



Connect & Serve

Investigating the state of police citizen interaction

Executive Summary

As part of Carnegie Mellon University's Master's of Human-Computer Interaction capstone project, Team Themis has partnered with Deloitte Digital to explore the domain of law enforcement. Our mission is to identify opportunities for technology to improve law enforcement's effectiveness and to make situations safer for both law enforcement officers and the members of the public they protect and serve.

We studied the space of law enforcement

We broadly surveyed the field of law enforcement to identify areas that have the most potential to improve with design. We interviewed over 15 individuals, including local/federal officers, criminal justice experts, and emergency response planners. We supplemented these interviews with over 50 academic papers, news articles, surveys, and podcasts.

We gained insights into the space

Our research revealed four insights around: law enforcement's reliance on the community, influence of social media, necessity of soft skills, and inefficiencies of technology and communication in the field.

We will prototype a solution

Our insights strongly suggest two possible design opportunities, which will be our focus during the summer. We will prototype potential solutions to improve community rapport and how officers operate in the field.

“*If there is a distrust of the police themselves and the system, all of these scientific advances are not going to help us.*”²

— **Vernon Geberth**
Retired NYPD Homicide Detective

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Introduction

Imagine you are a police officer in a small city. It is a warm July afternoon and you are on patrol when you receive a 9-1-1 dispatch transmission of a possible break-in. You go to the house to investigate and knock on the door. A man answers and you ask him to step outside, informing him that you are responding to a possible break-in at this house. The man refuses, indignant that you are treating him like a criminal in his own home. He shows you his ID, which does prove that he is telling the truth, and then berates you for racially profiling him.

You feel frustrated at this man's combative behavior; can't he see that you're only doing your job? You choose to ignore him and go outside. He follows you, seeming more and more agitated. He says that he is going to report you and that you have no idea who you're messing with.

What would you do? Would you keep walking away? Try to reason with him? Arrest him?

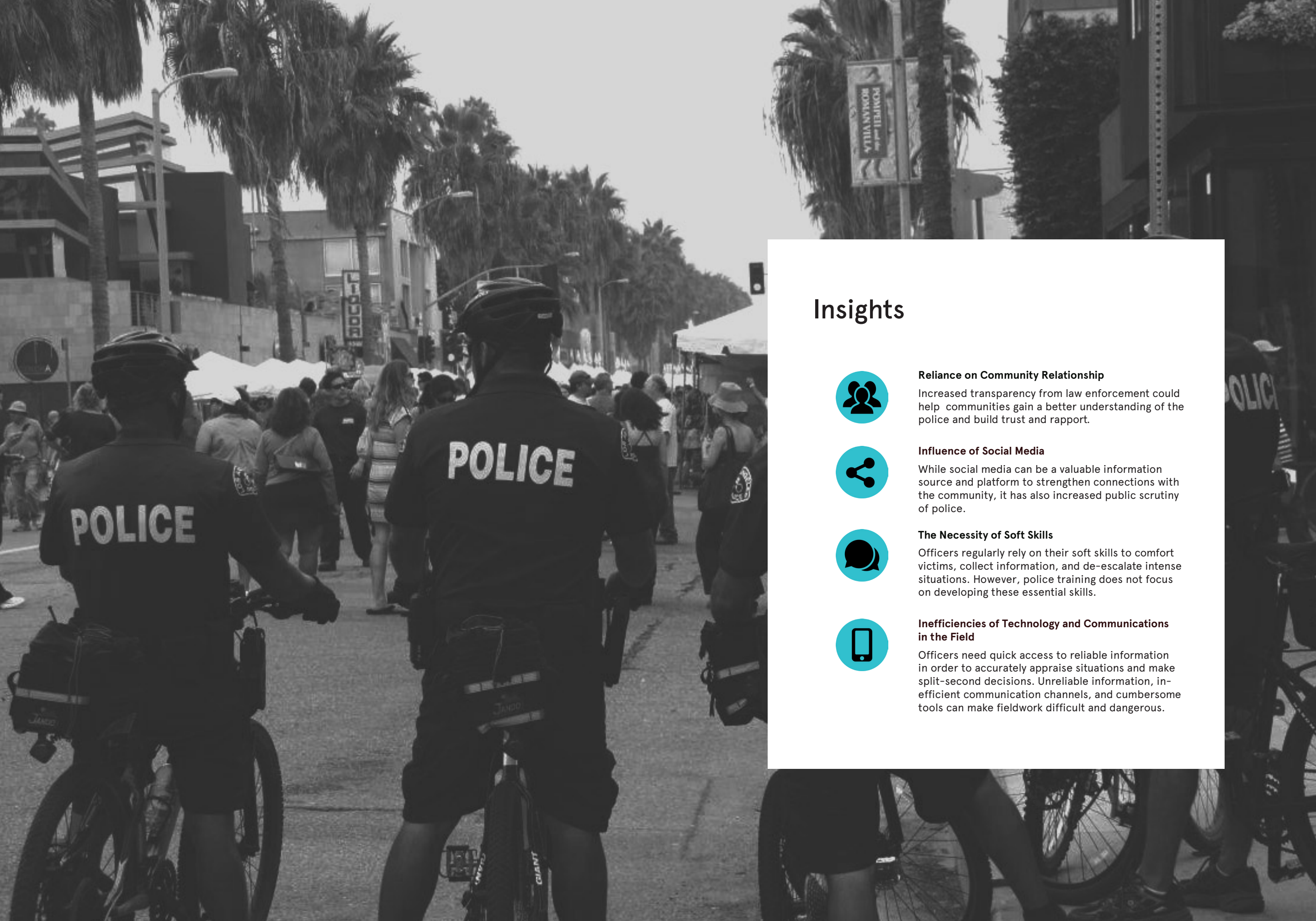
Something very similar happened in 2008 when Sergeant James Crowley encountered and eventually arrested Harvard professor Henry Louis Gates after a neighbor called to report a break-in. Although the details of what actually happened differ between both men, an official investigation faulted both for failing to seize opportunities they had to deescalate the situation.

This story portrays the kinds of challenges that officers face in the field every day and how situations can quickly go awry. Officers regularly interact with members of the public and must react to situations where they have limited information. Their actions have a strong influence on the community's perception of law enforcement.

Our research investigates design opportunities for improving the tools officers use in the field and in these high-tense situations, as well as opportunities for improving rapport between law enforcement and the communities they serve.



Portland Police Chief speaks with community members gathered for an event in response to the police shootings of Philando Castile and Alton Sterling.



Insights



Reliance on Community Relationship

Increased transparency from law enforcement could help communities gain a better understanding of the police and build trust and rapport.



Influence of Social Media

While social media can be a valuable information source and platform to strengthen connections with the community, it has also increased public scrutiny of police.



The Necessity of Soft Skills

Officers regularly rely on their soft skills to comfort victims, collect information, and de-escalate intense situations. However, police training does not focus on developing these essential skills.



Inefficiencies of Technology and Communications in the Field

Officers need quick access to reliable information in order to accurately appraise situations and make split-second decisions. Unreliable information, inefficient communication channels, and cumbersome tools can make fieldwork difficult and dangerous.

Reliance on Community Relationship



The lack of trust and support for law enforcement in some communities inhibits officers' ability to do their job. The public feels that law enforcement is not transparent enough, whereas officers feel that the public does not understand the nature of police work and has little empathy for police.

Importance of Community-Police Relationship

Lack of community cooperation makes it difficult for law enforcement to effectively do their job.

Many of the law enforcement officers we interviewed cited witnesses as the most helpful investigative resource, second to video footage. Witnesses are useful for understanding what happened, getting more leads, and providing testimony as evidence in court.

A common frustration officers feel is that people are unwilling to disclose what they saw, even though it's clear they have seen something. Some people distrust law enforcement and do not want to give information that would help their investigation. Others are afraid that their community will ostracize them for collaborating with law enforcement or that the person they are giving information about will hurt them or their family in retaliation.

The national average clear rate for murder investigations in the United States is 65%¹, though in many urban areas it is much lower. Some officers attribute this to difficulties getting anyone to come forward as a witness. Officers believe that their clear rate could go up to 90% if they could get people to come forward more often.

Public Perception of Police

Officers feel that the public has little empathy for the dangers and challenges of police work. Additionally, they feel that the public forgets that police are also part of the community.

Officers we spoke with mentioned several misconceptions they perceive the public has about their job - for example the public forgets that members of the police are also members of the community. However, community is very important to law enforcement; Officers mentioned making a difference in their



Pittsburgh Police participate in a workshop with local communities at the Center on Race and Social Problems, University of Pittsburgh



San Diego Police support community events like the qualifications for the special olympics

“The most common misconception around law enforcement is that people forget that officers are people too and they are also a part of the community.”

– **Special Agent**
United States Government

community is what motivated them to pursue a career in law enforcement.

Although there are times when officers apply force inappropriately, most officers feel that the public’s criticism in most cases is unwarranted. They think the public has little empathy for the difficulties that law enforcement faces, as they constantly need to make split-second decisions with limited information in dangerous situations. As one officer notes, “It’s very easy to sit back in the comfort of your own home and say, ‘That cop shouldn’t have shot that person.’ It’s much harder to do after you’ve put yourself in that position.”

Transparency in Law Enforcement

Members of the public want more transparency and accountability of police, but police feel they are as transparent as their job allows.

Transparency is essential for building mutual trust and understanding, especially in the relationship between law enforcement and the community². Police feel more posi-

tive towards members of the public when they answer questions truthfully. The public feels the same way about police when police candidly disclose information regarding their operations.

A 2016 Gallup poll revealed that only 56% of people in the United States trust the police³. Many members of the public feel that the police are not transparent enough, especially related to giving updates on open cases, releasing statistics on department performance, or disclosing details related to perceived officer misconduct. This makes some believe that law enforcement is being intentionally opaque to protect their public image or the career of individual officers.

However, law enforcement feels that they release as much information to the public as they are able to. Many agencies regularly release crime data reports through their websites, social media pages, and through emails to the community. Moreover, laws and strict procedures prevent agencies from releasing too much information. For example, agencies are hesitant to disclose information regarding ongoing cases for fear of compromising the investigation. The confi-

dentiality of body camera footage is another concern: some states have started passing laws that no longer classify body camera footage as part of public record. Some feel these laws limit public oversight of police while others think the laws are necessary to protect the privacy of members of the public^{4,5}.

In some cases, the data simply doesn’t exist. For example, there is no federal record for how many officers have shot members of the public in a given year. Currently the most comprehensive information comes from news sources like The Washington Post⁶ and The Guardian⁷. FBI director James Comey even acknowledged that it is embarrassing that the media is better able to report on these statistics than law enforcement can^{8,9,10}. To rectify this, the United States Justice Department is launching a pilot program to track the use of force across 178,000 federal agents. This is part of a larger project to collect better data from local and federal agencies¹¹.

Balancing transparency with legal and infrastructural limitations will continue to be a challenge for law enforcement moving forward.

“I just wish I could get [officers and citizens] to stop and listen to each other during these moments of tension.”

– **Detective**
Pittsburgh Bureau of Police

Influence of Social Media



Social media has created both opportunities and challenges for law enforcement. While it can be a valuable information source and platform to strengthen connections with the community, it has also increased public scrutiny of police.

Social Media for Public Outreach

Social media enables law enforcement to engage the public, but lack of resources or best practices prevents agencies from utilizing it effectively.

Over 95% of law enforcement agencies use social media as a channel for connecting with the community². Agencies post internal news (e.g. job promotions) and public service announcements, advertise department events, and source tips from users. Several law enforcement agents feel their presence on social media helped increase community engagement.

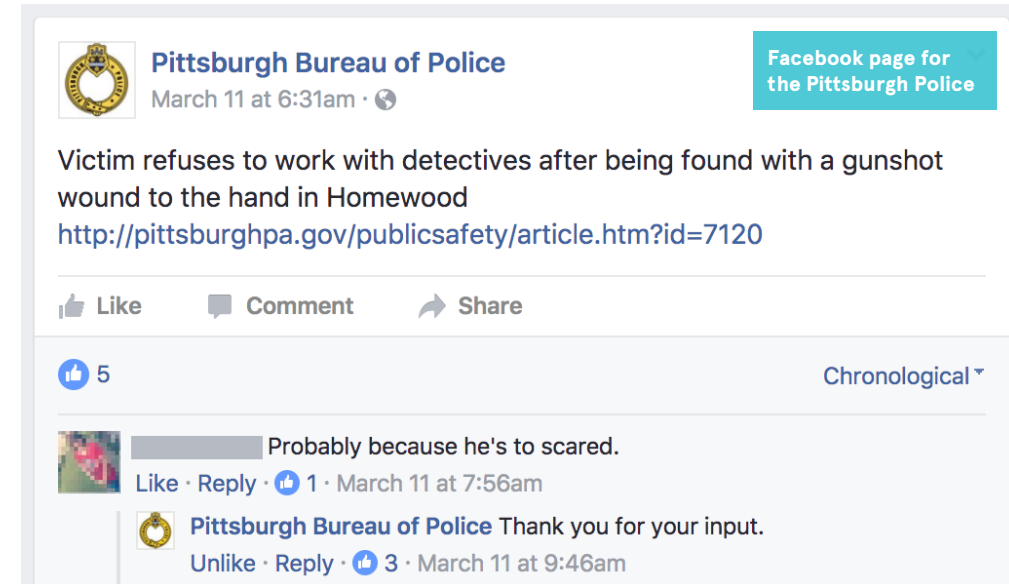
However, since social media is still relatively new, agencies have difficulty establishing appropriate standards or allocating resources to manage their social media presence. In many cases, detectives manage their agency's social media presence in addition to their regular duties¹³. Lack of rules or guidelines for maintaining a social media

presence can occasionally lead to controversy. For example, several law enforcement agencies received a negative response after posting mugshots of convicted criminals to their Facebook pages¹⁴.

Some federal agencies are starting to establish standards and a unified brand on social media, but this may harm the presence of local branches. One federal officer recounted that their department used to have a very active Facebook page until their superiors told them to cease activity so that they could consolidate social media presence across all agency locations. Unfortunately, this plan was not effective and the officer laments the loss of freedom they had with their old page.

Social Media as an Investigation Tool

Social media platforms yield opportunities to gain information on particular suspects or city-wide trends.



Law enforcement uses social media for investigative purposes. By looking at public information online, officers are able to get information on suspects, their associates, and the places they visit. Law enforcement also leverages third party services that aggregate information from social media such as Geofeedia for location trends. However, some of these tools have recently been shut down due to privacy concerns¹⁵.

Increased Scrutiny of Law Enforcement

Social media's viral nature has increased public scrutiny of law enforcement, making officers more cautious when interacting with members of the public.

The rise of social media and smartphones has increasingly democratized the sharing of news and information. This has put a spotlight on officer misconduct as members of the public use their mobile devices

to record and share officers' actions on social media. The raw footage of these incidents go viral and draw the attention and outrage of the general public.

However, many law enforcement officers feel that some of the stories portraying incidents with officers are meant to evoke a strong reaction rather than present a factually complete story. They feel that these stories unfairly portray the officer in a negative light and inflame negative sentiment towards law enforcement in their community, even if the event did not occur locally. Officers and departments have acquired a heightened sensitivity that any misstep could lead to major backlash from the public. As a result, over 70% of officers are hesitant to act in situations that might require the use of force or approaching a person of interest. Some criminologists and law enforcement experts suggest officers' over-caution could lead to an increase in crime, though there are others who disagree^{16,17,18}.

The Necessity of Soft Skills



Officers in the field regularly rely on their soft skills to comfort victims, persuade witnesses to disclose information, and de-escalate intense situations. However, police training does not focus on developing these essential skills.

Soft Skills Increase Effectiveness in the Field

Officers with strong soft skills are more effective in the field and less likely to rely on physical force.

Because most of day-to-day law enforcement work involves interacting with people, officers regularly need to rely on their soft skills, such as the ability to communicate effectively, to read others' emotions and intentions, to empathize with people, to persuade others to comply, and to monitor their own emotions.

Officers with well-developed soft skills are better at interviewing citizens as witnesses or suspects, building rapport, and getting more information, all of which are common in investigative police work. One officer stressed the importance of not letting personal feelings take over when interviewing suspects. He said that even if what the suspect has done is utterly reprehensible, showing empathy instead of disgust

builds rapport and opens them up to sharing information.

Additionally, soft skills can be useful for de-escalating intense situations without needing to use force. While there are some situations where the use of force is necessary and unavoidable, others can de-escalate if the officer has the proper training and finesse.

Soft Skills Are not the Focus of Police Training

The amount of time that police academies spend training new recruits on soft skills is not proportional to their importance in the field.

With an increasingly aging police force, agencies are becoming more reliant on younger, inexperienced officers. Before becoming full-fledged officers, new recruits spend hundreds of hours training in police academies in addition to training in

“ I tend to pride myself on doing old-fashioned police work, like going out and talking to people... things that sometimes get missed by the new technology generation.”

— Special Agent
United States Government



Officers on bikes are perceived to be more approachable and in cities like Seattle they have higher arrest rates. In Minneapolis, officers on community patrols have tried a series of programs to build trust between immigrants and the police.



Considered state-of-the-art, close to 360° simulation training is used to experience decision-making in tense situations. Most agencies use a simple projector on a single wall.

“We’re proficient in [shooting], but we’re not proficient in the No. 1 thing: dealing with people.”²²

— Mike Chitwood,
Sheriff, Volusia County, Florida



At some agencies, officers receive cultural training to learn how to deal with citizens of different cultures, traditions, and religions with respect.

the field under the supervision of an experienced officer. This training emphasizes operations, knowledge of the law, and physical skills such as defense, use of force, and weapons. Even though officers frequently rely on their soft skills in the field, the amount of training time for soft skills is relatively small. Out of an average of 556 training hours, only 40 focus on developing soft skills, though some of the operational training may indirectly touch on them¹⁹.

Officers usually develop their soft skills over time as they get more experience on the job. However, relying on officers to gain this experience in the field may come with a risk since younger officers are more likely to rely on force than older, more experienced officers²⁰. This could be due to lack of experience dealing with high-stress situations in the field or lack of experience applying soft skills.

Technology’s Effect on Soft Skills Development

Younger officers’ preference for using technology over directly interacting with members of the public may inhibit their soft skills growth.

In addition to a lack of training, older police officers perceive that younger officers’ reliance on technology inhibits soft skills development. Older officers claim that younger officers tend to prefer relying on technology as an investigation tool and are more reluctant to do “old-fashioned police work”, such as asking nearby residents if they saw anything relevant to the investigation. Some younger officers acknowledge that their soft skills are not as developed as older officers in their agency, but feel that their expertise in technology make them a valuable part of the police force and that they will just learn as their career progresses.

Soft Skills Include

- Empathy
- Emotional intelligence
- Persuasion and interviewing skills
- Effective communication
- Emotional self-awareness

Inefficiencies of Technology and Communication in the Field



Officers in the field need quick access to reliable information in order to accurately appraise situations and make appropriate split-second decisions. Incomplete or unreliable information, inefficient communication channels, and cumbersome tools can make fieldwork difficult and dangerous.

Information Can be Unreliable or Unavailable

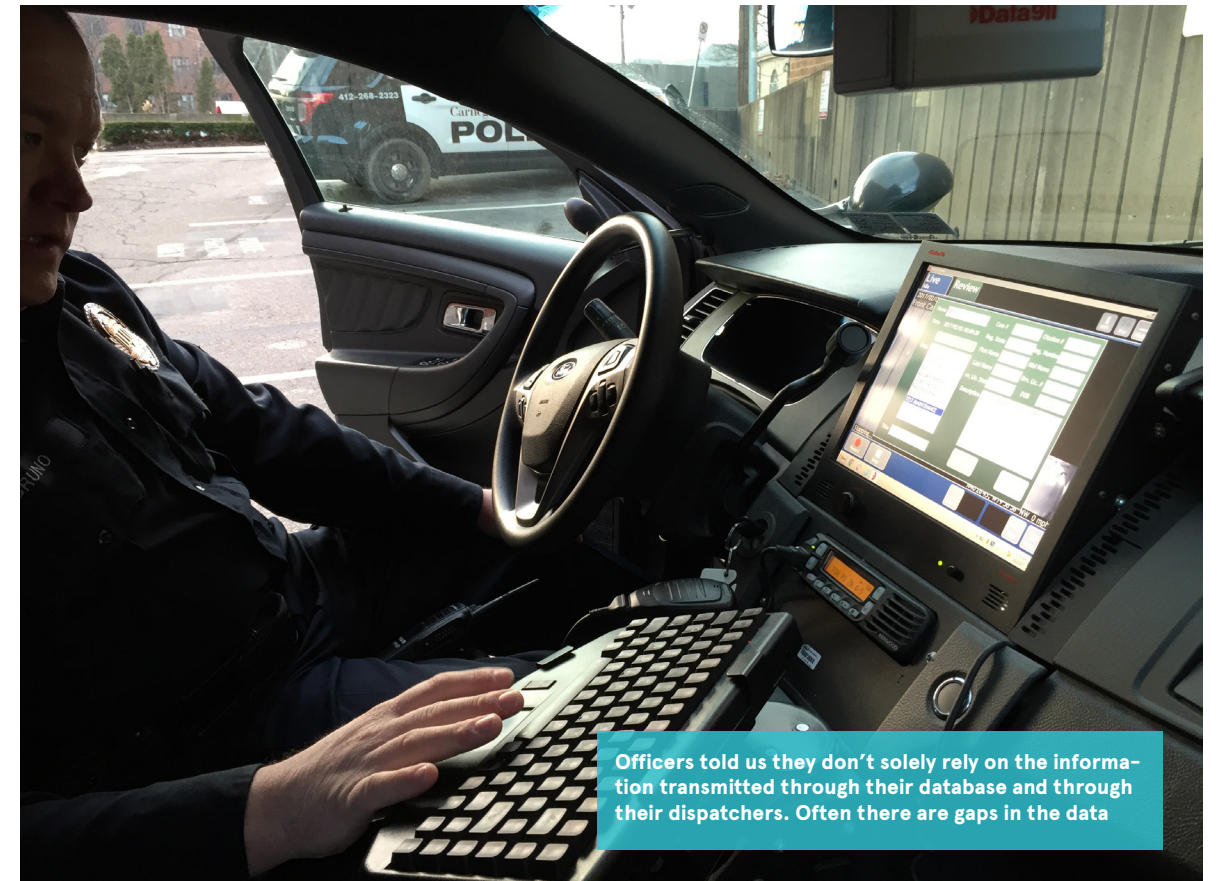
When officers have to make decisions based off of unreliable or incomplete information, the results can be fatal.

One significant challenge for law enforcement is that they need to quickly react to situations before they have an accurate understanding of what is happening. In this context, a lack of information can be fatal.

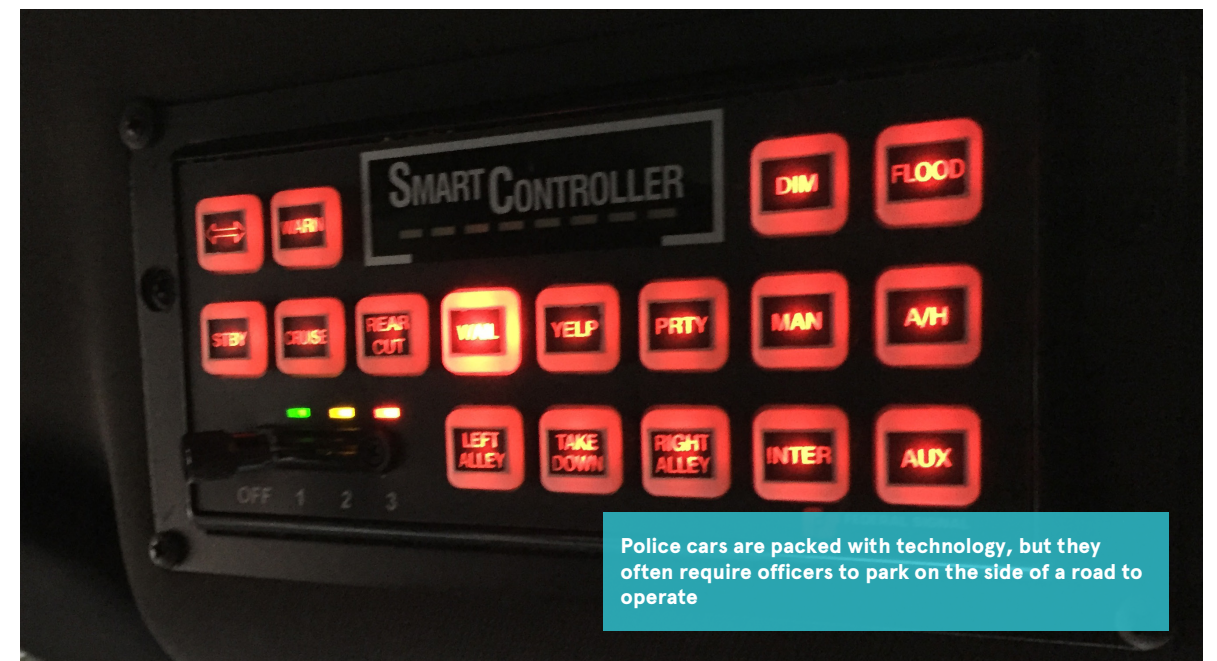
Although being well-informed is critical in the field, many officers have problems accessing reliable information on persons of interest. Sharing warrants, BOLOs, and arrest records across agencies is almost impossible because each agency uses a different system. Additionally, the information in these systems can be unreliable. One officer told us that he once visited a person of interest for the fourth time, but the system had only recorded two previous visits. Experiences like this

have led officers to mistrust their software systems and instead rely on their memories. It is unclear if inaccuracies are due to improper information saving or if officers do not update the system.

Law enforcement officers responding to emergency calls face an additional complication. When responding to a situation, the information they receive can be unreliable. In one tragic case of misinformation, police went to the residence of Rick and Andi Sheldon with information from a dispatcher leading them to believe that Andi had chased her husband out of the house with a shotgun after a domestic dispute. In actuality, Rick had left the house to settle down and Andi had gone to bed. Police went to the Sheldon's house and Andi, thinking that the people outside her house were burglars or intruders, stepped out holding a shotgun with the intent of defending herself. The officers shot her and she died at the scene^{21,22}. While these types of fatal mistakes



Officers told us they don't solely rely on the information transmitted through their database and through their dispatchers. Often there are gaps in the data



Police cars are packed with technology, but they often require officers to park on the side of a road to operate

“Since I don’t work with a partner, I need to stop my car every time I look up information.”

– Police Officer
Pittsburgh Bureau of Police

are rare, it is worth noting that an improved communication system could have prevented it.

Reliance on Verbal Communication

Officers rely heavily on verbal communication, which can be slow and lead to miscommunications.

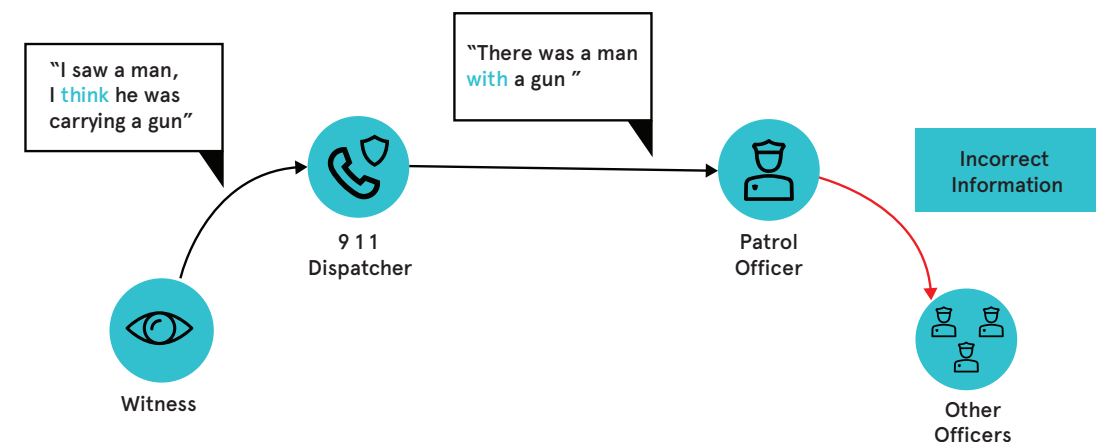
In many situations, law enforcement officers need to quickly communicate with 911 operators, emergency responders or other officers while mobile. These communications are primarily verbal, which are slow and can lead to miscommunications. One officer mentioned an incident where he was coordinating with other members of his agency to track down a suspect. To compensate for the fact that he did not have a radio in his car, the officer called a colleague in another car. The colleague held a cellphone in one hand and a radio in the other hand, relaying information to and

from the officer. This became confusing when the officer was pursuing the suspect and relayed information about his location to everyone else in the operation. Because of the delay, the officer’s unit had difficulty understanding where he was. Fortunately, they were able to catch the suspect without any casualties. The officer remarked that knowing his colleagues’ location during a group operation is still a challenge, even when everyone is using the same communication system.

Utility and Mobility of Field Tools

Mobile technology in the field is increasingly common, but some tools are unreliable or difficult to use, resulting in lost time or information.

The rise of mobile technologies has led to an increase in tools available to law enforcement on the go. The utility of in-car systems, electronic forms, and body cameras indicate that technology’s role in law



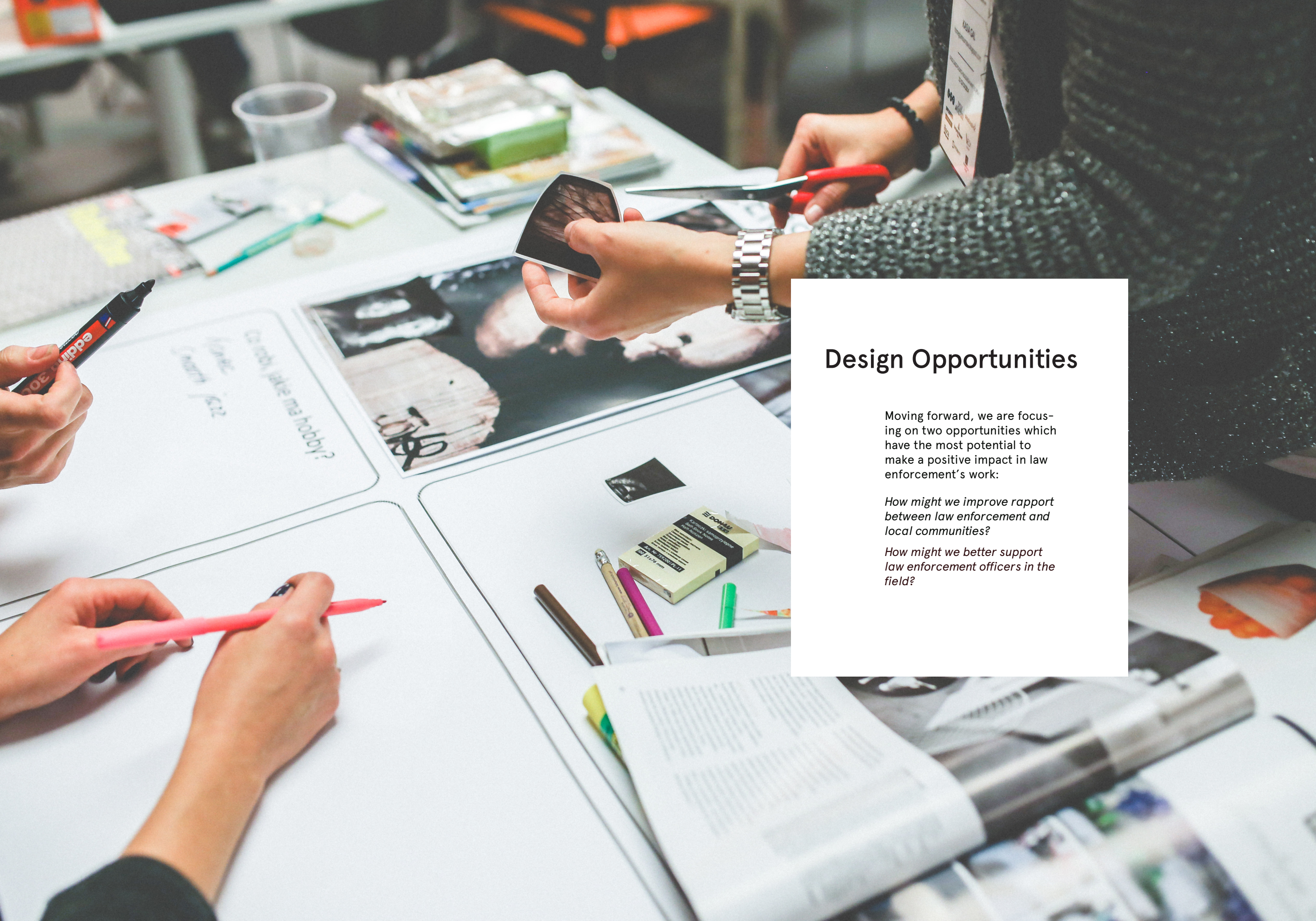
enforcement fieldwork will continue to grow. But if officers are going to rely on technology while they are in the field, it is important for it to be usable and reliable.

Many of the tools that officers have come to rely on are riddled with issues. Patrol officers use in-car systems to look up important information while mobile, but these systems are slow and uncomfortable to operate. One officer remarked that he needs to stop his car every time he wants to look up information if he does not have a partner.

Systems for recording valuable case information in the field have reliability issues as well. In-car recording systems automatically upload footage from an officer’s car to the agency’s server nearby, but sometimes the upload does not succeed and the footage gets lost in the process. Additionally, applications officers use to take notes on crimes are prone to crashes, which also result in the loss of critical data.

“That first bit of information, that 911 call you get... it’s always wrong. And if you’re operating on that first piece of information and you’re flying in at a hundred miles an hour, you’re going to make a wrong decision.”²²

– Mike Chitwood
Sheriff, Volusia County, Florida



Design Opportunities

Moving forward, we are focusing on two opportunities which have the most potential to make a positive impact in law enforcement's work:

How might we improve rapport between law enforcement and local communities?

How might we better support law enforcement officers in the field?

Design Opportunity #1: Community Rapport

Challenges we address with this design direction:



Reliance on Community



Influence of Social Media



Necessity of Soft Skills



Technology and Communication

The Importance of Community Rapport

Law enforcement relies heavily on the support and cooperation of local communities to effectively perform their duties. Members of the community provide information to help law enforcement solve cases and they help law enforcement devise solutions to local crime and disorder problems.

Public trust in law enforcement is recovering from an all-time low in 2015 and as a result, officers have difficulty getting members of the community to trust and work with them. This makes us wonder: *how might we design a solution to improve rapport between law enforcement and local communities?*

Addressing Implicit Bias

Some members of the public mistrust law enforcement because they feel that officers' implicit biases influence decision making. Implicit bias could be a factor in who officers choose to investigate or when officers apply force. Many police officers, especially experienced officers, mentioned that they rely on their intuition to assess the innocence or guilt of suspects. Relying on something subjective like intuition introduces the opportunity for implicit biases to influence decisionmaking.

There are opportunities to design standardized procedures, training, or in-field tools to combat the influence of implicit bias in officers' decision making processes.

Facilitating Community Interactions

Casual face-to-face interaction with law enforcement may improve the community's relationship with law enforcement. Officers get to know the people whom they are protecting and serving and members of the public get to know their officers in a non-enforcement context.

There are opportunities to use technology as a way to connect local law enforcement with community members and facilitate casual face-to-face interactions as a way to build community rapport.

Safe Space Information Sharing

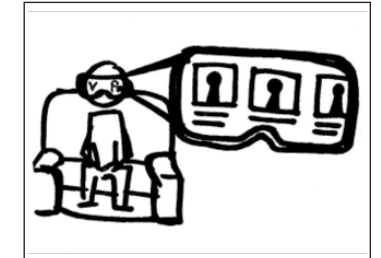
A remote sharing platform to help witnesses feel comfortable sharing information



Officer Prater is scheduled to meet with a witness of a recent robbery



Both log on to a common platform that allows them to communicate remotely in the same space



The witness is able to share information from the comfort of his home and protect his identity

Supporting the Transparency of Police Work

Transparency builds public trust in law enforcement and is critical to building positive police-community relationships.

There are opportunities to increase the accessibility of publicly available records which community members may not necessarily be aware of. Additionally, it might be possible to create a solution that enables members of the public to track investigation progress on crimes they have reported while protecting confidential case information.

“We see evidence through [the lens of bias]. So to get a full grasp of the complex criminal justice system and where it is erroneous, we have to look at ourselves as flawed human beings... any solution has to start with a better understanding of ourselves as human beings.”

— **Marissa Bluestine**
Legal Director, Pennsylvania Innocence Project

Design Opportunity #2

Challenges we address with this design direction:



Reliance on Community



Influence of Social Media



Necessity of Soft Skills



Technology and Communication

The Importance of Tools that Facilitate Field Work

A significant amount of law enforcement work occurs out in the field – patrolling local areas, interacting with the community, interviewing witnesses, and tracking down leads. This work in the field requires officers to make split-second decisions in unpredictable situations, which can escalate dangerously for both officers and the members of the public they interact with. This made us wonder: how might we better support law enforcement officers in the field to improve safety and effectiveness?

Improving Existing Tools

Some existing tools officers use in the field are unreliable, cumbersome, and unintuitive to use. These tools cost officers precious decision-making time or could result in the loss of important case information.

There are opportunities to improve these tools to intuitively and reliably support officers' needs in the field.

Supporting Communication in the Field

Officers rely on communicating with others to get information or coordinate during operations in the field. Existing communication systems can

be inefficient or lead to misunderstandings.

There are opportunities to improve communication so that officers are more informed to make better decisions.

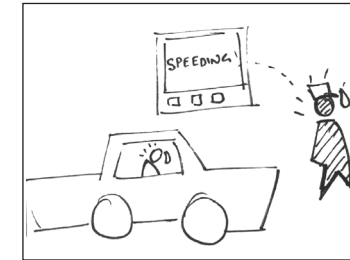
Improving Upon Training

Soft skills are essential for officers to learn, but the new officers may not get as much training time as they need to effectively develop them.

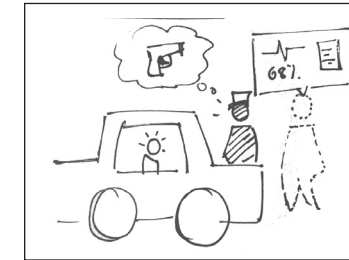
There may be opportunities to design and build tools that can facilitate or augment soft skills training in the field and enable officers to improve their skills faster.

In-the-Field Assistant

An intelligent assistant to help reduce cognitive load and allow for mobility in the field



Officer Wood has stopped a speeding car on a local road



While speaking with the driver, she obtains contextual information about the driver and what questions to prompt from her smart assistant



The assistant provides information at the moment of interaction that she would have had to lookup on her police car computer

“ We don't have access to other agencies' radio bands so if we're working a case together, you'll literally have to have one person in a car with both radios coordinating back and forth.”

– **Special Agent**
United States Government

Our Process

50

Literature Review Sources

5

Local Officers and Detectives

5

Federal Law Agents

4

Emergency Planning Officials

1

Community Policing Volunteer

1

Criminal Justice Experts

1

Criminal Data Analyst

Literature Review
Expert Interviews
Contextual Inquiry
Affinity Clustering
Rose-Bud-Thorn

Co-Design Workshops
Speed Dating
Card Sorting
User Testing
Higher Fidelity Prototyping

Exploratory Phase

Generative Phase

Evaluative Phase

Observation Studies
Sketch Prototyping
Bodystorming
Storyboarding
Graffiti Walls



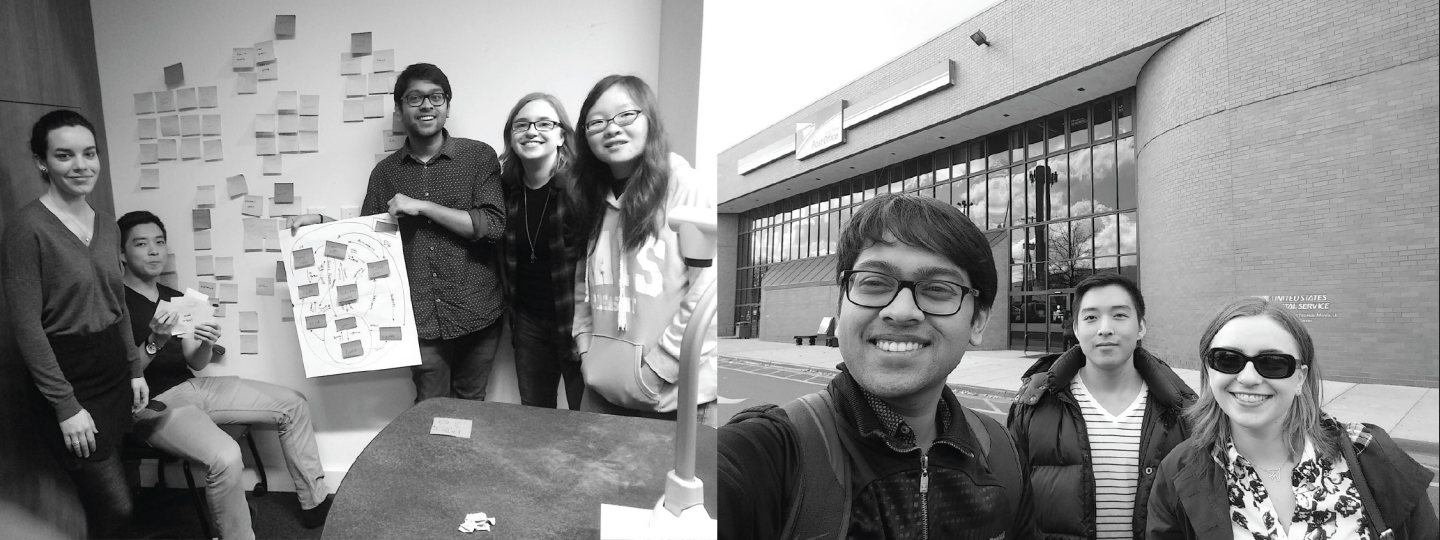
We conducted over 17 contextual interviews with experts



We used an affinity diagram to organize our findings



Early-stage bodystorming of our initial ideas



About Us

The Team



Shannon Sullivan
Project Manager

User experience designer with a passion for research.



Alex Wang
Research Lead

Bachelor's in Information Systems and Human-Computer Interaction, Minor in Design



Vita Chen
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Irene Alvarado
Prototype Lead

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About HCII

The Human-Computer Interaction Institute (HCII) is a department housed in the School of Computer Science at Carnegie Mellon University. Drawing on research in the fields of design, computer science, and the behavioral sciences, the HCII takes an interdisciplinary approach to creating technology that supports and advances human endeavors. The Masters in HCI (MHCI) program is a 12-month, three semester, graduate program where students learn the fundamentals of programming, design, and research methods. In the second and third semesters of the program, we have the opportunity to apply the methods and skills we have learned in a capstone project. This book is the culmination of the first semester of the capstone project.

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- * A full list of references can be found in the accompanying external drive to this report

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