

New Challenges in Public Safety and 9-1-1 Centers

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Preface

Today's public safety agencies face an unprecedented set of challenges. New technology, an expanded set of requirements and regulations, and increasing citizen expectations are pushing even the most progressive agencies to their limits. These challenges are made even more formidable by reduced funding and budgets, difficulties in recruiting and retaining qualified staff, and a continual need to do more with less.

In this environment, agencies must evaluate and select their technology carefully to obtain reliable, extensible solutions that can evolve as requirements shift. This paper examines how Impact 360® for Public Safety Powered by Audiolog™ can help EMS and 9-1-1 centers, public safety answering points (PSAPs), and other first-responder agencies better manage their workforce performance through mission-critical recording, investigation and analytics, quality assurance, eLearning and coaching, and citizen survey functionality.

About Verint

Verint® Systems Inc. is a leading provider of Actionable Intelligence® solutions for an optimized enterprise and a safer world. More than 10,000 organizations in over 150 countries rely on Verint solutions to perform more effectively, build competitive advantage, and enhance the security of people, facilities, and infrastructure.

EMS and 9-1-1: An Evolving Mission

For many—if not most—Americans, the concept of “public safety” is inextricably linked to the services accessed through 9-1-1, notably, emergency medical services (EMS), police, and fire/rescue services. The general expectation is that contacting 9-1-1 will result in prompt dispatch of trained, qualified personnel, regardless of the time of day, location, and nature of the emergency.

This expectation affirms the success of U.S. public safety organizations in organizing and promulgating a coordinated emergency response system. Surprisingly, the system has been in existence for only the last 40 years. In 1966, two landmark events—the establishment of the U.S. Department of Transportation (DOT) and the publication of a report by the National Academy of Sciences entitled *Accidental Death and Disability: The Neglected Disease of Modern Society*—sparked the evolution of EMS services in the United States. The report caused public outcry, in part because it contained statistics showing that in the year 1965 alone, more Americans had died in automobile accidents (50,000) than in eight years of the Vietnam War.¹ According to the report, many of the fatalities were the result of unregulated, unsophisticated pre-hospital care.

The DOT was given the authority and responsibility to improve EMS education, including the development of standards. The DOT’s National Highway Safety Bureau (the predecessor agency to what is now the National Highway Traffic Safety Administration) was created, and part of the new agency was dedicated to EMS.²

Lack of uniform federal, state, and local laws concerning EMS standards posed immediate challenges to the agency. Equipment, communications, and training varied widely across—and even within—states. In 1968, efforts began in earnest to develop national standards for basic training for EMS personnel, and American Telephone and Telegraph began reserving the digits 9-1-1 for emergency use.³

Early 9-1-1 systems were built using analog technology over copper land lines. In the 1980s, many of these basic 9-1-1 systems were upgraded to “enhanced 9-1-1” with the addition of automatic number identification (ANI – the phone number from which a call originates) and automatic location identification (ALI – a corresponding physical address obtained from a lookup in a phone network provider’s subscriber database).⁴ The basic system infrastructure, however, remained unchanged.

Today, citizens communicate using a wide range of devices that are wireless, mobile, and support more than just voice calls. Unfortunately, these devices require communications innovations such as digitization, packet switching, and Internet Protocol (IP) standards, which are poorly supported in the 9-1-1 environment. The 9-1-1 network’s 40 year-old technology was not designed to handle communications from mobile phones, mobile phone video cameras, automated computer alarm systems, or telematics systems (such as OnStar) that automatically provide crash or vehicle location information.⁵

Now, public safety organizations are facing a tenuous situation in which consumer expectations for the 9-1-1 system have outstripped the ability of the legacy system to meet them. Analog systems cannot carry text messages, as demonstrated by the tragic Virginia Tech incident, in which students attempted to

¹ *Safer Roads, Fewer Fatalities: Emergency Medical Services*, Iowa Department of Transportation, December 2004, p. 2.

² “The History of EMS at NHTSA,” www.ems.gov.

³ Iowa Department of Transportation, *op. cit.*, p. 3.

⁴ *U.S. DOT Next Generation 9-1-1 Project: A National Framework and Deployment Plan*, U.S. Department of Transportation Intelligent Transportation Systems, Emergency Services Workshop, October 10, 2008.

⁵ “Health of the 9-1-1 Emergency Network in the United States,” Summarized by Jeff Robertson, *Emergency Number Professional*, June/July 2008.

text message the 9-1-1 dispatch center with vital information, only to find the system could not process the data they had sent.⁶

A report by the National Emergency Number Association (NENA) summarizes the situation bluntly: “Simply put, the 9-1-1 system has not kept up with technology and is badly in need of modernization.”⁷

Next-Generation 9-1-1 and Other Initiatives

Public safety organizations and government agencies are painfully aware of the shortcomings of the existing 9-1-1 network and are taking action to modernize the system.

The Federal Communications Commission has imposed rules for enhanced wireless 9-1-1 to improve the reliability and the accuracy of the location information transmitted with 9-1-1 calls. Likewise, the Association of Public-Safety Communications Officials (APCO) launched Project Locate Our Citizens At Times of Emergency (LOCATE) in August 2005 as an independent study to test wireless location data delivered to public safety answering points (PSAPs) by wireless carriers.

To address the broader issues associated with processing voice over IP, images, video, text, and telematics, NENA initiated planning for Next-Generation 9-1-1 (NG9-1-1) in 2000. The organization began crafting standards in 2003, working in partnership with industry, public safety, and government agencies, as well as with other organizations, including APCO.⁸

In a joint statement issued in March 2007, APCO and NENA outlined the roles that each agency will play in NG9-1-1. NENA’s focus is on the technical and architectural components of the NG9-1-1 systems, along with the operational environment in which those systems must operate. APCO is focusing on the operational utility of those systems, including the development of educational and related strategies to optimize their use by the public, the public safety community, and the governance and public policy entities that are ultimately responsible.⁹

The DOT is funding the *Next Generation 9-1-1 Project*, a two-year research and development initiative to define a NG9-1-1 system architecture and develop a transition plan that considers the responsibilities, costs, timelines, and benefits associated with deploying IP-based emergency communications across the nation. The long-term goal of the project is to enable the general public to make a 9-1-1 request via any real-time communications medium (voice, text, or video) from any wired, wireless, or IP-based device, and to allow the emergency services community to take advantage of advanced call delivery and other functions through new technologies based on open standards.¹⁰

Modernization will touch on all parts of the 9-1-1 system, including hardware, software, data, and operational policies and procedures. The system is envisioned as providing a nationwide overlay of system links that can operate at the national, regional, tribal, state, or local level, as required.

The DOT successfully completed a proof-of-concept test involving five 9-1-1 agencies and announced the results in a September 17, 2008 report entitled *Next Generation 9-1-1 (NG9-1-1) System Initiative: Proof of Concept Testing Report*. The proof-of-concept focused specifically on handling 9-1-1 calls from origination to delivery and handling by public safety call takers. The test was strictly a proof of concept—not a beta test—and no live calls were used during the testing.

⁶ *Ibid.*, p. 20

⁷ *A Policy Maker Blueprint for Transitioning to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1*, National Emergency Number Association, October 2008.

⁸ “Emergency Communications: The Future of 911,” *CRS Report for Congress*, Linda K. Moore, Congressional Research Service, November 21, 2008.

⁹ Written statement of Wanda McCarley, President of the Association of Public-Safety Communications Officials (APCO) International before the U.S. Senate Committee on Commerce, Science, and Transportation, April 10, 2007, p. 7.

¹⁰ *U.S. DOT Next Generation 9-1-1 Project: A National Framework and Deployment Plan, op. cit.*, slide 4.

Challenges with Implementing NG9-1-1

Although the need to upgrade 9-1-1 is undisputed, many agencies will be hard-pressed to do so in the near term. Implementing NG9-1-1 will require not only the development of an IP-enabled network and systems, but will also entail changes in operational procedures, training, funding models, and state—and possibly federal—regulations and laws.¹¹

In a written statement made before the U.S. Senate Committee on Commerce, Science, and Transportation on April 10, 2007, Wanda McCarley, then president of APCO, noted, “Public safety faces three major challenges to meeting the public’s expectations of the future, including technology, funding, and staffing.”¹²

The infrastructure investments required to address NG9-1-1 include devices that comply with FCC requirements for caller information for 9-1-1 calls (especially location information); local networks to route communications; call-processing equipment, computers, software, and other equipment for PSAP call centers; and interfaces with first responders.¹³

Fortunately, off-the-shelf commercial technology is available to meet these challenges. The challenge lies less with availability of equipment and more with the lack of money with which to procure it.

Funding for services from basic 9-1-1 to enhanced 9-1-1 is provided by a number of sources, including surcharges on telephone subscribers (wireline and wireless) in a given area. The amount of the surcharge varies according to state and local laws, and many states that distribute surcharge funds to PSAPs do so based entirely on the number of landline telephones in their jurisdiction.¹⁴ As the number of landline telephones dwindle, so does funding for the PSAPs. Moreover, in some states, funding collected from consumers for 9-1-1 is sometimes diverted to other uses. The 9-1-1 Industry Alliance—a group of prominent organizations within the public safety industry—has recommended using a state-legislated, audited surcharge model that applies across all new devices.¹⁵

In 2004, the U.S. Congress created an Enhanced 9-1-1 Implementation Coordination Office (ICO) to foster efforts to improve 9-1-1 systems. The federal grant program administered by the ICO is scheduled to disburse over \$41 million in matching grants in 2009. While allowing for the consideration of developing 9-1-1 services for unserved communities, the proposed rules for the grant program would favor purchases of hardware and software for enhanced 9-1-1 and IP-enabled systems, as well as training in connection with these investments.¹⁶

Funding for training is critical, as there is currently no federal grant program for 9-1-1 that can be used to train communications center personnel.¹⁷ However, in the NG9-1-1 environment, training will be paramount as PSAPs incorporate new equipment, software, databases, systems, and processes; new forms of communication or data (such as text messages or telematics); advanced data sharing; and greater communication and collaboration with multiple agencies.¹⁸ Given the sweeping nature of these changes, it is possible—even likely—that best practices, rules, and regulations for the proper handling of calls may change as well.

¹¹ Moore, *op. cit.*, p. CRS-2.

¹² McCarley, *op. cit.*, p. 10.

¹³ Moore, *op. cit.*, p. CRS-17.

¹⁴ McCarley, *op. cit.*, p. 8.

¹⁵ Robertson, *op. cit.*, p. 22.

¹⁶ Moore, *op. cit.*, p. CRS-18.

¹⁷ McCarley, *op. cit.*, p. 11.

¹⁸ U.S. DOT Next Generation 9-1-1 Project: A National Framework and Deployment Plan, *op. cit.* slide 3.

These are some of the most salient changes; however, there are other, more subtle changes that may also impact public safety agencies. New skill sets may be required to administer the system, process “calls,” and manage inter- and intra-agency communications, data-sharing, and reporting. Monitoring and evaluating the performance of call takers and dispatchers will almost certainly require new processes and methods. Even launching NG9-1-1 to the public and monitoring how the new service is perceived may require skills and processes that are new to most agencies.

Next Steps

With the DOT proof-of-concept testing completed, NG9-1-1 transition planning is underway to examine cost, value, and risks and to develop a final transition plan.¹⁹ NENA has estimated that the earliest a fully standards-compliant NG9-1-1 system could be in place would be mid-2009.²⁰

In the meantime, public safety agencies can help prepare themselves by taking advantage of the documentation available in print and over the Web, including information posted on these sites:

DOT - <http://www.its.dot.gov/ng911>

APCO - <http://www.apco911.org>

NENA - <http://www.nena.org>

Additionally, public safety organizations can begin investigating technology to help them address their current and future challenges. In doing so, they should be mindful of the NG9-1-1 key architecture goals as stated in the DOT Next-Generation 9-1-1 Project. These include:

Scalability – Meets the needs of PSAPs and 9-1-1 authorities of differing sizes.

Extensibility – Permits future technologies to be woven into the system without requiring wholesale replacement.

Reliability – Requires redundant hardware, multi-path connectivity, and no single point of failure.

Configurability – Supports the diverse nature of PSAPs and 9-1-1 authorities.

Interoperability – Enables interfacing and communicating across various systems and networks.

Openness – Uses open systems, standards and protocols.²¹

One solution designed to help meet the stringent and mission-critical requirements of PSAPs is Impact 360® for Public Safety Powered by Audiolog™, a next-generation public safety offering. The solution is offered by Verint® Systems, an experienced provider of public safety solutions whose portfolio includes proven and patented technologies for 9-1-1 emergency services and workforce optimization.

Impact 360 for Public Safety brings together functionality for voice and screen recording, quality assurance, analytics, scorecards, call taker training, and citizen surveys into a flexible, easy-to-use, packaged offering. The solution introduces a host of workforce optimization functionality to help today's complex, rapidly evolving 9-1-1 operations reduce liability, enhance accuracy and immediacy, and conduct more efficient investigation analysis and reconstruction.

¹⁹ U.S. DOT Next Generation 9-1-1 Project: A National Framework and Deployment Plan, *op. cit.*, slide 13.

²⁰ “Overall NG9-1-1 Status,” www.nena.org, July 23, 2007.

²¹ U.S. DOT Next Generation 9-1-1 Project: A National Framework and Deployment Plan, Briefing for NENA NG Partner Program, March 6, 2008.

The foundation of the solution is Verint Audiolog, a proven multimedia call recording, quality assurance, retrieval, and archiving solution. Audiolog features a single platform across IP, TDM and radio, integrated quality assurance for call takers and dispatchers, a multi-channel player for incident replay, screen recording, and instant recall for playback of current and recent calls.

In addition to recording telephone and radio interactions through Audiolog, Impact 360 for Public Safety also features:

Multimedia Recording—Captures telephone and radio interactions and related data—including phone numbers and locations—and helps increase immediacy, accuracy, quality and overall service. It also provides the option for capture of console PC screens.

Quality Assurance (QA)—Enables efficient call review and scoring to help ensure call taker proficiency, skills enhancement, and regular performance feedback, along with compliance with state and agency standards. Flexible form creation, embedded call playback, and dynamic reporting provide maximum impact from invested quality assurance time.

Incident Reconstruction and Analytics—Enable call searches and make the retrieval of important recordings easier through Application Event Triggers that tag calls with key information, such as CAD incident ID or call taker name. The result is the potential for better investigative insights.

eLearning and Coaching—Deliver training and timely communication to call takers' desktops, addresses skill gaps, and helps increase productivity and staff retention.

Performance Scorecards—Empower call takers and dispatchers to view personal performance in relation to agency goals.

Citizen Surveys—Deliver outbound surveys as follow-up to citizen calls, introducing a proactive approach to quality reinforcement and citizen satisfaction, and helps to build citizen confidence.

To promote superior reliability and availability and cost-effective operation, Impact 360 for Public Safety is built on an open architecture and uses standard PC components. The solution can help PSAPs comply with state standards, board, or agency mandates for call handling evaluation and reporting while offering deeper insight into calls to help reconstruct incidents and facilitate investigations.

Going further, Impact 360 for Public Safety can help PSAPs maximize their resources and take a targeted approach to performance via scorecards and call taker/dispatcher training. It can also help improve operational effectiveness and heighten citizen trust.

By bringing together multiple functions into a scalable, extensible platform, Impact 360 for Public Safety can help EMS, 9-1-1, and other PSAPs better meet their current missions while positioning themselves to take on the new challenges that lie ahead.