

The IACP Research Advisory Committee is proud to offer the monthly Research in Brief column. This column features evidence-based research summaries that highlight actionable recommendations for *Police Chief* magazine readers to consider within their own agencies. The goal of the column is to feature research that is innovative, credible, and relevant to a diverse law enforcement audience.

Research in Brief: Assessing the Effectiveness of Automatic License Plate Readers

By Jason Potts, Lieutenant, City of Vallejo, California, Police Department

Although the evidence-based policing movement has gained traction, many of the policies and practices U.S. law enforcement employ are still based on dogma and tradition, rather than research. As a result, there are efforts under way to promote the use of research to make jurisdictions more effective, more efficient, and safer.

In this line of thinking, the Vallejo Police Department (VPD) in California sought to discover whether automatic license plate reader (ALPR) technology would help improve motor vehicle theft detection. In partnership with a nonprofit research organization, BetaGov, VPD conducted a randomized control trial (RCT) study that provided empirical evidence showing that ALPR technology effectively identifies stolen cars and individuals linked to auto theft crimes. This trial provided invaluable information to inform the VPD's approach to motor theft. It also showed a few of the cynics that an RCT design could be conducted successfully and result in applicable, relevant findings.

The United States presents a challenging environment for police research. With 18,000 distinct police departments, police practices often go untested despite the enormous cost of inefficient and even harmful operations.¹ Further exacerbating the issue, many departments have fewer than 10 officers and significant resource constraints.² Given huge variations in the size, resources, training, and culture of these agencies, many policing practices are based on traditions and anecdotal experience—not on data or research.

VPD's partnership with a research organization mitigates this limitation by providing practitioners with a roadmap to run trials that are relevant and useful to their departments.³ With policing research, the challenge is often transferability: what might work in one jurisdiction might not work in another—for a program to be effective, it must be tested within an agency's specific staff, demographics, environment, and culture.⁴

RCTs are the gold standard of research.⁵ They allow police departments to isolate the causal effect of an intervention by comparing the outcomes of an intervention group with a control group.⁶ With this approach, agencies can discover whether an intervention is working as intended, has no effect, or is doing harm.⁷ The VPD used this design to determine whether ALPR technology was effective in its jurisdiction and working as intended.

Trial and Results

Vallejo's study involved randomizing patrol cars equipped with ALPR technology. Officers selected cars based on seniority and were blinded to the study condition. The vehicles were randomly assigned to have ALPR



alerts “activated” (ALPR alert function on). The control condition had their alerts “deactivated” (ALPR alert function off). The randomization schedule was set to a 2:1 ratio of intervention (alert on) to control (alert off).

Analysis of trial data found that police cars equipped with ALPR technology showed a 140 percent greater ability to detect stolen cars. However, further analysis showed the technology also identified many more lost or stolen plates—as many as four times more—many of which were duplicates that may have desensitized officers to legitimate hits. Fixed ALPR (stationary units) were found to be more efficient than mobile ALPR in making arrests, as officers tended to sit downstream of fixed locations waiting for hits, resulting in more custody arrests. The control data also showed that 35 percent of all hits were misreads for the mobile readers, with a similar number (37 percent) for the fixed readers. After controlling for the number of cars assigned to each condition, the department found there were significantly more hits in the ALPR intervention condition ($p < 0.05$).

Identified stolen vehicles were also more likely to yield arrests when identified by officers with more seniority, but this was only marginally significant ($p < 0.10$). A patrol car using the fixed ALPR system had substantially higher odds of identifying a stolen vehicle compared to one that did not ($p < 0.001$). When flagging stolen cars, these cases were more likely to result in an arrest ($p < 0.01$).

The study was conceived and run by the officers; it employed a randomized design; and it relied on objective records for outcomes.

Action Items

Research can and should play a part in responding to policing challenges. This research should complement—not replace—officer discretion and personal leadership. Data and science should motivate and empower police to test traditional policing methods and technology, which should be done with competent crime analysts.

Policing agencies might consider these action items when implementing research-based strategies such as RCTs:

- Employ and utilize crime analysts.
- Embrace a culture that standardizes evidence-based policing concepts in promotional testing and field training manuals.
- Celebrate successful experiments with the public to help build awareness and momentum for data-driven strategies.
- Shift from an emphasis on random patrol, rapid response, and reactive investigations to looking at data through the lens of targeting, testing, and tracking.⁸

Conclusion

There are many challenges to an evidence-based policing approach, especially when attempting an RCT. Policing deals with real lives, concerns, and consequences—it doesn't happen within a controlled laboratory environment, and it is often difficult to measure intention and meaning. Law enforcement executives also often have to contend with political pressures both externally and internally.

However, despite the challenges, the law enforcement profession must do more than make policing a "check-the-box" concept.⁹ Evidence-based policing can enhance traditions and good instincts while empowering officers to be more effective by using science and data. With limited resources, the VPD designed and implemented an easily replicable and useful study.

Other departments can do the same. The worlds of research and policing can converge if evidence-based concepts and studies are digestible, relevant, easily replicated, and compelling to the more than 750,000 state and local law enforcement officers in the United States.¹⁰ ♦

Notes:

¹Lawrence W. Sherman, "The Rise of Evidence-Based Policing: Targeting, Testing, and Tracking," *Crime and Justice* 42, no.1 (2013): 377–451.

²Christopher Stone and Jeremy Travis, "Toward a New Professionalism in Policing," *New Perspectives in Policing* (March 2011): 13, 11, <https://www.ncjrs.gov/pdffiles1/nij/232359.pdf>; Duren Banks et al., *National Sources of Law Enforcement Employment Data*, revised October 4, 2016, <https://www.bjs.gov/content/pub/pdf/nsleed.pdf>.

³Angela Hawken, "Evidence-Based Policing Panel" (presentation, American Society of Evidence-Based Policing Conference, Phoenix, AZ, May 22, 2017).

⁴Hawken, "Evidence-Based Policing Panel."

⁵Hawken, "Evidence-Based Policing Panel."

⁶Mathew Syed, *Black Box Thinking: Why Most People Never Learn from Their Mistakes--But Some Do* (New York, NY: Penguin, 2015).

⁷David Wilkinson, "What Is Correlation?" *The Oxford Review* (blog), May 22, 2017, <https://www.oxford-review.com/what-is-a-correlation>.

⁸Sherman, "The Rise of Evidence-Based Policing."

⁹Nathan Constable, "A Course of Leeches," *Nathan Constable* (blog), April 24, 2017, <https://nathanconstable.wordpress.com>.

¹⁰American Society of Evidence-Based Policing, "About ASEBP," <https://www.americansebp.com>; Banks et al., *National Sources of Law Enforcement Employment Data*.

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