Bridging the future

Inclutech CTO – and Ian Thompson Bursary winner – Dr Jonathan Sinclair discusses some of the crucial lessons learned at last year's APCO Canada event, particularly in relation to NG999/911 evolution

The future of emergency services lies not in the systems we have built, but in the connections we forge. At the APCO Canada 2024 Conference in Toronto, this truth became evident as professionals from across North America and the UK converged to share insights into Next Generation 911 (NG911) systems.

While the UK's NG999 framework differs – operating primarily through BT rather than multiple public safety answering points (PSAPs) – the underlying mission remains unchanged: to save lives through technology and innovation.

The transition to next-generation emergency services represents more than a mere technological upgrade. Rather, it is a fundamental reimagining of how we handle crisis response in the digital age. Traditional voice-only systems, while reliable, increasingly fall short in an era when data drives decision-making.

Verbal systems fall short in capturing quality data, while non-verbal systems excel – and quality data is the key to unlocking the full potential of machine learning, analytics and AI.

Innovation in action

This reality came into sharp focus during visits to pioneering PSAPs across Canada. At Hamilton's PSAP, APCO president Jen Moreton showcased the first phase of their NG911 transition, demonstrating how integrated solutions like RapidSOS and What3Words are revolutionising emergency response through precise location data and standardised frameworks.

The demonstration highlighted how modern emergency services can leverage technology to pinpoint callers with unprecedented accuracy. This is a crucial advancement for urban and rural responses alike.

Perhaps even more impressive was the PEEL Regional Police's NG911 PSAP, which handles nearly one million emergency calls annually for a ➥

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population of 1.9 million, plus 40 million Toronto Airport visitors. Their Community Safety Centre exemplifies the future of emergency response, where multi-channel services – including video and non-verbal communication options – are becoming the norm rather than the exception.

The centre's advanced analytics capabilities, and modern hardware and software infrastructure, demonstrate how data-driven insights can transform emergency response operations.

Collaborative framework for success

The success of these implementations hinges largely on effective public-private partnerships. Canada's Emergency Service Working Group, overseen by the Canadian Radio-television and Telecommunications Commission (CRTC), demonstrates how collaborative governance can drive innovation.

Their achievement in becoming the first country to reach end-to-end NENA i3 compliance in 2023 speaks volumes about the power of unified purpose. This success story offers valuable lessons for the UK's own journey toward next-generation emergency services.

The CRTC's approach to governance and collaboration, particularly through multiple task forces and robust public-private sector engagement, provides a blueprint for effective emergency service modernisation. Its straightforward mission – 'Improve 911' – has driven remarkable progress through focused effort and clear objectives.

The Emergency Service Working Group's achievement in reaching NENA i3 compliance wasn't merely technical. Rather, it represented a cultural shift in how emergency services view collaboration. The working group comprises multiple specialised task forces, each addressing different aspects of implementation, from technical standards to accessibility requirements.

This structure has enabled it to tackle complex challenges systematically while maintaining rapid progress. Its governance model balances central oversight with distributed decision-making, allowing for agile responses to emerging issues.

What makes this approach particularly relevant for the UK is its emphasis on stakeholder inclusion. Rather than treating the private sector as merely vendors or service providers, the working group integrated them as essential partners from the outset.

This approach ensured that technical solutions were designed with real-world operational constraints in mind. As one working group member explained: "When telecommunications providers, hardware manufacturers and emergency services collaborate as equals, innovations emerge that none could have developed independently."

This inclusive approach has enabled Canada to overcome technical hurdles that might otherwise have stalled implementation. It is a lesson the UK would do well to incorporate into its own NG999 framework.

Technical standards and data integration

At the heart of these advancements lies data standardisation. The NENA i3 architecture provides crucial frameworks for handling various communication forms, from traditional voice calls to IoT-generated alerts.

"Technology serves people, meaning both personnel and communities"

Key components include the Presence Information Data Format – Location Object (PIDF-LO), which standardises location data transmission, ensuring precise co-ordinate delivery for emergency responders. The Emergency Incident Data Document (EIDD), meanwhile, provides structured formats for transferring incident data between systems, including computer-aided dispatch (CAD) platforms. These standards ensure uniform data processing across agencies.

Perhaps most importantly, the framework supports multimodal data integration, incorporating social media feeds, IoT devices and multimedia inputs into the emergency response framework. This comprehensive approach to data handling enhances situational awareness and response capabilities significantly.

The human element

The human element remains crucial, as emphasised in Daniel Lewis's compelling keynote on S.E.E.N. (supportive, empowering, effective, necessary). This philosophy recognises that technology serves people, both emergency service personnel and the communities they protect.

This became particularly evident when I had the opportunity to demonstrate Inclutech's innovative non-verbal emergency reporting tool, TapSOS, accredited by British APCO, that ensures accessibility for vulnerable populations.

The tool's importance cannot be overstated for individuals with hearing or speech impairments, victims of domestic abuse, or those in situations where speaking is unsafe. The enthusiastic response from PSAPs in Canada and the US reinforced the critical need for such accessibility solutions within next-generation emergency service frameworks.

The reception to TapSOS at the conference revealed a crucial insight. That is, accessibility isn't an afterthought in next-generation emergency services – it is fundamental to their design philosophy.

PSAP operators recognised that non-verbal reporting tools address critical gaps in current

systems, particularly for vulnerable populations. As one Canadian PSAP manager noted: "When we talk about serving our communities, we must ensure that 'community' includes everyone, especially those who cannot communicate through traditional means."

The demonstration sparked numerous discussions about implementation strategies, with PSAPs expressing particular interest in TapSOS's ability to transmit critical information silently and securely.

This interest extended beyond theoretical support, with multiple agencies requesting follow-up demonstrations and information about integration requirements, signalling a concrete commitment to accessibility.

This experience underscored the importance of designing NG999 with inclusivity as a core principle rather than a supplementary feature. As the UK continues developing its next-generation framework, solutions like TapSOS should be incorporated from the ground up, ensuring that emergency services are truly accessible to all citizens regardless of their communication abilities or circumstances.

Real-world implementation

Behind the scenes, operational NG911 PSAP centres demonstrate several key advancements over legacy systems. These are:
- Real-time location tracking capabilities that significantly surpass current UK systems.
- AI-driven triage tools that assist call-takers in prioritising incidents and providing more tailored responses.
- Enhanced data-sharing between agencies that eliminates the fragmentation often seen in traditional systems.

While these centres have faced their own challenges with infrastructure deployment, their experiences offer valuable lessons in overcoming obstacles through effective governance and strong public-private collaboration.

European context and UK opportunities

The UK's position within Europe offers unique opportunities for advancement. The European Emergency Number Association (EENA) has developed valuable frameworks for cross-border emergency response. Countries like Sweden and the Netherlands, meanwhile, have successfully integrated real-time location tracking and multimedia communication into their dispatch systems.

For the UK's NG999 system, these insights offer a roadmap forward. While facing its own challenges, particularly with the Emergency Services Network deployment, the UK can learn from North American experiences in flexible implementation, cross-

sector collaboration and resilient procurement strategies. Key recommendations include:
- Adopting flexible timelines that allow for incremental roll-outs rather than an all-or-nothing approach.
- Engaging telecom providers and technology firms early in the development process.
- Implementing agile procurement adjustments to prevent stagnation.
- Aligning more closely with EENA's collaboration model.
- Expanding citizen engagement through mobile app-based emergency reporting.

Moving forward

The path forward requires several key steps. These include aligning with international standards while maintaining local relevance, strengthening private-public partnerships, investing in comprehensive training, and ensuring technology serves all members of society. The UK must also address ESN delays proactively, applying lessons from NG911 to ensure flexible, adaptive governance and procurement strategies.

As we look to the future of emergency services, one thing becomes clear: success lies not in the technology itself but in how we harness it to serve our communities.

Whether through advanced data analytics, AI-driven triage tools or innovative accessibility solutions like TapSOS, the goal remains unchanged. That is, ensuring that every call for help receives the response it deserves.

Behind every emergency report stands a dedicated professional, supported by increasingly sophisticated technology. Their mission transcends borders and systems, united in the commitment to protect and serve.

As we continue to advance emergency services technology, we must remember that innovation serves a single purpose: saving lives through better, faster and more accessible emergency response.

A call to action

The transformation of emergency services is not just about technology, it is about people, processes and partnerships. As the UK continues its journey toward NG999, the experiences and insights from North America and Europe provide valuable guidance.

By embracing these lessons while adapting them to our unique context, we can build an emergency response system that truly serves all members of our society.