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# THESIS

**BIG BROTHER OR TRUSTED ALLIES? HOW THE POLICE CAN EARN COMMUNITY SUPPORT FOR USING UNMANNED AIRCRAFT**

by

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This thesis examines how local law enforcement agencies can adopt unmanned aircraft, or drones, as tools to help them perform their public safety missions while earning the support and trust of the communities they serve for the use of this controversial technology. The paper presents the current state of the law surrounding drone use by the police, along with published recommendations on drone implementation and trust-building practices. Through the use of a structured multicase study and comparative analysis, the author tests the validity of the drone-specific recommendations of groups like the International Association of Chiefs of Police, American Civil Liberties Union, and Community Oriented Policing Office of the United States Department of Justice. The case studies also examine the influence of factors like demographics, political affiliation, crime rate, and pre-existing community law enforcement relationships on the success or failure of an agency's drone adoption efforts. Based on the analysis of the case studies, the thesis provides a recommended process to follow for law enforcement leaders looking to implement their own drone programs using evidence-based practices to earn the trust of their citizens.

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**BIG BROTHER OR TRUSTED ALLIES? HOW THE POLICE CAN EARN COMMUNITY SUPPORT FOR USING UNMANNED AIRCRAFT**

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# ABSTRACT

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# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ACLU | American Civil Liberties Union |
| ACSO | Alameda County Sheriff's Office |
| APD | Arlington Police Department |
| BWC | body-worn cameras |
| CALEA | Commission on Accreditation of Law Enforcement Agencies |
| CHDS | Center for Homeland Defense and Security |
| COPS | Community Oriented Policing Services |
| DHS | Department of Homeland Security |
| FAA | Federal Aviation Administration |
| FBI | Federal Bureau of Investigation |
| IACP | International Association of Chiefs of Police |
| MPD | Modesto Police Department |
| NAACP | National Association for the Advancement of Colored People |
| SJPD | San Jose Police Department |
| SPD | Seattle Police Department |
| sUAS | small-unmanned aircraft systems |
| SWAT | special weapons and tactics |
| UAS | unmanned aircraft systems |
| UASI | Urban Area Security Initiative |
| USDOJ | United States Department of Justice |

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# EXECUTIVE SUMMARY

The police have long recognized the critical observation and decision-making advantages provided by the use of aircraft to give an aerial view. They have used manned aircraft for decades in their public safety missions, but fixed-wing aircraft and helicopters are prohibitively expensive and very few departments can afford their high purchase and operating costs.[1]

Currently, however, the use of small-unmanned aircraft systems (sUAS), which are known by many acronyms but most commonly called drones, is on the rise. These devices are used with increasing frequency by private hobbyists and commercial operators to record aerial video and photographs, and they are available for minimal expense. Their use by American law enforcement agencies is no longer an emerging issue, but while police and sheriff's departments seem to be adopting these tools ever more rapidly, their use is not yet commonplace. The idea of American law enforcement agencies flying these small, quiet, and inexpensive devices over this nation's neighborhoods still stirs controversy in many communities. That controversy may vary from place to place, but is frequently stirred by concerns about erosions of privacy rights and the use of drones for warrantless, pervasive surveillance. While the use of drones for aerial surveillance may often be legal, it may not be acceptable to the public, and the police need the public's trust to serve them effectively.

How then, can a local law enforcement agency earn the trust and support of its community for the use of drones in support of public safety? A number of organizations have addressed the issues of police legitimacy and community trust of law enforcement. The American Civil Liberties Union (ACLU), International Association of Chiefs of Police (IACP), and Community Oriented Policing Office of the United States Department

[1] Ron Chambers, "Policing's New Eye in the Sky: The Use of Unmanned Aerial Vehicles in Law Enforcement," *Journal of California Law Enforcement* 40, no. 3 (2006): 7–14.

of Justice (USDOJ) have even produced drone-specific guidelines with recommendations for how the police can earn the public's trust for their use of unmanned aircraft.[2]

This thesis uses a structured and systematic multicase study to facilitate a comparative analysis of five agencies as a way to answer whether the guidelines produced by the aforementioned organizations are effective methods for law enforcement agencies to follow in their pursuit of community trust for a beneficial but controversial technology. The thesis studies four municipal police departments and one county sheriff's office from the western United States that implemented, or tried to implement, drone programs between 2010 and 2016. The goal of the research is to study the situations and methods of the agencies in their drone adoption processes to determine what factors led to the agency's success or failure in implementing an operational drone program.

The research shows that three of the agencies succeeded in adopting and operationalizing drones in their public safety missions while one failed completely and another has faced major hurdles and delays, but has now obtained city council approval to start a pilot program with drones. The thesis showed a strong correlation between the community engagement efforts recommended by the IACP and USDOJ with an agency's success in earning community support for a law enforcement drone program. The research was inconclusive about the influence of other factors, like crime rates, a community's political affiliation and demographics, and the preexisting conditions of trust between a police agency and its constituents. Based on the findings, the author provides the following recommendations for law enforcement leaders seeking to adopt drones in their jurisdictions.

[2] "Domestic Drones," American Civil Liberties Union, accessed October 7, 2016, https://www.aclu.org/issues/privacy-technology/surveillance-technologies/domestic-drones; International Association of Chiefs of Police, Aviation Committee, *Recommended Guidelines for the Use of Unmanned Aircraft* (Alexandria, VA: International Association of Chiefs of Police, 2012), http://www.theiacp.org/portals/0/pdfs/IACP_UAGuidelines.pdf; and Maria Valdovinos, James Specht, and Jennifer Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS): Guidelines to Enhance Community Trust* (Washington, DC: Office of Community Oriented Policing Services, 2016), https://ric-zai-inc.com/ric.php?page=detail&id=COPS-W0822.

- **Begin with a Needs Assessment:** Before a law enforcement leader or agency allocates funds or applies for grants to buy an unmanned aircraft, identify which community needs the equipment will meet.

- **Create an Engagement Plan:** Work with available resources, including marketing or outreach specialists, to create an engagement plan tailored to the unique community and agency needs.

- **Inform and Involve the Jurisdiction's Elected Leaders:** Law enforcement leaders trying to adopt a drone program should respect their city council or county supervisors by involving them even before beginning outreach to the community.

- **Implement the Engagement Plan/Develop Policy:** Take the communities' input seriously, and if the feedback indicates they do not want or need a drone program, be prepared to either continue working on earning their support or cancel the program. A technology program is not more valuable than the trust of the population.

- **Program Implementation**: Now that the public has been engaged, their input taken and folded it into the local policy and program, it is possible to work on funding, staffing, and training for the UAS program.

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I need to thank many people for their help and support during the 16 months spent pondering, researching, cursing, and writing this thesis. The project came about because I wanted to implement a drone program at my own police department, and I wanted to find a way to bring value from the Center for Homeland Defense and Security (CHDS) master's degree program to the agency that has given me the time and support to pursue this opportunity and so many others over the course of my career.

To begin, I need to thank my chief of police and friend, Hank Schreeder, for encouraging me to apply to the CHDS program and supporting me during the application process and through all the in-residence sessions and coursework. I would not have been able to do this without his support. I also want to thank the Santa Rosa city manager, Sean McGlynn, who ensured I had the time to spend 13 weeks away from my primary duties. I hope I am able to bring back benefits that will give the city a great return on investment.

The faculty and staff at CHDS have been phenomenal. In the thesis process, I especially need to call out Dr. Lauren Wollman and Greta Marlatt. Lauren's ability to empathetically mentor students while at the same time showing a take-no-prisoners taskmaster mentality was just what we needed to motivate us and keep us moving toward completion. Thank you, Lauren, for your leadership, coaching, and friendship. Greta's tireless work to help complete our theses and produce rigorous, well-researched academic documents was spectacular. I do not think anyone who meets her has any doubt how much she cares about her students and her craft. Thank you, Greta, for all your work. Maybe next year will be better for our Giants.

My thesis team consisted of Professor Tom Johnson as my advisor and Dr. Erik Dahl as my second reader. Using T-Harmony early in the program to connect with advisors felt strange, almost like a first foray into online dating, but Tom and Erik have been outstanding. They were helpful, supportive, and highly responsive while I was writing this thesis. Tom's blueprint for how to structure the document set me up for

success, and both he and Erik were available to answer my frequent questions or provide quick, insightful feedback to the drafts I sent them. Thank you both for guiding me through this process.

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# I. INTRODUCTION

## A. PROBLEM STATEMENT

Local law enforcement agencies have been using manned aircraft for decades in an effort to enhance their public safety and homeland security missions and few in the law enforcement profession would dispute the safety and efficiency benefits of having an eye in the sky.[1]

Police helicopters and fixed-wing aircraft have provided critical tactical and decision-making advantages to officers on the ground in a wide variety of circumstances, from the pursuit of fleeing criminals to search and rescue or crime scene mapping. Unfortunately, very few police agencies can afford the high cost of operating a traditional helicopter or fixed-wing aircraft. In fact, a Rotor and Wing article from July 2008 quoted a United States Department of Justice (USDOJ) official who stated that fewer than 300 of the approximately 19,000 law enforcement agencies across the country operate aviation units.[2]

Now, however, remotely piloted aircraft offer similar benefits as manned aviation with significantly lower cost, reduced maintenance and training time, and greater operational flexibility than possible with manned aircraft. They stand to improve public safety, making officers' jobs safer and more efficient.[3] The public and media more commonly call these small-unmanned aircraft, like their larger "UAS" cousins used by the military and federal government systems, "drones." Their adoption for law enforcement missions would seem to be a logical and simple matter were it not for a number of challenges in earning the public's trust for using this new technology in police work.

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[1] Ron Chambers, "Policing's New Eye in the Sky: The Use of Unmanned Aerial Vehicles in Law Enforcement," *Journal of California Law Enforcement* 40, no. 3 (2006): 7–14.

[2] Ramon Lopez, "Unmanned Aircraft in Demand by Law Enforcement," *Rotor & Wing*, July 2008.

[3] Paul Shultz, "The Future Is Here: Technology in Police Departments," *Police Chief* 75, no. 6 (June 2008): 20–25.

While many recognize the advantages unmanned aircraft offer to law enforcement, some see widespread police use of the technology as a serious threat to their privacy rights.[4] The fact that small drones are so much less expensive than conventional fixed wing aircraft or helicopters may lead many law enforcement agencies across the nation to use this technology and enable widespread surveillance of the American people. The thought of the widespread drone use by police departments nationwide raises understandable fears of misuse and invasions of privacy as Americans go about their daily activities. American Civil Liberties Union (ACLU) writer Jay Stanly has given voice to his organization's concerns when he said that law enforcement drones have the "very real potential for becoming a tool for mass surveillance."[5] These concerns come at a time when the narrative about policing in America is frequently focused on abuses of authority and a public mistrust of law enforcement institutions in the wake of numerous high profile use-of-force cases against minorities.[6] The problem for law enforcement agencies is finding a way to use potentially beneficial, but controversial drone technology with the support and trust of their communities.

A great deal of literature is available on the benefits of unmanned aircraft technology for law enforcement, and diverse organizations like the ACLU, the International Association of Chiefs of Police (IACP), and the USDOJ have produced guidelines for police and sheriff's departments to follow as they look to add the capabilities offered by drones.[7] It is broadly agreed upon in these sources that drones may soon become "airborne partners" for this nation's law enforcement officers, but it cannot

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[4] Maria Valdovinos, James Specht, and Jennifer Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS): Guidelines to Enhance Community Trust* (Washington, DC: Office of Community Oriented Policing Services, 2016), https://ric-zai-inc.com/ric.php?page=detail&id=COPS-W0822.

[5] Robb Jeffries, "Fourth Amendment Concerns Raised at Unmanned Aircraft Summit," McClatchy—Tribune Business News, June 1, 2013, http://search.proquest.com.libproxy.nps.edu/docview/1357188101/abstract/AEE0F6214C9C452EPQ/8.

[6] President's Task Force on 21st Century Policing, *Final Report of the President's Task Force on 21st Century Policing* (Washington, DC: Office of Community Oriented Policing Services, 2015), http://cops.usdoj.gov/pdf/taskforce/TaskForce_FinalReport.pdf.

[7] "Domestic Drones," American Civil Liberties Union, accessed July 23, 2016, https://www.aclu.org/issues/privacy-technology/surveillance-technologies/domestic-sUAS; International Association of Chiefs of Police, Aviation Committee, *Recommended Guidelines for the Use of Unmanned Aircraft* (Alexandria, VA: International Association of Chiefs of Police, 2012), http://www.theiacp.org/portals/0/pdfs/IACP_UAGuidelines.pdf; Valdovinos, Specht, and Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS)*.

happen unless American citizens trust that the police are using the devices for their benefit.[8] This scenario was borne out in Seattle when the city's police department was forced to cancel its fledgling drone program due to community members' outcry over privacy concerns.[9] The primary research question of this thesis, which is covered in greater detail later, is whether the recommendations by the groups previously mentioned are valid and reliable methods for law enforcement leaders to follow in earning public trust for the use of drones by the police.

## B. 21ST CENTURY POLICING AND RECOMMENDED PRACTICES FOR POLICE DRONE USE

If the American public can both benefit from and be threatened by law enforcement's use of drones, the challenge for police, sheriff's departments, and communities is to find a way to adopt the technology wisely. Agencies and communities should use technology to improve public safety and policing services and enhance the community's trust in law enforcement and the legitimacy of the police.[10] The executive summary of the *Final Report by The President's Task Force on 21st Century Policing* states, "Trust between law enforcement agencies and the people they protect and serve is essential in a democracy. It is key to the stability of our communities, the integrity of our criminal justice system, and the safe and effective delivery of policing services."[11]

This task force was formed in reaction to the many recent examples of communities suffering an environment of mistrust between law enforcement agencies and some of the people they serve. In the wake of high profile and controversial uses of force across the nation, many seemingly focused at African Americans or other people of color, the work by the President's Task Force on 21st Century Policing is perhaps the most comprehensive source about the value of building cooperative and trusting relationships between law enforcement agencies and the communities they serve.

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[8] Valdovinos, Specht, and Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS).*

[9] Christine Clarridge, "Seattle Grounds Police Drone Program," *Seattle Times*, February 7, 2013, http://www.seattletimes.com/seattle-news/seattle-grounds-police-drone-program/.

[10] President's Task Force on 21st Century Policing, *Final Report of the President's Task Force on 21st Century Policing*.

[11] Ibid.

The Task Force's final report, while not directly related to the use of drones or privacy issues, points to the origins and benefits of police legitimacy and community trust. The report documents recommendations in six areas, or pillars: building trust and legitimacy, policy and oversight, technology and social media, community policing and crime reduction, officer training and education, and officer safety and wellness.[12] Although the report does not make drone-specific recommendations, the broader subjects it covers are foundational to building and maintaining a trusting relationship between the police and their communities and to law enforcement's adoption of controversial technology.[13]

The first pillar in the Task Force's report is about building trust and legitimacy between the police and citizens. The Task Force noted that even though law enforcement agencies have become better equipped and more effective over the last 20 years, the public's confidence in the police has either stayed flat or even declined. The Task Force drew from the conclusions in an article titled "Legitimacy in Policing: A Systematic Review" to opine that the public is more likely to trust and view as legitimate those officials who follow the practices of procedural justice:

- Treat people with dignity and respect.
- Give people a voice.
- Be neutral and transparent in decision-making.
- Demonstrate trustworthy motives.[14]

The second pillar of the report builds on the legitimacy building practices of the first pillar by noting that law enforcement policies must be reflective of community

[12] President's Task Force on 21st Century Policing, *Final Report of the President's Task Force on 21st Century Policing*.

[13] Ibid.

[14] Ibid.; Lorraine Mazerolle et al., "Legitimacy in Policing: A Systematic Review," *The Campbell Collection Library of Systematic Reviews* 9 (January 2013), https://www.campbellcollaboration.org/library/legitimacy-in-policing-a-systematic-review.html.

values, publicly available and clearly articulated, and transparently implemented.[15] By maintaining these principles, agencies can practice the tenets of procedural justice and improve their services by building trust with their communities. The third pillar in the report addresses law enforcement's use of technology and social media, noting that the use of devices like body-worn cameras, unmanned aircraft, and social media, are outpacing the laws and regulations governing the technology.[16] The report notes that technology can bring both benefits and risks for law enforcement agencies in their public safety and crime fighting missions. It recommends that officials use advances in technology to build on and improve policing practices and community trust. To do so, officials should "engage and educate communities" in a transparent dialogue about the costs and benefits, potential privacy risks, and accountability measures associated with new technology programs.[17] The work by the President's Task Force on 21st Century Policing drew from many sources, and complements the more specific recommendations that both preceded and followed it about implementing law enforcement drone programs.

The ACLU published a report in 2011 outlining the organization's stance on the use of drones by government. The report, titled "Protecting Privacy from Aerial Surveillance," covers the capabilities of the technology now and as it may be in the future. It also details the organization's concerns over the erosion of privacy rights with the use of drone technology and ends with recommendations for their use by government agencies. The report calls for:

- Regulations restricting the use of drones for mass surveillance and requiring a warrant based on probable cause before the use of the device to collect evidence related to a specific criminal act;

- Restrictions on the retention and use of images collected by aerial surveillance technology;

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[15] President's Task Force on 21st Century Policing, *Final Report of the President's Task Force on 21st Century Policing*.

[16] Ibid.

[17] Ibid.

- Explicit and publicly available written policies and procedures for the use of drones or other aerial surveillance technology;

- Democratically controlled deployment and policy decisions made based on open information rather than the police departments and their policies;

- Measures to audit the accountability processes and effectiveness of drones used by the government.[18]

In August 2012, the IACP published a set of recommended guidelines for the use of unmanned aircraft by law enforcement agencies. These recommendations differed from the ACLU's partially because the ACLU preferred to regulate the use of law enforcement drones in the law while the IACP discussed setting restrictions in individual agency policies. The following section from the IACP Recommended Guidelines concluded as follows:

- Law enforcement agencies desiring to use drones should first determine how they would use this technology, including the costs and benefits to be gained.

- The agency should then engage its community early in the planning process, including its governing body and civil liberties advocates.

- The agency should assure the community that it values the protections provided citizens by the U.S. Constitution. Further, that the agency plans to operate the aircraft in full compliance with the mandates of the Constitution, federal, state, and local law governing search and seizure.

- The community should be provided an opportunity to review and comment on agency procedures as they are being drafted. Where

[18] Jay Stanley and Catherine Crump, *Protecting Privacy from Aerial Surveillance* (New York: American Civil Liberties Union, 2011), https://www.aclu.org/sites/default/files/field_document/protecting privacyfromaerialsurveillance.pdf.

appropriate, recommendations should be considered for adoption in the policy.

- As with the community, the news media should be brought into the process early in its development.[19]

The IACP guidelines also contain recommendations about accountability processes, noting that all flights should be approved by a supervisor and only for authorized or legitimate law enforcement purposes, along with providing suggestions for the documentation of flights, retention of images, and flight crew requirements.[20]

The Community Oriented Policing Services (COPS) Office at the USDOJ expanded on the IACP's recommendations in its 2016 document, *Community Policing & Unmanned Aircraft Systems (UAS), Guidelines to Enhance Community Trust*.[21] The COPS Office document built on the ideas presented by the President's Task Force on 21st Century Policing and applied those concepts to the implementation of law enforcement unmanned aircraft programs. The COPS Office document took the community engagement processes discussed by the ACLU and IACP and explained how the practices they recommend bring benefits beyond just the public acceptance of an unmanned aircraft program. Instead, the report identified the processes as a way to use the implementation of a controversial technology to build trust and enhance community-policing practices to benefit agencies and the public more broadly. Its recommendations complemented those of the IACP and focused on the following concepts:

- Conduct outreach efforts early and often in the adoption process.
- Seek stakeholder engagement proactively using a multitude of resources including:
    - Social media

[19] International Association of Chiefs of Police, Aviation Committee, *Recommended Guidelines for the Use of Unmanned Aircraft.*

[20] Ibid.

[21] Valdovinos, Specht, and Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS).*

- Community presentations
- Surveys
- Citizens' police academies
- Traditional media outlets
- Focus groups
- City council or other public meetings
- Use of community volunteers in the program's development and operation

- Demonstrate how the agency will protect citizens' privacy rights.
- Convince the community of the public safety benefit drones will provide.
- Explain how the agency will maintain safety when operating the devices.
- Explain the uses and restrictions of the agency's drones.
- Reassure the public about the agency's accountability processes.
- Maintain the program's transparency after the initial implementation.[22]

## C. RESEARCH QUESTIONS

While it can be assumed that police and sheriff's departments should follow the established community engagement and trust building recommendations for drone program implementation if they want to adopt this controversial technology without damaging their relationships with the communities they serve, research for this thesis did not find any studies documenting the relationship between the recommendations and successful drone adoption efforts. By identifying law enforcement agencies that have tried to implement drone programs and studying whether they followed those recommended processes, this thesis attempts to answer the following research questions:

[22] Valdovinos, Specht, and Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS).*

- Are the UAS adoption guidelines published by the IACP and USDOJ reliable processes to help local law enforcement agencies earn their communities' support for the use of drones in policing missions?

- Did the agencies studied have the trust of their communities when they tried to adopt drone technology, and did that pre-existing situation influence community acceptance of police drone use?

- Did the demographics, crime rate, or political preferences of the jurisdictions sampled impact the community support for law enforcement's drone use?

The answers to these questions can serve as a guide to help law enforcement agencies looking to improve their services through the adoption of drones or other controversial technology by showing how to maintain their communities' support for their efforts.

## D. CASE SELECTION

The agencies selected for analysis by this thesis are the Seattle Police Department (SPD), the Alameda County Sheriff's Office (ACSO) in northern California, the San Jose Police Department (SJPD), also in northern California, the Arlington, Texas Police Department (APD), and the Modesto, California Police Department (MPD). These agencies have all added drone programs, or tried to, within the last seven years, which means their experiences are recent enough to remain relevant and also well documented in existing literature.

The samples selected are all mid-sized or large agencies in the western United States, and with the exception of the ACSO, are all municipal law enforcement agencies serving urban and suburban populations. The ACSO is distinct in that its leader is elected by the people rather than appointed by a city manager or city council. It serves rural areas, but also operates in large population centers in the San Francisco Bay Area, which makes it similar to the other sample agencies.

Finally, the sample agencies are selected because they provide differentiation in the outcome of their drone adoption efforts. Some of the departments have succeeded in creating operational programs, with department staff flying the devices on law enforcement missions. Others have been forced to delay or abandon their efforts based at least in part on the public reaction to the agencies' use of drones.

Although more U.S. police and sheriff's departments have adopted or are in the process of adopting drone technology, the sample in this thesis is limited to the five agencies as a way to keep from expanding the scope of document too broadly.

## E. THESIS OVERVIEW

The next chapter provides a review of the current literature surrounding the use of drones in law enforcement missions in the United States, including the technologies benefits and limitations, privacy concerns associated with aerial surveillance, and the legal framework agencies within which they must operate. In the examination of the legalities of law enforcement drone use, the literature review covers relevant statutory and case law, along with the regulatory structure put in place by the Federal Aviation Administration (FAA). It also includes an analysis of the current case law and how it may impact drone operations in future court decisions.

Chapter III presents the research process and hypotheses, along with the recommendations tested in this thesis. Chapter IV is a series of case studies analyzing the drone implementation efforts of five sample agencies from Washington, California, and Texas. Chapter V presents a comparative analysis. Finally, Chapter VI concludes the thesis with a review of the issues and findings, recommendations for agencies looking to adopt their own drone programs, and comments about areas for future study.

An important caveat of this thesis involves the language law enforcement employs when discussing small-unmanned aircraft. Many sources refer to the devices as UAS, UAV, or sUAS. Some of the sources used in this thesis avoid the use of the word "drone," perhaps because of a perceived negative association with the military's use of the devices as a weapon in the Global War on Terror. Despite these agencies' use of more official-sounding names or abbreviations for the devices, the public and media almost

universally refer to them as drones. The public has embraced the use of the devices for recreational and commercial purposes, and “drone” has become the title by which they are known. Government is unlikely to convince the public to begin using “sUAS” or “unmanned aerial vehicle” in place of the more popular title, and the author believes that the word drone should not be shied away from or feared. In fact, some stakeholders outside the law enforcement profession have viewed the use of terms like sUAS or UAV to be euphemisms meant to mask the real topic of conversation. This thesis primarily refers to the devices by their widely recognized moniker, or drones.

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# II. LITERATURE REVIEW

This literature review relies on a variety of sources including government documents, journal articles, case law decisions, news articles, trade journal articles and blogs, or documents from industry experts and civil liberties advocates. The review covers three general topics: the applications for drones in law enforcement service, privacy concerns and recommendations for implementation, and the current legal landscape.

## A. APPLICATIONS AND BENEFITS OF DRONES IN LAW ENFORCEMENT OPERATIONS

One area of broad agreement among the diverse set of authors writing about law enforcement's use of drones is that the technology offers many beneficial capabilities to agencies tasked with protecting the public, enforcing the law, and investigating crime. Even the ACLU has acknowledged their utility in missions like search and rescue, mapping, and more.[23] Many of the articles describing the utility of drones in law enforcement are found in trade journals and were chosen because of the perspective and expertise they bring to the topic. For example, in the June 2008 issue of *Police Chief* magazine, Paul Schultz outlines how drones stand to improve public safety, make officers' jobs safer and more efficient, and do so at a cost far lower than that of manned aviation systems.[24]

A number of other authors and publications also weigh in on the beneficial uses of unmanned aircraft for law enforcement missions, including Ron Chambers in the *Journal of California Law Enforcement*, and Brett Davis and Don Roby for another issue of *Police Chief* magazine.[25] Davis and Roby write that the drone technology currently available to law enforcement agencies allows them to complete a wide range of

[23] "Domestic Drones."

[24] Shultz, "The Future Is Here: Technology in Police Departments."

[25] Chambers, "Policing's New Eye in the Sky."

surveillance missions to protect the public, first responders, and critical infrastructure.[26] These authors identify many potential missions for police drones, including high-risk search and arrest warrants, barricaded subject incidents, mass-casualty attacks, criminal investigations, crime scene documentation and reconstruction, search-and-rescue operations, post-disaster damage assessment, and fire suppression.[27]

## B. PRIVACY CONCERNS AND RECOMMENDATIONS FOR IMPLEMENTATION

Substantial literature details the privacy concerns and public trust challenges that come with law enforcement's use of drone technology. These sources tend to represent two opposing views or spectrums of concern. At one end of the spectrum are authors who view the use of drones by police departments as a clear threat to this nation's Fourth Amendment rights against unreasonable searches and seizures. Some authors, however, believe those concerns are overstated and posit that few valid concerns exist when it comes to the police using unmanned aircraft to observe people and property. Many of the sources addressing this topic also provide recommendations for steps police agencies can take to overcome or at least mitigate the privacy concerns and trust issues.

Authors like Saby Ghoshray, who wrote an article in the *Northern Illinois University Law Review*, represent the view of those who fear the privacy threats posed by police drones. Ghoshray paints an extreme view of a post-modern America in which fears over threats to this country's national and individual security trump individual privacy rights.[28] Ghoshray constructed his argument by examining the post-9/11 environment as the factor that allows law enforcement and security concerns to supersede individual privacy rights. He describes the pervasive surveillance and armed strike capabilities of government drones and stresses the importance of the Fourth Amendment as a bulwark against the "drone culture."[29]

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[26] Brett Davis and Don Roby, "Unmanned Aircraft Systems: All the Boxes Checked, but Challenges Remain," *Police Chief* 80, no. 6 (June 2013): 60–63.

[27] Ibid.

[28] Saby Ghoshray, "Domestic Surveillance via SUAS: Looking through the Lens of the Fourth Amendment," *Northern Illinois University Law Review* 33, no. 3 (579).

[29] Ibid.

Other sources supporting the idea that the police use of drones endangers U.S. Fourth Amendment rights are less dire than Ghoshray, but also discuss the potential for Constitutional violations when law enforcement officers fly drones with sophisticated surveillance cameras that observe places and activities often considered private. The ACLU, for example, has staked out a clear and strong position in its writings on police drones. In "Domestic Drones," the ACLU acknowledges some beneficial public safety uses for unmanned aircraft, but also notes that they could cause "unprecedented invasions of our privacy rights."[30] The organization recommends a number of privacy safeguards in the areas of operational limitations, data retention, policy development, accountability, and weaponization.[31] Kaveh Waddell's 2015 article on privacy limitations and the use of police drones further clarifies the ACLU position. Waddell quotes ACLU writer Jay Stanly as saying that law enforcement drones have the "very real potential for becoming a tool for mass surveillance," particularly if they are equipped in the future with sophisticated technologies not yet in widespread use by law enforcement.[32]

At the other end of the privacy spectrum are authors like Rosenzweig et al. who argue that few Constitutional limits currently exist concerning the use of drones by law enforcement in the United States.[33] Rosenzweig and his co-authors present a brief analysis of relevant Fourth Amendment case law and conclude that legal limits on police drone use should come from policy and statutes rather than Constitutional restrictions.[34] They also note that the use of drones for law enforcement missions should have "sensible and minimal restrictions."[35]

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[30] "Domestic Drones."

[31] Ibid.

[32] Kaveh Waddell, "Few Privacy Limitations Exist on How Police Use Drones," in *National Journal Daily A.M.* (Washington, DC: Atlantic Media, Inc., 2015), http://search.proquest.com.libproxy.nps.edu/docview/1651959704/abstract/1E749A1C41384394PQ/61.

[33] Paul Rosenzweig et al., *Drones in U.S. Airspace: Principles for Governance* (Washington, DC: The Heritage Foundation, September 20, 2012), http://www.heritage.org/defense/report/drones-us-airspace-principles-governance.

[34] President's Task Force on 21st Century Policing, *Final Report of the President's Task Force on 21st Century Policing*.

[35] Rosenzweig et al., *Drones in U.S. Airspace*.

This view is supported by Gregory McNeal's article, "Drones and Aerial Surveillance: Considerations for Legislators," published by the Brookings Institution. McNeal presents a balanced view that examines the use of unmanned aircraft as aerial observation platforms for the police, along with the common arguments against that use.[36] His analysis includes the reasons that sUAS stoke public fears of pervasive government surveillance along with information on case law, legislative solutions, and recommendations for legislators looking to promote small drones as a beneficial tool for law enforcement while protecting this nation's constitutional rights.[37] Both McNeal and Rosenzweig reject the arguments put forth by the ACLU and others that search warrants should be required for law enforcement drone missions, saying that the proposed solution unreasonably restricts the beneficial use of drone technology without preventing the harm privacy advocates fear.[38]

A number of sources present recommendations on how law enforcement agencies can operate drones in a way that preserves privacy rights and garners public trust. While the ACLU has issued calls for laws restricting law enforcement's use of drones, the IACP has crafted guidelines for agencies looking to implement drone technology. The IACP recognizes both the beneficial uses of drones for law enforcement missions and the public's concerns over potential invasions of privacy. In their 2012 guidelines for the use of unmanned aircraft, the group provides recommendations for community engagement, policy development, data retention, and accountability that closely resemble those of privacy advocates.[39]

## C. THE CURRENT LEGAL LANDSCAPE

The privacy concerns detailed in the previous section led to a review of the current state of the law for police use of unmanned aircraft. This review included a look

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[36] Gregory S. McNeal, "Drones and Aerial Surveillance: Considerations for Legislators," *Brookings Institution: The Robots Are Coming: The Project on Civilian Robotics*, 2014, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2523041.

[37] Ibid.

[38] Ibid., Rosenzweig et al., *Drones in U.S. Airspace*.

[39] International Association of Chiefs of Police, Aviation Committee, *Recommended Guidelines for the Use of Unmanned Aircraft*.

at the relevant case law decisions from the United States Supreme Court as a way to determine how courts may rule on future cases involving drones. It also included a study of federal aviation regulations that apply to small-unmanned aircraft and how those regulations might influence or intersect with Fourth Amendment decisions by the courts. Finally, the review of the legal landscape included efforts by state legislatures to limit law enforcement's use of drones as a way to address privacy concerns.

### 1. Case Law

The United States Supreme Court has issued a number of rulings dating back to 1967 relevant to the Fourth Amendment implications of using unmanned aircraft to observe people or property on the ground. Perhaps the foundational case in this area was the first, that of *Katz v. United States, 389 U.S. 347 (1967)*. This case is useful to this review because it set the modern standard for privacy rulings. After the ruling in *Katz v. United States*, a trespass was no longer required to invoke a citizen's Fourth Amendment rights. Instead, only a subjective expectation of privacy by the citizen was required, as well as an acceptance by society (as determined by the courts) that the expectation of privacy was reasonable.[40] This two-prong test was used in at least five later Fourth Amendment rulings, some of which were directly related to the admissibility of aerial surveillance by law enforcement.

In 1986, the Supreme Court decided the case of *California v. Ciraolo, 476 U.S. 207*. In this case, the Justices ruled that the naked-eye observations of law enforcement officers overflying a citizen's property in a fixed-wing aircraft at 1,000 feet were not a violation of the respondent's Constitutional rights and did not require a search warrant.[41] The case brief on the Cornell University Law School's website quotes the Justices in their ruling when they noted, "Any member of the public flying in this airspace who cared to glance down could have seen everything that the officers observed. The Fourth

[40] "Katz v. United States 389 U.S. 347 (1967)," accessed October 11, 2016, https://supreme.justia.com/cases/federal/us/389/347/case.html.

[41] "California v. Ciraolo," accessed October 10, 2016, https://www.law.cornell.edu/supremecourt/text/476/207.

Amendment simply does not require police traveling in the public airways at 1,000 feet to obtain a warrant in order to observe what is visible to the naked eye."[42]

Four years later, the Court weighed in on another case involving observations by airborne law enforcement officers in *Florida v. Riley, 488 U.S. 445*. This case was remarkably similar to *Ciraolo*, except the officers in Riley made their naked-eye observations from a helicopter at 400 feet over Riley's property. The Court in this case applied both Katz' two-prong test and the logic they used in deciding *Ciraolo*. An important factor in this case was the Justices' reliance on FAA regulations and definitions of public airspace to determine the admissibility of the officer's search.[43]

The use of drones eliminates the possibility of a naked-eye observation, but the Court has also ruled on the legality of aerial surveillance with high-tech surveillance systems in the case of *Dow Chemical v. United States, 476 U.S. 227 (1986)*. According to Diane Skalak's analysis of the decision in the *Pace Law Review*, the Court ruled that a series of over flights of a Dow Chemical plant in 1977 to take photos with a high-powered camera were admissible under the Fourth Amendment even though the Environmental Protection Agency (EPA) did not obtain a search warrant. Skalak refers to a *Vanderbilt Law Review* article called "Recent Developments, Warrantless Aerial Surveillance: A Constitutional Analysis" to describe how the Court's rationale in the case leads to the per se rule that property visible from the air can never satisfy the Katz Test and is therefore not subject to Fourth Amendment protections.[44]

Skalak points out that the Justices in the Dow case found the use of the technologically advanced camera in the aerial surveillance was not a violation of privacy because it was technology commonly available to the public.[45] This factor is potentially important in future rulings on the admissibility of law enforcement's use of drones

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[42] "California v. Ciraolo," Legal Information Institute, accessed October 10, 2016, https://www.law.cornell.edu/supremecourt/text/476/207.

[43] Florida v. Riley, 488 US 445 (Supreme Court 1988).

[44] Diane Skalak, "Dow Chemical Co. v. United States: Aerial Surveillance and the Fourth Amendment," *Pace Environmental Law Review* 3, no. 2 (1986): 277–96.

[45] "Dow Chemical Co. v. United States 476 U.S. 227 (1986)," Justia, accessed October 30, 2016, https://supreme.justia.com/cases/federal/us/476/227/case.html.

because many authors have pointed out that the technology is gaining widespread acceptance by private citizens, businesses, and government.[46]

The last case reviewed is the earliest of the relevant rulings issued by the Supreme Court, and one that brings more ambiguity to the precedents set in later rulings. The 1946 case of *United States v. Causby, 328 U.S. 256*, was not a Fourth Amendment case, but could be especially instructive in determining the constitutionality of law enforcement drone use because it dealt with low altitude airspace rights and the ability of a private citizen to claim the airspace over his property for the purpose of excluding governmental trespass by aircraft. [47] In this case, a farmer named *Causby* sued the government because military aircraft were flying over his property at an altitude as low as 83 feet, infringing on his use and enjoyment of his home and land.[48] The Court in *Causby* determined that citizens have the right to control the airspace over their property at least as high as they can occupy or use. Any flights into that airspace could constitute a trespass, but the exact altitude was left ambiguous. This ambiguity creates an area of debate in the legality of law enforcement drone missions.[49]

### 2. Federal Regulations

The FAA issued new rules in August 2016 for the operation of unmanned aircraft in the national airspace. Gregory McNeal writes about the potential impacts of these new rules on future Fourth Amendment decisions as judges try to interpret both the Constitution and airspace rights based on the aforementioned decisions.[50] As an example, the FAA regulations specify that small UAS must operate below 400' above ground level, an area that is now publicly navigable airspace, but can also be interpreted based on

[46] Cyrus Farivar, "County Sheriff Quietly Expands Drone Fleet to 6, Flown Dozens of Times," Ars Technica, July 2, 2016, http://arstechnica.com/tech-policy/2016/07/county-sheriff-quietly-expands-drone-fleet-to-6-flown-dozens-of-times; Michaelle Bond, "Drones a Benefit for Law Enforcement, but Raise Concerns," *The Philadelphia Enquirer*, August 10, 2015; Donald L. Shinnamon, "Personal Privacy and the Use of Small Unmanned Aircraft by Law Enforcement," *Sheriff* 64, no. 2 (April 2012): 66–68.

[47] McNeal, "Drones and Aerial Surveillance."

[48] "United States v. Causby 328 U.S. 256 (1946)," accessed October 22, 2016, https://supreme.justia.com/cases/federal/us/328/256/case.html.

[49] Ibid.

[50] McNeal, "Drones and Aerial Surveillance."

the Causby decision as being so low that it may constitute an unreasonable government trespass and also an invasion of privacy unless authorized by a search warrant.[51]

### 3. State Legislation

A number of authors, including Yakabe, McNeal, and Farber, have written on the status of legislative efforts in the various states of this nation to limit or regulate law enforcement's use of small UAS. Yakabe's article offers a detailed look at both the policy and legislative environment for the use of drones in the national airspace system without specifically focusing on the law enforcement mission. She examines the legal and policy restrictions the federal government and a number of states have imposed on the operation of both civil and government sUAS, and included a table summarizing those states' efforts.[52]

## D. CONCLUSION

As seen, plentiful sources identify the benefits and challenges associated with using drones in policing. The relevant case law and legislation has been examined in both primary sources and articles to provide an analysis on the impact of the law on the future of drone use. Also, a number of articles and papers provide theoretical recommendations about how law enforcement agencies can work with their communities to gain public acceptance for the use of a controversial new technology like unmanned aircraft.

Although a number of authors note the fact that many more law enforcement agencies are starting to use unmanned aircraft to assist in public safety missions, those agencies have had varying degrees of success over the last several years.[53] Some articles note how the SPD, an early adopter of drone technology, was forced to abandon its

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[51] McNeal, "Drones and Aerial Surveillance."

[52] Alison Yakabe, "UAS on Main Street: Policy and Enforcement at the Local Level," *Homeland Security Affairs* XI (2015), http://search.proquest.com.libproxy.nps.edu/docview/1728289863/abstract/D60B574100D7427BPQ/6.

[53] Bond, "Drones a Benefit for Law Enforcement, but Raise Concerns"; Farivar, "County Sheriff Quietly Expands Drone Fleet to 6, Flown Dozens of Times."

program in the face of public mistrust, outcry over how the systems were to be used, and fears of widespread privacy violations.[54]

Missing in the literature was any research examining whether the law enforcement agencies that have already tried to implement unmanned aircraft programs have followed the recommendations provided in the literature or whether those recommended processes were effective in earning public support for drone adoption.

An unanswered question then seems to be how law enforcement's community engagement and trust-building efforts will influence a community's willingness to tolerate and even support their police or sheriff's department implementing a beneficial but controversial surveillance tool like unmanned aircraft.

[54] Clarridge, "Seattle Grounds Police Drone Program."

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# III. RESEARCH DESIGN AND METHODOLOGY

## A. RESEARCH PROCESS

The primary methodology employed by this research is structured and systematic case studies that lend themselves to comparative analysis. This method applies the same set of research questions, presented previously, to each of the five law enforcement agencies in the sample. This type of study can effectively answer the research questions while examining contemporary issues in the studied behaviors over which no one has control.[55] This research method allows for the systematic assessment of patterns or variations in a number of variables that may impact each sample agency's success in earning public trust for an unmanned aircraft program. These factors include all departments' pre-existing relationship with their community, the agencies' community engagement efforts, population sizes, demographics, political preferences in the community, and crime rates. Therefore, a central focus of the research is aimed at assessing what steps these departments (case) took to engage with their community about their drone program, and at what stage of the respective programs' development they specifically engaged their relevant populations. A pictorial presentation of the research process is presented in Figure 1.

[55] Robert Yin, *Case Study Research Design and Methods*, 5th ed. (Los Angeles: Sage Publications, 2014).

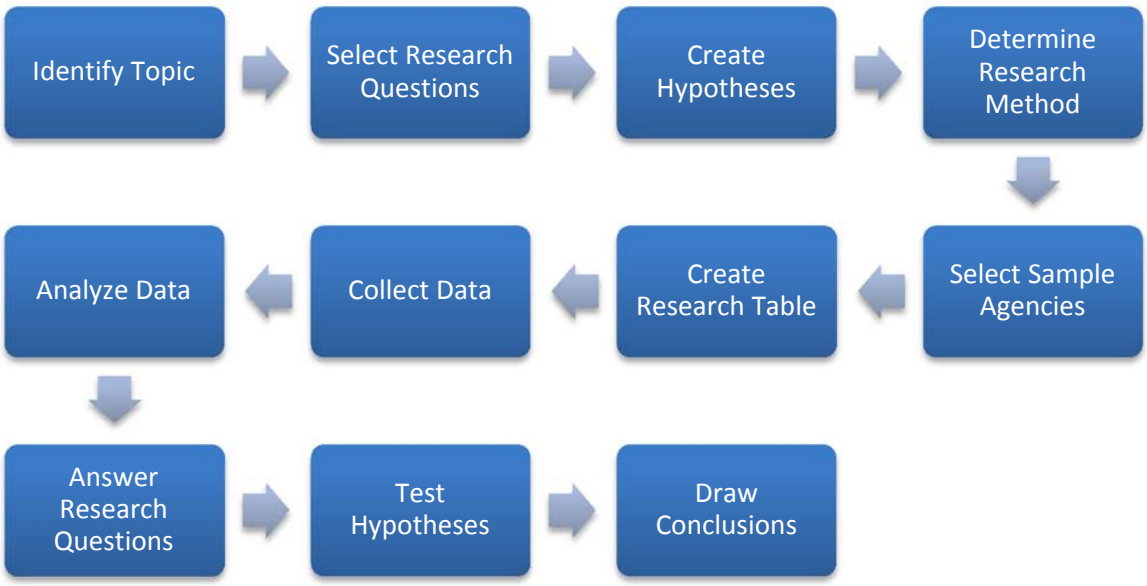


Figure 1. Graphical Representation of Research Process

## B. HYPOTHESES

The primary research questions for this thesis involve how local law enforcement agencies can earn the support of their communities for the use of drones in policing missions. In the years since small-unmanned aircraft first came on the scene as potential tools for the police to use in various types of public safety missions, a number of organizations have put forth recommendations on how agencies can successfully adopt the technology with their communities' trust and support. Those recommendations, discussed in the following section, drove the primary hypothesis tested in this thesis.

- **$H_1$**: If law enforcement agencies follow the drone-specific community engagement recommendations suggested by the IACP and USDOJ then they are more likely to earn public trust and successfully adopt drone technology in support of their law enforcement missions.

The test for this hypothesis involves examining the practices of each of the five sample agencies during their drone adoption process to see whether they followed some

or all of the established recommendations and attempting to determine whether those agency practices affected the success or failure of their drone programs.

The second hypothesis is designed to test an assumption that a law enforcement agency's pre-existing relationship with its community plays a critical role in determining the success or failure of the agency's adoption of drones. The hypothesis states:

- **$H_2$:** If a law enforcement agency has not previously earned the trust of its community then it is less likely to succeed in creating a drone program.

This hypothesis is tested by examining data to determine whether the sample agencies followed the principles published in the final report of the President's Task Force on 21st Century Policing as discussed in Chapter I.

The third hypothesis tested by this thesis is based on the idea that the crime rate, demography, and political preferences in a community impact the community's willingness to support law enforcement's use of drones.

- **$H_3$:** If a community is politically conservative, has a comparatively high crime rate and smaller minority population, then it is more likely to support law enforcement's use of drones.

The test for this complex hypothesis is based on identifying the population demographics, political or voting preferences, and crime rates for each of the sample communities and assessing whether a relationship exists between those facts and the eventual success or failure of the drone implementation efforts of the sample agencies.

## C. WHY ARE THE HYPOTHESES IMPORTANT?

The hypotheses and research questions of this thesis are selected because the use of drones by police and sheriff's departments is a relatively new phenomenon. Although a growing body of law covers the use of the devices, this topic is thus still in a period of some uncertainty about both what law enforcement agencies can legally do with drones, and more importantly perhaps, what the public will accept.

As noted in the literature review, several Supreme Court cases address the constitutionality of warrantless aerial surveillance. The Court has defined that search warrants are not generally required when law enforcement conducts surveillance from an aircraft in publicly navigable airspace, the same way a police officer's observations are not a Fourth Amendment violation when the officer makes them while legally occupying a public highway or other public space. As previously suggested, the Court has stated that a manned fixed-wing aircraft is in publicly navigable space when it is as low as 1,000 feet over the ground, and a helicopter above 400 feet.[56] The Court has also ruled that an officer's use of high technology, but publicly available camera equipment, does not necessarily trigger the Fourth Amendment warrant requirements.[57] In another case, the Court ruled that manned-aircraft flying low enough, below 83 feet in the case of *U.S. v Causby*, could impact a person's property use rights enough to constitute a trespass.[58]

Case law for police observations from unmanned aircraft remains to be set, but now that the FAA has regulated unmanned aircraft and requires them to fly no higher than 400 feet over the ground, it can be argued that warrantless observations from a law enforcement drone flying between 100 feet and 400 feet over the ground is to be treated the same as observations from an airplane or helicopter in public airspace.

Even if such surveillance is found to be lawful, using drones to observe people on the ground can alarm members of the public and possibly damage the relationships between the police and those they serve. This difference, between what the Courts rule is legal and what the public is prepared to accept, sets the stage for a number of organizations to weigh in on issue of what the law enforcement community should do when trying to adopt a drone program without infringing on citizens' constitutional rights and damaging their relationships with the people they serve. The answers to the research questions and hypotheses presented in this thesis serve as a test of those established recommendations and may help guide law enforcement agencies across the country as they work to integrate drone technology in their public safety operations.

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[56] "California v. Ciraolo"; and Florida v. Riley, 488 US.

[57] "Dow Chemical Co. v. United States 476 U.S. 227 (1986)."

[58] "United States v. Causby 328 U.S. 256 (1946)."

## D. RESEARCH LIMITATIONS

This thesis does not present new research on the potential applications and benefits for unmanned aircraft in the law enforcement or homeland security mission. Nor does it suggest how to integrate unmanned aircraft into the national airspace system, or what legislative remedies can be implemented either to regulate law enforcement's use of the technology or mitigate privacy concerns. Numerous sources, including Naval Postgraduate School theses, have systematically addressed these topics. Moreover, assessing these topics would unreasonably increase the scope of this thesis and require addressing issues peripheral to the research questions.

## E. DATA SOURCES

As suggested previously, several Naval Postgraduate School theses cover various topics related to law enforcement's use of drones, along with numerous articles in scholarly journals, magazines, newspapers and other media sources. The literature review analyzes a number of articles from scholarly journals, as well as articles from periodicals and newspapers not peer-reviewed. The literature review also includes information from government documents, case law, and legal analyses to examine the current state of the law on government's use of drones and high-technology surveillance equipment.

The case studies and comparative analysis of this thesis rely heavily on information taken from local government documents and printed news reports about the sample agencies and their efforts to implement drone programs. Some of the information presented in this thesis is also based, partly, on interviews and personal contact with representatives of the law enforcement agencies in the sample.[59]

## F. OUTPUT

As suggested, the primary goal of this research is to test the effectiveness of established recommendations for implementing a controversial technology like small-unmanned aircraft. By asking the same questions of each sample agency, which has

[59] The Naval Postgraduate School Institutional Review Board reviewed the questions posed in interviews and determined they did not constitute human subject research.

either succeeded or failed in adopting unmanned aviation programs, the empirical research allows the thesis to forecast what community engagement and trust-building efforts are likely to win over communities skeptical of law enforcement's desire to use a high-tech surveillance technology like drone systems.

The ultimate aim of this thesis is to provide local government and law enforcement leaders with evidence-based recommendations to help them enhance the safety and security of their communities with the successful adoption of their own unmanned aviation programs.

## G. INTRODUCTION TO CASE STUDY MATRIX

The case studies themselves are facilitated by the use of a structured table, as seen in Table 1, to present the application of the same set of research questions to each agency. Each sample agency is shown in a row and each research question or other relevant information appears in a column to help in the comparative analysis. In Chapter V, each cell of the table contains the appropriate, agency-specific, answer to the research question for that column as a way to facilitate a comparative analysis of the case studies. This format allows the reader to view and quickly compare the answers for each research question. Finally, the tables in Chapter V are color-coded with green cells to indicate a "positive" answer to the research question, and red cells to indicate a "negative" response. For the purposes of this thesis, a positive answer is one more likely to result in a successful adoption of drone technology to an operational status for law enforcement or public safety missions.

Table 1. Drone Implementation Multicase Study

| Drone Implementation Study | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Agency Size (Sworn Staffing) | Population Served (in year of adoption) | Population's Political Party Affiliation | Community Demographics | Property Crime Rate (per 100,000 residents) | Violent Crime Rate (per 100,000 population) | Date Acquired | Pre-existing Community Trust Problems at time of Adoption | Followed Established Adoption Recommendations | Operational |
| Seattle PD | | | | | | | | | | |
| Arlington PD | | | | | | | | | | |
| Alameda County SO | | | | | | | | | | |
| San Jose PD | | | | | | | | | | |
| Modesto PD | | | | | | | | | | |

## H. CONCLUSION

In summary, this thesis employs the case study method to assess the efforts to adopt drone technology by four municipal police departments and one county sheriff's office in the western United States, but in a comparative and systematic way. Case studies, in and of themselves, are a very valuable approach to assessing many problems but often cannot generate relevant results beyond the specific case in question (i.e., idiographic knowledge). This thesis aims to generate nomothetic knowledge that can help police forces beyond the specific cases presented in this thesis to ask important questions relative to their employment of drones. Those questions may mirror the aforementioned research questions and include:

- How the police can earn their community's trust and support for their use of drones?

- Are the drone-specific recommendations and guidelines published by the ACLU, IACP, and USDOJ a valid way to earn community trust?

- How much does a police department's pre-existing relationship with its community influence that community's willingness to support a law enforcement drone program?

- Do factors unique to each jurisdiction like crime rates, political affiliation, and demographics influence the willingness of communities to support their police departments' use of drones?

Chapter IV presents the story of each sample agency and focuses on the relevant data to answer the research questions and test the hypotheses. Chapter V then provides a completed version Table 1, along with a comparative analysis of the data and conclusions about the validity of the three hypotheses.

# IV. CASE STUDIES

## A. SEATTLE POLICE DEPARTMENT—A CAUTIONARY TALE

The SPD is the largest of the agencies considered in this thesis, with a sworn staffing of 1,264 officers, supervisors, and managers. Although the SPD has more officers than the other agencies in the study, Seattle's population at the time the SPD tried to adopt unmanned aircraft was only 626,865, significantly below San Jose's population of 1 million people.[60] The city had the highest rate property crimes rate and the second highest violent crime rate of the cities studied.[61] Politically, the City of Seattle skews more liberal than the other agencies in the study, with the results of the 2012 Presidential election showing that Seattle residents voted in favor of the Democratic incumbent, Barack Obama, over the Republican Nominee, Mitt Romney, by a margin of 69% to 29%.[62]

The story of the SPD's efforts to adopt an unmanned aircraft program is a cautionary tale of how the actions, or omissions, of a law enforcement agency in the area of community engagement can be the determining factor in whether or not the agency ultimately succeeds or fails with controversial programs. The SPD was the first of the sample agencies to acquire unmanned aircraft, using grant funding from the Department of Homeland Security's (DHS) Urban Area Security Initiative to buy two small drones in 2010. Although they acquired the devices in 2010, the department did not reveal them to the public until 2012. The timing of the SPD's acquisition of drones and its subsequent efforts to inform the public about its plans to use the devices coincided with several high-

60 Shawn Musgrave, "Seattle Police Seek More Drones While Two Sit Unused," MuckRock, October 11, 2012, https://www.muckrock.com/news/archives/2012/oct/11/two-seattle-police-drones-sit-unused-department-se/.

61 "Table—Washington," Federal Bureau of Investigation, accessed March 26, 2017, https://ucr.fbi.gov/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/tables/8tabledatadecpdf/table-8-state-cuts/table_8_offenses_known_to_law_enforcement_by_washington_by_city_2012.xls.

62 "2012 Washington State Election Results," *Seattle Times*, updated November 27, 2012, http://old.seattletimes.com/flatpages/politics/2012-washington-election-results.html.

profile use-of-force incidents leading to a strained relationship between the police department and the people of Seattle.[63]

In 2010, the fatal shooting of a person of color, along with other controversial SPD uses of force against people of color, resulted in accusations from the community, civil rights advocates, and politicians of racial bias and excessive force by the SPD.[64] The federal government intervened and initiated an investigation by the Civil Rights Office of the USDOJ. The investigation found that SPD had "participated in a pattern or practice of excessive force that violated the United States Constitution and other federal laws," and in 2012, the police department entered into a settlement agreement to reform its practices.[65] The SPD's efforts to eliminate unconstitutional policing ended up being overseen by a monitor appointed by the federal court.[66]

Against this backdrop of controversy and distrust, the SPD used $82,553 in federal grant funding from the DHS's Urban Areas Security Initiative to purchase two small remotely piloted helicopters without the knowledge of the public or Seattle City Council.[67] A 2012 lawsuit from the Electronic Frontier Foundation led to the first public revelation of the SPD's purchase and application for FAA certification to operate the devices.[68]

In April 2012, the SPD demonstrated its Draganflyer X6 drones to the media as a way to alleviate public concern over the use of the technology by law enforcement.[69]

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[63] Seattle Community Police Commission, *An Assessment of the Seattle Police Department's Community Engagement* (Seattle: Seattle Community Police Commission, 2016), https://www.seattle.gov/Documents/Departments/CommunityPoliceCommission/CPC_Report_on_SPD_Community_Engagement.pdf.

[64] Eric Greening, *Know Your Audience: The Seattle Police Department Drone Program* (Seattle: Seattle Police Department, 2016, unpublished).

[65] "Overview," Seattle Police Monitor, accessed May 7, 2017, http://www.seattlemonitor.com/overview.

[66] Ibid.

[67] Drew Atkins, "Washington: The 'Wild West' for Surveillance Drones," Crosscut, April 19, 2016, http://crosscut.com/2016/04/washington-the-wild-west-for-surveillance-drones/.

[68] Musgrave, "Seattle Police Seek More Drones While Two Sit Unused."

[69] Christine Clarridge, "Police Department Demonstrates New Drone, to Help Allay Concerns," *Seattle Times*, April 28, 2012, http://old.seattletimes.com/text/2018090173.html.

SPD staff at the demonstration spoke of potential public safety benefits of the devices and also noted their understanding of the public's concerns over privacy threats, saying the SPD would work with the community and the ACLU to create a policy that ensured privacy protections and strict accountability.[70] A few days after the media demonstration, SPD Assistant Chief Paul McDonagh gave a presentation to the city council's Public Safety, Civil Rights, and Technology Committee and apologized to council members for not keeping them informed about the department's plans to use unmanned aircraft. The *Seattle Times* covered the hearing and wrote that the SPD had been training to operate the devices it acquired two years before, but had not yet drafted policies for how the drones would be used.[71] Despite Assistant Chief Mcdonagh's assurances that his department would not be using them to "monitor the city," council members expressed skepticism about the program, with one saying that the police department's failure to engage with the community about its drone program "played into people's worst fears" about the government spying on its citizens.[72]

The SPD's plans to use its Draganflyer X6s appeared to be doomed following a public meeting in October 2012 to gather public opinion. The meeting, attended by about 100 people, was raucous. Protesters chanted and shouted so loudly that Assistant Chief McDonagh was unable to speak for more than half of the meeting.[73] Some of the protesters seemed to be upset with the SPD over more than just the issue of unmanned aircraft, shouting things like, "We don't trust you with the weapons you do have." The ACLU of Washington registered its concerns with the SPD proposals, saying the proposed uses for the SPD's drones were too broad and included a "catchall phrase" saying the devices could be used in any situations if the operators received permission.[74]

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[70] Clarridge, "Police Department Demonstrates New Drone, to Help Allay Concerns."

[71] Lynn Thompson, "Police Apologize for Not Keeping Council in Loop on New Drones," *Seattle Times*, May 2, 2012, http://www.seattletimes.com/seattle-news/police-apologize-for-not-keeping-council-in-loop-on-new-drones/.

[72] Ibid.

[73] Christine Clarridge, "Protesters Steal the Show at Seattle Police Gathering to Explain Intended Use of Drones," *Seattle Times*, October 25, 2012, http://www.seattletimes.com/seattle-news/protesters-steal-the-show-at-seattle-police-gathering-to-explain-intended-use-of-drones/.

[74] Ibid.

The ACLU representatives opposed a policy as the way to govern law enforcement's use of drones because it could be easily changed, as opposed to the greater public protections provided by an ordinance or law.[75] The *Sky Valley Chronicle* urged opposition to Seattle's use of drones and explicitly noted the USDOJ findings about the SPD's pattern or practice of excessive force and unconstitutional policing practices even without the use of drones.[76]

In the wake of heated criticism by stakeholders in Seattle, the Seattle City Council proposed legislation to restrict the ways the SPD could use its drones. The ordinances would have prevented the use of unmanned aircraft for general surveillance, specified that a search warrant would be required to collect data with the drones barring exigent circumstances, and required approval from a lieutenant or higher ranking officer for use in those exigent circumstances.[77] The day after this legislation was introduced, Seattle's mayor and police chief decided to cancel the program and focus the department's efforts on maintaining the public's trust. In a statement by Mayor McGinn released in early 2013, he said, "We agreed that it was time to end the unmanned aerial vehicle program, so that SPD can focus its resources on public safety and the community-building work that is the department's priority."[78]

In this case, it is clear that the SPD failed to implement an operational drone program successfully. The SPD was an early adopter and did not have the benefit of reviewing or using the ACLU, IACP, or USDOJ recommendations on the best practices for the adoption of drones. Its community engagement and policy development efforts did not meet the standards set in those documents. The SPD did not engage the public either early or frequently in the implementation process. It did not involve community

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[75] Clarridge, "Protesters Steal the Show at Seattle Police Gathering to Explain Intended Use of Drones."

[76] Steve Watson, "Seattle Police to Roll out Surveillance Drones with Infrared Cameras," Infowars, October 25, 2012, http://www.infowars.com/seattle-police-to-roll-out-surveillance-drones-with-infrared-cameras/.

[77] "Council Bill Number: 117707," Office of the City Clerk, April 18, 2016, http://clerk.seattle.gov/~scripts/nph-brs.exe?d=ORDF&s1=117707.cbn.&Sect6=HITOFF&l=20&p=1&u=/~public/cbory.htm&r=1&f=G.

[78] Laura Myers, "Seattle Mayor Grounds Police Drone Program," Reuters, February 8, 2013, http://www.reuters.com/article/us-usa-drones-seattle-idUSBRE91704H20130208.

stakeholders in policy development, and it was not able to persuade its citizens of the technology's benefits or the agency's commitment to safeguard constitutional rights. This case is the first point of proof for the first hypothesis and shows a correlation between the failure to follow the recommended implementation practices and the failure to win community support for law enforcement drone use.

The case of the SPD also seems to confirm hypothesis $H_2$. The agency's relationship with its community was at a low point following several controversial uses of force. The SPD's failure to follow the principles later espoused in the 21st Century Policing Report actually led to intervention and oversight by the USDOJ to correct the problem. Against that backdrop, and combined with the agency officials' lack of engagement for their drone adoption, the public and elected leaders did not support the SPD's use of drones.

The SPD serves the most liberal population of the sample agencies, and that population's lack of support for the department's use of drones doomed the program, which supports the idea that a liberal population is less likely to support law enforcement's use of drones. The city of Seattle had the highest property crime rate and second highest violent rate among the sample agencies, but did not support the use of drones by the police, which contradicted the idea that people living in higher crime areas would be more likely to support the police use of drones. Finally, Seattle had the largest percentage of white residents in the sample at 69% of the population, but the relative lack of minority residents did not seem to result in increased support for the SPD's use of drones.[79] These conflicting results indicate that the political climate of a jurisdiction is perhaps more important to the success of a law enforcement drone program than the crime rate or diversity of the population.

## B. ARLINGTON PD—SETTING THE EXAMPLE

The police department in Arlington, Texas was the first of the sample agencies to field an operational unmanned aircraft program, but actually acquired its systems a year

[79] "U.S. Census Bureau QuickFacts: Seattle City, Washington; UNITED STATES," United States Census Bureau, accessed July 14, 2017, https://www.census.gov/quickfacts/fact/table/seattlecitywashington,US/PST045216.

after the SJPD. It is one of three agencies in the sample group to succeed in creating an operational drone program. The 638 sworn officers and managers of the APD served a population of nearly 371,000 people at the time of the department's UAS implementation. The city sits in the Dallas-Fort Worth-Arlington metropolitan area and is notably more conservative than the other sampled jurisdictions, with a voter split of 41% Democrat and 57% Republican.[80] Arlington, Texas ranked third of the five sample agencies in both violent and property crime rates.[81]

The APD acquired a remotely operated helicopter in 2011 with DHS grant money with the goal of assisting local police officers in providing security during Super Bowl XLV in February 2011. The device was still owned by the vendor at the time, and the APD obtained FAA approval for flying training missions in a defined, unpopulated, area. Unlike some of the agencies examined in this thesis, the APD enjoyed broad support for its drone program from the city's elected leaders. The mayor, Robert Cluck, and City Councilman Robert Rivera publicly backed the APD's use of the drone by making statements like, "The idea is [to] provide an extra level of public safety for the city of Arlington."[82]

Councilman Charlie Parker held a town hall meeting on May 8, 2013 at which he discussed the APD's aviation unit. The aviation unit at that time consisted of one small battery operated helicopter purchased with a $100,000 federal grant. Councilman Parker highlighted the capability of the drones to conduct search and rescue, assist with fire suppression efforts, etc. but noted it was not to be used for general surveillance missions.[83]

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[80] "Cumulative Report—Official Tarrant County—Joint General and Special Elections—November 6, 2012," Tarrant County, Texas, November 6, 2012, http://access.tarrantcounty.com/content/dam/main/elections/2012/Nov6/results/cumulative.pdf.

[81] "Table 8—Texas," Federal Bureau of Investigation, accessed March 29, 2017, https://ucr.fbi.gov/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/tables/8tabledatadecpdf/table-8-state-cuts/table-8-texas.

[82] "Arlington, TX Hopes to Keep Aerial Drone," Homeland Security Newswire, May 17, 2011, http://www.homelandsecuritynewswire.com/arlington-texas-hopes-keep-aerial-drone.

[83] Jim Bass, "Action North Arlington Reports on District 1 Town Hall Meeting," Opinion Arlington, May 9, 2013, http://www.opinionarlington.com/?p=2838.

The APD conducted a broad outreach effort before its drones began flying missions for Arlington. It used town hall meetings to share both potential uses for the drones and also missions that would be off-limits. Jennifer Casseday-Blair quoted Arlington Police Lieutenant Christopher Cook for an article in *Fort Worth Magazine*, "The public appears to support the safe and responsible use of vehicles based upon our record of transparency and setting up a standalone web page to detail what our program is all about. We really stress our commitment to protecting the privacy rights of all individuals and have had extensive conversations about our program."[84]

Arlington's efforts in establishing one of the earliest successful drone programs while earning the community's trust earned them recognition in the USDOJ COPS office's guide for law enforcement agencies implementing unmanned aircraft programs. In that publication, Arlington Police Chief Will Johnson and his staff described many of the steps his agency took to adopt a controversial technology with the support and trust of their community.[85] Chief Johnson said his staff met with "every possible community group" to showcase the drones and provide detailed information about how they would be used to enhance community safety and officer safety.[86] They confronted the public's concerns directly and emphasized the privacy protections in the department's policies. Finally, the APD worked to show how its remotely piloted helicopters could save taxpayer money while offering unique capabilities. As Chief Johnson stated, "We emphasized price, privacy, regulations and responsible deployment, and we really reduced anxiety."[87]

Despite the apparent political and public support for APD's drone efforts, the Electronic Frontier Foundation and other civil liberties organizations were not happy about Arlington's deployment of drones. In a continuing effort to earn its community's trust, the APD created a website in 2013 meant to calm the fears of those who saw the

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[84] Jennifer Casseday-Blair, "Up in the Air," *Fort Worth Magazine*, November 24, 2015, http://www.fwtx.com/articles/fwtxmag/features/air.

[85] Valdovinos, Specht, and Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS).*

[86] Ibid.

[87] Ibid.

APD's use of unmanned aircraft as a threat to their privacy rights.[88] The website featured videos of the drones in action and an explanation of their approved uses from Chief Johnson.[89] In Arlington's case, the objections of civil libertarians were overcome by the agency's record of transparency and the support of the public and elected leaders. The APD began flying its drones operationally in 2013 and is known today as one of the leaders and early success stories in law enforcement adoption of the technology.

The APD's drone adoption practices set an early standard for other departments to follow, and their efforts serve as a second point of proof for the primary hypothesis, $H_1$. The department followed practices later codified in IACP and USDOJ recommendations. It engaged with its elected leaders and community early and frequently in the adoption process, using a variety of outreach methods including community meetings, the internet, and traditional media sources to spread its message. It convinced stakeholders of both the public benefits from law enforcement's drone use and the department's commitment to preserve privacy rights and act constitutionally. In the end, its efforts led to public support and a successful drone program.

No evidence indicated that the APD suffered from any pre-existing conditions of distrust between the department and the citizens of Arlington, and its efforts in undertaking the implementation of a drone program tend to show that the department embraces and follows the principles later published by the President's Task Force on 21st Century Policing. This data supports hypothesis $H_2$, but is insufficient to draw a strong conclusion.

As the most politically conservative of the sample jurisdictions, Arlington's support for its police department's use of drones is another point of confirmation for the first assumption of hypothesis $H_3$. Arlington has the second least diverse population in

[88] Anna Merlan, "Arlington Police Bought Two Drones, Which They Hope to Start Using Very Soon," *Dallas Observer*, February 15, 2013, http://www.dallasobserver.com/news/arlington-police-bought-two-drones-which-they-hope-to-start-using-very-soon-7137705; Robert Wilonsky, "Arlington PD Launches Website to Dispel Rumors That Its Unmanned Helicopters Will Seize Your Civil Liberties," *Dallas News*, March 22, 2013, http://www.dallasnews.com/news/crime/2013/03/22/arlington-pd-launches-website-to-dispel-rumors-that-its-unmanned-helicopters-will-seize-your-civil-liberties.

[89] Wilonsky, "Arlington PD Launches Website to Dispel Rumors That Its Unmanned Helicopters Will Seize Your Civil Liberties."

the sample, with 59% of the residents estimated to be Caucasian.[90] The population supported the department's use of drones, which is a point of confirmation for the second assumption of hypothesis $H_3$. The city of Arlington had the third highest crime rate among the five sample agencies, and although the public supported the police department's drone program, it is unclear whether the crime rate played a role in that support, as assumed in the final part of hypothesis $H_3$.

## C. ALAMEDA COUNTY—A STUDY IN PERSISTENCE AND POLITICAL WILL

The ACSO is unique in this series of case studies because it is the only law enforcement agency led by an elected official and the only agency responsible for providing law enforcement services beyond the geographic limits of an incorporated city. The Sheriff's Office is responsible for operating the jails in Alameda County, and also provides patrol and criminal investigation services in the unincorporated areas of the county. In addition, the Sheriff's Office is under contract to provide law enforcement services to the city of Dublin and the Oakland International Airport.[91] The ACSO's annual report for 2013 stated that its 950 sworn deputies served a county population of over 1.5 million residents. The vast majority of those residents live in cities that receive police services from municipal police departments, however, and the 2013 population living in the balance of the county is only 143,820.[92] The crime rate outside of the incorporated cities in Alameda County is relatively low, with the lowest rate of property crimes and the second lowest violent crime rate of the sample jurisdictions.[93]

The ACSO has established a reputation in the San Francisco Bay Area as a highly professional organization. The history page on the ACSO website notes that the agency is one of only 13 in the nation to earn the "triple crown" of national accreditation, having

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[90] "Table 8—Texas."

[91] Alameda County Sheriff's Office, *Annual Report* (Alameda, CA: Alameda County Sheriff's Office, 2013).

[92] Ibid.

[93] "Table 8—California," Federal Bureau of Investigation, accessed March 29, 2017, https://ucr.fbi.gov/crime-in-the-u.s/2014/crime-in-the-u.s.-2014/tables/table-8/table-8-by-state/Table_8_Offenses_Known_to_Law_Enforcement_by_California_by_City_2014.xls.

earned accreditation from the Commission on Accreditation of Law Enforcement Agencies (CALEA), the American Correctional Association, and the National Commission on Correctional Health Care/California Medical Association.[94] The ACSO developed and hosted the Urban Shield Tactical Training Exercise in 2007, and continues to host the annual event.[95] Urban Shield is a full-scale readiness exercise that brings together law enforcement Special Weapons and Tactics (SWAT) teams, explosive ordinance teams, with other first responders to take part in 48 continuous hours of scenario-based exercises.[96] It was the first exercise of its kind and has been replicated in Boston and other cities across the nation.[97] The agency also works closely with the San Francisco Bay Area Urban Area Security Initiative (UASI) to provide regional training in the areas of law enforcement, fire, emergency medical services, public health, and emergency management.[98]

With this background, it is unsurprising that the ACSO would be one of the first law enforcement agencies in the state of California to explore the use of unmanned aircraft in law enforcement, public safety, and homeland security missions. The agency began testing drones in late 2011, and gave a public demonstration of how the technology might be employed during the Urban Shield exercise in October 2012.[99] In late 2012 and early 2013, Sheriff Ahern and his staff planned to use federal grant funding administered through the Bay Area UASI to purchase two small quadcopter unmanned aircraft for a little over $30,000.[100]

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[94] "History," Alameda County Sheriff's Office, 2013, https://www.alamedacountysheriff.org/history.php.

[95] Ibid.

[96] "About Urban Shield," Urban Shield, 2017, http://www.urbanshield.org/about/urban-shield-training.

[97] "History."

[98] Ibid.

[99] "Privacy Advocates Succeed in Delaying Drone Purchase by California Country Sheriff," Homeland Security Newswire, December 17, 2012, http://www.homelandsecuritynewswire.com/dr20121216-privacy-advocates-succeed-in-delaying-drone-purchase-by-california-country-sheriff.

[100] Chase Thomas, "Drone Debate Comes to Alameda County," *The Pioneer*, accessed May 7, 2017, https://thepioneeronline.com/15498/metro/drone-debate-comes-to-alameda-county/.

Ahern and his staff tried to bring the issue before the Alameda County Board of Supervisors in December 2012, but the ACLU in northern California and the Electronic Frontier Foundation successfully lobbied to have the item pulled from the agenda.[101] Sheriff Ahern eventually brought the issue forward at the Board of Supervisors' Public Protection Committee meeting on February 14, 2013. Over 150 residents and civil rights advocates attended the acrimonious meeting to express anger and fear at the idea of the sheriff's office conducting surveillance of citizens with drones.[102] Some in the audience called the idea an "assault on my community," and showed distrust when Sheriff Ahern said the devices would not be used for surveillance.[103]

Although Sheriff Ahern and Captain Tom Madigan worked to assure the supervisors and community members that the unmanned aircraft would be restricted to specific missions like search and rescue, firefighting, bomb-detection, and crime scene preservation, privacy advocates like the ACLU's Linda Lye strongly resisted the Sheriff's acquisition and use of drones. Lye and others accused Sheriff Ahern of trying to acquire the technology without public scrutiny.[104] In an article Lye published on the ACLU website on the day of the Public Protection Committee hearing, she commended Sheriff Ahern for his agency's efforts in drafting a written policy for drone use and committing not to use the technology for surveillance, but criticized the proposed policy as falling short of the necessary privacy protections.[105] She objected to the idea that a drone could be deployed for the limited purpose of a search and rescue mission but also record images of political protesters during the flight, images Sheriff Ahern could retain and analyze.[106]

The Alameda County Board of Supervisors rejected the use of federal grant funds to purchase drones for the sheriff's office, which may have ended the project for

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[101] "Privacy Advocates Succeed in Delaying Drone Purchase by California Country Sheriff."

[102] David Kravets, "California County Inching Toward Drone Deployment?," WIRED, accessed May 7, 2017, https://www.wired.com/2013/02/alameda-drone-deployment/.

[103] Ibid.

[104] "Privacy Advocates Succeed in Delaying Drone Purchase by California Country Sheriff."

[105] Linda Lye, "Drones on the Radar," ACLU of Northern California, February 14, 2013, https://www.aclunc.org/blog/drones-radar.

[106] Ibid.

Alameda County except for the fact that county sheriffs are elected officials with different authorities and chains of command than municipal police chiefs. While county supervisors in California approve the sheriff's budget, they do not generally have the authority to control line items in that budget. Additionally, as elected officials, county sheriffs are beholden to the voters for their jobs, not county administrators or supervisors.

In the case of Alameda County, Sheriff Ahern's staff continued in its quest to start an unmanned aircraft program using its own budget. ACSO managers were well aware of the recommendations from the ACLU and IACP about best practices for earning community support and trust for the use of drones, and met several times with Linda Lye and the ACLU to collaborate on policy development following the Public Protection Committee hearing on February 14, 2013. Further, the ACSO met with the Alameda County District Attorney's Office, the Alameda County Public Defender's Office, and other groups to gather input on policy issues. Input from the ACLU led directly to language changes in the policy concerning the collection of "data" versus pictures and video, among other things.[107]

One area of disagreement between the ACSO and ACLU covered what deputies should do about criminal activity they saw with drones that was unrelated to the original purpose for the flight. The ACLU wanted the sheriff's office to ignore any incidental criminal activity they saw, but the ACSO could not agree to that condition.[108]

By December 2014, Sheriff Ahern had spent $97,000 from the county budget to purchase two drones that would be operated by ACSO employees assigned to the County's Office of Homeland Security and Emergency Services.[109] Linda Lye accused Sheriff Ahern of avoiding public scrutiny by buying the drones in secrecy using his own budget after the Board of Supervisors failed to approve his request to use grant

[107] Tom Madigan, Alameda County Sheriff's UAS Engagement Efforts, e-mail message to author, May 7, 2017.

[108] Ibid.

[109] Henry K. Lee, "Alameda County Sheriff Reveals That He's Bought 2 Drones," SFGate, December 3, 2014, http://www.sfgate.com/crime/article/Alameda-County-sheriff-reveals-that-he-s-bought-5930981.php.

funding.[110] She admitted the ACLU had worked on policy development in early 2013, but said the sheriff's office told her they no longer planned to purchase any drones.[111] Once again, Sheriff Ahern strongly denied Lye's accusation, noting that his staff had reached out to the ACLU and other public groups about his agency's plans and policy at more than 25 events.[112] Sheriff Ahern also told reporters he had informed county supervisors of his intentions in the months before his agency received the devices.

Despite the outcry by privacy advocates, the ACSO continued and expanded its drone program, and by 2016, the agency had a fleet of six small-unmanned aircraft flown by both sworn deputies and citizen volunteers on law enforcement and support missions. The use of civilian volunteers as participants in a law enforcement drone program later became one of the proposals in the USDOJ COPS Office guidelines on best practices for implementing law enforcement unmanned aircraft programs.[113] The ACSO staff has flown its fleet of drones on approximately 100 missions that ranged from tracking fleeing suspects and assisting with search warrants to scouting ahead of law enforcement tactical teams searching for an armed suspect who had killed one police officer and wounded another.[114] The devices have also been used during firefighting efforts and during search and rescue operations for missing persons. Alameda County now has perhaps the most active unmanned aircraft program in the state, one that serves as a model for other agencies, like the Modesto Police Department (MPD), seeking to implement their own drone programs.[115] In 2016, then-Captain Madigan reported that the public reaction to the program since it became operational has been "nothing but positives."[116]

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[110] Lee, "Alameda County Sheriff Reveals That He's Bought 2 Drones."

[111] Matt O'Brien, "Alameda County Sheriff Buys Two Drones," *Mercury News*, July 23, 2016, http://www.mercurynews.com/ci_27059034/alameda-county-sheriff-buys-two-drones.

[112] Lee, "Alameda County Sheriff Reveals That He's Bought 2 Drones."

[113] Valdovinos, Specht, and Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS).*

[114] Madigan, Alameda UAS Engagement; Farivar, "County Sheriff Quietly Expands Drone Fleet to 6, Flown Dozens of Times."

[115] Madigan, Alameda UAS Engagement; Modesto Police Department, *UAV Program* (Modesto, CA: Modesto Police Department, 2017).

[116] Farivar, "County Sheriff Quietly Expands Drone Fleet to 6, Flown Dozens of Times."

Although privacy advocates from groups like the ACLU opposed the ACSO's use of drones, the agency has created an operational and successful unmanned aircraft program that appears to have the support of the general public. The agency engaged with its community before acquiring the devices, and continued to engage regularly with the public, civil liberties advocates, and elected leaders. It included a broad range of stakeholders, including program critics in the ACLU, in the development of policies. It used multiple communication methods to convey the devices' public safety benefit and the accountability measures the agency would use in the program. These practices, along with the positive public reaction to the agency's eventual use of drones in policing, demonstrate a third positive correlation to the first hypothesis, $H_1$.

As with the APD, no evidence was available to show the ACSO's practices prior to or during the drone implementation process led to a pervasive lack of trust between the agency and the public. This would tend to show another data point supporting hypothesis $H_2$, but without greater control of the variables, it is difficult to draw a conclusion for the second hypothesis based on this case study.

The population in Alameda County is the most liberal of the sample jurisdictions, with the lowest percentage of Republican voters and the second highest rate of Democratic voters. The fact that this more liberal population supports their sheriff's office using drones tends to disprove the political component of hypothesis $H_3$.[117] The population of Alameda County is also among the two most diverse in the sample, with only 43% of the residents identifying as Caucasian. This population's support of the ACSO's drone program runs counter to the demographic assumption based on Monmouth University's poll, that a population with a higher population of racial or ethnic minorities would be less likely to support law enforcement's use of drones.[118] Finally, Alameda County has the lowest property crime rate and the second lowest violent crime rate in the sample group, which does not support the idea in the third

[117] California Secretary of State, *Report of Registration as of May 19, 2014: Registration by Political Subdivision by County* (*California Secretary of State)* (Sacramento, CA: California Secretary of State, 2014), http://elections.cdn.sos.ca.gov/ror/ror-pages/15day-general-12/politicalsub1.pdf.

[118] Monmouth University Polling Institute, *U.S. Supports Some Domestic Drone Use* (West Long Branch, NJ: Monmouth University Polling Institute, 2012), MonmouthPoll_US_061212.pdf.

hypothesis that a population living with high crime rates is more likely than one with low crime rates to support law enforcement's use of drones.[119]

## D. SAN JOSE—FAILURE, PIVOT, AND PROGRESS

The city of San Jose, California sits at the south end of the San Francisco Bay in the heart of the Silicon Valley, a location world famous for high-tech innovation. It is the third largest city in California and the largest in the San Francisco Bay Area. Known as the capital of Silicon Valley, San Jose residents are used to technological innovation. The city and surrounding area is home to scores of innovative technology companies. The city skews liberal politically, with only 20% of the registered voters identifying as Republicans.[120] It had the lowest violent and second lowest property crime rates of the jurisdictions in this study.[121]

The police department in San Jose did not appear to have the public trust issues that the SPD faced when it tried to implement its unmanned aircraft program. In fact, the San Jose Police Department (SJPD) had been the example of transparency and inclusion when it began researching the use of body-worn cameras (BWC) by police officers in early 2014.[122] In January of that year, the department formed a committee including department employees and community members to examine benefits and concerns with the use of BWC technology and to help shape SJPD policy.[123] The SJPD posted its policy online for public review and created a website to inform the public about the program. The SJPD closed its narrative about the project with the statement, "Your opinion matters."[124] The SJPD's efforts to adopt unmanned aircraft technology, however, were originally undertaken in "stark contrast" with their body camera implementation

119 "Table 8—California."

120 California Secretary of State, *Report of Registration as of May 19, 2014*.

121 "Table 8—California."

122 "Body Cameras Project," accessed May 12, 2017, http://www.sjpd.org/.

123 Ibid.

124 Ibid.

process, with far less concern for transparency and impacts to the public's trust of the SJPD.[125]

In July 2014, the public learned through documents produced in response to a public records act request that the SJPD had quietly purchased an $8,000 unmanned aircraft with grant money from the DHS's Urban Areas Security Initiative.[126] The documents revealed the SJPD had put a one-line item on the city council's consent agenda in November 2013 to accept $1M in funding from the DHS. The city council did not debate the agenda item and no notice was posted about the SJPD's plans for the money.[127]

In an article published on July 30, 2014, the ACLU took the position that the SJPD never should have gone to the city council to approve DHS funding for a drone program without a vigorous public debate and explicit approval by the elected representatives of the citizens. One of the ACLU's complaints was that DHS decisions to award UASI grants were made by a group of 11 people who are not accountable to the citizenry, and unless individual jurisdictions create a process to ensure transparency, accountability, and oversight, the police have too much power to operate autonomously.[128]

The criticism gained energy, and on August 5, 2014, the *San Jose Mercury News* (San Jose's local newspaper) published a story noting widespread complaints by civil liberties groups and national media about SJPD's "secretive purchase of a drone."[129] In the wake of the public complaints, the SJPD leadership released a statement to the media on August 5, 2014 in which they stated the drones, devices also in use by hobbyists,

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[125] Thomas Miller, "San Jose Police Department's Secret Drone Purchase: Where's the Accountability?," *ACLU of Northern California* (blog), July 30, 2014, https://www.aclunc.org/blog/san-jose-police-departments-secret-drone-purchase-wheres-accountability.

[126] Robert Salonga, "San Jose: Police Apologize for Drone Secrecy, Promise Transparency," *Mercury News*, August 5, 2014, http://www.mercurynews.com/2014/08/05/san-jose-police-apologize-for-drone-secrecy-promise-transparency/; and Jennifer Wadsworth, "San Jose Weighs Drone Policy," *San Jose Inside*, August 10, 2015, http://www.sanjoseinside.com/2015/08/10/san-jose-weighs-drone-policy/.

[127] Salonga, "San Jose."

[128] Miller, "San Jose Police Department's Secret Drone Purchase."

[129] Salonga, "San Jose."

would be used to help bomb technicians safely access and view suspicious devices.[130] In the media statement, the SJPD leaders also apologized for their procurement process in 2013.[131] The SJPD's statement read:

> In hindsight, SJPD should have done a better job of communicating the purpose and acquisition of the UAS (Unmanned Aerial System) device to our community. The community should have the opportunity to provide feedback, ask questions, and express their concerns before we move forward with this project. To this end, we will first develop a community outreach plan before we take steps to deploy the UAS.[132]

The SJPD spokesman, Albert Morales, went on to say that the SJPD had no specific timetable for conducting community outreach about the program, and that the FAA had not yet cleared the SJPD to fly the device.[133] The SJPD's media statement also expanded the potential list of uses for its UAS to include situations where lives might be in immediate danger, a loose criteria that alarms surveillance critics concerned with mission creep and loss of privacy rights as a result of unchecked use of high-tech surveillance methods like drones.[134]

Documents released by the SJPD and published by the website MuckRock showed that Chief Esquivel's approval for the UAS program required a review by the city attorney's office, adoption of a UAS policy, and public outreach. It appears that outreach did not occur before the department acquired its UAS, and it is unclear whether the city attorney review ever occurred.[135]

Nicole Ozer, the technology and civil liberties policy director for the ACLU of California, stated the ACLU's concerns when she said that the media release by the SJPD confirmed her organization's concerns that the San Jose police intended to expand drone

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[130] Salonga, "San Jose."

[131] Ibid.

[132] Ibid.

[133] Ibid.

[134] Ibid.

[135] Cyrus Farivar, "San Jose Police Department Says FAA Can't Regulate Its Drone Use," Ars Technica, August 6, 2014, https://arstechnica.com/tech-policy/2014/08/san-jose-police-say-faa-cant-regulate-its-drone-use-faa-disagrees/.

use beyond the mission set they had originally described. Ozer advocated for a debate not about what missions the SJPD should plan for its drones but about whether they should be allowed to use the devices at all.[136] Ozer further stated, "The SJPD seems to definitely misunderstand some critical issues related to drones and to me that underscores why there should be a public debate so the right kind of information gets out."[137]

By the end of 2014, the SJPD had reversed course and began holding public meetings about their fledgling drone program. Members of the SJPD's leadership partnered with the San Jose Neighborhoods Commission, a group chartered by the city to "represent neighborhood interests and concerns on matters of public safety, transportation, budget, and quality of life in neighborhoods of San Jose," to hold four community meetings to discuss its UAS program between November 2014 and March 2015.[138] At the first of these meetings, the SJPD presented a draft policy for its UAS program so the neighborhood commissioners and members of the public in attendance could comment on the policy. Over the course of the four meetings, over 200 community members attended and participated in the discussions. Additionally, the meetings were recorded and uploaded to YouTube, where approximately 600 people viewed at least a portion of the recordings.[139]

The San Jose Neighborhoods Commission also conducted an online community survey to gather public input on the police department's UAS program. The survey went out at the end of 2014, with questions based on the discussions and public comment from the first Neighborhoods Commission meeting on the topic in November of that year. The survey was advertised at Neighborhoods Commission meetings, at neighborhood outreach events, and via e-mail messages sent to community networks across the entire

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[136] Farivar, "San Jose Police Department Says FAA Can't Regulate Its Drone Use."

[137] Ibid.

[138] City of San Jose Neighborhoods Commission, *Report to San Jose Mayor and City Council: Pilot Program: The San José Police Department's Unmanned Aerial System ('UAS')* (San Jose, CA: City of San Jose Neighborhoods Commission, 2015), https://www.scribd.com/mbeds/261166149/content?start_page=1&view_mode=scroll&show_recommendations=true.

[139] Ibid.

city. It was open for 10 weeks and over 600 people responded.[140] Fifty-six percent of the respondents favored the SJPD's use of a drone, and 71% favored the use of drones in bomb threat or active shooter incidents. A minority viewed drones as appropriate for general surveillance or monitoring protests.[141]

Despite these outreach efforts and public assurances of limited and beneficial uses of the police department's drones, some in the community were still wary of local police using the technology based on the potential for mission creep and also a perception of how drones are used for international warfare.[142]

In March 2015, the San Jose Neighborhoods Commission drafted recommendations to the San Jose City Council for the consideration and possible adoption of the police department's unmanned aircraft program and associated policies. The Neighborhoods Commission recognized and acknowledged public concerns over surveillance and personal privacy risks with the use of law enforcement drones, but recommended the city council approve the adoption of a pilot program allowing the SJPD to operate one drone for a year and only in exigent situations like an active shooter, or in support of the department's bomb disposal unit.[143]

The city council accepted the Neighborhoods Commission report in a public meeting on March 19, 2015, and authorized the SJPD to implement their pilot UAS program in another public city council meeting in August, five months later. The SJPD did not expect to receive FAA approval to fly its drone until the end of 2016, and as of Spring 2017, it is not yet operational.[144]

The case of the SJPD's drone adoption efforts is useful to this thesis because the agency's initial failure to follow recommended practices seemed to prevent the agency

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[140] City of San Jose Neighborhoods Commission, *Report to San Jose Mayor and City Council*.

[141] Ibid.

[142] Rachael Myrow, "San Jose Police Try to Sell Public on Drones," KQED News, December 5, 2014, https://ww2.kqed.org/news/2014/12/04/san-jose-police-try-to-sell-public-on-drones/.

[143] City of San Jose Neighborhoods Commission, *Report to San Jose Mayor and City Council*.

[144] Ramona Giwargis, "San Jose Council Approves Policies for Police Drone," *Mercury News*, August 11, 2015, http://www.mercurynews.com/2015/08/11/san-jose-council-approves-policies-for-police-drone/.

from successfully creating an operational drone program. After that initial failure, however, the department began the public debate called for by privacy advocates and engaged with the community through meetings, surveys, and social media. It went back to its elected leaders at the city council and engaged in public debate at an open meeting that resulted in the council's approval of a pilot program for the SJPD to begin operating drones. Although the department's program has not reached operational status, the evidence in this case study seems to validate the primary hypothesis, $H_1$.

As previously noted, at the time of their drone adoption efforts, the SJPD did not appear to have pervasive public trust problems, and the department was recognized for the procedurally just and transparent way it undertook the implementation of a BWC program for its officers. The fact that the public initially opposed the SJPD's drone program but later approved of it leaves an unclear result for hypothesis $H_2$. It could be that the agency's positive efforts in the past helped it overcome its initial missteps in the drone program, but the research does not support a conclusion in this case.

The research in this case also failed to prove the components of the third hypothesis, $H_3$. San Jose is one of the two most diverse communities in the sample, with the lowest violent crime and second lowest property crime rates, and the second lowest percentage of registered Republicans in the sample, but the SJPD was able to win public and city council support once it undertook a public engagement process as outlined in the established recommendations by the IACP and USDOJ COPS Office.[145] One possible conclusion from this case study is that following the engagement and transparency processes outlined in recommendations from groups like the IACP and USDOJ is more important to the success of a law enforcement drone program than the conditions tested in hypothesis $H_3$.

[145] "Table 8—California"; "U.S. Census Bureau QuickFacts: San Jose City, California; UNITED STATES," United States Census Bureau, accessed July 14, 2017, https://www.census.gov/quickfacts/fact/table/sanjosecitycalifornia,US/PST045216; California Secretary of State, *Report of Registration as of May 19, 2014*.

## E. MODESTO POLICE DEPARTMENT—LEARNING FROM THE SUCCESSES AND FAILURES OF OTHERS

The City of Modesto sits in California's Central Valley, 92 miles east of San Francisco and 68 miles south of Sacramento. It is surrounded by the rich farmland of Stanislaus County and with an estimated 2016 population of just over 212,000 people is among the 20 largest cities in California.[146] Crime data reported to the Federal Bureau of Investigation (FBI) for 2015 showed that the City of Modesto had very high crime rates that put the city as the third most dangerous in California.[147] Modesto's political climate is the most conservative of the California agencies studied, with Republicans comprising 38% of the city's registered voters in 2016, the year Modesto implemented its sUAS program.[148] The MPD seems to enjoy a generally positive relationship with its community, and Lt. Ivan Valencia noted that his department is able to call upon community groups like the local chapter of the National Association for the Advancement of Colored People (NAACP) for their help in maintaining community peace and safety during volatile crimes or incidents involving the police.[149]

The MPD started looking into the idea of using unmanned aircraft to assist in its public safety mission in March 2016.[150] As the last of the agencies in this case study to implement a drone program, Modesto would seem to have a distinct advantage because it could learn from the successes and failures of other law enforcement agencies across the country. It also had the advantage of beginning its program after the devices had grown in popularity among hobbyists. Finally, the MPD began its program close to the time when the FAA was set to release its final regulations for the operation of UAS and integration of UAS into the national airspace. Also, organizations like the ACLU and IACP

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146 "U.S. Census Bureau QuickFacts: Modesto City, California," United States Census Bureau, accessed July 14, 2017, https://www.census.gov/quickfacts/fact/table/modestocitycalifornia/PST045216.

147 "Most Dangerous Cities in California," Law Offices of Graham D. Donath, APC. May 12, 2016, http://www.gddlaw.com/2016/05/12/cities-california-dangerous/.

148 California Secretary of State, *Report of Registration as of September 9, 2016: Registration by Political Subdivision by County* (Sacramento, CA: California Secretary of State, 2016), http://elections.cdn.sos.ca.gov/ror/ror-pages/60day-gen-16/politicalsub.pdf.

149 Ivan Valencia, *Modesto Police UAV Program* (Modesto, CA: Modesto Police Department, 2017).

150 Modesto Police Department, *UAV Program*.

published their recommendations for how law enforcement agencies could adopt UAS technology while earning or maintaining community support before Modesto's implementation efforts. With these potential advantages over the early adopter agencies included in this study, how did the MPD handle its implementation process?

The MPD leadership formed a committee of MPD sworn officers and managers to research both the benefits drones could bring to their mission, as well as the potential disadvantages of implementing this relatively new technology.[151] Modesto's UAS Committee determined that implementing an unmanned aviation program would enhance the MPD's mission of protecting lives and property and turned to the next steps in getting its program off the ground. The committee met with local aviation officials and was able to obtain guidance from the FAA's law enforcement coordinator on how to navigate the process for the certificate of authorization it would need to fly UAS in the national airspace system. The committee also met with the MPD command staff and got its approval to begin a UAS pilot program.

Before beginning its own program, Modesto's UAS committee met with the only other agency in the area operating unmanned aircraft team in a law enforcement capacity, the ACSO. During that site visit, the committee learned more about the FAA approval process and also about some of the UAS available to law enforcement.

The MPD specifically considered the UAS recommendations by the IACP, ACLU, and others in the implementation of its program. The MPD met with community stakeholders, including the Police Chief's Clergy Council, Neighborhood Watch leaders, and Business Watch leaders, to educate them on the benefits of drones for law enforcement and community safety.[152] According to a document from the MPD, all the people present favored the program and recognized the community benefit provided by the MPD's drones. The MPD also conducted outreach about the program at community

[151] Modesto Police Department, *UAV Program*; Valencia, *Modesto Police UAV Program*.

[152] Valencia, *Modesto Police UAV Program*.

events like National Night Out and a local race called the Peace Officer Memorial Half Marathon.[153]

The MPD committee presented the concept for the its UAS pilot program to the city council's Great Safe Neighborhoods Committee for review on August 8, 2016.[154] In Police Chief Galen Carroll's report to the Great Safe Neighborhoods Committee, he noted community concerns about police drones infringing on individual privacy rights and stated his department would not use UAS for random surveillance. Carroll instead wrote that the department would limit the use of the UAS to specific missions like search and rescue and crime scene investigation. Chief Carroll also noted how the department's unmanned aircraft can only fly for about 28 minutes before their batteries need to be recharged. Chief Carroll's report highlighted "extensive research" his department had conducted before starting the UAS program, and also stated his desire to bring the program before the city council early in the implementation process. In an email message, Chief Carroll wrote, "However, given some misunderstanding that occurs with unmanned aerial vehicles and their use, I believed it should come in front of the Council. The program is not fully implemented. We are in the training stage, which is the very first phase required by the FAA."[155] The Great Safe Neighborhoods Committee approved the program and the MPD then completed a presentation to the city council itself.

MPD staff engaged with the community in other ways as well. The day after the Great Safe Neighborhood Committee meeting, MPD officials held a technology demonstration and answered questions for the media and public in a parking lot at the Vintage Faire Mall. Once again, the MPD sought to reassure the public about the purpose for and restrictions on its UAS program. Lt. Ivan Valencia told reporters, "The drones will not be used for random surveillance. If we're in open public space where we have the right to be anyway, there's no search warrant required ever, but if we want to fly over somebody's house, yes," the police would need to get a search warrant to safeguard

[153] Modesto Police Department, *UAV Program*.

[154] Kevin Valine, "Modesto Council Committee to Get Update on Police Drone Program," *Modesto Bee*, accessed April 19, 2017, http://www.modbee.com/news/article94179267.html.

[155] Valine, "Modesto Council Committee to Get Update on Police Drone Program."

citizens' privacy rights.[156] Sgt. David Mullins was also on record saying, "This is not a secret program. This is not random surveillance. These are directed. You'll know we're there; no different than if we deploy a canine in an area. You're going to know the police are there and they're looking for somebody."[157]

The MPD staff publicly delineated when its department policy allows it to use its drones. These missions include assisting in the service of search warrants; assisting other law enforcement agencies; responding to biological, chemical, or radiological disasters; disaster management; crime investigations; search and rescue; civil disturbances; dignitary protection; providing increased situational awareness for officers; and documenting crime scenes.[158] The devices can also be used to search for fleeing criminal suspects, much like a police canine, in a way that is safer and more efficient than using only human police officers on the ground.

Those at the demonstration also heard about two recent incidents where Modesto's UAS were able to assist officers with real-world missions.[159] In one of the examples, officers told how their UAS was able to spot a fleeing robbery suspect for ground units and aid in his capture. In another, the MPD was able to fly its UAS to assist the county's water rescue team in assessing a stretch of river it could not access safely.

One of the local reporters at this technology demonstration event polled community members on camera to ask their feelings about the use of UAS technology by their police department. Everyone he interviewed supported the department's use of unmanned aircraft in its day-to-day operations.[160]

The MPD has used social media to communicate with the public about its UAV program as well. In February 2017, the MPD published a video on its Facebook page in which Lt. Ivan Valencia showcased how the department's UAS were being used to assist

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[156] Deke Farrow, "Modesto Police Give Demonstration of Three Drones," *Modesto Bee*, August 9, 2016, http://www.modbee.com/news/local/crime/article94711542.html.

[157] Ibid.

[158] Farrow, "Modesto Police Give Demonstration of Three Drones."

[159] Ibid.

[160] Modesto Police Department, *UAV Program*.

with emergency planning and management by providing real-time video footage of threatened or flooded waterways to police, fire, and emergency management officials.

The MPD now has five drones assigned to their Patrol and Investigations Division, and notes that the devices have been used during perimeter searches, missing person investigations, crime scene documentation, emergency management during flooding, and at search warrants.[161]

The MPD went to great lengths to engage with the public early and often as it sought to implement a drone program. It spoke with and listened to a wide range of stakeholders and conveyed both the public benefit to law enforcement's use of drones, as well as the MPD's commitment to upholding the constitutional rights of citizens. The fact that the public and elected leaders supported the MPD's acquisition and use of drones is a strong indicator that hypothesis $H_1$ is true. As noted previously, evidence of prior community trust or police legitimacy problems with the MPD does not exist, which can indicate support for hypothesis $H_2$.

Modesto, with 38% of its voting residents identifying as Republicans, is the second-most conservative jurisdiction in the sample.[162] Since the MPD won the trust of the community for its drone program, it could be concluded that the conservative makeup of the population made it easier for the agency to earn that support. With the MPD's strong engagement efforts, however, it is difficult to isolate the politics of the population as a causative factor. The remaining assumptions in $H_3$ gain at least some support from the data, since Modesto had the highest violent crime rate and the second highest property crime rate in the sample. The city's population was 50% Caucasian, making it the third least diverse jurisdiction in the sample.[163] Even though the data tends to support the third hypothesis, it is once again difficult to determine with certainty the role the factors in this hypothesis played in the MPD's successful drone program.

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[161] Modesto Police Department, *UAV Program*.

[162] California Secretary of State, *Report of Registration as of September 9, 2016*.

[163] "U.S. Census Bureau QuickFacts: Modesto City, California."

## F. CONCLUSION

The case studies presented in this thesis have shown how four municipal police departments and one county sheriff's office in the western United States adopted, or tried to adopt, unmanned aircraft in support of their law enforcement and public safety missions. The agencies were chosen for the timing of their adoption efforts, their locations, and the results of their efforts. One agency, the SPD, failed to implement an unmanned aircraft program and has since transferred its UAS to the Los Angeles Police Department. Three of the other agencies, the APD, ACSO, and MPD, succeeded and are now flying their drones on public safety missions. The SJPD initially failed to win support for its program, but has since obtained approval to begin a pilot program to operate drones. The next chapter provides an analysis of the case studies to test the three hypotheses in this thesis and determine what factors led to the success or failure of the sample agencies.

# V. COMPARATIVE ANALYSIS

## A. INTRODUCTION

As discussed in the research design chapter, the key research component of this thesis is a structured and systematic multicase study. This method allows both the application of a common set of research questions to multiple cases and the subsequent comparative analysis based on the results of the answers to those research questions. It also allows the researcher to present the sample agencies, research questions, and resulting data in a set of tables so the reader can quickly see the results to identify patterns. The first of those tables, showing a look at the overall research, is shown in Table 2.

This chapter begins with a review of the material covered in this thesis, and then provides a detailed analysis of each cell in the accompanying research table. It also expands on the individual case analyses to identify patterns and trends that lead to recommendations in the following chapter for law enforcement agencies wishing to implement their own drone program.

As discussed previously, the challenge of implementing a law enforcement drone program goes beyond the question of what is legal into the question of what the public is willing to accept from their police. Drones in government service, particularly law enforcement, are powerful surveillance tools that raise controversy for many people because of their ability to allow privacy intrusions and the erosion of civil rights in the United States. The case studies and accompanying analyses in this thesis therefore are meant to answer the following primary research questions:

- Are the UAS adoption guidelines published by the IACP and USDOJ reliable processes to help local law enforcement agencies earn their communities' support for the use of drones in policing missions?

- Did the agencies studied have the trust of their communities when they tried to adopt drone technology?

- Did the demographics, crime rate, or political preferences of the jurisdictions sampled impact the community support for law enforcement's drone use?

In the previous chapter, the thesis reviewed each of the five sample agency's efforts, their successes, and their failures in their implementation processes. The previous chapter also noted how the answers to the research questions for each of the sample agencies validated or refuted each of the hypotheses.

The individual case studies determined whether the sample agencies followed the processes outlined in published guidelines from the IACP and the USDOJ COPS Office by examining their processes to see if and how they engaged with their communities in their efforts to bring unmanned aircraft to policing.

## B. THE TABLE

Each of the sample agencies is presented in a separate row in the main research table, shown in Table 2. The first column shows the name of the agency and the second column shows the number of sworn personnel, generally from the rank of police officer through police chief, as a way to provide a comparison of the agencies' size at or near the time they began their drone adoption processes. The third column lists the estimated population served by each sample agency at or near the time each agency began its drone adoption process, once again as a way to help compare the sample agencies' size and scope of service.

The fourth, fifth, sixth, and seventh columns provide information about each sample jurisdiction's political preferences, demographics, and crime rates. The data in column four comes from either voter registration records or, where those do not exist, from voting records in the 2012 Presidential election. The data in column five is taken from U.S. Census records, and columns six and seven present information from the FBI's Uniform Crime Report. These columns are meant to help answer the research question about the impact of politics, demographics, and crime rates on the public's willingness to support law enforcement's use of drones.

Column eight notes the approximate date each agency first acquired drones. The information on when each agency acquired drones is important because it shows whether they were early adopters or began their processes later, when they had the benefits of reviewing and following the established recommendations discussed in Chapter I and also learning from the experiences of other agencies.

Column nine notes any pre-existing conditions of distrust between each agency and the community it serves. The data in this column helps answer the second research question, and is based on a variety of sources documenting the history and conditions at each agency when they acquired drones. The cells in this column are shaded green for those agencies with no identifiable community trust issues and red if such problems existed. The next column provides information about whether the agencies followed practices outlined in the IACP and USDOJ guidelines as they tried to implement their drone programs. This column is critical to the thesis research because it tests the primary hypothesis. Agencies that followed the recommended practices have cells in this column shaded green, while those that did not are shaded red. The SJPD's cell in the column is yellow because the department initially failed to follow the guidelines, but eventually adopted the community engagement and trust-building recommendations.

The last column, on the right of Table 2, answers whether the sample agencies have been able to operationalize their drone programs at the time of this thesis' writing. The answer to this question is critical because it is used as the measure of success for each agency's drone program. The cells in this column are shaded green for agencies that have successfully adopted drone programs and are flying the devices on law enforcement or public safety missions. Agencies that have tried but failed to implement operational programs have their cells in this column shaded red. The SJPD's cell is yellow because that department's program is not yet operational but the department has received city council approval to fly its drones on missions.

Table 2. Completed Drone Implementation Multicase Study[164]

| Drone Implementation Study | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Agency Size (Sworn Staffing) | Population Served (at of adoption) | Population's Political Affiliation | Population Demographics (US Census, 2010) | Property Crime Rate (per 100,000 residents) | Violent Crime Rate (per 100,000 residents) | Date Acquired | Community Trust at time of Adoption | Followed Adoption Recommendations | Operational |
| Seattle PD | 1,264 | 626,865 | D: 69%<br>R: 29% | White: 69%<br>Black: 8%<br>Hispanic: 7%<br>Asian: 14% | 5,094 | 598 | 2010 | No | No | No |
| Arlington PD | 638 | 370,900 | D: 41%<br>R: 57% | White: 59%<br>Black: 19%<br>Hispanic: 27%<br>Asian: 7% | 4,130 | 522 | 2011 | Yes | Yes | Yes |
| Alameda County SO | 950 | 1.54M/<br>143,820 | D: 58%<br>R: 13% | White: 43%<br>Black: 13%<br>Hispanic: 23%<br>Asian: 26% | 1,850 | 452 | 2012 | Yes | Yes | Yes |
| San Jose PD | 1,109 | 1M | D: 48%<br>R: 20% | White: 43%<br>Black: 32%<br>Hispanic: 33%<br>Asian: 32% | 2,456 | 324 | 2014 | Yes | No/Yes | No |
| Modesto PD | 218 | 212,175 | D: 41%<br>R: 38% | White: 50%<br>Black: 4%<br>Hispanic: 36%<br>Asian: 7% | 4,792 | 959 | 2016 | Yes | Yes | Yes |

[164] Adapted from "Table 8—California"; "Table 8—Texas"; "Table 10—California," Federal Bureau of Investigation, accessed March 29, 2017, https://ucr.fbi.gov/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/tables/10tabledatadecpdf/table-10-state-cuts/table_10_offenses_known_to_law_enforcement_california_by_metropolitan_and_nonmetropolitan_counties_2012.xls; "Table 8—Washington," Federal Bureau of Investigation, accessed March 26, 2017, https://ucr.fbi.gov/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/tables/8tabledatadecpdf/table-8-state-cuts/table_8_offenses_known_to_law_enforcement_by_washington_by_city_2012.xls; "U.S. Census Bureau QuickFacts: Seattle City, Washington; UNITED STATES"; "U.S. Census Bureau QuickFacts: Modesto City, California"; "U.S. Census Bureau QuickFacts: San Jose City, California; UNITED STATES"; "U.S. Census Bureau QuickFacts: Arlington City, Texas," United States Census Bureau, accessed July 14, 2017, https://www.census.gov/quickfacts/table/PST045216/4804000; "U.S. Census Bureau QuickFacts: Alameda County, California," United States Census Bureau, accessed July 14, 2017, https://www.census.gov/quickfacts/fact/table/alamedacountycalifornia/PST045216; California Secretary of State, *Report of Registration as of May 19, 2014*; California Secretary of State, *Report of Registration as of September 9, 2016*; "Cumulative Report—Official Tarrant County—Joint General and Special Elections—November 6, 2012"; Alameda County Sheriff's Office, *Annual Report*; "2012 Washington State Election Results"; Arlington Police Department, *Arlington Police Department Annual Report 2013* (Arlington, VA: Arlington Police Department, 2014), http://www.arlington-tx.gov/police/wp-content/uploads/sites/9/2015/01/2013-APD-Annual-Report.pdf.

## C. ANALYSIS

A major objective of this thesis is to investigate how a police department can start using drones to help its law enforcement missions. The use of small drones by hobbyists, corporations, and government is growing rapidly and it seems like the use of drones in policing is an inexpensive way for agencies that cannot justify the expense of a helicopter to gain many of the same benefits much more efficiently. Some of the agencies that tried to adopt drone technology had failed, seemingly because their communities did not support their use of unmanned aircraft because they did not trust the police to use them constitutionally or in the public's best interests. Knowing that, the research done for this thesis, and summarized in Table 2, was meant to illuminate ways police and sheriffs' departments could win the trust and support of the communities they serve. Would a process that treated the community as a stakeholder and partner be enough to do it, or were other factors involved, such as the agency's pre-existing relationship with the community, the politics of the community, crime rates, or the jurisdiction's demographics play a role in determining whether the people would trust the police and allow them to proceed with drone missions? For this comparative analysis, data related to individual hypotheses in the main research table are broken down into component tables and shown in Tables 3–6.

Table 3. Tests of Hypotheses H1 and H2

| Hypothesis $H_1$ & $H_2$ | | | | |
|---|---|---|---|---|
| | **Date Acquired** | **Pre-existing Community Trust Problems at time of Adoption** | **Followed Established Adoption Recommendations** | **Operational** |
| **Seattle PD** | **2010** | **Yes, Consent Decree** | **No** | **No** |
| **Arlington PD** | **2011** | **No** | **Yes** | **Yes** |
| **Alameda County SO** | **2012** | **No** | **Yes** | **Yes** |
| **San Jose PD** | **2014** | **No** | **No/Yes** | **No** |
| **Modesto PD** | **2016** | **No** | **Yes** | **Yes** |

- **Hypothesis $H_1$:** If law enforcement agencies follow the community engagement and trust-building recommendations suggested by the IACP and USDOJ then they are more likely to adopt drone technology successfully in support of their law enforcement missions.

The case studies showed a strong correlation between the use of IACP and USDOJ recommended community engagement practices and the ultimate success of a police drone adoption effort. Although an agency may not have begun the community engagement process before acquiring drones, the agencies that succeeded in creating an operational program did engage with their communities early and often, using a variety of methods and with a broad range of stakeholders. Both the SPD and the SJPD acquired drones in near secrecy, without the express knowledge or consent of elected leaders and the public. Both agencies faced a powerful public outcry in opposition to their use of the technology that ultimately led to political opposition and the suspension or termination of their adoption efforts. Seattle, as the first of the agencies in the sample to acquire drones, did not have the benefit of the guidelines and recommendations published by the IACP and USDOJ when they bought their Draganflyer drones, and it was apparent the agency's

leaders did not see the need at the time to talk with their elected leaders or community about their plans for the devices.

In San Jose's case, the program was revived after the department apologized to its community for its lack of engagement and undertook efforts to meet with stakeholders and show greater transparency in its efforts to use drones as a public safety tool. Department leaders took their program to a city council appointed committee, the Neighborhoods Commission, and worked with that group to hold community meetings, conduct online surveys to gather community input, and use social media sites like YouTube to help spread their engagement to a broader audience. This case study was perhaps the most interesting of the five because of SJPD's method and the results it saw. While its community, including privacy advocates, some media sources, and its elected leaders did not support the department's process or drone use initially, the department was able to turn that around once it undertook a transparent engagement process that educated the public about the department's intended uses for its drones and also sought the people's input about police drone use over their neighborhoods. Eventually, the Neighborhoods Commission reported back to the city council and recommended they approve a pilot program for the police department to operate drones. Although the department's program is not yet operational, it is an interesting turnaround that seems to indicate the validity of the recommendations by the IACP and USDOJ.

The ACSO engaged with the public before it even purchased any unmanned aircraft, but still faced a strong public backlash over concerns about privacy violations. It continued to engage with civil liberties advocates and even included them in dialogue about policy development and how to use drones effectively while also protecting people's constitutional rights. The ACSO and groups like the ACLU did not come to agreement on all items, but the agency's engagement process during the adoption process and after has resulted in greater community support, or at least a lack of opposition, for its drone use. The agency also had the benefit of being able to rely on the political will of the elected sheriff. Unlike a municipal police chief, the elected sheriff answers directly to the voters and not to an elected council or board of supervisors. This distinction can give

an elected sheriff more authority than a police chief in the implementation of policies and programs.

The police departments in Modesto, California and Arlington, Texas both successfully adopted their drone programs following strong efforts to engage with their communities and follow the processes formerly outlined. The APD implemented its drone program in 2011, one year after the SPD. This implementation occurred before the IACP and USDOJ COPS Office published their guidelines for how to implement drone programs successfully, but the engagement practices of the APD served as a model for others to follow. The USDOJ document specifically calls out the processes undertaken by the APD as examples.[165] The MPD was the last of the sample agencies to begin using drones, and had the benefit of published recommendations and the ability to learn from the experiences of agencies that had gone before it. Its program manager, Lt. Ivan Valencia, specifically acknowledged that his department sought to follow the recommendations of the IACP, ACLU, and others in the implementation of its program.[166]

The case studies in this thesis appeared to validate the first hypothesis. In every case, an agency that failed to follow the trust-building and community engagement failed to field an operational drone program. The agencies that followed some or all of the steps recommended by the IACP and USDOJ have successfully adopted UAS. The agency that seemed to best prove the validity of the recommendations was the SJPD since it did not engage the public or its elected leaders when it first tried to create a UAS program. It was unsuccessful in its efforts, but was later able to earn sufficient community support and city council approval for its use of drones after it reversed course and took part in a public conversation and debate.

- **Hypothesis $H_2$:** If a law enforcement agency has not previously earned the trust of its community then it is less likely to succeed in creating a drone program.

[165] Valdovinos, Specht, and Zeunik, *Community Policing & Unmanned Aircraft Systems (UAS).*

[166] Valencia, *Modesto Police UAV Program*.

It stands to reason that a police or sheriff's department that engages in community policing and procedural justice practices outlined in the report by the President's Commission on 21st Century Policing will maintain a relationship of mutual trust and respect with its community and be strongly positioned to succeed in the adoption of controversial technology like unmanned aerial systems. The police departments in San Jose, Arlington, Modesto, and the ACSO all appeared to have good relationships with their communities prior to their drone adoption efforts, but only three of the four have succeeded in getting their programs to operational status. San Jose's situation was unique, because while it appeared to have the trust of its community before undertaking its efforts to use drones, its lack of transparency and engagement at the beginning of the process set it back. It was able to recover, but the research did not allow a conclusion about whether it was its subsequent engagement efforts, the agency's previous relationship and reputation, or both that allowed that recovery.

The SPD was the only agency in the sample that seemed to have a troubled relationship with its residents at the time of its drone adoption efforts. As noted previously, the SPD had multiple controversial uses of force at about the same time it secretly acquired its drones. Those incidents led to a great deal of community concern and a federal investigation by the USDOJ. The investigation determined the department engaged in a pattern and practice of unconstitutional policing resulting in federal oversight of the department that continues to this day. Against this backdrop, the SPD's drone adoption efforts failed and it was forced to abandon its program. What the research did not make clear, however, was how much these pre-existing conditions contributed to the department's failure to implement an operational drone program. The author found some correlation for this hypothesis, but could not prove it based on the experiences of the sample agencies.

- **Hypothesis $H_3$:** If a community is politically conservative, has a comparatively high crime rate, or smaller minority population, then it is more likely to support law enforcement's use of drones. One could also state the inverse hypothesis.

Table 4. Effect of Crime Rates on Drone Implementation[167]

| Effect of Crime Rates | | | |
|---|---|---|---|
| | **Property Crime Rate (per 100,000 residents)** | **Violent Crime Rate (per 100,000 population)** | **UAS Operational** |
| **Seattle PD** | **5,094** | **598** | **No** |
| **Arlington PD** | **4,130** | **522** | **Yes** |
| **Alameda County SO** | **1,850** | **452** | **Yes** |
| **San Jose PD** | **2,456** | **324** | **No** |
| **Modesto PD** | **4,792** | **959** | **Yes** |

The data for this complex hypothesis was inconclusive, but in some cases, showed correlation. Modesto was the most violent of the communities studied, with 959 violent crimes per 100,000 residents, and suffered the second highest rate of property crimes with 4,792 per 100,000 residents.[168] The people of Modesto supported, or at least did not oppose, their police department's use of drones. Seattle residents came out against their police implementing a drone program, even though that city had the highest property crime rate and second highest violent crime rate of the sample agencies.[169] The data city of San Jose had the lowest violent crime rate and the second lowest property crime rate in the sample, at 324 and 2,456, respectively.[170] That city originally opposed the department's use of drones but later came to support it. Alameda County and Arlington, Texas both supported their law enforcement agencies' drone programs, even though the two communities had dramatically different property crime rates at 1,850 and 4,130, respectively.[171] Their rates of violent crimes were a closer match with 452 for the areas

[167] Adapted from "Table 8—Washington"; "Table 8—Texas"; "Table 8—California"; "Table 10—California."

[168] "Table 8—California," 8.

[169] "Table 8—Washington," 8.

[170] "Table 8—California," 8.

[171] "Table 10—California," 1; "Table 8—Texas," 8.

served by Alameda County and 522 for Arlington, Texas.[172] The crime rate data correlated in some of the cases, but no clear patterns were identified that would tend to prove that a community's crime rate was a reliable indicator about whether or not people would support or reject police drones. Instead, it appeared that a law enforcement agency's efforts to include the community in dialogue about the use of drones were more critical to success or failure than crime rates.

Table 5. Effect of Political Affiliation on Drone Implementation[173]

| Political Influences | | |
|---|---|---|
| | **Population's Political Party Affiliation/Preferences** | **UAS Operational** |
| **Seattle PD** | **D: 69% R: 29%** | **No** |
| **Arlington PD** | **D: 41% R: 57%** | **Yes** |
| **Alameda County SO** | **D: 58% R: 13%** | **Yes** |
| **San Jose PD** | **D: 48% R: 20%** | **No** |
| **Modesto PD** | **D: 41% R: 38%** | **Yes** |

The political preferences in a community did show a correlation to the acceptance of police drone programs, although only in some cases. It is difficult to state the strength of that correlation based on the data and small sample size. The test of this section of the hypothesis involved assumptions that a registered Republican was more conservative politically than a registered Democrat and more likely to support the police use of drones.

[172] "Table 10—California," 10; "Table 8—Texas."

[173] Adapted from California Secretary of State, *Report of Registration as of September 9, 2016*; California Secretary of State, *Report of Registration as of May 19, 2014*; "Cumulative Report—Official Tarrant County—Joint General and Special Elections—November 6, 2012"; and "2012 Washington State Election Results."

Seattle, with 69% of its voters identifying as Democrats and 29% percent as Republicans, represented one of the two most liberal of the sample jurisdictions, along with Alameda County at 58% Democrat and only 13% Republican.[174] Seattle's lack of support for its police department's use of drones fits with the political component of hypothesis $H_3$, but Alameda County's support does not. San Jose's political makeup, with 48% of its voters registered as Democrats and 20% as Republicans did not seem to correlate to that community's initial rejection and subsequent approval of the SJPD's drone program.[175] Arlington and Modesto, which both supported their police departments' use of drones, came in as the most conservative sample communities. Both had 41% of their voters either register as Democrats or vote for the Democratic candidate, but Arlington's Republican voters numbered 57% while Modesto's were at 38%.[176] Once again, not enough of a trend can be seen to conclude that the political preferences of a community are the most important indicator about that population's willingness to accept police drones flying over their homes, businesses, and streets. Once again, the research testing this hypothesis was inconclusive. While political preferences in a jurisdiction showed correlation in some cases to that community's acceptance of police drones, enough discrepancies occurred within the sample to prevent a certain conclusion. It did appear, as with the earlier component of $H_3$, that the political preferences of the community played a smaller role in the successful adoption of police UAS than the agency's efforts to involve the community and earn its trust.

[174] "2012 Washington State Election Results"; and California Secretary of State, *Report of Registration as of May 19, 2014*.

[175] California Secretary of State, *Report of Registration as of May 19, 2014*.

[176] "Cumulative Report—Official Tarrant County—Joint General and Special Elections—November 6, 2012"; California Secretary of State, *Report of Registration as of September 9, 2016*.

Table 6. Effect of Demographics on Drone Implementation[177]

| Demographic Influences | | |
|---|---|---|
| | **Community Demographics** | **Operational** |
| **Seattle PD** | **White: 69%**<br>**Black: 8%**<br>**Hispanic: 7%**<br>**Asian: 14%** | **No** |
| **Arlington PD** | **White: 59%**<br>**Black: 19%**<br>**Hispanic: 27%**<br>**Asian: 7%** | **Yes** |
| **Alameda County SO** | **White: 43%**<br>**Black: 13%**<br>**Hispanic: 23%**<br>**Asian: 26%** | **Yes** |
| **San Jose PD** | **White: 43%**<br>**Black: 32%**<br>**Hispanic: 33%**<br>**Asian: 32%** | **No** |
| **Modesto PD** | **White: 50%**<br>**Black: 4%**<br>**Hispanic: 36%**<br>**Asian: 7%** | **Yes** |

The data did not show any identifiable trends linking the racial and ethnic makeup of a community on the people's support for law enforcement's use of drones. This section of the hypothesis came from a Monmouth University study showing significant racial variance in the responses about privacy concerns, with black and Hispanic residents expressing somewhat more concern than white and Asian residents.[178] The racial demographic data from the sample jurisdictions did not seem to correlate to the success

[177] Adapted from U.S. Census Bureau QuickFacts: Arlington City, Texas"; "U.S. Census Bureau QuickFacts Selected: Alameda County, California"; "U.S. Census Bureau QuickFacts: Modesto City, California"; and "U.S. Census Bureau QuickFacts: San Jose City, California; UNITED STATES."

[178] Monmouth University Polling Institute, *U.S. Supports Some Domestic Drone Use*.

or failure of each agency's efforts to fly drones operationally on law enforcement missions.

Seattle, for example, did not support drone use even though it was the least diverse of the five communities sampled with 69% of its population identifying as white or Caucasian and only 15% as either African-American or Latino.[179] San Jose, with 65% of its population listed as either African-American or Latino, 43% white and 32% Asian, eventually supported the police department's drone program in contradiction to the assumption based on the results of the Monmouth poll.[180] The U.S. Census reported the demographics in Arlington, Texas as 59% white, 46% African-American or Hispanic, and 7% Asian, but despite the significant minority populations, the APD's acquisition and use of drones had broad public support.[181] The population demographic figures from Table 2 for Alameda County and Modesto also fail to show a correlation with the public's willingness to trust and support law enforcement's use of drones. Both communities have significant African American or Hispanic populations, at 36% for Alameda County and 40% for Modesto, and despite the initial outcry in Alameda, both communities have supported the use of drones in police service.[182] The lack of trend in this component of $H_3$ seems to invalidate the racial and ethnic component of the hypothesis, indicating the racial or ethnic makeup of a community is less important to its resident's support for police drone operations than the efforts an agency takes to engage with its community under hypothesis $H_1$.

## D. CONCLUSION

As expected, the research and analyses presented in this thesis validated the primary hypothesis, $H_1$. The tests of the other two hypotheses yielded less conclusive, but no less interesting, results. The data showed a strong validation of Hypothesis $H_2$, since the law enforcement agency that went into its drone adoption efforts with preexisting

179 "U.S. Census Bureau QuickFacts: Seattle City, Washington; UNITED STATES."

180 "U.S. Census Bureau QuickFacts: Arlington City, Texas."

181 "U.S. Census Bureau QuickFacts: San Jose City, California; UNITED STATES."

182 "U.S. Census Bureau QuickFacts: Modesto City, California"; "U.S. Census Bureau QuickFacts: Alameda County, California."

trust problems between the police and community was forced to give up its UAS and abandon its adoption efforts. The remaining agencies did not appear to have major trust problems when they acquired their unmanned aircraft, and they have all either fielded operational drone programs or received approval to do so.

As noted, hypothesis $H_3$ was a complex one with three separate components to it. The data in this research indicated that the factors in this hypothesis were less important to the success or failure of a law enforcement drone adoption effort than the factors in hypothesis $H_1$ and $H_2$. The data from Table 2 showed the greatest level of support for $H_1$, with a clear trend that agencies following the community engagement recommendations in the guidelines from the IACP and USDOJ succeeded in creating operational drone programs while those agencies that did not follow the recommended processes failed. The clearest indication of this trend came from the SJPD, which initially ignored the recommended principles and failed to win public support but eventually turned that around after it apologized and began a strong community engagement program.

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# VI. CONCLUSION AND RECOMMENDATIONS

## A. REVIEW

While the use of unmanned aircraft by the police is still a relatively new trend, it is one that is growing at a rapid pace. In the period from 2010–2012, very few of the more than 18,000 state, local, and tribal law enforcement agencies in the United States undertook the process of bringing unmanned aircraft, or drones, into police service. Agencies like the SPD, the APD, and the ACSO in California's San Francisco Bay Area became pioneers with their early adoption efforts. Now, however, many more agencies have either implemented their own drone programs or are considering it. The MPD, the sample agency that most recently adopted a drone program, noted in its literature that 21 law enforcement agencies from across the state of California have consulted with them in the last year about how to implement their own programs.[183]

As detailed in this thesis, law enforcement agencies face a number of challenges to the implementation of this burgeoning technology, not the least of which is the commonly held fear about drone-enabled surveillance and the erosion of this nation's privacy rights. Law enforcement officials frequently work to calm public fears of remote surveillance by fleets of cheap, easy-to-use drones by saying they will not use the devices for surveillance. These officials point out the limited capabilities of drones and how those limitations make them unsuitable for widespread, or long-term observation of even a specific person, let alone an area or the general public. They can only fly for 30 minutes or less on a battery charge, they have to be kept within the operator's line-of-sight, and they must remain below 400' AGL, etc.

Proponents of police drones may be missing the point with these assurances, however, since they do not recognize or validate the concerns citizens and privacy advocates have about how the technology may be used in the future. As the technology matures, privacy concerns that may seem extreme today can possibly become more

[183] Valencia, *Modesto Police UAV Program*.

reasonable. Drones in the future may be fitted with facial recognition technology, license plate readers, artificial intelligence, etc.

Today, small-unmanned aircraft used by law enforcement and many hobbyists are flying cameras. They exist to observe and record aerial images of their surroundings. Little doubt remains that law enforcement will use them for surveillance. The question then becomes what kind of surveillance is both lawful and acceptable to the public? Not all surveillance is the same, nor is warrantless surveillance always a violation of the U.S. Constitution. Will the police use drones to conduct targeted searches for missing persons and fleeing criminal suspects, or general surveillance of an area or population? Will those efforts be short-term and incident specific, or will they become pervasive? What policies or regulations will be in place to protect citizens' privacy rights in this new era of high-tech surveillance? How should law enforcement use these devices to improve the safety of this country's citizens without overstepping its authority and losing the trust of the people served? These issues make the implementation of a law enforcement unmanned aircraft program more than just a technical and budgetary exercise, taking it instead into the realm of community engagement and trust building.

The data from this case study show that a law enforcement agency that follows the UAS adoption guidelines put forth by the ACLU, IACP, and USDOJ COPS Office is more likely to succeed in creating an operational UAS or sUAS program than those that ignore those guidelines. The examples of the APD, MPD, ACSO, and even the secondary efforts of the SJPD, show how community engagement and partnerships are beneficial in acknowledging and overcoming community concerns about privacy violations and abuses of power with the use of unmanned aircraft. In fact, agencies like the APD and MPD were able to use their drone programs as a way to build relationships and trust in their communities because of the strong efforts they took to engage with their residents and stakeholders.

Based on these results, it seems clear that any agency looking to start its own drone program and fly the devices over their cities and counties can be well served to read and follow the IACP Guidelines and also the more recent document by the USDOJ. The community engagement, accountability, and transparency principles encouraged in

both documents offer a valid blueprint to follow, and also leave enough flexibility for law enforcement leaders to tailor their trust-building efforts to the circumstances and needs of their own communities.

The recommendations published about law enforcement unmanned aircraft programs apply the general concepts of community policing, trust, and police legitimacy specifically to the implementation of these relatively new systems. The research in this thesis indicates that these recommendations are valid and that law enforcement leaders who treat their communities as partners in the implementation of any drone program are more likely to succeed in bringing the public safety benefits of drone technology to their cities and counties.

## B. RECOMMENDATIONS

Now that the research has developed evidence validating the recommended guidelines published by the IACP and USDOJ, it is possible to get to the crux of the matter and discuss an action plan for law enforcement leaders thinking of adding unmanned aircraft to their departments' toolboxes.

### 1. Begin with a Needs Assessment

Before beginning to allocate funds or applying for grants to buy a new drone, identify what community needs the equipment can meet. Most importantly, think broadly and do not just look at drones or UAS as a law enforcement tool. Involve other city or county departments in the needs assessment. The devices are useful in many arenas, including fire prevention and suppression, disaster planning and relief, and public works among others. Including other government functions and departments brings in more stakeholders to the project and can add a base of support. The law enforcement agency does not have to adopt all the other departments' missions, but law enforcement is part of a larger public safety and government team, and these efforts may help those other city or county departments start their own programs.

### 2. Create an Engagement Plan

Work with available resources, including community engagement or outreach specialists, to create an engagement plan tailored to unique community and agency needs. Each community will have its own unique political situations, key stakeholders, and needs. The unique nature of each situation should be built into the engagement plan. The plan should include comprehensive and broad efforts to reach members of the community and include not just education, but dialogue. These efforts should include the use of traditional and social media, surveys, community meetings, etc. to reach large numbers of residents.

The plan should also involve influential community members and civil liberties advocates early in the process and continue that engagement through the needs assessment and policy development phases. As the ACLU has noted in the sample cases, a robust public dialogue should ensue not just on the potential uses of police drones, but also on whether they are needed.[184] It does not mean an agency must reach consensus with all critics, but it is important to engage with the public and treat them as the partners they are in keeping neighborhoods safe.

### 3. Inform and Involve a Jurisdiction's Elected Leaders

Political support is critical to the success of a law enforcement drone program, as presented in the five case studies. Law enforcement leaders trying to adopt a drone program should respect their city council or county supervisors by involving them even before beginning outreach to the community. Do not surprise them. It is crucial to educate the council members or supervisors about the benefits and challenges of drones for law enforcement, and also explain:

- How you will engage the public and earn their trust
- Ideas for potential uses and restrictions
- Commitment to ensure privacy and constitutional rights

[184] Miller, "San Jose Police Department's Secret Drone Purchase."

- Safety measures

Finally, be ready to answer questions, take input, and ask for the elected leaders' help where appropriate.

### 4. Implement the Engagement Plan/Develop Policy

Now that an outreach program has begun, be ready to take input and include it in the plans/policy if appropriate. Also, take the community input seriously, and if the feedback indicates they do not want or need a drone program, be prepared either to continue working on earning their support or cancel the program. A technology program is not more valuable than the trust of the population.

Select a group of stakeholders from agencies and communities to provide input on the development of a comprehensive policy that specifies when and how the devices can be used, when and how they may not be used, training and accountability requirements, and safety measures. Once the policy is written, ensure it is published online and available to the public.

### 5. Program Implementation

Now that the public have been engaged, their input taken, and folded into the policy and program, it is possible to work on funding, staffing, and training for the UAS program. It will be necessary to work with the FAA to obtain a certificate of authorization, train operators and observers, and slowly work the new tools into department operations. Continue to include the public and press in the program and frequently share information about how the drones are being used to improve community safety.

## C. AREAS FOR FUTURE SCHOLARSHIP

This thesis focused on only five sample agencies to test the effectiveness of previously published recommendations on how American law enforcement agencies can earn public trust and support for their use of drones in public safety missions. While the results indicate the effectiveness of the recommended community engagement processes,

the research did not clearly answer other research questions about the impacts of political preferences or culture, demographics, or crime rates on a community's willingness to accept law enforcement drone use. Future research can utilize a larger or differently focused sample to better control the variables and examine questions about the impacts of these issues. A researcher may also structure a study to examine regional differences on the successful implementation of law enforcement drone programs.

Another topic for future research can be to examine the applicability of the trust-building processes tested in this thesis to broader issues. Are these processes equally effective in earning support for the adoption of other potentially beneficial but controversial technology or practices?

Finally, with the rapid expansion of drone use in government, commercial, and recreational uses, future research can focus on whether or not the tipping point has been reached in public acceptance; the point when the technology is so widely accepted that law enforcement no longer needs to undertake specially focused community engagement processes before adopting drones in public safety missions.

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