

EMERGENCY COMMUNICATIONS v2.0
THE NEXT GENERATION AND BEYOND

by

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The Command College Futures Study Project is a FUTURES study of a particular emerging issue of relevance to law enforcement. Its purpose is NOT to predict the future; rather, to project a variety of possible scenarios useful for strategic planning in anticipation of the emerging landscape facing policing organizations.

This journal article was created using the futures forecasting process of Command College and its outcomes. Defining the future differs from analyzing the past, because it has not yet happened. In this article, methodologies have been used to discern useful alternatives to enhance the success of planners and leaders in their response to a range of possible future environments.

Managing the future means influencing it—creating, constraining and adapting to emerging trends and events in a way that optimizes the opportunities and minimizes the threats of relevance to the profession.

The views and conclusions expressed in the Command College Futures Project and journal article are those of the author, and are not necessarily those of the CA Commission on Peace Officer Standards and Training (POST).

Emergency Communications – v2.0 The Next Generation and Beyond

On July 1, 2018, the League of California Cities announced that the City of Hendrixland’s City Manger would receive their prestigious “President’s Advocacy Award.” The award is bestowed on a program or person that best advocates for the League Board's annual strategic priorities. The priorities in fiscal year 2017 were public safety, disaster preparedness, and homeland security. In her acceptance speech, the City Manager quoted Jimi Hendrix (for which the City is named) when she said, “*Knowledge speaks, but wisdom listens.*” She added, “I listened to my staff and trusted the experts... this was the moment in time to make a difference...our public expects the best we have to offer.”

Long thought to be the State’s leader in innovation and forward thinking, the fictional city of Hendrixland was at a crossroads. The mid-sized city was facing difficult economic times and needed to improve its E9-1-1 system. An upgrade would be costly; however, losing the public’s trust with an inefficient and outdated emergency services system would be more expensive. The City Manager decided to make public safety a priority, and would start by ensuring sufficient resources were available to implement the *New Generation* (NG) 9-1-1 system. Without hesitation, she also began to organize a statewide strategic planning process amongst her peers to update current legislation to support NG9-1-1. She also assigned a team of staffers to redirect funding streams to establish an upgrade to the *Next Generation* of emergency services.

Our story represents a future where City leadership meets the existing needs of public safety and emergency preparedness with an actual starting point for action. For years now, the

current three-digit / E9-1-1 has not been able to fully support new technologies that are currently on the consumer market. The time to change is now.

From Smoke Signal to Smartphone

The necessity to communicate with each other, especially during an emergency, is a basic need for all civilizations. Personal safety is essential. According to Dr. Abraham Maslow, the need for security is thought to be fundamental after biological and physiological necessities (Maslow, 1943). From the Smoke Signal to the Smartphone, societies have sought ways to communicate more effectively, especially in times of crisis. The manner in which we communicate during an emergency has evolved over time; particularly with the advent of telephony. The existing telephone-based three digit (9-1-1) emergency service system has worked well from its first call in 1968 (NENA, 1995). While effective for the time, the current system has been stretched to its limits with constant technological advancements in the mobile cellular phone market and the development of the Smartphone.

Smartphones now offer more advanced computing ability and connectivity. NG 9-1-1 will ultimately have the capacity to support these devices and the advanced technologies they possess. This includes pinpointing callers based on geographic coordinates, sending and receiving text and instant messages, and sharing high-resolution photographs or video images. All of this are current capabilities of the contemporary Smartphone, which is rapidly becoming the preferred means of communication for the general public. Public safety communications is already behind the curve; the question is, how quickly can we catch up?

A NG 9-1-1 system that is able to support smartphone technology will improve the effectiveness of emergency operations. For instance, should a catastrophic event take place, NG 9-1-1 will have the capacity to receive vital text and video from the field and assist Public Safety

Answering Point (PSAP) to pinpoint the location of the damage from multiple vantage points. In addition, it would offer even more for people who are deaf and hard of hearing. These individuals will be able to directly access PSAPs using their preferred mode of communication, whether by video, text, instant messaging or other means. Yet, most public safety agencies have been slow to keep pace with emerging trends in telecommunication and the public's desire for new technology.

In the United States, more than 300 million cell phones are used to communicate for private or business matters (CTIA, 2010). It is overwhelmingly obvious that the public prefers using a mobile cellular device to communicate, yet the current E9-1-1 infrastructure cannot support text data, images or video increasingly common in personal communication devices. Moreover, with the introduction of a new function or technology (e.g., wireless, GPS mapping, VoIP) E9-1-1 system, functions become even more convoluted and costly (The NG 911 Subcommittee Report to the Washington Enhanced 9-1-1 Advisory Committee, 2009). The functionality of mobile communications devices could enhance public safety by providing faster and more accurate information to PSAPs, as well as provide enhanced and more useful forms of information (data, images, and video). It is time for us to keep pace.

The Pace of Change

The mobile telephone is truly now a "social media device in a box" that includes nearly every social media tool in one piece of equipment (Brake & Safko, 2006). Since its arrival in the early 1970s, computer microprocessors have declined in price while power and memory increased (Intel, 2005). In his 1965 article, Gordon Moore predicted that "...machines similar to those in existence today will be built at lower costs and with faster turn-around" (Electronics, 1965). Known as "Moore's Law," this principle in the development of new innovations assists

the field with agility, speed, and creativity. Most technologically driven industries (i.e. national security, health care, education) all stand to benefit from this competition.

In the past, the federal government often led industry in the research and development of technology. In recent years, however, the private sector has surpassed the government to explore innovations; the resultant devices are becoming more a part of our daily experiences (Vision for IT-Enabled Enhancement of Government, 2002). The future success of NG 9-1-1 will profoundly depend on the development of new technology from the private sector. The current (outdated) three-digit emergency call system will still remain primarily a local government and communications industry responsibility. Non-governmental organizations and telecommunication equipment and service providers, though, will play a major part in the creation of next generation systems, thus helping to lower the costs of that development.

To fully implement NG 9-1-1 with mobile-interface functionality nationally will cost billions. Current funding models include but are not limited to changes to the federally based Universal Service Fund (USF), Congressional grants, or perhaps resourceful taxing models from local counties and cities. The current E9-1-1 system is funded through a combination of surcharges and revenues via an individual community's general fund. Existing E9-1-1 laws may not take into account the implementation and expansion of the current system; therefore, funding mechanisms and authority for contemporary emergency services should be reflected in a shared network of services (NENA, 2010).

Most portable devices can now perform a multitude of tasks in a matter of nanoseconds in addition to making a voice supported telephone call. The goal for any next generation system is to achieve digital convergence with the separate and technologies such as voice, data, video

and productivity applications that now interact with each other (US Department of Transportation –DOT, 2005). Developers will need to build upon existing systems with current technologies, as well as finding ways for early adopters to provide faster information with high-speed access as tested for larger integrated systems to come. Convergence is not necessarily a bad thing. On the contrary, "...widening the scope of possible futures is a critical first step to success (Bishop & Hines, 2006).

Substantial benefits can result from bridging the gap between the idea of enhancing public safety via contemporary mobile communication devices and the implementation of a Next Generation (NG) 9-1-1. A public safety agency can already improve emergency communications today to accept voice, text, video emergency calls for service from communication devices via Internet Protocol-based (IP) networks that are adaptable and responsive to the changes in telecommunication technologies. This same outcome can be accomplished by evaluating the potential of NG 9-1-1 on the existing system and providing a practical approach to resolve issues using a telephony infrastructure.

A Real State of Transition

California's transition to a next generation three-digit emergency call system will require standardization and technological upgrades. The use of common standards is necessary for E9-1-1 Public Safety Answering Points (PSAPs) to communicate and allow for the transfer and sharing of data - even among geographically dispersed PSAPs and auxiliary emergency response agencies. The structure that underlies E9-1-1 via Internet Protocol (IP) devices are based upon a variety of technical standards. National standards critical to an IP-enabled 9-1-1 are still in development, and need to be widely accepted, before the system can be effectively implemented.

While public safety and the telecommunications industry have managed a consensus on the overall architecture of a national NG 9-1-1, a lack of structure and design specifications has caused uncertainty among decision-makers and providers. The delay and lack of immediate standardization hinders progress toward Next Generation 9-1-1. This is the immediate need for any considered change in the 9-1-1 system. PSAPs will need to establish an IP-enabled 9-1-1 standard to successfully employ a sustainable interoperable system.

Interconnectivity; e.g., all parts of the system interacting seamlessly with one another, is one of the essential issues for a transition from the current system to a NG 9-1-1 system. Interconnectivity between the caller's device and the emergency service network is also crucial, since it creates the capability to effectively report an emergency via their preferred communication vehicle (text, data, and video) is critical to implementation. A goal of any public safety agency should "...be to determine the most inclusive, efficient and cost-effective way to manage the...technical systems operation perspective, while maintain the ability of local authorities to determine local call processing information sharing policies" (NENA, 2010).

It is possible the delay moving NG9-1-1 from its current state of "research and development" to "conversion" is related to the current system's history of success and efficiency. Another theory is that it is simply too costly (or perhaps excessively complicated) to carry out the endeavor. In spite of these impediments, it is incumbent on law enforcement to make the most of recent technology advancements. With it, public safety agencies can enable 9-1-1 calls from any networked device; provide quicker delivery and more accurate information to responders; incorporate better and more useful forms of information: text, images, video, and other data and ultimately improve emergency communications. In the end, the issues associated

with implementation are not technical. They are operational, economic, political, procedural and institutional.

NG 911 - A Starting Point

Hendrixland naysayers were heard saying that the City Manager was in a *Purple Haze* when she embarked on the process of implementing a more contemporary emergency service system (NG 9-1-1). Nevertheless, and like most successful management teams, the City was led by somebody that had the foresight and courage to move a monumental project forward by simply taking the first step and distinguishing a starting point. A guide to start the planning, creation, and implementation of a Next Generation 9-1-1 is essential.

The following guide can be modified based upon the needs of the agency, its resources and the community within which it operates. The list was adapted from John Kotter's *Eight-Stage Process of Creating Major Change* and further developed from a group of subject-matter experts that met in 2010 to discuss Next Generation 9-1-1 (Kotter, 1996). The panel was comprised of various personnel from a mid-sized police agency in Southern California, representatives from the business community, a telecommunication law expert, a technologist, a high school student and residents that may employ 9-1-1 to access emergency services. Outcomes of that meeting resulted in recommendations for any agency considering the transition to NG9-1-1. Chief amongst those recommendations were:

1. Create a feasibility committee to discuss and explore the possibility of implementing a transition plan for a Next Generation 9-1-1 system. The committee needs to be comprised of representatives from all City departments, consultants, vendors,

neighboring cities, and a cross-section of the community. Collectively, the Committee will bring a wide-variety of needs, and most importantly, differing perspectives. The most important task for the advisory committee is to evaluate the need for NG 9-1-1 and explore its effectiveness if implemented. Barriers and funding constraints will need to be identified with possible solutions for both.

2. Create a Project Management Team. This group will describe what NG 9-1-1 will look like, how it will operate, what it will cost and how it will end. The group will specialize in identifying the costs of upgrading E9-1-1 and prepare a budget and identify metrics that will measure the financial success of the program. In addition, they will recommend timetables, an outline of costs, and potential savings. In addition, this group will share their methods and findings with all members of the department and the original advisory committee. This sharing will ensure that there is consensus of meaningful metrics to analyze and determine how successful NG9-1-1 will be for the agency.
3. Develop an exit strategy and consolations. The proposed plan to implement a more contemporary emergency service system also requires an exit strategy. Next Generation (NG) 9-1-1 has the potential to improve effectiveness, situational awareness, interoperability, and share critical data/information in a timelier manner. It also has the potential to complicate an exceptionally successful and effective system. Portions of the existing system must stay in place during a migration.
4. Create a Transition Plan for the Project. Similar to the City of Hendrixland, the leader of the agency needs to champion this project and to create a sense of urgency for the change. The leader must set the expectations to all of the affected employees

and various departments and associated stakeholders. Those charged with the creating a transition plan will need to complete the following fundamental steps in order to safeguard a successful transition and ultimate implementation of an NG9-1-1 system:

- a. Perform a risk assessment and develop a risk management plan to ensure the successful transition to and continued management and operation of an updated emergency communication system (NG9-1-1 System).
- b. Identify functional requirements for state and regional Emergency Services IP-Enabled Networks and the criteria for and readiness of PSAPs and regional emergency services networks to connect at the state level.
- c. Identify operational issues and define the minimal governance/management necessary for the optimal health and security of the system.

The results from the above guide can generate the evolutionary next steps towards NG9-1-1 if designed to correspond with national, state, and local standards. Created without the necessary policy and technological standards, the plan will fall well short and delay execution. The existing system is effective because it interfaces with other systems and expanded with emerging technology. NG9-1-1 must follow this practice to ensure success for the next generation and beyond. As Alexander Graham Bell, the inventor of the first practical telephone, noted “The achievement of one goal should be the starting point of another.” Using an extension of the technology he developed more than a hundred years ago, we must do the same thing as we move 9-1-1 fully into the 21st Century.

Conclusion

At its core, a worthwhile NG9-1-1 system is an interconnected and interoperable system of local, regional and national emergency services networks. The system enables access to public emergency services by any personal communication devices regardless of its mobility and/or technology. This includes emergency service “calls” using text messages, instant messages, voice and video from handheld, personal computers, and wireless and hardwired phones.

Advancements in technology and the public’s dependency on electronic social networking as a means of communication, has greatly changed the manner in which governmental agencies and the public communicate. As a result, it identified the possibility of using these methods for contacting a Public Safety Answering Point (PSAP). It also demonstrates that a well-developed Next Generation 9-1-1 can vastly improve emergency communication if the agency takes advantage of the benefits it provides. A public agency can vastly expand emergency services by taking advantage of technological advancements that are related to telecommunications along with a dedicated effort to monitor society’s preferred means of social communication. Fundamentally, upgrading to NG 9-1-1 will resolve infrastructure limitations of the current system and speed data sharing with PSAPs and other emergency service providers. Adopted together, an agency can improve day-to-day communications with the public and more efficiently process emergency calls for service.

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