

Domestic Remotely Piloted Aircraft Use By Federal, State, and Local Governments

**A Monograph
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Abstract

REMOTELY PILOTED AIRCRAFT DOMESTIC USE BY FEDERAL, STATE, AND LOCAL GOVERNMENTS by MAJ Jack F. Harman, United States Air Force, 45 pages.

The United States military enjoys the continued growth of Remotely Piloted Aircraft assets and personnel. By 2015, Creech Air Force Base will employ almost one in every five active duty Air Force pilots. Remotely Piloted Aircraft are in such demand in Iraq and Afghanistan that they occupy over forty 24-hour continuous missions, planned to expand to over sixty within the next two years. However, with the drawdown in troops in both Iraq and Afghanistan inevitably approaching, the United States military will have a surplus of assets and operators undergoing training in the United States while waiting for the next crisis. The military remains committed to its Defense Support to Civil Authorities requirements but needlessly restricts its support beyond emergency response due to the outdated United States Code and self-inflicted Department of Defense Directives.

Unless the United States government, specifically the military, develops a system to allow Federal and State agencies to request habitual assistance from the military's Remotely Piloted Aircraft, those agencies will purchase separate equipment and operators. While military assets go operationally underused, the State and Federal agencies will not be able to fully exploit their expensive equipment and costly operators. However, if the Federal government implements an approach to maximize Remotely Piloted Aircraft efficiency and effectiveness, such as a system similar to the military's Close Air Support request system or an improved National Incident Management System, it would lower overall government costs through the sharing of equipment, bandwidth, and operators.

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Introduction

The United States military currently is experiencing the continued growth of its Remotely Piloted Aircraft programs. Since 2000, the Department of Defense drastically expanded its Remotely Piloted Aircraft inventory to almost 7,000 aircraft.¹ One of over twenty-five locations that house unmanned aircraft, Creech Air Force Base represents the largest unmanned aircraft base within the United States. It is home to three Remotely Piloted Aircraft reconnaissance squadrons, the Joint Unmanned Aircraft Systems Center of Excellence, and the Air Force's first Remotely Piloted Aircraft attack squadron.² By 2015, Creech Air Force Base will employ almost one in every five active duty Air Force pilots. Remotely Piloted Aircraft are in such demand in Iraq and Afghanistan that they perform over forty 24-hour continuous missions, planned to expand to over sixty within the next two years.³ However, with the drawdown in troops in both Iraq and Afghanistan inevitably approaching, the United States military will have assets and operators conducting training in the United States while waiting for the next crisis.

The demand for Remotely Piloted Aircraft for other than military purposes is also growing. Unique capabilities, such as endurance, electronic intelligence, communications relay, and both infrared and television cameras, make Remotely Piloted Aircraft useful to many local, State, and Federal agencies. Unless the United States government, specifically the military, develops a system to allow Federal, State, and local agencies to request assistance from the military's Remotely Piloted Aircraft, those agencies will purchase and maintain their own separate equipment and operators or operate without their distinctive capabilities. While military

¹ Matthew Russell. "Unmanned Systems: Can the Industrial Base Support the Pentagon's Vision?" *National Defense* (July 2010), 22.

² The Official Web Site of Creech Air Force Base. Creech Air Force Base. <http://www.creech.af.mil/units/> (accessed February 2, 2011).

³ Colonel Peter Gersten, e-mail to author, March 05, 2011. Colonel Peter Gersten is the Wing Commander of Creech Air Force Base, Nevada, which is home to the Remotely Piloted Aircraft 432d Wing and 432d Air Expeditionary Wing.

assets might operationally go underused, the State and Federal agencies would not be able to fully exploit their expensive equipment and operators due poor economies of scale and the intermittent need for Remotely Piloted Aircraft's specific capabilities. However, if the whole of government implements a systemic approach to maximize Remotely Piloted Aircraft efficiency and effectiveness, such as a system similar to the military's Close Air Support request system, it could lower overall government costs through the sharing of equipment, bandwidth, and operators. How can the separate Federal, State, and local government agencies use these Remotely Piloted Aircraft within the United States effectively and efficiently?

To metaphorically describe the Remotely Piloted Aircraft situation within the whole of government, picture a city consisting of ten square blocks governed by a single Governor where every block has its own Mayor. The people and Governor of the city require a firefighting force capable of extinguishing a two-alarm fire. Historically, the city had a maximum of three 2-alarm fires at any given time. Therefore, for safety, reliability, and control, each Mayor individually purchases a fire station and two fire trucks. Due to the city's systematic organization, the individual Mayors do not share their firefighting assets for fear of a potential fire on their block. Therefore, each Mayor sustains their costly, but separate, firefighting personnel, equipment, and infrastructure to combat a potential 2-alarm fire. However, a systemic problem arises when a 3-alarm, or greater, fire occurs on an individual block. Since Mayors do not share their assets, the block suffering the 3-alarm fire pleads to the Governor and other Mayors for assistance. Hesitant to relinquish control of their assets, Mayors offer piecemeal support that eventually extinguishes the fire but at much greater cost and damage than was required. Rather than permit the unnecessary delay and damage, the Governor should implement a holistic approach to firefighting. For example, the Governor could establish a single fire station with ten fire trucks instead of the combined twenty trucks from the individual city blocks. While maintaining half the fleet of fire trucks and only a single station, the Governor would still be able to combat five 2-alarm fires while maintaining the ability to fight up to a single 10-alarm fire.

Despite its simplicity, this metaphor draws parallels to the use of Remotely Piloted Aircraft within the United States. The Federal government represents the Governor while the separate Federal and State agencies represent the Mayors. Rather than each individual agency maintain its separate infrastructure, a holistic, whole of government approach to the use of Remotely Piloted Aircraft may permit more efficient use of the assets, pilots, and infrastructure on the most urgent missions while minimizing the overall government cost. The United States possesses a limited and overly bureaucratic system for sharing Federal and State resources across the whole of government. A streamlined national request system for Federal and State government agencies can request and employ military-owned Remotely Piloted Aircraft technology and personnel would lower overall government costs and maximize equipment usage.

This monograph provides a quantitative analysis of current Remotely Piloted Aircraft development and employment measured in terms of operators, aircraft, cockpits, and data-relay infrastructure in relation to Federal, State, and local governments' demand. By displaying the cost and growth of the industry, the monograph assesses the feasibility of maintaining separate Remotely Piloted Aircraft systems by separate Federal, State, and local government agencies. With information gathered from current military and other government agency publications, studies, and leadership interviews, this analysis shows the growth of the industry coupled with its tremendous financial cost. It also shows the rise in demand for these assets both by the military and other agencies, such as the Department of Homeland Security, Department of State, Central Intelligence Agency, National Forest Service, and individual States. The monograph assesses the cost of maintaining separate Remotely Piloted Aircraft fleets. In addition, the monograph compares personnel and equipment numbers, the combined projected demand from the separate agencies, and the overall costs to assess the need for implementing a system for maximizing the efficient and effective use of Remotely Piloted Aircraft assets.

Next, the monograph addresses the Remotely Piloted Aircraft legal restrictions and organizational issues associated with the military flying Remotely Piloted Aircraft within the United States. A Hurricane Katrina assessment illustrates the legal restrictions for Federal troops, and their assets, operating under Title 10 to work with the State National Guard forces operating under Title 32. The monograph compares the applicability of the Hurricane Katrina command and request structure and the State use of Federal military assets to a proposed Remotely Piloted Aircraft system. The monograph also assesses the organization of military forces in Cyber Command. It determines if Cyber Command is useful to command and control an integrated Remotely Piloted Aircraft system. Together, these cases provide insight into the legal restrictions imposed by Title 18, also known as the Posse Comitatus Act of 1878, Title 10, and Title 32 of the United States Code on the domestic use of the Federal military forces. These cases determine if a potential paradigm shift is rapidly occurring that allows for the use of military assets across civilian agencies within the United States.

The above variables, production, estimated utilization, legal restrictions, organizational complexity and request feasibility, lead to an assessment of how Federal, State, and local governments use Remotely Piloted Aircraft equipment, personnel, and infrastructure. Given the current political, military, and economic trends within the United States, the Federal government may need to assess the applicability of a systemic, whole of government approach to Remotely Piloted Aircraft use to maximize the benefits of these expensive assets. The monograph compares the current, linear system with possible recommendations for improvement within the existing legal framework. It then notes potential agencies that could be responsible for change initiation and implementation. Additionally, the monograph addresses future projections of Remotely Piloted Aircraft usage within the United States. By providing potential solutions, the monograph assesses the feasibility of Remotely Piloted Aircraft by multiple Federal, State, and local government agencies.

While addressing the need for the Federal government to tackle issues such as Remotely Piloted Aircraft from a systemic, complex systems perspective, this monograph limits its scope to current production estimates, demand estimates, and both military and government structures. However, it does not speculate on potential Remotely Piloted Aircraft innovations, criticize individual military service philosophies, or comment on the validity of current or future Remotely Piloted Aircraft requests. The Federal government should develop a system wherein the Federal, State, and local government agencies can request Remotely Piloted Aircraft to more effectively and efficiently use these limited resources. The current system is overly bureaucratic and needlessly restricts sharing Federal assets with other Federal, State, or local government agencies. A request system for the federal government whereby federal and state agencies can request and employ military-owned Remotely Piloted Aircraft technology and personnel who report directly to the non-military organization would lower overall government costs and maximize equipment usage.

Background

To understand the enormity and complexity of the Remotely Piloted Aircraft system, it is important to understand the cost, growth, and magnitude of the operator, aircraft, cockpits, and data-relay infrastructure in relation to the government's demand to highlight government inefficiencies and ineffectiveness. America first employed unmanned vehicles during the Civil War by placing explosives in balloons then sending them across enemy lines. These early unmanned vehicles were primarily flying weapons or target drones. During Vietnam, improved unmanned aerial vehicles flew high-risk missions for intelligence, surveillance, and reconnaissance purposes.⁴ During the 1980s and 1990s, United States interest in unmanned aircraft grew due to technological improvements, in both aircraft and sensor capabilities, and computer processing. After extensive use in the Kosovo, Iraq, and Afghanistan conflicts, the United States military realized the tremendous benefits of Remotely Piloted Aircraft, such as their lower operating cost, decreased risk to friendly personnel, and improved ability to remain airborne compared to conventional, manned aircraft.⁵

Several indicators reflect the overwhelming growth of Remotely Piloted Aircraft programs throughout the Department of Defense. Steady increases expanded to exponential growth following the addition of the AGM-114 Hellfire missile capability on the MQ-1 Predator in 2001. That same year, the military initiated the production of the Remotely Operated Video Enhanced Receiver, also known as the ROVER, system. It provides real-time video from the Remotely Piloted Aircraft to an airborne or ground receiver.⁶ Now on its fifth version, over 4,000

⁴ Thomas P. Ehrhard, *Air Force UAVs: The Secret History*, 23.

⁵ Major General Blair Hansen, "Unmanned Aircraft Systems Present & Future Capabilities" (presentation, 47th Annual Targets, UAVs & Range Operations Symposium & Exhibition, Savannah, GA, October 21-23, 2009), 3.

⁶ Frank Grimsley, "The Predator Unmanned System: From Advanced Concept Demonstrator to Transformational Weapon System" (presentation, Technology Maturity Conference, Virginia Beach, VA, September 9-12, 2008).

laptop-size units exist to receive data transferred from aircraft overhead.⁷ A strong indicator of growth is the remarkable rise in allocated funds. The budget for Remotely Piloted Aircraft increased from \$667 million in 2001 to a requested \$3.5 billion for 2010.⁸ Some estimates reference an even greater growth pattern. One source claimed the Remotely Piloted Aircraft budget totaled \$5.4 billion in Fiscal Year 2010 alone.⁹ Similar to funding, the number of personnel allocated to a mission is a key indicator of priority. According to Colonel Pete Gersten, the 432d Wing and 432d Air Expeditionary Wing commander, 19% of all Air Force active duty pilots will fly Remotely Piloted Aircraft by 2015.¹⁰ The first unmanned aircraft system declared initial operational capable was the RQ-2 Pioneer in 1986.¹¹ By mid-2004, only 150 total unmanned aircraft were in operational units.¹² Still, most of the industry's growth occurred after 2001. Since then, the Remotely Piloted Aircraft inventory had over a 25-fold increase to its current level of almost 7,000 aircraft.¹³ In 2008, the United States military had fourteen units of Remotely Piloted Aircraft dispersed to eleven locations.¹⁴ By 2013, 152 units will operate from 113 different military bases spread throughout the continental United States, Hawaii, and

⁷ Chris Pocock, "Farnborough Airshow News," *Aviation International News*, July 2008, under "Farnborough Air Show," http://www.ainonline.com/airshow-convention-news/farnborough-air-show/single-publication-story/browse/0/article/1-3-shows-latest-handheld-rover-terminal-16649/?no_cache=1&tx_ttnews%5Bmode%5D=1 (accessed November 10, 2010).

⁸ Elizabeth Bone and Christopher Bolkcom, *Unmanned Aerial Vehicles: Background and Issues for Congress* (SE Washington, DC: Congressional Research Service The Library of Congress, 2003), CRS-2; U.S. Department of Defense, *FY2009-2034 Unmanned Systems Integrated Roadmap*, 4.

⁹ John Keller, "Unmanned vehicle spending in the 2010 DOD budget to reach \$5.4 billion," *Military & Aerospace Electronics*, May 28, 2009, <http://www.militaryaerospace.com/index/display/mae-defense-executive-article-display/363553/articles/military-aerospace-electronics/executive-watch/unmanned-vehicle-spending-in-the-2010-dod-budget-to-reach-54-billion.html> (accessed November 9, 2010).

¹⁰ Colonel Peter Gersten, e-mail to author, March 05, 2011.

¹¹ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030* (2005), 37.

¹² *Ibid.*, 67.

¹³ Thomas P. Ehrhard, *Air Force UAVs: The Secret History*, 3.

¹⁴ Major General Blair Hansen, "Unmanned Aircraft Systems Present & Future Capabilities," 11.

Alaska.¹⁵ While the number of aircraft increases every year, the associated infrastructure must also expand to accommodate Remotely Piloted Aircraft operating both within and beyond line of sight from the control facility.

The infrastructure required to operate the current global unmanned aircraft system is vast and expensive. The system must contain a launch and recovery element, a communications network, command and control for deconfliction, systems and personnel to process data feeds, and pilots and sensor operators to control the Remotely Piloted Aircraft. For beyond line of sight operations, there must also be a network and satellite system to transfer data from the controller to the users.¹⁶ Currently, the Department of Defense uses a networked satellite constellation that communicates transfer commands and data to and from Remotely Piloted Aircraft for beyond line of sight operations.¹⁷ A Forward Launch and Recovery Element must deploy within line of sight to the airfield conducting Remotely Piloted Aircraft operations. Once airborne, the operations cell, located in the United States, can take control of the aircraft allowing for more efficient use of pilots and sensor operators.¹⁸ Beale, Creech and Cannon Air Force Bases house the primary operations facilities for the United States Air Force. Cockpits, located at each of these bases, allow pilots and sensor operators to direct the movements and sensors of Remotely Piloted Aircraft. These cockpits may be deployed to within approximately one hundred miles to enable more rapid and responsive control of the aircraft.¹⁹ However, by keeping cockpits at their home stations, pilots, sensor operators, and supporting staff may rotate in and out of position to provide greater flexibility and durability to handle the diverse manning requirements of global

¹⁵ Major General Blair Hansen, "Unmanned Aircraft Systems Present & Future Capabilities," 11.

¹⁶ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, C-4.

¹⁷ *Ibid.*, C-11.

¹⁸ Major General Blair Hansen, "Unmanned Aircraft Systems Present & Future Capabilities," 9.

¹⁹ Headquarters, United States Air Force, "United States Air Force Unmanned Aircraft Systems Flight Plan 2009-2047" (Washington, D.C., May 18, 2009), 26.

operations.²⁰ Improvements in technology will gradually reduce the equipment needed at operations centers and deployed locations. However, the system requires both a costly Remotely Piloted Aircraft and trained personnel to launch, operate, and recover the aircraft as well as collecting, processing, exploiting, and then disseminating data.²¹

The military demand for Remotely Piloted Aircraft capabilities continues to skyrocket. In Afghanistan alone, the United States Air Force is increasing its current forty-three combat air patrols to sixty-five within the next two years.²² To meet this demand, the Air Force maintains a freeze on its current Remotely Piloted Aircraft pilots, sensor operators, and intelligence personnel while continuing to train and expand each of those career fields.²³ The Air Force restricts military members in specific career fields from leaving the service when it is unable to train persons to replace experienced service members without significantly impacting the mission.²⁴ Also, within the last five years, neither the 432d Wing nor the 432d Air Expeditionary Wing has had a continuation of training flying program to allow pilots and operators to practice their skills.²⁵ On extremely rare circumstances, a sortie may be provided to the local training area in

²⁰ Major General Blair Hansen, “Unmanned Aircraft Systems Present & Future Capabilities,” 3.

²¹ Joint Publication 2-01, Joint and National Intelligence Support to Military Operations, recognizes data as just part of the intelligence process. That process also includes planning and direction, collection, processing and exploitation, analysis and production, dissemination and integration, and evaluation and feedback. A Remotely Piloted Aircraft can collect data but relies on other systems for the other functions. Some Remotely Piloted Aircraft disseminate data via the Remotely Operated Video Enhanced Receiver (ROVER), which delivers sensor data directly to a laptop display. Others rely on satellite communications to transfer data through satellite feeds to distribution centers then to the user. The pilot or operator also possesses a display that the individual can use to verbally disseminate data to its users. While data remains important, the ability to transform data into information requires a more robust system. This intelligence system analyzes the data across time and space then disseminates and integrates the information for the end user. Not all users require an intelligence system but certain organizations would benefit from real-time data processing and information sharing. For instance, the United States Forest Service could collect data then disseminate processed information to regional centers and their multiple firefighting people and assets to integrate into their firefighting plan.

²² Colonel Peter Gersten, e-mail to author, March 05, 2011.

²³ Michael Hoffman, “Officials Extend UAV Jobs Freeze,” *Air Force Times*, (October 25, 2009), http://www.airforcetimes.com/news/2009/10/airforce_creech_102509w/ (accessed February 15, 2011).

²⁴ Ibid.

²⁵ Colonel Peter Gersten, e-mail to author, March 05, 2011.

order to help Army and/or Air Force units preparing for deployments.²⁶ Training sorties refine operator skills prior to employing in stressful, life-threatening combat situations. However, the current operating environment demands every sortie Beale, Creech and Cannon Air Force Bases can produce and therefore training sorties are virtually nonexistent. Eventually the supply of Remotely Piloted Aircraft will allow military units the opportunity to conduct training inside the United States. Rather than practice fictional training scenarios, pilots and operators could provide support to domestic agencies to refine their skills. Assisting domestic agencies supports the demand for Remotely Piloted Aircraft other than military applications outside the continental United States.

Federal, State, and local agencies desire the unique longevity, capability, and reduced operating costs of unmanned systems. Possible entities include the Department of Homeland Security, Department of Commerce, Department of State, Federal Bureau of Investigation, National Forest Service, Department of Agriculture, State police, and local government agencies during emergencies or special situations. For example, the Department of Homeland Security could take advantage of the Wide Area Airborne Surveillance capability, which provides thirty simultaneous Remotely Operated Video Enhanced Receiver queries within a ten by ten kilometer area, to conduct border security.²⁷ The Federal Bureau of Investigation could benefit from Remotely Piloted Aircraft's ability to distinguish facial features from up to four miles away when conducting special event intelligence or inaugural security.²⁸ Also, the National Forest Service could benefit from improving loiter times, which now range from hours to days, that could help detect forest fires during peak fire seasons.²⁹ The rapidly growing sensor capabilities of long-

²⁶ Colonel Peter Gersten, e-mail to author, March 05, 2011.

²⁷ Major General Blair Hansen, "Unmanned Aircraft Systems Present & Future Capabilities," 13.

²⁸ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, 71.

²⁹ *Ibid.*, 58.

endurance Remotely Piloted Aircraft, as shown in Figure 1, make these assets desirable to agencies at all levels of government.

Operational Requirement* (Section 3)	Technology Requirement (Section 4)	Example Capability Metrics	Availability Timeframe
BA, FL	Endurance	Field a heavy fuel-powered tactical UA	2005-10
BA	''	Field fully automated aerial refueling capability	2010-15
BA	''	Achieve 40% increased time-on-station with same fuel load	2015-20
FP	Signature	Field an UA inaudible from 500 to 1,000 ft slant range	2005-10
BA, FA	Resolution	Field a sensor for detecting targets under trees	2005-10
FP	''	Distinguish facial features (identify individuals) from 4 nm	2005-10
BA, FA	''	Achieve 3 inch resolution in SAR resolution over a 20 nm wide swath	2010-15
BA	Data Rate	Relay entire COMINT spectrum in real time	2005-10
BA	''	Relay entire ELINT spectrum in real time	2025-30
BA, FA	''	Relay 100-band hyper-spectral imagery in real time	2010-15
BA, FA	''	Relay 1,000-band ultra-spectral imagery in real time	2025-30
BA, FA	Algorithm Processor	Automatic Target Recognition capability for large numbers of military vehicles	2005-10
C2	Processor Speed	Provide human-equivalent processor speed and memory in PC size for airborne use	2025-30
BA, FP	''	Map surf zone sea mines in real time	2015-20
BA, FA, FL	''	Reduce DTED level 5 data in real time	2020-25
* Based on Joint Functional Capabilities identified in COCOM IPLs.			
BA = Battlespace Awareness; FL = Focused Logistics; FP = Force Protection; C2 = Command and Control FA = Force Application			

Figure 1: UAS Roadmap 2005 Example Capability Metrics ³⁰

³⁰ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, 71.

System	Unit	Base	No. of Systems
Global Hawk	12 Recon Sqdn	Beale AFB, CA	1 (51 aircraft planned)
Hunter	1 MI BN	Hoensfels, Germany	1 (6 aircraft)
	15 MI BN	Ft. Hood, TX	1 (6 aircraft)
	224 MI BN	Savannah, GA	1 (6 aircraft)
Pioneer	VMU-1	Twenty Nine Palms MCAS, CA	1 (5 aircraft)
	VMU-2	Cherry Point MCAS, NC	1 (5 aircraft)
	Fleet Composite Squadron Six	Paxtuxent River, MD	1(3 aircraft)
Predator	11 Recce Sq	Indian Springs AAF, NV	5 (20 aircraft)
	15 Recce Sd	"	5 (20 aircraft)
	17 Recce Sq	"	2 (12 aircraft)
Shadow	3 Bde, 2 ID	Ft. Lewis, WA	1 (4 aircraft)
	1 Bde, 25 ID	"	1 (4 aircraft)
	1 Bde, 1st Cav	Ft. Hood, TX	1 (4 aircraft)
	2 Bde, 1st Cav	"	1 (4 aircraft)
	3 Bde, 1st Cav	"	1 (4 aircraft)
	1 Bde, 82 Abn	Ft. Bragg, NC	1 (4 aircraft)
	2 Bde, 82 Abn	"	1 (4 aircraft)
	2 Bde, 1 ID	Germany	1 (4 aircraft)
	3 Bde, 1 ID	"	1 (4 aircraft)
	1 Bde, 2 ID	Korea	1 (4 aircraft)
	2 Bde, 2 ID	"	1 (4 aircraft)
	1 Bde, 4 ID	Ft. Hood, TX	1 (4 aircraft)
	2 Bde, 4 ID	"	1 (4 aircraft)
	29 ID (PA NG)	Indian Town Gap, PA	1 (4 aircraft)
	56 Bde (MD NG)	Baltimore, MD	1 (4 aircraft)
172 SIB	Ft. Wainwright, AK	1 (4 aircraft)	
1 – 4 UA 3 ID	Ft. Stewart, GA	4 (16 aircraft)	

Note: Small UAVs are not included as the number of units having hand launched systems are too numerous to mention.

Figure 2: UAS Roadmap 2005 Remotely Piloted Aircraft Inventory and Locations³¹

The cost of each agency maintaining its own Remotely Piloted Aircraft capability is unsustainable in all the agencies requiring unmanned capabilities. In 2005 alone, the Air Force trained approximately ninety-six pilots averaging thirty-five flight hours, sixty-six sensor operators averaging almost forty-three flight hours, and over 170 maintenance professionals.³² That same year, the United States Army trained forty Hunter internal pilots, averaging approximately twenty-one flight hours, and 240 Shadow operators, averaging just over fourteen

³¹ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, 67.

³² *Ibid.*, 63.

flight hours.³³ In both services, pilots and operators received between three and six months of training to gain proficiency in their specific Remotely Piloted Aircraft.³⁴ The cost to train pilots and operators to be capable of flying Remotely Piloted Aircraft includes their salary, the staff's salaries, fuel, maintenance, infrastructure use, airfield use, and facility expenses. In addition to the cost of qualifying personnel, the Remotely Piloted Aircraft is also expensive. The average cost of Predator, Reaper, Shadow, Hunter, or Global Hawk Remotely Piloted Aircraft with its associated sensors was \$38.15 million per platform in 2005.³⁵ The combination of these training and acquisition costs with current operating and research and development costs adds up to the 2010 budget of \$3.5 billion.³⁶

The demand for unmanned aircraft extends from the Department of Defense to the Department of Homeland Security, Department of State, Central Intelligence Agency, National Forest Service, Department of Agriculture, State agencies, and local governments.³⁷ Some agencies already purchased some of the equipment and infrastructure. For instance, the United States Customs and Border Protection Office already purchased six low-to-medium altitude Predator aircraft.³⁸ Customs and Border Protection currently employs contractor personnel who operate the lower cost, line-of-sight capability from their ground control station. However, they soon will transition to beyond-line-of-sight capability missions using satellite transmissions, relayed to a common operating location, controlled by Air and Marine Operations law

³³ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, 63.

³⁴ *Ibid.*

³⁵ *Ibid.*, 56.

³⁶ Elizabeth Bone and Christopher Bolkcom, *Unmanned Aerial Vehicles: Background and Issues for Congress*, CRS-2; U.S. Department of Defense, *FY2009-2034 Unmanned Systems Integrated Roadmap*, 4.

³⁷ The Murfreesboro Post, "Partnership for unmanned aerial systems research, training," The Murfreesboro Post, <http://www.murfreesboropost.com/partnership-for-unmanned-aerial-systems-research-training-cms-24175> (accessed February 24, 2011).

³⁸ Chad C. Haddal and Jeremiah Gertler, *Homeland Security: Unmanned Aerial Vehicles and Border Surveillance* (SE Washington, DC: Congressional Research Service The Library of Congress, 2010), 1.

enforcement pilots.³⁹ At a cost of \$34 million, the Customs and Border Patrol plans to procure two Remotely Piloted Aircraft in 2011 with the beyond-line-of-sight capability.⁴⁰ To operate the expanding fleet, the Customs and Border Patrol hired five persons at an additional yearly cost of \$900,000.⁴¹ Extra material and equipment also had to be purchased to accommodate the growth, which cost another \$2 million.⁴² Based on those 2011 budget numbers for the Customs and Border Patrol, the total first-year cost of purchasing then operating an aircraft, control system, pilot and operator averages approximately \$18,450,000 per Remotely Piloted Aircraft. A Congressional Research Service report determined Remotely Piloted Aircraft operating costs currently exceed manned aircraft costs.⁴³ However, it also projected recently developed improvements in command and control systems as well as sensors could shift the operating cost advantage in favor of unmanned aircraft.⁴⁴ An asset with a high acquisition cost, modular sensor capabilities, and projected lower operating costs is conducive to sharing across multiple users rather than forcing individual agencies to purchase and sustain separate systems.

Remotely Piloted Aircraft have application across government agencies and will continue to grow in the next ten years as they integrate into the National Airspace Structure.⁴⁵ The Department of Homeland Security praised the effectiveness of Remotely Piloted Aircraft but determined the costs to be a limiting factor to their civilian law enforcement activities.⁴⁶ To maximize the efficient and effective use of Remotely Piloted Aircraft personnel and assets, the

³⁹ U.S. Department of Defense, *Unmanned Systems Roadmap, 2007-2032*, (2007), 38.

⁴⁰ *Department of Homeland Security Appropriations Bill, 2011*, Report 111-222 to accompany S 3607, 111th Cong., 2d sess. (July 19, 2010), 42.

⁴¹ *Ibid.*

⁴² *Ibid.*

⁴³ Chad C. Haddal and Jeremiah Gertler, *Homeland Security: Unmanned Aerial Vehicles and Border Surveillance*, 5.

⁴⁴ *Ibid.*

⁴⁵ The Murfreesboro Post, "Partnership for unmanned aerial systems research, training."

⁴⁶ Chad C. Haddal and Jeremiah Gertler, *Homeland Security: Unmanned Aerial Vehicles and Border Surveillance*, 5.

United States government could introduce a centralized, shared unmanned aircraft system whereby individual agencies request access to unmanned capabilities. Overall, the increased demand coupled with the continued need for Remotely Piloted Aircraft and associated personnel makes the cost of maintaining separate fleets of unmanned aircraft infrastructures and personnel impractical.

The disparity in the federal budget allocation makes it unreasonable for separate federal agencies to maintain their own operators, equipment, or infrastructure. In 2010, not including Social Security and Medicare, the Department of Defense budget was almost three times larger than the next Federal agency and over eight times larger than the Departments of Homeland Security and State combined.⁴⁷ Only barely surpassing Social Security in the budget, it constituted the lead department in discretionary spending at \$689.1 billion, more than the combined total of all other international and domestic discretionary spending.⁴⁸ During the same timeframe, the gross cost of the Department of State, Department of Homeland Security, and Department of Agriculture were \$24.5 billion, \$58.9 billion, and \$137.6 billion respectively.⁴⁹ Simply stated, other Federal agencies could benefit from the Department of Defense's Unmanned Systems projected budget of \$18.9 billion from Fiscal Years 2009 to 2013.⁵⁰

This chapter highlighted the financial burden associated with individual agencies acquiring separate Remotely Piloted Aircraft capabilities. The government must consider the infrastructure required to manage the proliferation of unmanned systems. The cost of maintaining

⁴⁷ U.S. Government Accountability Office, "Financial Statements of the United States Government for the Years Ended September 30, 2010, and 2009," Government Accountability Office Financial Statement, <http://www.gao.gov/financial/fy2010/10stmt.pdf> (accessed March 05, 2011), 40.

⁴⁸ Congressional Budget Office, "Congressional Budget Office," Congressional Budget Office Historical Tables, January 14, 2011, <http://www.cbo.gov/ftpdocs/120xx/doc12039/HistoricalTables%5B1%5D.pdf> (accessed March 05, 2011), 8.

⁴⁹ U.S. Government Accountability Office, "Financial Statements of the United States Government for the Years Ended September 30, 2010, and 2009," 40.

⁵⁰ U.S. Department of Defense, *FY2009-2034 Unmanned Systems Integrated Roadmap*, 4.

separate personnel and infrastructures makes its effectiveness unattainable due to cost inefficiency. Individual agencies cannot support their own fleets due to the cost of acquiring and maintaining separate unmanned aircraft, operators, analysts, and infrastructure. The cost of maintaining separate fleets is excessive without major reprioritizations of existing budgets or increases in agency allocations. However, certain restrictions on military forces acting under Title 10 authority require analysis to determine whether the government can implement a system capable of sharing the military's assets across Federal, State, and local agencies.

Legal Issues

Several issues, including legal restrictions and administrative hurdles, affect the ability to operate Remotely Piloted Aircraft in the United States. The key laws and directives that govern the role of the military within the United States are the Posse Comitatus Act, Department of Defense Directive 5525.5, the Stafford Act and Chapter 18 of Title 10, Military Support for Civilian Law Enforcement Agencies. Four main conceptual categories outline the legal restrictions of Federally controlled Remotely Piloted Aircraft operating within the United States: 1) The use of Title 10 military forces to collect data within the United States borders, 2) Title 10 support to individual States, 3) Title 32 support to the Federal government, and 4) Remotely Piloted Aircraft operations within Federal Aviation Administration airspace. These limitations are the result of our national history and our belief in an individual's civil liberty. Therefore, the United States developed a military system designed to preserve national sovereignty while protecting those liberties.

At the nation's inception, George Washington and Alexander Hamilton feared a large standing army could infringe on the rights of the people or affect the government itself. After the Civil War, the Union Army became involved in stability operations and law enforcement in the southern States.⁵¹ Army responsibilities involved protection of Federal employees, enabling biracial citizen participation in State government, and general law enforcement duties to prevent the influence of terrorist groups, such as the Ku Klux Klan.⁵² Protection also extended to ex-Confederate Republicans appointed by President Johnson in 1865.⁵³ Southern Democrats

⁵¹ Craig T. Trebilcock, "The Myth of Posse Comitatus," *Journal of Homeland Security* (October 2000), under "Posse Comitatus Articles," <http://www.homelandsecurity.org/journal/articles/trebilcock.htm> (accessed November 1, 2010).

⁵² Matt Matthews, *The Posse Comitatus Act and the United States Army: A Historical Perspective*, vol. 14 Occasional Paper: Global War on Terrorism (Fort Leavenworth: Combat Studies Institute Press, 2006), 26.

⁵³ *Ibid.*, 23.

determined these Union Army's activities in the southern States to be infringements on individual rights and liberties.⁵⁴ After seven years of Southern reconstruction efforts, Northern Republican interest waned as Federal treasure and military manning continued to pour into the south.⁵⁵ As the Army gradually withdrew, Southern Democrats regained control of the political system.⁵⁶ In an effort to balance national defense with the preservation of liberties, Southern Democrats, led by Kentucky Congressman J. Proctor Knott, drove Congress to pass Title 18, the Posse Comitatus Act, in 1878.⁵⁷ This landmark legislation limited the Army's ability to conduct operations within the boundaries of the United States. Its original passage applied solely to the Army. However, after World War II, amendments and Department of Defense directives eventually placed all Title 10 forces, such as the Air Force, Navy, Marine Corps forces, as well as their Reserve components, under Posse Comitatus.⁵⁸ The Act does not apply to the Title 13 Coast Guard forces or National Guard forces when operating under Title 32 State control. The Posse Comitatus Act was Congressional legislation, not a constitutional provision, which makes it subject to the amendments of successive legislation and judicial ruling.⁵⁹

The Posse Comitatus Act of 1878 established limits for the employment of Federal military forces operating under Title 10. The intent of the Posse Comitatus Act was "to remove the Army from civilian law enforcement and to return it to its role of defending the borders of the United States."⁶⁰ *State v Nelson* established the precedent of "active" versus "passive" Federal

⁵⁴ Matt Matthews, *The Posse Comitatus Act and the United States Army: A Historical Perspective*, 30.

⁵⁵ *Ibid.*

⁵⁶ *Ibid.*, 31.

⁵⁷ *Ibid.*, 32.

⁵⁸ Trebilcock, "The Myth of Posse Comitatus."

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*; 18 U.S.C. § 1385.

troop participation in civilian law enforcement.⁶¹ In the decision, the court determined the “legislative purpose of the Posse Comitatus Act is to preclude the direct active use of Federal troops in aid of execution of civilian laws . . . Passive activities of military authorities which incidentally aid civilian law enforcement are not precluded.”⁶² The military may conduct operations within the United States as long as those operations are conducted solely for military reasons. Upon discovery of criminal activity, the information must then be shared with the appropriate civilian law enforcement agency.⁶³ For instance, the Federal government, specifically the Department of Defense, may actively conduct counter-terrorism activities while passively assisting law enforcement agencies.

Due to the desire of law enforcement for improved resources and capabilities, the strict enforcement of Posse Comitatus eroded over the last thirty years.⁶⁴ Paul Stevens, at the Center for Strategic and International Studies, highlights that Constitutional and legal statutes limit the restrictions imposed by the Posse Comitatus Act. He notes, “[E]ven where the *Posse Comitatus* statute does apply, only certain kinds of military activity involving the exercise of explicit police powers fall within the prohibition of the act. Other military activities are not prohibited by the statute.”⁶⁵ Major Craig Trebilcock highlights Congressional changes in Title 10 as an example. The revised Title 10 permits Federal military assistance in anti-drug operations, immigration control, and tariff enforcement. These three areas were previously considered part of law enforcement.⁶⁶ Except when authorized, the courts established precedent claiming the Posse Comitatus Act “is violated (1) when civilian law enforcement officials make ‘direct active use’ of

⁶¹ State v. Nelson, 260 SE 2d 629 (N.C., December 4, 1979), 639.

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Trebilcock, “The Myth of Posse Comitatus.”

⁶⁵ Paul S. Stevens, *US Armed Forces and Homeland Defense: The Legal Framework* (NW Washington, D.C.: Center for Strategic and International Studies, 2001), 4.

⁶⁶ Trebilcock, “The Myth of Posse Comitatus.”

military investigators, (2) when the use of the military ‘pervades the activities’ of the civilian officials, or (3) when the military is used so as to subject citizens to the exercise of military power that is ‘regulatory, prescriptive, or compulsory in nature.’”⁶⁷ After the Cold War and the events of September 11, 2001, the United States focused its efforts on detecting domestic terrorist threats. The erosion of Posse Comitatus allows the Federal government to provide assistance in numerous situations, especially counter-terrorism efforts, within the United States. However, the United States government policy and law prevent the explicit assistance required to produce efficient and effective interagency, State, and local use of Federal government resources.

Department of Defense Directive 5525.5 outlines the Department of Defense’s guidelines for cooperation with civilian law enforcement officials and their activities. Using the Posse Comitatus Act as its foundation, it outlines permissible direct, or active, assistance. This broad directive describes how defense personnel can operate equipment when cost or time prohibit the training of non-defense persons as long as national security or military preparedness remain intact.⁶⁸ Defense personnel may also monitor air and sea traffic when communicating their observations of criminal activities directly to the appropriate law enforcement officials.⁶⁹ The directive provides many opportunities to support civilian law enforcement agencies. For instance, it permits the removal of persons unlawfully present on Indian lands, actions in support of certain customs laws, and the protection of national parks and other Federal lands.⁷⁰ Unfortunately, the most recent guidance found in Change 1, dated December 20, 1989, fails to adequately account for today’s internet connectivity, modern terrorist threats, or expanding friendly capabilities, such as Remotely Piloted Aircraft. Other legislation, such as the Stafford Act of 2007, provides

⁶⁷ Jennifer K. Elsea and R. Chuck Mason, *The Use of Federal Troops for Disaster Assistance: Legal Issues* (SE Washington, DC: Congressional Research Service The Library of Congress, 2008), 2.

⁶⁸ U.S. Department of Defense, *Directive Number 5525.5, Change 1* (December 20, 1989), 18.

⁶⁹ *Ibid.*, 19.

⁷⁰ *Ibid.*, 16-17.

additional guidance for military and civilian coordination. Unfortunately, these updated legislative measures restrict Federal military assistance to specific emergency situations.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act complicates the military's authorities within the borders of the United States. The purpose of the Act is to provide the statutory authority for military assistance during domestic disaster or emergency situations.⁷¹ Similar to the Posse Comitatus Act, it prevents military forces from conducting law enforcement activities. Likewise, it does not limit the military's ability to assist in the protection of life and property against major natural disasters. The Stafford Act defines a major disaster as "any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance" to "supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby."⁷² The Stafford Act specifically permits the military's conduct of logistical and administrative functions, such as dissemination of public information and search and rescue. Recently, Defense Coordinating Officers and Elements, consisting of ten member teams, established relationships with the ten Federal Emergency Management Agency zones to increase cooperation between the Federal military and civilian agencies.⁷³ Improved relations and military assistance outside of law enforcement activities increase the Federal military's use within the United States.

⁷¹ Jennifer K. Elsea and R. Chuck Mason, *The Use of Federal Troops for Disaster Assistance: Legal Issues*, 4.

⁷² U.S. Department of Homeland Security, *National Response Framework*, (January 2008), 41.

⁷³ Lieutenant General Guy Swan III, "US Army North" (lecture, Lewis and Clark Center, Leavenworth, KS, December 2, 2010).

Chapter 18 of Title 10, called Military Support for Civilian Law Enforcement Agencies, provides multiple sections offering clear guidance for the conduct of military personnel. Section 371 states the “Secretary of Defense may, in accordance with other applicable law, provide to Federal, State, or local civilian law enforcement officials information collected during the normal course of military training or operations that may be relevant to a violation of any Federal or State law within the jurisdiction of such officials.”⁷⁴ The subsequent paragraph emphasizes the interaction of military personnel and equipment with law enforcement agencies. It requires the military to incorporate civilian law enforcement needs into daily training and operations to the “maximum extent practicable.”⁷⁵ However, these accounts address active measures, as defined by *State v. Nelson*, outside the borders of the United States or passive measures of law enforcement within the United States. Section 374 states that upon a Federal law enforcement agency’s request and in accordance with other applicable law, the Secretary of Defense may make military personnel available to assist law enforcement agencies. It goes on to say those military personnel made available can operate their equipment for aerial reconnaissance purposes.⁷⁶ The subsequent section coincides with the *State v. Nelson* decision by stating “this chapter does not include or permit direct participation by a member of the Army, Navy, Air Force, or Marine Corps in a search, seizure, arrest, or other similar activity in such activity by such member is otherwise authorized by law.”⁷⁷ Therefore, Title 10 reinforces the *State v. Nelson* decision in support of passive participation by military forces conducting anti-terrorism activities or protecting Federal land.

⁷⁴ 10 U.S.C. § 371.

⁷⁵ *Ibid.*

⁷⁶ 10 U.S.C. § 374.

⁷⁷ 10 U.S.C. § 375.

Restrictions on the use of the Federal military within the United States are restricted to Title 10, not Title 32, of the United States Code.⁷⁸ This limitation prevents the use of Title 10 Federal forces, which constitutes the overwhelming majority of Remotely Piloted Aircraft, from operating inside the borders of the United States without the permission of the President.⁷⁹ The United States Army, Marine Corps, Navy, Air Force, and their Reserve components, constitute Title 10 forces.⁸⁰ Individual States have organized militias, now referred to as the National Guard, which report to the State Governor when activated by the State. Title 32 provisions allow National Guard members to conduct law enforcement activities, as they do not fall under the Posse Comitatus Act.⁸¹ The National Guard changes from Title 32 to Title 10 when activated into Federal service by the President of the United States. Upon activation by the President, the National Guard becomes part of the Department of Defense and is subject to all applicable active-duty, Title 10 restrictions.

Federal military forces provide support to other Federal, State, and local agencies despite the guidelines established to limit Federal forces from conducting law enforcement activities. From the Civil War to the ongoing OPERATION Noble Eagle, the precedent exists for the use of Federal forces to assist with State issues, patrol the border, protect Federal lands, and aid in emergency situations.

This monograph focuses on four cases that occurred post September 11, 2001, due to their applicability to current laws, government infrastructure, and modern military technology. Hurricane Katrina, Cyber Command operations, Department of Homeland Security, and OPERATION Noble Eagle serve as current examples of Federal forces operating within the

⁷⁸ 10 U.S.C. § 375.

⁷⁹ Major General Blair Hansen, “Unmanned Aircraft Systems Present & Future Capabilities,” 11; U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, 67.

⁸⁰ Trebilcock, “The Myth of Posse Comitatus.”

⁸¹ *Ibid.*

United States. The disaster caused by Hurricane Katrina required Federal troops and their assets to assist National Guard forces. Despite early warning and an accurate forecast of Hurricane Katrina's arrival, the National Response Plan failed to adequately assist, or supplant when required, local first responders.⁸² Local, State, and Federal governments' inability to effectively interact, plan, and cooperate delayed emergency response actions.⁸³ Without established working relationships, higher levels of government simply applied a response template that ignored the uniqueness of the actual emergency or the needs of the specific communities.⁸⁴ The resulting Federal military response to the emergency was suboptimal due to the lack of a clear organizational structure or rehearsed operations. The Final House Report for Hurricane Katrina mentions the military as playing "an invaluable role, but coordination was lacking."⁸⁵ Delays in the Federal government's overall response were partially due to a combination of poor coordination between Federal Title 10 Active Duty and Title 32 National Guard forces in addition to Federal forces arriving with low situational understanding, due to scarce information sharing and insufficient joint, multiagency training.⁸⁶ The report also faults insufficient training and equipment as reasons for suboptimal response.⁸⁷ Command and control also affected the Federal government's reaction capabilities. The dual command structure under Hurricane Katrina caused confusion, decreased Federal government coordination, and lowered effectiveness.⁸⁸ Title 10 forces deployed to the coastal States in response to the emergency could not perform law

⁸² The Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina, *A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina* (Washington, DC: U.S. Government Printing Office, February 15, 2006), 1.

⁸³ *Ibid.*, 2.

⁸⁴ *Ibid.*

⁸⁵ *Ibid.*, 3.

⁸⁶ *Ibid.*, 4.

⁸⁷ *Ibid.*

⁸⁸ *Ibid.*, 201.

enforcement functions. To avoid legal issues, the Title 10 forces joined mixed teams consisting of State National Guard forces operating under Title 32 as well as State and local law enforcement.⁸⁹ The Title 10 forces could not actively perform law enforcement activities. However, they could patrol alongside Title 32 forces in accordance with their permitted activities such as search and rescue and, if required for self-defense, passively conduct law enforcement.⁹⁰ Remotely Piloted Aircraft could use this same legal framework. For instance, Title 10 forces could operate the aircraft and use their infrastructure while reporting all data to their mixed team of Title 32 or law enforcement officials. The Department of Defense claims it filled all of the Federal Emergency Management Agency's requests for assistance.⁹¹ However, the Federal Emergency Management Agency claims requests were informally denied before they officially submitted the request form.⁹² These miscommunications and inefficiencies highlight the legal complexities and lack of preapproved options for military to civilian law enforcement assistance. Most importantly, Hurricane Katrina highlighted how a well-intentioned, aggressive response by capable agencies found it difficult to overcome poor preparation, complex legal hurdles, and inadequately established coordination systems. Government agencies sharing Remotely Piloted Aircraft face these same difficulties.

The internal ability of United States Cyber Command, led by General Keith Alexander who is also the National Security Agency director, to leverage Air Force, joint, and interagency capabilities is an example for Remotely Piloted Aircraft personnel and asset utilization. As a benefit, but legal complication to their overlapping interest, a strong and expanding relationship

⁸⁹ The Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina, *A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina*, 213.

⁹⁰ Ibid.

⁹¹ Ibid., 204.

⁹² Ibid.

exists between the National Security Agency and Cyber Command.⁹³ The Cyber Command structure allows personnel to conduct operations in accordance with the legal directives associated with the assigned task. For instance, if conducting operations overseas or in defense of the United States and its military forces, employees operate under Title 10 authorities.⁹⁴ However, if conducting operations within the United States for law enforcement activities, they report to non-military officials and operate under Title 50 provisions.⁹⁵ This flexibility allows employees to contribute to the effectiveness of multiple Federal, State, and local agencies regardless of their agency affiliation. This nonlinear approach to employee infrastructure maximizes the government's capabilities across organizations and mission sets. For this reason, Cyber Command serves as an excellent example for Remotely Pilot Aircraft operations.

The Department of Homeland Security has three primary users of aviation. The Coast Guard, Customs and Border Protection, and Counter Narcotics Office each contain aviation elements. Both the Coast Guard and Customs and Border Protection elements maintain active unmanned aircraft programs since their initiation in 2003.⁹⁶ The success of unmanned aircraft led the Department of Homeland Security to prepare plans for their use "in roles varying from port security to open ocean fisheries protection and in environments from the Gulf coast to Alaska."⁹⁷ The military and Customs and Border Patrol partnership started with Joint Task Force 6 counterdrug operations in the 1990s.⁹⁸ To avoid legal issues during these law enforcement

⁹³ Mesic, Richard, Myron Hura, Martin C. Libicki, Anthony M. Packard, and Lynn M. Scott, *Air Force Cyber Command (Provisional) Decision Support* (Monograph, Santa Monica, CA: RAND Corporation, 2010), 13.

⁹⁴ Shachtman, Noah, "The Dangers of Turning Spies into Generals (and Vice Versa)," *Wired.com*, June 03, 2010, <http://www.wired.com/dangerroom/2010/06/the-dangers-of-turning-spies-into-generals-and-vice-versa> (accessed March 05, 2011).

⁹⁵ *Ibid.*

⁹⁶ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, I-2.

⁹⁷ *Ibid.*

⁹⁸ *Ibid.*, I-3.

activities, Customs and Border Patrol sat adjacent to the operators in the Ground Control Station. Upon discovery of illegal or suspicious activity, the Customs and Border Patrol representative directed appropriate agents to the area of interest.⁹⁹ This procedure provides an effective work-around to legal limitations. It also represents a tactical method of legally employing Department of Defense personnel and assets within the United States. This Customs and Border Patrol interaction could be applied throughout the government on a permanent basis.

Executive Order 13223 created OPERATION Noble Eagle in response to the terrorist attacks of September 11, 2001.¹⁰⁰ OPERATION Noble Eagle mobilized active duty, National Guard, and Reserve personnel to perform numerous security functions inside the borders of the United States.¹⁰¹ Specifically, OPERATION Noble Eagle provided homeland defense and civil support by the activated persons. Part of the homeland defense mission involved designating aviation assets, on both ground alert and airborne patrols, to intercept suspicious airborne traffic. Because of the mission's interstate nature, the National Guard and Ready Reserve operated under active duty, Title 10, authority when they executed Noble Eagle taskings.¹⁰² Federal air and space assets provide capabilities, such as Remotely Piloted Aircraft, that can ignore or close the seams between Federal, State, and local jurisdictions. In its first six months alone, OPERATION Noble Eagle flew in excess of 20,000 sorties over North America to prevent another airborne terrorist attack.¹⁰³ The interstate nature of airborne assets dictates a Federal command structure when operating within the United States. Every OPERATION Noble Eagle sortie flown operated under Title 10, not Title 32, guidelines. By using Title 10 forces, the assumption must be made that individual aircraft pose a risk to national security and thus requires Federal personnel and

⁹⁹ U.S. Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005-2030*, I-2.

¹⁰⁰ Executive Order no. 13,223, *Code of Federal Regulations*, title 3, p. 785 (January 1, 2002).

¹⁰¹ *Ibid.*

¹⁰² *Ibid.*

¹⁰³ Defense Study and Report to Congress, *The DoD Role in Homeland Security* (Washington, DC: Department of Defense, 2003), 2.

assets to assist law enforcement activities. While terrorism poses such ambiguous threats, such an argument could allow individuals to claim that any vehicle or person crossing the border illegally could also be a threat to national security. Therefore, Title 10 personnel could actively conduct border patrol and associated law enforcement functions. Despite the legal implications, this enduring interaction between the Department of Defense and the Federal Aviation Administration at least improved their coordination and collaboration.¹⁰⁴

These cases outline current organizational issues affecting the Federal government's ability to help State and local governments. Aside from those issues, Remotely Piloted Aircraft must also overcome regulation hurdles. Several Federal Aviation Administration restrictions currently exist limiting the use of unmanned aerial vehicles within United States National Airspace System. While the Federal government sidesteps certain requirements because it operates Remotely Piloted Aircraft in restricted airspace, operations outside of restricted airspace must receive approval from the Federal Aviation Administration prior to flight. The Federal Aviation Administration currently requires local, State, and Federal government agencies to apply for a Certificate of Waiver or Authorization, known as a COA, to operate an unmanned system in civil airspace.¹⁰⁵ If approved, it permits the unmanned system to operate in specific conditions, at specific times, in approved locations. Most importantly, to receive approval for a Certificate of Waiver or Authorization, someone on the ground, or airborne associated with the unmanned system, must keep visual contact to prevent accidents whenever operating in airspace not restricted to other users.¹⁰⁶ Despite these restrictions, the number of total active Certificates of

¹⁰⁴ Defense Study and Report to Congress, *The DoD Role in Homeland Security*, 2.

¹⁰⁵ Les Dorr and Alison Duquette, "Fact Sheet – Unmanned Aircraft Systems (UAS)," Federal Aviation Administration, http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=6287 (accessed December 07, 2010).

¹⁰⁶ *Ibid.*

Waiver or Authorization almost doubled from 146 in 2009 to 273 in 2010.¹⁰⁷ The Federal Aviation Administration created the Unmanned Aircraft Program Office, the Aviation Rulemaking Committee, and the Air Traffic Organization Unmanned Aircraft System office to address the growing demand for unmanned aircraft to operate in unrestricted airspace. These offices work in conjunction with the Department of Defense's Joint Planning and Development Office and the Radio Technical Commission for Aeronautics to find a solution to the safe operation of unmanned systems in the National Airspace System.¹⁰⁸ Despite these regulations, Remotely Piloted Aircraft integration and acceptance into the National Airspace System is progressing. The Predator was not Federal Aviation Regulation 23 compliant as of December 2001. However, less than four years later, in March 2005, the Federal Aviation Administration granted the MQ-9 Reaper its airworthiness certification.¹⁰⁹

Many legal and administrative issues exist affecting the ability to operate Remotely Piloted Aircraft in the United States. The primary legislation and directives consist of the Posse Comitatus Act, Department of Defense Directive 5525.5, the Stafford Act, and Chapter 18 of Title 10, Military Support for Civilian Law Enforcement Agencies. These guidelines describe the extent to which the Department of Defense personnel and assets, specifically Remotely Piloted Aircraft, can assist other agencies. They also limit the Federal military's ability to assist local, State, and other Federal agencies beyond the intent of the regulations since the existence or capabilities of Remotely Piloted Aircraft were nonexistent when the government wrote these regulations. The intent of the legislation was to restrict the Federal military from conducting law enforcement activities. The advent of computers and airpower suggest we should reevaluate these legal and administrative restrictions. The Department of Defense could lead this effort

¹⁰⁷ Les Dorr and Alison Duquette, "Fact Sheet – Unmanned Aircraft Systems (UAS)."

¹⁰⁸ Ibid.

¹⁰⁹ Frank Grimsley, "The Predator Unmanned System: From Advanced Concept Demonstrator to Transformational Weapon System."

while taking measures to ensure our tradition of civil liberties holds. Following Hurricane Katrina, both Senator John Warner, Chairman of the Senate Armed Forces Committee, and former Chairman of the Joint Chiefs of Staff, General Peter Pace, recommended researching possible alterations to better enable the Department of Defense to assist domestic problems.¹¹⁰ Therefore, the United States might develop a system that allocates Federal resources, to include personnel, equipment, and infrastructure, to local, State, and other Federal agencies. The American people want their layers of government to provide a capable system that protects public health and safety, effectively responds to emergencies, and respects the system of federalism.¹¹¹ A thorough understanding of our current incident response framework is essential to the development of potential options for improvement.

¹¹⁰ Matt Matthews, *The Posse Comitatus Act and the United States Army: A Historical Perspective*, 1.

¹¹¹ The Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina, *A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina*, x.

Current System

The National Response Framework (NRF), the National Incident Management System (NIMS), and the Defense Support to Civil Authorities (DSCA) structures govern the nation's response to national emergencies. According to the Department of Homeland Security, the National Incident Management System “provides the template for the management of incidents, while the NRF provides the structure and mechanisms for national-level policy for incident management.”¹¹² Specific to the military, these documents orchestrate the use of personnel and equipment, such as Remotely Piloted Aircraft, when local and State resources are incapable.

The current request system of sharing Federal resources with other Federal, State, tribal, and local governments is reactive. Homeland Security Presidential Directive 5, *Management of Domestic Incidents*, dated 28 February 2003, directed the creation and operation of the National Incident Management System.¹¹³ In accordance with this directive, the Department of Homeland Security instituted the National Incident Management System, overseen by the National Integration Center, on 4 March 2004.¹¹⁴ Under Title 6, the Secretary of Homeland Security, “through the National Integration Center, and in consultation with other Federal departments and agencies and the National Advisory Council, shall ensure ongoing management and maintenance of the National Incident Management System, the National Response Plan, and any successor to such system or plan.”¹¹⁵ Specifically, the National Incident Management System “provides a consistent nationwide template to enable Federal, State, tribal, and local governments, nongovernmental organizations (NGOs), and the private sector to work together to prevent,

¹¹² U.S. Department of Homeland Security, *National Incident Management System* (December 2008), 1.

¹¹³ The White House Office of the Press Secretary, “Homeland Security Presidential Directive/HSPD-5,” U.S. Department of Homeland Security, http://www.dhs.gov/xnews/releases/press_release_0105.shtm (accessed February 2, 2011).

¹¹⁴ U.S. Department of Homeland Security, *National Incident Management System*, i.

¹¹⁵ 6 U.S.C. § 319.

protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity. This consistency provides the foundation for utilization of NIMS for all incidents, ranging from daily occurrences to incidents requiring a coordinated Federal response.”¹¹⁶ The system prepares for disasters, takes measures to prevent their occurrence, and integrate agencies in response when those measures fail.

The National Response Framework, dated January 2008, is the nation’s guide for responding to various hazards. The Framework replaced the Federal Response Plan in 2004 as a direct result of lessons learned from the attacks on September 11, 2001.¹¹⁷ The audience for the Framework is “government executives, private-sector and nongovernmental organization (NGO) leaders, and emergency management practitioners.”¹¹⁸ In the introduction, it specifically highlights the concern for the constantly changing leadership’s ability to control the resources available during national emergencies. The structure, therefore, is designed to offer an outline for operational planning rather than provide strategic guidance or a system for tactical execution. The National Response Framework document specifies the key principles, participants, roles, and structures for handling incidents. Unfortunately, the document falls short of its stated goal to strengthen the nation’s “systems, structures, and institutions that cut across the homeland security enterprise and support our activities to secure the homeland” by preventing the habitual interaction and efficient use of the Federal government’s available high-demand, but low-quantity, resources.¹¹⁹

¹¹⁶ Federal Emergency Management Agency, “NIMS Implementation and Compliance Guidance for Stakeholders,” U.S. Department of Homeland Security, <http://www.fema.gov/emergency/nims/ImplementationGuidanceStakeholders.shtm#item1> (accessed February 2, 2011).

¹¹⁷ U.S. Department of Homeland Security, *National Response Framework*, 2.

¹¹⁸ *Ibid.*, 1.

¹¹⁹ *Ibid.*, 13.

The National Response Framework requires all levels of government to fund and execute their own emergency response capabilities.¹²⁰ “A basic premise of both NIMS and the NRF is that incidents typically be managed at the local level first.”¹²¹ Local resources in conjunction with written agreements with other agencies or departments provide the initial, and usually total, response to emergency situations.¹²² Therefore, the onus of public safety and citizen welfare lies mainly on local officials and their limited resources. Local then State agencies may request Federal assistance only when their resources are anticipated to be, or are, overwhelmed.¹²³ The document specifically notes that it “is not necessary that each level be overwhelmed prior to requesting resources from another level.”¹²⁴ “If additional or specialized resources or capabilities are needed, Governors may request Federal assistance” via the Robert T. Stafford Disaster Relief and Emergency Assistance Act, also known as the Stafford Act.¹²⁵ Upon activation by the President in emergency or disaster situations, the Stafford Act provides the financial or other requested assistance to the appropriate organization(s).¹²⁶ Without a habitual working relationship or precedent of cooperation, a reasonable expectation cannot exist for a responsive, integrated effort from Federal assets. Therefore, to receive the benefits of Federal resources, such as Remotely Piloted Aircraft, local and State governments would have to maintain their own personnel, infrastructure, and equipment for locally manageable emergencies. While this approach forces local and State governments to prepare themselves for emergency incidents, it prevents Federal military forces from providing a capability that may increase situational awareness and thus decrease the overall risk to life and property. In such incidents, the Federal

¹²⁰ U.S. Department of Homeland Security, *National Response Framework*, 5.

¹²¹ U.S. Department of Homeland Security, *National Incident Management System*, 12.

¹²² *Ibid.*

¹²³ U.S. Department of Homeland Security, *National Response Framework*, 5.

¹²⁴ *Ibid.*, 10.

¹²⁵ U.S. Department of Homeland Security, *National Incident Management System*, 12.

¹²⁶ U.S. Department of Homeland Security, *National Response Framework*, 40.

asset remains idle when local or State resources are less effective or efficient. Despite the National Incident Management System providing the process for tracking, reimbursing costs, and enabling recovery, organizational hurdles currently prevent Federal assistance unless the disaster exceeds State and local capabilities.¹²⁷

Developed by the Secretary of Homeland Security, the National Incident Management System establishes the process for Federal, State, and local agency cooperation when confronting emergencies.¹²⁸ It is the companion document to the National Response Framework's structure and mechanisms. The National Incident Management System offers the templates for command and management structures for all levels of government, private sector, and nongovernmental organization involvement. It also provides a common doctrine, set of terminology, and process for organizing the response effort.¹²⁹ The National Incident Management System has five major components: Preparedness, Communications and Information Management, Resource Management, Command and Management, and Ongoing Management and Maintenance. Air Force owned and operated Remotely Piloted Aircraft do not participate in any of the major components involving training, coordination, or preparation prior to an incident. Therefore, should an emergency arise that requires the capabilities of unmanned aircraft, the capabilities might not be efficiently or effectively integrated into the existing structure due to the lack of prior coordination or established working relationship. Without coordination, a Remotely Piloted Aircraft's communication and video capabilities may not easily fit within established radio network or frequency management procedures.¹³⁰ Remotely Piloted Aircraft may also have difficulty fitting into the airspace structure established by the Area Command Aviation

¹²⁷ U.S. Department of Homeland Security, *National Incident Management System*, 8; U.S. Department of Homeland Security, *National Response Framework*, 6.

¹²⁸ Federal Emergency Management Agency, "NIMS Implementation and Compliance Guidance for Stakeholders."

¹²⁹ U.S. Department of Homeland Security, *National Incident Management System*, 3.

¹³⁰ *Ibid.*, 110.

Coordinator. The Area Command Aviation Coordinator works with the Operations Section Chief within the Incident Command System's Air Operations system.¹³¹ Together, they deconflict aircraft in the incident's airspace and coordinate aircraft capabilities to maximize efficiency.¹³² Despite the lack of a habitual interaction, the National Incident Management System's Resource Management structure, National Integration Center, Reimbursement Mechanisms, and Target Capabilities List provide a system where Federal unmanned assets could easily integrate should they be more readily available.

The Department of Defense's vast resources of personnel, equipment, and organization are critical to the Federal government's ability to handle national emergencies. However, for the Department of Defense, the protection of the United States takes precedence over assisting during domestic emergencies. Therefore, unless local military commanders are taking immediate action to preserve lives, property, or the environment, the Secretary of Defense and President retain authority to commit Federal resources to assist civil authorities. Only specific individuals may direct Federal Title 10 forces to assist other agencies, States, and local governments via the Stafford Act or the Defense Support to Civil Authorities, as directed by Joint Publication 3-28. The Secretary of Defense "retains approval for Federal support to civil authorities involving the use of DOD forces, personnel, and equipment."¹³³ For the Army, the Director of Military Support is a general officer appointed by the Secretary of the Army who plans and executes the Department of Defense's involvement in domestic missions to civil authorities.¹³⁴ Except during attacks using weapons of mass destruction, the "Secretary of the Army, as an executive agent for the Secretary of Defense, is the approval authority for Federal emergency support in response to

¹³¹ U.S. Department of Homeland Security, *National Incident Management System*, 116.

¹³² *Ibid.*, 102.

¹³³ Field Manual 3-19.15, *Civil Disturbance Operations* (U.S. Department of the Army, April 2005), B-2.

¹³⁴ *Ibid.*

natural and man-made disasters.”¹³⁵ This aligns with Department of Defense Directive 3025.15, February 1997, which states the Secretary of Defense, in coordination with the Chairman of the Joint Chiefs of Staff, can release personnel and/or equipment previously assigned to a Combatant Commander in support of civil authorities.¹³⁶

The Secretary of Defense weighs several factors when determining which civil authority requests are supported by Title 10 personnel and/or resources. Cost, risk, legality, availability of resources, and appropriateness are some of the criteria used by the Secretary of Defense.¹³⁷ The approval of such requests will be made only if local and State providers are determined to be unable or ill equipped to handle the emergency. If tasked to assist local authorities, the military forces retain their chain of command through the on-scene commander, through the Secretary of Defense, eventually to the President. The Incident Commander possesses no authority or responsibility over assigned Federal forces.¹³⁸ This is not applicable to State militias and National Guard forces not in Federal service. These units remain under the command of the State’s Governor unless activated by the President. The Stafford Act and a Presidential directive are not the only means available to direct Federal resources. Federal assistance can be provided through preapproved contingency plans.¹³⁹ However, no current plan exists to enable local or State authorities to use Federal Remotely Piloted Aircraft systems. Despite this shortcoming, the current applicability and use of the Incident Command System under the National Response Framework makes a broader application and incorporation of Federal resources both applicable and easily incorporated.

¹³⁵ Field Manual 3-19.15. *Civil Disturbance Operations*. B-2.

¹³⁶ U.S. Department of Defense, *Directive Number 3025.15* (February 18, 1997), 3.

¹³⁷ *Ibid.*

¹³⁸ U.S. Department of Homeland Security, *National Response Framework*, 11.

¹³⁹ *Ibid.*, 24.

The Federal government prepositions assets and personnel to assist in national emergencies. The Federal Emergency Management Association divided the nation into ten regions to aid in local and State cooperation. The Department of Defense assigned a Defense Coordinating Officer to each of the regions.¹⁴⁰ The Defense Coordinating Officer supervises any Defense Support of Civil Authorities requests for Federal military resources then oversees their implementation upon approval. He also serves as sole liaison for Department of Defense issues and reports the status of activities to the National Military Command Center as well as through local, State, and Federal Emergency Management Agency officials.¹⁴¹ If required, the Defense Coordinating Officer incorporates a Defense Coordinating Element team to address any complex issues due to the encountered emergency.¹⁴²

According to Joint Publication 3-28, Defense Support to Civil Authorities is the “civil support provided under the auspices of the National Response Plan.”¹⁴³ Although Joint Publication 3-28 was published in 2007, it references the National Response Plan, which was replaced by the National Response Framework three years earlier, in 2004. This highlights the lack of priority the military gives to domestic emergency issues, specifically doctrine, when confronted with multiple contingencies overseas.

The Commander, United States Northern Command, is responsible for assisting the Department of Homeland Security to counter terrorist threats to the United States, assist during national emergencies, and protect the nation’s critical infrastructure.¹⁴⁴ The Air Force has standing Defense Support to Civil Authorities requirements to support Northern Command’s ability to assist domestic incidents. According to this document, the United States Air Force must

¹⁴⁰ U.S. Department of Homeland Security, *National Response Framework*, 68.

¹⁴¹ *Ibid.*, 56.

¹⁴² *Ibid.*, 68.

¹⁴³ Joint Publication 3-28, *Civil Support* (14 September 2007), GL-7.

¹⁴⁴ U.S. Northern Command: Defending Our Homeland, “About U.S. Northern Command,” U.S. Department of Defense, <http://www.northcom.mil/About/index.html> (accessed February 2, 2011).

deploy a Remotely Piloted Aircraft when requested by the Secretary of Defense. The requirement calls for the Air Force to establish a single Remotely Piloted Aircraft overhead and fully operational orbit anywhere in the United States within 72 hours.¹⁴⁵

Several components of the National Response Framework and National Incident Management System raise concern. First, the requirement to handle emergencies at lowest level may cause local leaders to delay their request for support until after they are overwhelmed. Instead of an optimal, systemic response to emergencies, the approach is systematic and layered. Such a response could prevent the inclusion of Remotely Piloted Aircraft when the use of that particular asset could increase situational awareness and improve the overall emergency response. Second, the Air Force Remotely Piloted Aircraft are not part of the equip, train, and exercise framework. With only a single Remotely Piloted Aircraft allocated to respond to national emergencies, the asset is not in position to efficiently and effectively integrate into the response to a national incident. Third, the process is overly bureaucratic. The Secretary of Defense or the President of the United States must approve the use of Remotely Piloted Aircraft in response to an incident. A plan does not exist to permit the use of Remotely Piloted Aircraft to assist local or State governments. Finally, the structure and process for incident management are reactionary rather than proactive. They lack habitual relationships and coordination. For instance, according to former Secretary of Defense Donald Rumsfeld, the first role of the United States is to defend its air and maritime approaches.¹⁴⁶ The second role supports other “Federal domestic departments and agencies and indeed State and local government, as coordinated by and in cooperation with the Office of Homeland Security under emergency conditions for special

¹⁴⁵ Colonel Peter Gersten, e-mail to author, March 05, 2011.

¹⁴⁶ Office of the Assistant Secretary of Defense (Public Affairs), “Transcript of Testimony by Secretary of Defense Donald H. Rumsfeld on Homeland Security before Senate Appropriations Committee,” U.S. Department of Defense, <http://www.defense.gov/speeches/speech.aspx?speechid=214> (accessed February 2, 2011).

purposes.”¹⁴⁷ Despite their importance in incident response, Remotely Piloted Aircraft lack the continued interaction with disaster response authorities that would increase their effectiveness. Together, the National Incident Management System, the National Response Framework, and Defense Support to Civil Authorities establish an overly bureaucratic request structure focused on agency prerogative without regard for efficiency. To enable the most effective and efficient government support to the American people, the Federal government should implement changes to the current system to allow the use of high demand Federal assets such as Remotely Piloted Aircraft.

¹⁴⁷ Office of the Assistant Secretary of Defense (Public Affairs), “Transcript of Testimony by Secretary of Defense Donald H. Rumsfeld on Homeland Security before Senate Appropriations Committee.”

Possible System Organization

Given the current political, military, and economic trends within the United States, the Federal government must assess the applicability of a systemic approach to Remotely Piloted Aircraft to maximize the benefits of these expensive assets. Public discourse points to a changing opinion due to fiscal constraints and the threat of terrorism. Since September 11, 2001, terrorism changed from a criminal act to a direct attack on the nation's sovereignty and overall interests. This shift required the Department of Defense's assistance to law enforcement agencies, such as OPERATION Noble Eagle. It is impractical for multiple Federal agencies, individual State or local governments to purchase and sustain separate Remotely Piloted Aircraft fleets. Small changes in organization and process will improve the government's use of Remotely Piloted Aircraft. However, to fully optimize the capabilities of these expensive assets and their associated infrastructure, Congress would have to make legal changes to current statutes. Such changes could expand the acceptable uses of Remotely Piloted Aircraft equipment and personnel to non-emergency law enforcement activities. These revisions would help Federal, State, and local agencies conducting defense or saving lives and property.

Eventually, the number of available stateside Remotely Piloted Aircraft will increase that will allow many of them to be stationed inside the United States. Several opportunities exist at both the Federal and State levels to improve the system for requesting and using Remotely Piloted Aircraft in domestic matters. At the Federal level, the government could improve the system of cooperation. It could enact an assistance plan, approved by the President and the Secretary of Defense, permitting the use of an Air Force Remotely Piloted Aircraft by local and State authorities. The Secretary of Defense could allocate a number of Remotely Piloted Aircraft to assist Federal, State, and local agencies without being a detriment to military readiness. State and local authorities could request assets by using the already established National Incident Management System request procedure. The requesting agencies could reimburse the Federal government in accordance with National Incident Management System procedures. Such

assistance would exercise Air Force deployment capabilities and decrease costs to the Department of Defense while maintaining operator and equipment readiness. However, measures must be taken that allow the use of Federal personnel and equipment to be used in support of local and State agencies, such as law enforcement, without waiting until an uncontrollable emergency develops. To remain in line with the intent of the Posse Comitatus Act, these changes must require Title 10 military personnel to communicate all the information obtained directly to the requesting State or local officials. The Remotely Piloted Aircraft personnel must be under the tactical control of the requesting officials.

An increase in the number of Air National Guard Remotely Piloted Aircraft would also improve State and local capabilities. Air National Guard forces remain under the command and control of the State governor while performing Title 32 duties. Therefore, they are not restricted by Posse Comitatus unless activated to Title 10 by the President of the United States. An increase in State controlled Remotely Piloted Aircraft would enable States to enter assistance agreements with other States, such as the Emergency Management Assistance Compact, as desired by the National Response Framework.¹⁴⁸ These agreements could enable both nonemergency and emergency use of unmanned capabilities. The expansion of Remotely Piloted Aircraft in the Air National Guard could permit continued limited involvement from active duty Air Force Remotely Piloted Aircraft. Thus allowing the Air Force to continue to restrict its domestic involvement to emergency response when State and local authorities anticipate their capabilities will be exceeded.

Remotely Piloted Aircraft are not currently owned and operated by private organizations due to the legal issues associated with domestic unmanned flight. However, as the barriers to unmanned flight change, another solution to assisting local, State, and Federal governments is Remotely Piloted Aircraft operated and owned by private organizations. These organizations

¹⁴⁸ U.S. Department of Homeland Security, *National Response Framework*, 6.

could respond to emergency and everyday situations as demand and opportunity present themselves. Importantly, competition could lead to reduced operating costs. These savings would eventually provide Remotely Piloted Aircraft capabilities at a reduced cost to the taxpayer. Crucial to such development is the removal of unmanned flight restrictions, the availability of Remotely Piloted Aircraft infrastructure, and training opportunities. Until some of these changes occur, private sector unmanned aircraft will remain limited in size, capability, and applicability.

Due to the continued growth of the Remotely Piloted Aircraft, an effective solution will require some combination of Title 10, Title 32, and private sector cooperation. Therefore, an effective process for coordination and cooperation is as beneficial as the procedures for Remotely Piloted Aircraft allocation. The Department of Defense, due to it owning a preponderance of Remotely Piloted Aircraft assets, should establish a joint, interagency, intergovernmental request system. This system could allocate Remotely Piloted Aircraft to individual taskings based on priority, location, and requested capability. This process could closely resemble the current Joint Close Air Support process used to apportion, allocate, and distribute aircraft to Army units. Regardless of the location or quantity of Remotely Piloted Aircraft hardware, such a system would allow the Federal government to assist local or State agencies without declaring a national incident or requiring Presidential directive. Upon activation, other Federal agencies should assign liaison officers at applicable Department of Defense locations that control Remotely Piloted Aircraft to assist in legal command and control issues.

While our hierarchical governmental structure is effective at delivering the services allocated to the separate agencies, it must reorganize to balance this effectiveness with greater efficiency. Whether the Federal government increases the availability of Title 10 Remotely Piloted Aircraft or States increase their portion of unmanned assets, something can be done to better use the expanding capabilities of unmanned platforms within the United States. A system should permit all levels of government to use, and pay for, the benefits of these capabilities. Such a system, designed to maximize efficiency, could make better use of government assets by

maximizing the use of expensive equipment, infrastructure, and personnel. Habitual working relationships that maximize the use of government assets are required in today's domestic environment. Changes to the Remotely Piloted Aircraft system enables greater government efficiency and effectiveness and more responsive to the needs of its people.

Conclusion

Organizational structure needs to adapt to complex modern environment by prioritizing capabilities over department assignment. The current linear governmental model and segregated Federal agency infrastructures are inadequate. During 2010, the Department of Defense's unmanned systems budget was less than 1% of its overall budget. If another organization were to invest that same amount, \$4.5 billion, it would have to allocate approximately 20-25% of its overall budget. Based on the projected increase in Remotely Piloted Aircraft demand, it is easy to anticipate the government requiring more than sixty total 24-hour patrols throughout the United States. In other words, the internal demand will soon reach the current demand for Remotely Piloted Aircraft over Afghanistan. When the mission in Afghanistan eventually requires fewer unmanned systems, the United States government must have a solution that permits its Air Force to assist other Federal, State, and local agencies in their requirements. In addition to being a more efficient means to use government resources, it would also allow the Department of Defense to share the cost of maintaining this incredible unmanned system with the participating agencies while operators and mechanics keep their proficiencies.

A system cannot work effectively if it is only designed to cooperate during times of national emergencies or incidents. That system will definitely fail when the approval authority for coordination rests within the highest levels of government. The rapid increase in demand for unmanned vehicles will quickly outpace our government's ability to supply resources. Unfilled missions and bureaucratic infrastructures will lead to frustration, inefficiencies, and delays. A simple solution to maximize the effectiveness and efficiency of Remotely Piloted Aircraft assets does not exist. It requires a governmental reframe that forces agencies to share their assets, personnel, and infrastructures without jeopardizing individual civil liberties, compromising security, or violating the law.

To use the metaphor outlined in the introduction, people are unwilling to tolerate a fire station on every block. Individual Mayors cannot afford to purchase their own fire equipment,

firefighters, and alarm infrastructure. They can and should maintain the necessary system to meet their basic needs. However, the Governor should make his resources available to meet the more demanding scenarios. Not only should the city operate a competent force for emergency fires, but it should assist the individual blocks on a regular basis. Increased interaction would enable more efficient and effective coordination during major emergencies.

The systemic government approach to the use of Remotely Piloted Aircraft permits greater access to and use of assets, pilots, and infrastructure of unmanned systems, while minimizing the government cost required to maintain such an infrastructure. An acceptable solution could take advantage of the vast Title 10 and Title 32 resources available to the Department of Defense. It can establish working relationships among the tacticians rather than just the strategists and policy makers. It can maximize utility to the greatest number of Federal, State, and local agencies without deteriorating the effectiveness of combat requirements. The government could also address agency cooperation. The American people will probably not support a government that fails to provide services efficiently. The government monopolizes its control over its people. The public cannot simply choose to receive services from another supplier. As good stewards for the people and representatives of our government agencies, we should inspire change that improves the resource allocation system.

BIBLIOGRAPHY

- Bone, Elizabeth, and Christopher Bolkcom. *Unmanned Aerial Vehicles: Background and Issues for Congress*. SE Washington DC: Congressional Research Service The Library of Congress, 2003.
- Builder, Carl H. *The Masks of War: American Military Styles in Strategy and Analysis*. Baltimore: The Johns Hopkins University Press, 1989.
- Burton, Andrew. *Developing a Whole-of-Government Approach to Complex Problems*. 2007.
- Cerone, Scott R. *How Should the Joint Force Handle the Command and Control of Unmanned Aircraft Systems*. Fort Leavenworth, KS: US Army Command and General Staff College, 2008.
- Congressional Budget Office. "Congressional Budget Office." Congressional Budget Office Historical Tables. January 14, 2011.
<http://www.cbo.gov/ftpdocs/120xx/doc12039/HistoricalTables%5B1%5D.pdf> (accessed March 05, 2011).
- Crutchfield, James A. *Uninhabited Combat Aerial Vehicles in 2015: Providing Utility Across the Spectrum*. Fort Leavenworth, KS: US Army Command and General Staff College, 2003.
- Defense Study and Report to Congress. *The DoD Role in Homeland Security*. Washington, DC: Department of Defense, 2003.
- DiMarco, Joyce P. *Service Culture Effects on Joint Operations: The Masks of War Unveiled*. Fort Leavenworth, KS: US Army Command and General Staff College, 2004.
- Dorr, Less, and Alison Duquette. *Fact Sheet – Unmanned Aircraft Systems (UAS)*. Federal Aviation Administration.
http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=6287 (accessed December 7, 2010).
- Ehrhard, Thomas P. *Air Force UAVs: The Secret History*. Arlington, VA: Mitchell Institute Study, 2010.
- Elsea, Jennifer K., and R. Chuck Mason. *The Use of Federal Troops for Disaster Assistance: Legal Issues*. SE Washington DC: Congressional Research Service The Library of Congress, 2008.
- Executive Order no. 13, 223. *Code of Federal Regulations*. title 3, p. 785. January 1, 2002.
- Federal Emergency Management Agency. *NIMS Implementation and Compliance Guidance for Stakeholders*. <http://www.fema.gov/emergency/nims/ImplementationGuidanceStakeholders.shtm#item1>. (accessed February 2 02, 2011).
- Field Manual 3-19.15. *Civil Disturbance Operations*. U.S. Department of the Army, April 2005.
- Good, Anthony Scott. *US Border Patrol OCONUS: Possible Contributions to the Whole of Government Approach to Stability Operations*. Fort Leavenworth, KS: US Army Command and General Staff College, 2010.
- Grimsley, Frank. "The Predator Unmanned System: From Advanced Concept Demonstrator to Transformational Weapon System." Presentation, Technology Maturity Conference, Virginia Beach, VA, September 9-12, 2008.

- Haddal, Chad C., and Jeremiah Gertler. *Homeland Security: Unmanned Aerial Vehicles and Border Surveillance*. SE Washington DC: Congressional Research Service The Library of Congress, 2010.
- Hancock, Jason M. *Whole of Government -- The Search for a True Joint Interagency Approach to Military Operations*. Fort Leavenworth, KS: US Army Command and General Staff College, 2008.
- Hanson, Major General Blair. "Unmanned Aircraft Systems Present & Future Capabilities." Presentation, 47th Annual Targets, UAVs & Range Operations Symposium & Exhibition, Savannah, GA, October 21-23, 2009.
- Harshman, William R. *Army Unmanned Aerial Vehicle (UAV) Requirements and the Joint UAV Program*. Fort Leavenworth, KS: US Army Command and General Staff College, 1990.
- Hassell, Billy E., Jr. *Medium and High Altitude Unmanned Aircraft System Acquisition: An Efficiency Study of Magnitude and Capability*. Fort Leavenworth, KS: US Army Command and General Staff College, 2009.
- Headquarters, United States Air Force. "United States Air Force Unmanned Aircraft Systems Flight Plan 2009-2047." Washington, D.C., May 18, 2009.
- Hoffman, Michael. "Officials Extend UAV Jobs Freeze." *Air Force Times*. October 25, 2009. http://www.airforcetimes.com/news/2009/10/airforce_creech_102509w/ (accessed February 15, 2011).
- Joint Publication 2-01. *Joint and National Intelligence Support to Military Operations*. 7 October 2004.
- Joint Publication 3-28. *Civil Support*. 14 September 2007.
- Keller, John. *Military & Aerospace Electronics*. May 28, 2009. <http://www.militaryaerospace.com/index/display/mae-defense-executive-article-display/363553/articles/military-aerospace-electronics/executive-watch/unmanned-vehicle-spending-in-the-2010-dod-budget-to-reach-54-billion.html> (accessed November 9, 2010).
- Leister, Barry P. *Time for Centralized Control of Unmanned Aerial Systems*. Carlisle Barracks, PA: US Army War College, 2007.
- Levo, Dwayne. *Adaptations to the "Whole of Government" Approach by the United States Department of State*. Fort Leavenworth, KS: US Army Command and General Staff College, 2010.
- Matthews, Matt. *The Posse Comitatus Act and the United States Army: A Historical Perspective*. vol. 14 of Occasional Paper: Global War on Terrorism, Fort Leavenworth: Combat Studies Institute Press, 2006.
- Mesic, Richard, Myron Hura, Martin C. Libicki, Anthony M. Packard, and Lynn M. Scott. *Air Force Cyber Command (Provisional) Decision Support*. Monograph, Santa Monica, CA: RAND Corporation, 2010.
- Morgan, Joseph Troy. *Toward Holistic Joint Force Structure Decisions*. Fort Leavenworth, KS: US Army Command and General Staff College, 2009.
- Murtha, Anthony T. *Defense Support to Civil Authorities, Surveying Institutional Challenges*. Fort Leavenworth, KS: US Army Command and General Staff College, 2009.

- Office of the Assistant Secretary of Defense (Public Affairs). *Transcript of Testimony by Secretary of Defense Donald H. Rumsfeld on Homeland Security before Senate Appropriations Committee*. <http://www.defense.gov/speeches/speech.aspx?speechid=214> (accessed February 02, 2011).
- Pocock, Chris. *Aviation International News*. (July 2008). http://www.ainonline.com/airshow-convention-news/farnborough-air-show/single-publication-story/browse/0/article/1-3-shows-latest-handheld-rover-terminal-16649/?no_cache=1&tx_ttnews%5Bmode%5D=1 (accessed November 10, 2010).
- Russell, Matthew. "Unmanned Systems: Can the Industrial Base Support the Pentagon's Vision?" *National Defense*, July 2010: 22-25.
- Shachtman, Noah. "The Dangers of Turning Spies into Generals (and Vice Versa)." *Wired.com*. June 03, 2010. <http://www.wired.com/dangerroom/2010/06/the-dangers-of-turning-spies-into-generals-and-vice-versa/> (accessed March 05, 2011).
- State v. Nelson*. 260 SE 2d 629 (N.C., December 4, 1979).
- Stevens, Paul Schott. *U.S. Armed Forces and Homeland Defense: The Legal Framework*. Center for Strategic and International Studies, NW Washington, D.C.: The CSIS Press, 2001.
- The Murfreesboro Post*. August 20, 2010. <http://www.murfreesboropost.com/partnership-for-unmanned-aerial-systems-research-training-cms-24175> (accessed February 24, 2011).
- The Official Web Site of Creech Air Force Base. *Creech Air Force Base*. <http://www.creech.af.mil/units/> (accessed February 2, 2011).
- The Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina. *A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina*. Washington, DC: U.S. Government Printing Office, February 15, 2006.
- The White House Office of the Press Secretary. *Homeland Security Presidential Directive/HSPD-5*. February 28, 2003. http://www.dhs.gov/xnews/releases/press_release_0105.shtm (accessed February 02, 2011).
- Trebilcock, Craig T. "The Myth of Posse Comitatus." *Journal of Homeland Security*. (October 2000). <http://www.homelandsecurity.org/journal/articles/trebilcock.htm> (accessed November 1, 2010).
- U.S. Congress. *Department of Homeland Security Appropriations Bill, 2011*. Report 111-222 to accompany S 3607. 111th Cong., 2d sess. July 19, 2010.
- U.S. Department of Defense. *Directive Number 3025.15*. February 18, 1997.
- . *Directive Number 5525.5, Change 1*. December 20, 1989.
- U.S. Department of Defense. "FY2009-2034 Unmanned Systems Integrated Roadmap." 2009.
- U.S. Department of Defense. "Unmanned Aircraft Systems Roadmap, 2005-2030." 2005.
- U.S. Department of Defense. "Unmanned Systems Roadmap, 2007-2032." 2007.
- U.S. Department of Homeland Security. "National Incident Management System." December 2008.
- U.S. Department of Homeland Security. "National Response Framework." January 2008.

U.S. Government Accountability Office. "U.S. Government Accountability Office." Financial Statements of the United States Government for the Years Ended September 30, 2010, and 2009. <http://www.gao.gov/financial/fy2010/10stmt.pdf> (accessed March 05, 2011).

U.S. Northern Command: Defending Our Homeland. *About U.S. Northern Command*. <http://www.northcom.mil/About/index.html> (accessed February 02, 2011).

Walker, Scott W. *Integrating Department of Defense Unmanned Aerial Systems into the National Airspace Structure*. Fort Leavenworth, KS: US Army Command and General Staff College, 2010.

Weiger, Rusty L. *Military Unmanned Aircraft Systems in Support of Homeland Security*. Carlisle Barracks, PA: US Army War College, 2007.