportunities to improve operations. AI transcription transforms unstructured voice data into actionable intelligence, ensuring critical information is visible when it matters most.

#2 – Keyword Searches on 911 Calls & Incident Reconstruction: Unlocking Real-Time and Historical Insights

AI enables rapid keyword searches across call transcripts, drastically improving both real-time situational awareness and post-incident reconstruction.

For example, in a real-world case, a child was reported kidnapped in a white van. A centre receiving hundreds of calls per hour could not manually sift through all of the 911 voice recordings, without hours of effort. However, by searching all of the call transcriptions for "white van," dispatchers were able to quickly identify a related call containing the van's license plate, and this led to the child's swift recovery.

Beyond immediate emergencies, AI supports comprehensive incident reconstruction, a process which is traditionally cumbersome and time intensive. Incident reconstruction necessitates gathering information from multiple data sources—audio recordings, CAD records, logs from officers in the field, and even bodycam or CCTV footage—to understand exactly what happened. AI accelerates this process by:

- Automatically linking voice recordings to CAD incident numbers
- Tagging calls based on keywords, phrases, or contextual cues (so they are easily searchable)
- Highlighting relevant interactions across multiple calls and units
- Generating chronological summaries of events for investigators and QA teams

By combining transcription, keyword searches, and intelligent tagging, AI allows teams to reconstruct incidents faster, more accurately, and with less manual effort. ECC staff can quickly locate, and piece together calls related to a complex incident, supporting public records requests, legal proceedings, and internal reviews, and ensuring that critical evidence is always accessible, organised, and actionable.

Furthermore, AI's ability to link related incidents over time helps supervisors and analysts detect patterns or repeat behaviors. For instance, repeated calls from the same location reporting minor disputes may reveal a broader trend that requires community outreach or targeted law enforcement strategies.

In short, AI transforms incident reconstruction from a labour-intensive, manual process into a streamlined, data-driven workflow that enhances situational awareness, accountability, and public safety.

#3 – Call Categorization: Prioritizing Calls and Improving Operational Accuracy

AI-powered call categorization goes beyond transcription to interpret call content, automatically classifying incidents based on keywords and context. Examples include calls from children or repeat callers, and calls involving mental health crises, suicide, missing people, shootings, injured victims, bomb threats, and complaints. This enables supervisors to quickly identify high-risk situations and prioritize calls for QA review.

By aggregating trends over time, agencies can identify recurring complaint types, high-risk areas, and training opportunities. AI also allows centres to validate CAD entries, comparing automated categorization with manual coding to enhance accuracy and reduce misclassifications.

These insights support better resource allocation, improve training programs, and help maintain high standards of professionalism by identifying mishandled or unprofessional interactions.

Case Study: Enhancing 911 Call Categorization with AI-Powered Transcription

In one large 911 centre handling 40,000 calls per day, AI-powered transcription and call categorization have been integrated into daily operations for the past ten years to enhance quality, accountability, and data accuracy. Supervisors use AI to monitor key call categories, including child callers, complaints, repeat callers, officer shootings, suicide incidents, and injured victims, in order to identify best practices and training opportunities.

AI also plays a crucial role in internal investigations by quickly locating calls linked to complaints, such as instances of rudeness, dead air, or repeated call attempts, and in validating CAD data accuracy by comparing logged incident types with what is found in the audio recordings.

The system helps identify misclassifications and ensures that calls are triaged and dispatched correctly, which is essential for operational effectiveness and preventing over-dispatching of resources. AI enables supervisors to audit classification accuracy by analyzing calls with contextual keyword detection and comparing them with manually coded CAD entries, allowing for improvements in coding, telecommunicator coaching, and process refinement.

High-profile incidents, such as car chases or disturbances caused by motorcycle gangs, are monitored in near real-time, with AI facilitating rapid identification of relevant calls.

#4 – Call Summarization: Transforming Audio into Actionable Reports

AI-powered summarization reduces the cognitive load on call handlers and supervisors by producing concise, readable summaries of emergency calls. Summaries allow teams to quickly understand incidents, support QA, and provide clear documentation for reports and investigations. Generative AI can create post-call summaries almost immediately, offering fast insights without exposing staff to repeated trauma from listening to distressing audio.

This technology supports:

- Faster and more accurate dispatch decisions
- Reduced telecommunicator workload and stress
- Improved handoff of incidents to first responders
- Clear, concise documentation for investigations and training

The potential impact of deploying technologies such as this is profound. For example, one UK policing study suggests that leveraging high tech tools, including AI and automation, could free up to fifteen million policing hours annually, highlighting the transformative potential of such tools for emergency communications as well.

AI-powered call summarization in 911 centres could transform how emergency communications are managed by quickly condensing lengthy, complex calls into concise, actionable summaries. In high-pressure environments where call-takers handle multiple incidents simultaneously, having an AI-generated summary would allow supervisors, dispatchers, and first responders to understand the key details of a call at a glance—such as the type of emergency, location, parties involved, and immediate threats—without needing to replay the entire recording. This would save valuable time, reduce the risk of misinterpretation, and support faster, more accurate decision-making, especially during critical incidents like active shootings, medical emergencies, or large-scale public disturbances.

Additionally, AI summarization could enhance QA and training by highlighting critical call elements for review, allowing supervisors to focus on the most relevant portions of interactions, such as how effectively call-takers gather information, communicate with distressed callers, and follow protocols. Summarized transcripts could also streamline internal investigations and post-incident reporting, making it easier to document patterns, identify recurring issues, and ensure compliance with policies. Over time, this could improve overall operational efficiency, reduce cognitive load on staff, and provide a richer data set for analytics to enhance response strategies and resource allocation.

#5 –Automated Quality Assurance: Precision in Performance Improvement

AI enables supervisors to conduct keyword-targeted QA, focusing on high-risk calls or those flagged as sensitive or complex. Rather than reviewing calls randomly, managers can search

transcripts for specific phrases, patterns, or outcomes, such as "not breathing," "gun," or "heart attack." This targeted approach to quality-assuring high-acuity calls improves feedback, accelerates coaching, and can enhance overall public safety outcomes.

Beyond targeted review, AI can also facilitate automated QA scoring, evaluating whether telecommunicators are asking the right questions, following protocols, and correctly categorizing calls. While full AI-powered QA adoption remains low, hybrid models combining AI pre-scoring with human review are preferred and provide measurable efficiency gains.

#6 – Smarter Workforce Management: Predicting Needs Before They Arise

AI is increasingly being applied to workforce management in 911 centres, addressing challenges of staffing and scheduling. Advanced AI models analyze historical call volumes, seasonal patterns, local events, holidays, and even weather to forecast staffing needs accurately. By automating scheduling, these systems generate optimal shift plans that account for employee availability, skill sets, and labour rules, saving supervisors hours of manual work.

The result is more efficient staffing, reduced over- and understaffing, and improved telecommunicator morale and job satisfaction, all of which contribute to better response times and reduced burnout. Smarter workforce management represents a direct way that AI can support both operational efficiency and staff retention.

#7 – AI Agents for Non-Emergency Calls: Freeing Humans for Critical Response

Over 60% of 911 calls do not involve a crime or immediate safety concern. For example, calls to 911 can often involve noise complaints, lost property, minor traffic accidents, welfare checks, and animal-related issues. This growing volume of non-emergency calls places a heavy burden on dispatchers and emergency communication centres that are already facing staffing shortages and high stress levels. To help address these challenges, many agencies are turning to new technologies — particularly AI agents — to manage routine calls more efficiently while ensuring that human operators remain focused on true emergencies.

An AI agent is a software system that acts independently to achieve specific goals — perceiving information, making decisions, and taking actions without continuous human input. Unlike a basic chatbot that simply answers questions, an AI agent can plan and execute multi-step workflows, adapt to different situations, and complete tasks efficiently from start to finish.

In 911 centres, AI agents are being adopted to help manage high call volumes and ongoing staffing shortages. These systems can answer and triage non-emergency or low-acuity calls — such as noise complaints, parking issues, or welfare checks — by gathering key information, validating caller locations, and escalating emergencies to human dispatchers when necessary. This helps reduce dispatcher workload, improve data accuracy, and ensure human call-takers can focus on life-threatening emergencies.

A similar transformation is happening in 311 centres, which handle non-emergency municipal service requests such as pothole reports, trash collection issues, and noise complaints. AI agents in these environments function as virtual city service representatives — answering calls or online inquiries, classifying requests, and routing them to the correct department for resolution. By automating these repetitive tasks, cities can manage service requests more efficiently and provide faster, 24/7 responses to residents without increasing staffing costs.

Across both 911 and 311 operations, AI agents are proving to be valuable partners — supporting, not replacing, human professionals. They help optimize staffing, improve response times, and enhance the accuracy and consistency of information handling, strengthening how public safety and city services respond to community needs.

The Future of AI in Emergency Communications

The potential for AI in ECCs is far from fully realized. One major frontier is advanced *real-time* call triage and decision support. Rather than just processing a call and logging it, future AI systems will listen to the caller, transcribe the conversation, detect critical keywords and urgency cues (such as the caller's tone, background noise, or language barriers) and dynamically assess the priority of the incident. For example, AI may flag that a call involves a suspected stroke or large-vehicle accident within seconds of the caller speaking, then immediately surface relevant information and route the call through a more accelerated workflow. Furthermore, by integrating with historical call data, incident databases, and even IoT/network feeds, these systems can aid dispatchers in forecasting resource needs and positioning responders ahead of time.

Beyond triage alone, another promising area is multimedia and sensor data integration. As NG-911 infrastructure becomes more widespread, emergency communication centres will increasingly accept not just voice calls, but texts, images, video streams and telemetry from connected devices (smartphones, vehicles, wearables, smart homes). AI will play a crucial role in analyzing this rich data: for instance, identifying smoke or fire in a video clip, mapping the GPS location of a vehicle crash from telematics, or recognizing distressed speech patterns in a live feed. By providing this context to dispatchers, response teams can arrive on scene with far better situational awareness. For example, a caller could be streaming a video of a collapsed structure while the system automatically geofences the area, alerts multiple agencies, and triggers a tailored response.

Training, QA, and continuous improvement also stand to benefit from AI in the near future. Rather than solely relying on human supervisors to review selected calls, AI models can monitor nearly all calls in near-real time for protocol adherence, identify where agents might be missing critical steps, and then generate customized training modules. Similarly, simulation platforms are being developed where AI agents function as virtual callers in highly realistic scenarios — enabling dispatchers to train for rare but high-stakes events in a safe, controlled environment.

Of course, with these advances come important challenges and considerations. Data privacy and security remain paramount when integrating video, audio, and device telemetry into emergency workflows. The reliability of AI judgement in high-stakes situations must be rigorously evaluated — misclassification or delay could have profound consequences. The human-in-the-loop model will remain essential: current and foreseeable systems are intended to *augment* rather than *replace* human dispatchers and decision-makers.

In sum, the future of AI in emergency communications is not about replacing the 911 telecommunicator; it's about equipping them with richer information, faster decision support, and smoother workflows so that when seconds count, they're working with the best possible tools. These advancements promise more informed responses, better resource allocation, and ultimately safer outcomes for the public that will save lives.

Works Cited

Dholakia, Nazish. "Most 911 Calls Have Nothing to Do with Crime. Why Are We Still…." *Vera Institute of Justice*, 22 Apr. 2022, www.vera.org/news/most-911-calls-have-nothing-to-do-with-crime-why-are-we-still-sending-police.

"Investing in Tech Would Free up 15 Million Hours of Police Time." *National Police Chiefs' Council (NPCC)*, 2025, news.npcc.police.uk/releases/better-investing-in-science-and-technology-would-free-up-15-million-hours-of-police-time.

NiCE Public Safety. *AI in Emergency Communications Benchmark Study Results Report Assessing the Adoption, Current Impact and Future Role of AI in Improving Emergency Communications and Response AI in Emergency Communications Benchmark Study Results Report 2*. Mar. 2025.

"Project RETAINS." *APCO International*, 2025, www.apcointl.org/services/staffing-retention//project-retains/#study. Accessed 30 Oct. 2025.

"Survey: More than Half of 911 Centers Face Staffing Crisis." *911.Gov*, www.911.gov/newsletters/issue-14/survey-more-than-half-of-911-centers-face-staffing-crisis/.