

Virtual Command Systems: The Future of Emergency Operations Centers

By

Lieutenant Douglas A. Pittman

Marin County Sheriff's Office

Command College Class 50

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).

Virtual Command Systems: The Future of Emergency Operating Centers

Hollywood stretches the imagination of its audiences by sensationalizing futuristic devices into their motion pictures. In the movie *Avatar*, the invading army is seen directing and controlling their ground and air forces from one main command center utilizing virtual command technology. In the BBC movie *Dirty War*, the City of London is polarized by a radiological terrorist attack where a “dirty bomb” is detonated at the Liverpool Street Station. The movie focuses on the emergency services struggle to respond, command and control the event utilizing a vast system of security cameras positioned throughout the city. The movie successfully demonstrates the advantages of having such advanced monitoring systems available, the question is, is public safety and the communities they serve ready and prepared to think creatively about ways they can stretch into the future to implement such systems for their own communities? Consider a scenario from our own possible near future...

In the spring of 2021, one of the greatest fears of every public safety emergency manager in the Greater San Francisco Bay Area comes to fruition; the Hayward Fault finally gives in to the over 170 years of building tension, producing a catastrophic earthquake measuring 7.9 on the moment magnitude scale, or 8.2 on the open-ended Richter Scale more commonly known to the general public. The quake, lasting only 24 seconds, is the most severe earthquake to occur in the Bay Area since the great San Francisco Earthquake in 1906; it is also the most severe earthquake in California since the 1952 Kern County Quake.

In the emergency operation center, where the use of virtual command systems has gone online, public safety and community leaders will be able to actually watch, hear and monitor live

and real time video feeds from wireless cameras and voice transmissions from throughout their areas of their responsibility. Because of years of integrating both public and private wireless surveillance systems, information will not be limited to just those systems owned and operated by public safety agencies, but also those owned and operated by public and private identities. They have access to satellites, common radio frequencies, traffic and private security monitoring systems, and both public and privately owned surveillance systems. They can also interact seamlessly with contemporary social media, keeping the community informed and involved every step of the way. This scenario will be possible in the next decade, and can lead to the next evolution of incident command the Virtual Emergency Operations Center.

The Troubles That Lie Before Us

More than four million people now live along the Hayward Fault, and more than eight million people in the region would be affected if this catastrophic earthquake occurred today (USGS, 2011). Geographic studies indicate the Hayward Fault follows a path that extends from the City of Fremont north to the San Pablo Bay and together with its northern extension, the Rodgers Creek Fault, is regarded as one of the most hazardous faults in northern California. Property damage from a major quake along this fault is expected to be \$12 to \$14 billion dollars; loss of life, at minimum, is estimated above 600 people throughout the greater Bay Area and northern California, with more than 9,000 injured, and more than 8,000-14,000 people homeless (ScienceDaily, Dec. 14, 2010).

Although the damage, destruction, and loss of life would still be substantial, what is notably different behind the scenes in 2021 is the change in response by public safety agencies. This is primarily due to a number of vast improvements in inter-agency operability and

communications. The implementation and integration of Virtual Command Systems to support public safety operations in the near future will be as common as the use of the facsimile machine in 1990.

At present, almost every emergency operation center (EOC) operated by public safety personnel is dependent on receiving data from the field via archaic means. If an emergency event was to happen, police officer gathering vital information in the field wanting to pass this information on to an EOC is limited to the use of that agency's radio system, the officer's cell phone, or even hard line connections. If the officer is able to reach someone in the EOC, this information is usually captured via a voice conversation and the person receiving the call is now required to capture the information by having to prepare a handwritten message form. This form then needs to be physically hand delivered to its intended recipient within the emergency operation center to be read before a course of action or response can be decided. Each of these steps within this process takes up vital time when seconds vs. minutes can make the difference when making life and death decisions. Rather than relying on time-tested standards for EOCs, emerging technologies allow us to assess if now is the time to move beyond bricks and mortar to a virtual command structure. With an ever increasing number of people and stakeholders representing so many different interests, it is already impossible to physically locate everyone in one sole and primary location, the implementation of a virtual command based EOC will not be just a luxury for some, but a necessity for all.

Identifying the Road Ahead

Advances in technology have historically outpaced the knowledge and skills of those responsible to manage and direct current Emergency Operations Centers. An emergency

operation center utilizing virtual command based systems in their operations would provide its staff a more efficient process for receiving and determining the appropriate course of action. Information systems are continually being developed and improved upon everyday, mainly used and developed for the government and military before they become available to local government or public use.

"Virtual EOC" is a concept wherein command center participants can share information, make decisions, and deploy resources without the requirement to be physically present in the command center. Typically using web-enabled software, a Virtual EOC (VEOC) allows participants to work from their normal workstation, from home, or from the field. Emergency plans and reports are available from any location. In fact, all information can be maintained in a central database that is available to command center participants from anywhere in the world. In fact, all information can be maintained in a central database that is available to VEOC participants from anywhere in the world.

Moving to this model will permit effective direction and control of resources, automate processes and methodologies, assign and track tasks, and efficiently communicate real-time information. In addition, if configured properly, a VEOC can protect communication and data with needed redundancy, security, and flexibility. Moving to it, though, will not be without effort to address issues with public perception and privacy concerns. Although the VEOC user will see the system as a way to enhance and increase the efficiency of public safety operations, there will be others concerned with "big brother" violating their rights and privacy (ACLU, April 2008).

An expert panel of emergency managers convened in April of 2011 to discuss the virtualization of EOC operations in California; specifically, its suitability for the San Francisco

Bay Area. The panel was comprised of several experts in the area of emergency management including the California Emergency Management Agency's (CalEMA) Chief of their Law Enforcement Division, two Professors of Carnegie Mellon Silicon Valley University, two fire Battalion Chiefs who serve as Operations Section Chiefs on Cal Fire's Type I Emergency Management Teams, Emergency Operation Center GIS Specialists, a County Supervisor charged with overseeing the responsibilities of a County's Emergency Operation Center, and a County Attorney to help address any legal concerns that could arise of implementing advanced virtual command systems.

Several trends were discussed; it was agreed that policing demands are changing amidst budget shortfalls. There was a consensus the road map to address these emerging issues with perspectives differing depending on the agency represented. The panel identified three major obstacles to the implementation of virtual approaches to EOC operations: current lack of available funding, concerns for the safety and security of information related to privacy issues, and the ability to manage and maintain a system where end users and multiple disciplines will have to work collaboratively.

All involved in the discussion agreed and recognized the need to move forward, plan and forecast as to how the use of virtual command systems can be implemented into our interoperability and communications systems. Furthermore, everyone agreed that moving towards such a level of high interoperability is going to require a strong level of commitment from every agency and organization involved. Other key areas identified as being crucial to the future success of these systems included the need for specialized or advanced educational requirements of those charged with using and maintaining the systems, an on-going commitment by department heads and agency leaders to support the program (including financial and personnel

resources), and the need to maintain transparency in EOC operations to ameliorate rights or privacy concerns.

Recommendations

All agreed that moving forward with the level of commitment necessary to successfully implement a VEOC for emergency operations is crucial to help meet the known and unknown challenges public safety will face in the future. Whether the plan is well received will depend on how to use the system and the many advantages it will bring to enhancing the communication and information sharing between all the stakeholders. All agreed that the objective of implementing these systems was tangible, but will require a true and long-term commitment to achieve the successes these systems will provide.

In fact, the prospect of developing and implementing virtual command systems in local and county Emergency Operation Centers is an idea that has been around for the past few years. While benefits to Emergency Operation Centers are documented as being many and varied, the real effects of these changes in future emergency operations centers has yet to be tried and tested in future real life events.

An Emergency Operation Center in 2021 will no longer be dependant to be located in one physical location. Information being gathered in the field of operation will now be instantly captured and directed to public safety personnel and local officials in a far more efficient manner that will allow more expedient and informed decisions. There will no longer be a need for its users to be physically face-to-face or side-by-side. Utilizing advanced communication and monitoring technology, those tasked with directing its operation can work remotely, from their

homes, cars, and offices, but still being able to share the same information that is provided to them instantaneously and in real time.

Conclusion

So in the spring of 2021, when the earth finally gives way to the 170 years of built up tension along the Hayward Fault, public safety organizations responsible to maintain and operate emergency operation centers that have adopted the VEOC model will no longer be restricted to obsolete communication technology. Public safety, local community leaders, and the communities they serve will be able to work virtually hand in hand, and virtually side by side, in a world where everyone, no matter where they may be located, can look, see and hear a greater flow of information simultaneously. This immediate and real time flow of information will create a higher level of inter-operability, not only amongst public officials and public safety organizations, but equally as important, for those who serve and those we serve.

The Virtual Emergency Operation Center is well on its way; its applications and uses will be limited only to the imagination of those who build and use them. The only real question is if we in public safety are ready and able to try to keep up with ever increasing evolution of technology that lies before us

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