

THE EMERGENCY SERVICES COMMUNICATIONS CENTER IN 2019

by

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May 2011

COMMAND COLLEGE CLASS 48

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.

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The Emergency Services Communications Center In 2019

The year is 2019, in a suburb outside of a beach town on California's central coast. Mr. Smith hears a crash from the street outside his home. Through his window, he sees the aftermath of minor traffic collision. He doesn't want to get involved with the two irate drivers, so he snaps a picture with his mobile and selects "9-1-1" as the recipient. A mobile application embeds the picture and provides a menu of options for Mr. Smith to select from. He selects "traffic collision" from one of the nine buttons. The interactive application asks if there are any apparent injuries (he selects "unknown") and whether or not the roadway is blocked (he selects "yes"). Meanwhile, all active mobile phone identifiers within a 1000-foot radius are captured and appended to the newly created incident log. The automated system acknowledges receipt of the information; Mr. Smith closes his blinds and returns to his lunch.

The incident log is sent electronically to the closest available traffic officer for disposition. One of the vehicles involved has also sent a crash notification alert to a private call center, where the data was evaluated and forwarded to the city's emergency response system. The automated system linked this data to the file created from Mr. Smith's report and coded it as a possible match for the same incident. While enroute to the scene, the responding officer calls the mobile device tethered by Bluetooth to one of the involved vehicle's communications system. When the driver answers, the officer is able to confirm there were no injuries, that the roadway was blocked and that one tow truck was needed.

Later, as he was preparing to complete the collision report, the officer confirmed the linkage between the information received from Mr. Smith and the incident file received from the

private call center. One incident file was created containing both sets of data. As part of his investigation, the officer sends a standard survey to all of the active mobile devices nearby at the time of the incident (their identification was captured when Mr. Smith contacted the emergency services system). The interactive survey tool asks if the owner of the device witnessed the collision, or if they went to the scene afterwards. A “no” response will end the survey. A “yes” response will branch to other progressively detailed questions for inclusion in the investigation.

All Roads Lead to Convergence

How do we get from here to the probable future scenario described above? In truth, it is possible today. A ten-year window is probably necessary, though, for the various technologies and business processes to converge on a broad scale.¹ Efforts are already underway in several states to develop and implement a Next Generation 9-1-1 (NG 9-1-1) operational model and financial and programmatic support exists at the federal level. The ENHANCE 9-1-1 Act of 2004 made \$250,000,000 per year for five years available for NG 9-1-1 projects that focused on building an IP-enabled network infrastructure. Since then, the federal government’s E9-1-1 Implementation Coordination Office continues working to develop standards, governance, a viable funding model and education and awareness with the support of the New and Emerging Technologies 911 Improvement Act of 2008. This will set the foundation for a reality that will most likely include an app or web-based interface for the public to contact any public safety answering point, anywhere in the country where there is Internet or wireless connectivity, for emergency and non-emergency services.

The Strategic Need

From a strategic perspective, first responder agencies should seek out and engage with their statewide 9-1-1 Office or similar coordination point. Those entities should **also** be working

with the National 9-1-1 Office, created by the U.S. Department of Commerce and the National Highway Traffic Safety Administration.² The National 9-1-1 Office is charged with working in concert with their counterparts at the state and local level to develop strategies to address issues related to governance and policy; funding; operations; standards and technology; and education. The New and Emerging Technologies 911 Improvement Act of 2008, which superseded the ENHANCE 9-1-1 Act of 2004, provides a roadmap for development of strategic and long range planning efforts.

While the effort involved appears challenging and costly, research conducted by the National 9-1-1 Office demonstrates that once an IP-enabled network is established, it will provide significantly higher value at costs similar to that of current circuit-switched emergency communications networks.³

Automating NG 9-1-1 Call Processing

Next Generation 9-1-1 implementation appears daunting to most practitioners because they envision a system that accepts free-form text, video and pictures in the same manner that individuals send text messages today to friends and associates. This model would require the dispatcher to process calls on a first-in-first-out basis that would involve a high degree of human interaction and processing before the data could be passed from the dispatcher to a first responder. Confusing images or text would complicate the decision-making process for dispatchers or call-takers because they would first need to interpret the data in front of them and determine if an emergency or crime in progress exists.

A much simpler approach would be to format incoming data in such a manner that computer logic could triage incoming data and present it in a manner that reduces or eliminates

the need for interpretation and analysis by dispatchers. A common mobile application, provided free of charge for all mobile devices capable of connecting to the Internet, and using standardized data elements, would simplify the process of categorizing and prioritizing emergency requests for service.

This common mobile interface should be the same nationwide to facilitate ease of use, and would be the common front end for the National Emergency Number Association's (NENA) proposed shared network platform known as the Emergency Services IP Network (ESInet).⁴ Users of an NG 9-1-1 system should be able to rely upon a consistent user experience as they move between cities and states – the way that those same users can currently rely upon 9-1-1 as the universal number to contact public safety answering points (PSAPs) anywhere in the nation. A federal data model and Application Programming Interface (API) could provide the same consistency that the numbers “9-1-1” provide today.

The Standardized Interface

In the near future, citizens will download the emergency response application to their phone or have it pre-installed by the phone retailer. The app would be similar to those already in widespread use on smartphones, tablets and similar devices now. Using the system would be as simple as selecting a response type from the nine buttons and stepping through the interactive menu, if applicable. Options to add pictures, video or narrative text would allow the caller to provide additional details about the incident. Since the buttons are merely labels for the underlying data elements, the text on the buttons can be presented in any language, while the underlying data elements can appear in English when it makes its way to the dispatcher or first responder's terminal. An interactive web-based application would also eliminate problems

currently experienced in trial settings with SMS messages that arrive hours or days after being sent and not appending location or caller identity data to the message.⁵

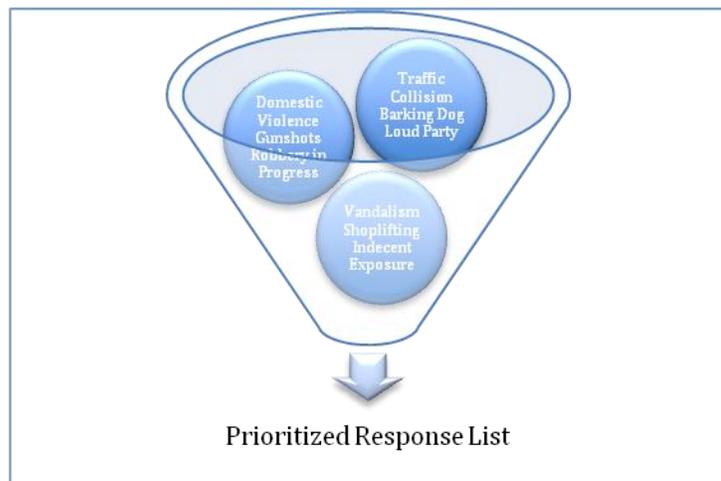
If a user records a still or digital image outside of the emergency services application and then selects "9-1-1" as the recipient, the emergency services application would start up and embed the multimedia file. The caller would then need to simply choose an incident type and send.



Users of the system with base mobile phone devices that have a keypad for calls and text messaging but no Internet access or touch screen can still have their calls for service processed through this system. For example, if a user types a text message and sends to "9-1-1", a return automated reply will ask the user to select the number "1" to request a police response, the number "2" to report a fire, etc. Their selection will create an incident log identical to one created through the emergency response application and insert the appropriate data element in place of the character typed into the handset. A basic implementation of this concept is being

beta tested at the University of Maryland. Using the campus VoIP network, students will be able to contact the campus dispatcher center using a mobile app that will open a two-way video communications link. The system will not be connected to the 9-1-1 network.⁶

This possible system design will allow the emergency response application to categorize and queue incidents based upon priority before they are sent to a dispatcher or directly to a first responder. Certain categories of incidents may go directly to the nearest first responder for action with a copy going to the Computer Aided Dispatch system for incident tracking by the dispatcher.



The Evolution of the Mobile Phone

As mobile phones – or “cellular phones” as they are known in this country – continue to expand our definition of communication, they may eventually become less “smart” to fully realize their potential. Mobile phone functionality is trending toward cloud-based application and data storage – giving these devices tremendous data storage and functional capabilities. Lars Erik Holmquist of the Mobile Life Centre in Kista, Sweden, foresees a time in the very near

future where Web 2.0 services and the technological capabilities of mobile phones will converge on a browser or mobile application and present “abundant mobile services.”⁷

Cloud computing will also transform mobile phones into devices with tremendous storage capacity and functionality compared to phones today. Mobile devices will also continue to incorporate Wi-Fi into more and more handsets until nearly all devices will be able to seamlessly switch between cellular voice or data services and Wi-Fi where available, without dropping the call. In the next few years, version 6 of the Internet protocol (IPv6) will **also** replace the version now in use (IPv4). When that occurs, every electronic device in the world could have its own unique static IP address. Any device connecting to the emergency services network can be quickly and accurately identified – whether that device is a mobile phone, a networked security camera, a laptop in a hotel room (whose owner information can be compared to the guest registry to trace a call for service to a particular room), or a motor vehicle crash notification system. These developments will make for a smoother transition to the IP-enabled emergency services network.

What's Next?

Transition to a Next Generation 9-1-1 system will require a re-assessment of staffing formulas and job descriptions. Dispatch center business processes will undergo significant change with the introduction of text, video and picture processing. If the call processing model presented in this article is implemented, the impact should be minimal, as incoming requests for service would be automatically prioritized and distributed. Otherwise, more personnel resources would be expended on analyzing text, video and pictures for elements of an offense before the call can be categorized. Follow up information from the same citizen would also have to be

manually matched to earlier communications and dispatch center staff would be exposed to visual representations that may induce higher levels of job stress.

Getting from where we are today to the scenario described at the beginning of this article will be a fiscal and operational challenge. It will not be a technical one. Migration from Public Branch Exchange (PBX) phone systems to a voice over Internet protocol (VoIP) system capable of supporting intelligent call routing, data and voice communications, interoperability and shared network services is a necessary early goal. A few state and local agencies in Vermont, Indiana, Texas and California have begun acquiring and installing IP-enabled equipment for their centers using ENHANCE 9-1-1 grant funding.⁸

Future grant funding opportunities and State 9-1-1 funds are the two most likely funding sources for NG 9-1-1 implementation. Established procurement processes may be the likely avenue to acquire the upgraded 9-1-1 system, but some thought should be given to shared acquisition or leveraged procurement with other public safety answering points in the region. Sharing services or a purchasing vehicle could result in significant savings and possibly shorten the procurement cycle. Also, development and support of a new tariff structure that will adequately support the IP-based emergency services architecture will become increasingly necessary as citizens migrate away from their wireline phone service in favor of wireless.

The rate of change in the feature set of most mid-range mobile phones will fill the few remaining technical gaps in two or three generations. The challenge for public safety agencies will be to focus our efforts on adopting the IP-based infrastructure that citizens and businesses alike are already using. The Internet is the next frontier for our emergency services communications needs; we need to be ready to implement technologies that maximize its presence if we are to serve best those who depend on us for their safety.

¹ The National E9-1-1 Implementation Coordination Office, *A National Plan for Migrating to IP-Enabled 9-1-1 Systems*, http://www.e-911ico.gov/NationalNG911MigrationPlan_sept2009.pdf (accessed March 23, 2011).

² The National E9-1-1 Implementation Coordination Office, *A National Plan for Migrating to IP-Enabled 9-1-1 Systems*, http://www.e-911ico.gov/NationalNG911MigrationPlan_sept2009.pdf (accessed March 23, 2011).

³ The National E9-1-1 Implementation Coordination Office, *A National Plan for Migrating to IP-Enabled 9-1-1 Systems*, http://www.e-911ico.gov/NationalNG911MigrationPlan_sept2009.pdf (accessed March 23, 2011).

⁴ National Emergency Number Association, *NG9-1-1 Transition Policy Maker Blueprint*, (September, 2008), http://www.nena.org/sites/default/files/NG9-1-1PolicyMakerBlueprintTransitionGuide-Final_0.pdf (accessed February 9, 2010).

⁵ The National E9-1-1 Implementation Coordination Office, *A National Plan for Migrating to IP-Enabled 9-1-1 Systems*, http://www.e-911ico.gov/NationalNG911MigrationPlan_sept2009.pdf (accessed March 23, 2011).

⁶ Hilton Collins, Corey McKenna and Lauren Katims; *EM Bulletin*, (Emergency Management, March/April 2011), eRepublic, Inc.

⁷ Lars Erik Holmquist, *The Age of the Mobile Mash-Up*, (TechCrunch.com, May 30, 2010), http://techcrunch.com/2010/05/30/the-age-of-the-mobile-mash-up/?utm_source=feedburner&utm_medium=feed&utm_campaign=feed%3A+Techcrunch+%28TechCrunch%29 (accessed August 29, 2010).

⁸ The National E9-1-1 Implementation Coordination Office, *A National Plan for Migrating to IP-Enabled 9-1-1 Systems*, http://www.e-911ico.gov/NationalNG911MigrationPlan_sept2009.pdf (accessed March 23, 2011).