

**UNMANNED AERIAL VEHICLES ARE THE FUTURE
SUPPLEMENT TO POLICE AIR OPERATIONS**

by

**Lieutenant Michael W. Mullen
Orange County Sheriff's Department**

September 2009

COMMAND COLLEGE CLASS XXXV

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).

Unmanned Aerial Vehicles are the Future Supplement to Police Air Operations

Imagine that you are the Incident Commander when a major disaster strikes in your city. It could be a manufactured biological or chemical incident, an air-sea disaster or civil unrest over a large urban area. There are emergency operations plans that have been on the shelf for years and now you find yourself as the Commander looking at these plans for the first time. One of the initial questions you will ask is, “what resources do I have available right now to help our officers and department?” This is an important question knowing that your critical incident management decisions from the onset might very well affect a successful outcome in a short time period. One of the mainstays of assessing unfolding events has been to view them from the air. Using helicopter crews, incident commanders can often quickly determine where and when to place assets, and respond in a manner that is both efficient and effective.

In the near future, the airborne assets at hand will be more than just helicopters and fixed-wing piloted craft. We are at the doorway of incorporating Unmanned Aerial Vehicles (UAV) into public safety fleets. Incorporating UAV into police air operations will occur because increasing operational effectiveness during public safety incidents and reducing costs associated with a traditional “helicopter only” air support fleets is both a necessary and worthy step.

Managing in real time

A valuable asset available to some police departments during emergency events is air support and the associated technologies on each aircraft. Traditional emergency operations center configurations allow commanders to receive real-time intelligence

through radio transmissions, television telecasts and possibly video downlink images from closed circuit television directly to a command post. For those with airborne units, incident commanders can rely on the information received from a helicopter crew to direct resources to respond to critical locations or for long term strategic planning. In the near future, that information can easily come from air units that do not have a crew.

Unmanned aerial vehicles (UAV) offer law enforcement agencies a wider range of operational efficiency and flexibility that does not exist with the current air support fleet configuration. UAVs are smaller, quieter and more technologically advanced than their helicopter counterpart. Consider being the commander of this significant event with the capability of having advanced infrared images and real time video downlink streaming to the mobile command post to assist you with operational decision-making. Imagine if you could have these same images sent to the mobile data computers in the patrol cars of the officers responding to the event. According to Joetey S. Attariwala in the September/October 2008 issue of 9-1-1 Magazine, domestic law enforcement applications of UAVs can provide precise and real-time imagery to ground control operators, who can then disseminate information to other units on the ground. This will facilitate informed decisions regarding the deployment of officers and emergency services (Attariwala 2008). UAV can increase efficiency, allow first responders to process the same intelligence the emergency managers are viewing and enhance on-site status reporting communications directly related to this incident.

The role of air support and costs to maintain the status quo

Police agencies rely on air support for a multitude of mission specific operations. An experienced crew of a police helicopter can safely conduct patrol-oriented calls for

service for the department and provide an observation platform for investigation and surveillance operations. Police helicopters are also valuable as a regional asset during mutual aid events or during natural disaster emergency management incidents. Images captured from media helicopters over any of the recent wild land fires in Southern California show police and fire helicopters engaged in water dropping in support of the fire operations plan. Not seen in these images is the numerous fire mapping missions conducted by these helicopters and their crews. At a substantial cost savings, along with the operational flexibility of allowing helicopters to continue firefighting operations, UAVs could assume some of these responsibilities. With the costs associated with these types of mutual aid events, using UAV is both effective with regard to its utility and cost-effective as a means to manage these large-scale incidents. The economic downturn of 2009 is but one example of creating a need to “do more with less.” As we assess our ability to retain aerial capacities, it may be the most appropriate solution.

Budgetary concerns

The budgetary limitations of the current economy are felt by all sections of the organization; air operations included. These costs can fluctuate significantly based on the economy, and depending upon the resources and accommodations of the department as it seeks to retain core services. Unfortunately, the traditional revenue streams that fund the budget for air operations, maintenance and expansion of air support units have dried up for the near future. Major James C. Hoffman, USAF wrote in the spring 2005 issue of *Air & Space Power Journal* that UAVs hold the promise of delivering on a wide range of airpower tenants difficult to realize with current manned systems. Furthermore, based on the experience and success of military UAV applications, the lower acquisition and

operating costs of the UAV can provide for an expanded force structure by nurturing a new crop of air warriors who require far less formal pilot training and who do not owe primary allegiance to manned systems.

The military applications and successes of the unmanned aerial vehicle

Over the past decade, the United States military has effectively operated UAVs in the combat arena with unprecedented successes. The demands and changes with fighting a non-conventional enemy during the War on Terror have formed an environment for military leaders to be creative when developing missions for UAVs. Whether it is ordinance deployment, mission planning, obstacle detection / avoidance, or as a wireless communication network platform, UAVs have been on the leading edge of military special operations.

In a Congressional Report for Congress dated May 13, 2008, the Congressional Research Service analyzed the costs associated with Customs and Border Protection (CBP) UAV program. The unit costs of UAVs vary widely, from \$350,000 for the Shadow UAV to \$4.5 million for the Predator. In contrast, the unit costs for manned aircrafts used along the border vary from \$8.6 million for the CBP Blackhawk helicopter to \$36 million for Immigration and Custom Enforcement's P-3 manned aircraft. In F/Y 2008, the Department of Homeland Security was appropriated \$15 million dollars for their UAV program. DHS explored the use of UAVs in the marine environment, in addition to the border. (Bolkcom 2008).

Progress has been made by the military and CBP to incorporate UAVs into traditional manned aircraft missions. The costs associated with operating a manned aircraft fleet have become quite costly. Operating costs that include pilot salaries,

maintenance, training, fuel and infrastructure capabilities continue to drive budgets in an upward trend. The operating and maintenance costs associated with UAVs are significantly less when compared to jet powered aircraft.

One of the benefits of the UAV experienced by CBP has been to fill a gap in border surveillance by improving coverage along remote sections of the U.S. borders. Electro-Optical (EO) sensors (cameras) can identify an object the size of a milk carton from an altitude of 60,000 feet. The UAV used along the southern border can fly for more than 30 hours without having to refuel, compared with a helicopter's average flight time of just two hours (Bolkcom 2008).

Military UAVs have continued to evolve with each new generation of prototypes created by aircraft contractors. The technologies continue to advance with the capabilities to deliver greater data and intelligence back to commanding officers. UAVs have become smaller and quieter, enabling operators to be highly successful through flexibility and creativity. The advances made within the military domain will transition into the civilian law enforcement arena.

The cost and length of training for UAV operators are substantially less than they are for pilots of manned aircraft. The reasonable expansion of mission areas that could be addressed by UAV technology in the future is limited only by imagination (Hoffman 2005).

The future of UAVs in civilian law enforcement

Department of Homeland Security Secretary Janet Napolitano stated in a July 24, 2009 press release that coordinating with our partners across the United States and around the world is critical to protecting the nations from terrorist attacks (Napolitano

2009). One of the advanced technologies available to civilian law enforcement in the future will be UAVs. This platform will enable officers to request overhead surveillance during tactical operations and intelligence gathering in criminal investigations. This use of advanced technologies will enable police agencies to meet their obligations to the communities they serve.

UAV technology has resolved the balance between operational readiness and budgetary limitations through advanced research and development. The operational feasibility of UAV deployment includes evidence collection, long-term surveillance and assessing hazardous situations prior to deploying personnel. In addition, the mobility platform concept capable of positioning assignments and deploying non-lethal chemical agents and weapon systems make UAVs an ideal future supplement for civilian law enforcement air support units. There are, though, both political and legal issues to resolve before police agencies can launch their own UAVs into the skies.

The FAA's Perspective

The Federal Aviation Administration (FAA) controls all of the airspace in the United States. The scope of their responsibilities and authorities spans multiple public and private enterprises, safety oversight, commercial airlines, the military, general aviation and airport operators. The FAA has not yet approved UAV operation in controlled airspace.

The FAA has banned civilian law enforcement agencies from using UAVs for any type of police operations without first applying for and receiving a Certificate of Authorization. Several law enforcement entities are actively lobbying the FAA in an effort to reduce the limitations currently in place for law enforcement. The FAA's official

position is that UAVs are not reliable enough for operation in United States airspace.

The major obstacle involving the operation of UAVs in controlled airspace continues to be the inability to meet the “see and avoid” standard that manned aircraft operate under.

The potential still exists for the safe operation of UAVs in controlled airspace and still meet the standards mandated by the FAA. In the CRS Report for Congress, the FAA and the Department of Homeland Security will need to address collision-avoidance, communication and weather avoidance issues before final approval is granted for operation in controlled airspaces (Bolkcom 2008). The possibility of operating the UAV from a police helicopter, while maintaining a constant visual of the UAV while in flight is one option. However, the cost savings of UAVs would be eliminated with this option. Another option is to operate the UAV outside of controlled airspaces of commercial airports. UAV operations by law enforcement would also fall under any temporary flight restrictions put forth by the FAA. In any case, the need to lobby for a change in federal law may be a necessary step in this evolution of airborne law enforcement. Once allowed, though, there are real-life considerations that must be met.

The Future of Law Enforcement Aviation

Traditional police helicopters will not be replaced by UAV. There will always be a need for human pilots to make on-scene assessments from the air. UAV should be seen as adding the capacity of another tool for emergency managers. Commander Heal of the Los Angeles County Sheriff's Department (LASD) is the officer in charge of the department's Technology Exploration Unit, and has acute knowledge of the issues involving operating unmanned vehicles. His unit is working on the validation of UAV technology intended to support deputies in the field. In the July 2009 edition of 9-1-1

Magazine, Commander Heal stated that LASD is not setting out to replace helicopters and they have identified two fundamental strategic missions for UAVs. One is to augment the missions of existing helicopters and the other is to replace some helicopter missions (Attariwala 2008).

There are numerous areas of public policing and national security operations where civilian law enforcement UAV will be effective and efficient. Some of these potential applications will include border and coastal monitoring, disaster management, search and rescue operations, ground transportation monitoring and control, and fire detection and mapping. The Florida Department of Transportation funded a research project to determine the viability of a UAV in an airborne traffic surveillance system (Srinivasan). The National Aeronautics and Space Administration (NASA) completed a comprehensive overview of the civil UAV capabilities. The review determined potential civil missions for UAVs, determined the technologies necessary to support future missions, and the present state of the UAV platform capabilities in the civil arena (Cox). To effectively and efficiently utilize the advanced technologies and capabilities associated with UAVs during emergency management events, a network of systems and infrastructure that coordinates all of these capabilities will need to be developed. Interoperability, along with intelligence sharing, evaluation and assessment during policy- making and strategic operations planning are the main goals of this interactive system

The first is to transition an existing emergency management building with the ability to accommodate all stakeholders involved in policymaking and command operations. Most large municipalities and counties already have emergency operations

centers for large-scale events and incidents. The combination of live video down link of the event to be viewed real-time by the policy group will effectively narrow the scope of the goals and objectives of the operation. Other infrastructure needs should include dispatch capabilities, 911 call takers and press information support structure.

The second is to have the operations center for the UAV program to be in the same emergency management building. As a regional air operations center, the emergency managers and command operations personnel will have immediate access to the pilot flying the UAV in advance of the goals set forth by the policy group. The interaction between the pilot and the emergency managers will assist in determining future mission of the UAV, along with determining the future outcome of the event.

Finally, agencies will have to develop a training curriculum specifically designed for department personnel and emergency managers related to the capabilities of the UAV during public safety events. Classroom instruction on the capabilities of the UAV and practical application during controlled field training scenarios will provide a thorough and comprehensive understanding for the students. The simulated emergency management scenario training, along with the practical application exercises involving the UAV, will increase the efficiency of the emergency managers and policy makers during actual events.

The capability exists and now it is time to utilize the technology

Based on the successes and benefits experienced by the United States military and the Customs and Border Protection, there is little doubt that UAVs will have a tremendous impact on law enforcement. UAV aircraft and the associated technologies of the aircraft will effectively and efficiently transition into civilian law enforcement. The

cost comparison between UAVs and manned aircraft is complicated. UAVs are less expensive to procure than manned aircraft but may cost more to operate. The life cycle cost of UAVs could actually be greater than the life cycle of manned aircraft.

The disparity in operating may be offset by the fact that UAVs can remain in the air more than 10 times longer than the helicopters currently being used by CBP. UAV command and control systems are being developed that can control multiple UAVs simultaneously. When fielded, these new capabilities may change the cost comparisons to favor UAVs over manned aircraft (Bolkcom 2008). Only current technologies, infrastructure designs and effective strategic planning limit the operational benefits to police managers, incident commander, criminal investigators and emergency managers.

The financial benefits to the police department could be significant as well. The costs associated with flying and maintaining helicopters will continue to rise, and the revenue streams needed to finance air support units continue to trend downward. These costs, when compared to the operational and maintenance costs of a UAV could make them fiscally prudent and operationally necessary. The need to augment the UAV fleet with a helicopter will be necessary due to the experience and expertise of a human air crew needed for certain types of air operations where the UAV would not be as efficient or effective.

Finally, the benefit to emergency managers is perhaps the most persuasive reason to consider this move forward. The ability to quickly deploy a UAV with advanced technologies and capabilities to an event anywhere in your jurisdiction will be a significant operational benefit and tactical advantage. The capability to transmit real time video down link images and intelligence directly to the incident commander and

emergency managers enables them to make sound decisions based on accurate and actual information. The ability to maintain a position for long periods also represents a significant advantage over traditional police aircraft. All of the technologies and capabilities associated with UAVs will be a vital asset for forward thinking emergency managers and civilian law enforcement agencies.

References

- Attariwala, Joetey S. (Sept/Oct 2008) *Communicating with UAVs: Unmanned Aerial Vehicles for Emergency Services*. 9-1-1 Magazine.
- Bolkcom, Christopher, Nuñez-Neto, Blas. *Homeland Security: Unmanned Aerial Vehicles and Border Surveillance*. CRS Report for Congress
- Cox, T., Nagy, C., Skoog, M., Somers, I., Warner, R. *A Report Overview of the Civil UAV Capability Assessment*.
- Hoffman, Maj. James C. USAF. (March 2005) *At the Crossroads: Future "Manning" for Unmanned Aerial Vehicles*.
- Office of the Press Secretary, Department of Homeland Security, (July 2009) *DHS Coordinates National Level Exercise to Prevent Terrorist Attacks with Federal, State, Local Tribal, Private Sector, and International Partners*.
- Srinivasan, S., Latchman, H., Shea, J., Wong, T., McNair, J. *Airborne Traffic Surveillance Systems – Video Surveillance of Highway Traffic*.