

Solving Property Crimes

with DNA Evidence

Written by Dale Garrison

RESULTS OF A STUDY by the National Institute of Justice (NIJ) suggest that collecting and processing DNA evidence from scenes of property crimes significantly increases the likelihood of an arrest and is more cost-effective in the long run to law enforcement. The project—called the DNA Field Experiment—resulted in a report that was produced by the Urban Institute. The report analyzed the use of DNA evidence in the investigation of property crimes in five jurisdictions: Orange County, California; Los Angeles, California; Denver, Colorado; Phoenix, Arizona; and Topeka, Kansas.

The study found that in property-crime cases where DNA evidence is processed, twice as many suspects are identified, twice as many suspects are arrested, and more than twice as many cases are accepted for prosecution compared to traditional investigation. Further, the study determined that when compared with fingerprints, DNA is at least five times more likely to result in a suspect identification.

“We were surprised to see it was so much more effective than fingerprints,” said one of the report’s authors, John K. Roman of the Urban Institute. “Given how much larger the national fingerprint database is compared to the national DNA database, it is really surprising.”

Property crime:

Higher numbers, lower priority

Compare the seriousness of a home burglary or car break-in to a rape or a murder, and it is easy to see why more time and resources are allocated to the

violent crimes. A look at the number of property crimes compared to violent crimes, however, shows why the NIJ is looking for better ways to solve everyday crime: In 2006, murders and rapes accounted for about 110,000 crimes in the United States. That same year, burglaries accounted for more than 2 million of the crimes committed in the United States.

While collection and use of DNA evidence is commonplace in violent crimes, it is rare in the United States for investigators to look for biological evidence in property crimes such as burglaries. The study identified several challenges that arise when DNA is used to help solve high-volume crimes. These challenges include a shortage of laboratory funding and an increased volume of cases that go to court. But the results also provide some strong evidence that processing DNA evidence in at least some property-crime investigations can significantly increase the speed and efficiency for getting bad guys off the street.

DNA collection and analysis proved especially potent in fighting serial burglars and other individuals who may be responsible for hundreds of crimes a year. Although processing DNA evidence carries a higher price tag than traditional forensic methods such as latent-print analysis, the report shows that the method can improve law enforcement’s ability to have a positive impact on local property crimes.

“We found that we could link to more of the suspect’s life’s work as a

burglar,” Lynn Kimbrough, the communications director for the Denver (Colorado) District Attorney’s Office. “That alone makes a huge difference.”

DNA can paint the picture of a long criminal history

The study showed that collecting DNA at property-crime scenes could, over time, help link a repeat offender to multiple crimes. Rather than taking an individual to court for a single crime, DNA evidence collected from multiple scenes can paint a “big picture” that shows a criminal involved in hundreds—or even thousands—of crimes.

“It is not uncommon to have a burglar face probation, or certainly less than two years in prison,” Kimbrough said. “With DNA evidence, we were able to go in and link more of their work. That would result in an average sentence of 14 years.”

In the Denver study, up to 90 criminal cases involved burglars who proved to be responsible for 100 to 200 burglaries a year. “Taking just a few of these people off the street would have a huge impact on the community,” Kimbrough added.

A closer look

at the DNA Field Experiment

The DNA Field Experiment evaluated the cost-effectiveness of using DNA evidence to help in the investigation of high-volume crimes, including residential burglary, commercial burglary, and theft from automobiles.

Biological evidence was collected at up to 500 crime scenes in each of the

five participating jurisdictions between November 2005 and July 2007. These cases were randomly assigned to either the treatment or control groups, producing a roughly equal split of cases within each site. In the treatment group, DNA processing and traditional practices were used to investigate the case. In the control group, biological evidence was not initially tested, and suspects were identified using only traditional investigative and forensic methods.

Some interesting statistics emerged from the study. When DNA analysis was involved in an investigation, a suspect was identified in 31 percent of those cases. In the control cases that did *not* use biological evidence, a suspect was identified in only 12 percent of those cases. Other findings noted that:

- ❑ Suspects identified by DNA had at least twice as many prior felony arrests and convictions as those identified by traditional investigation.

- ❑ Blood samples produced the best results. When compared to cells collected from items that were touched or handled, blood samples were six to eight times more likely to yield a DNA profile that was suitable for upload to the Combined DNA Index System (CODIS), and three to five times more likely to yield a hit in CODIS.

- ❑ Saliva samples were the next most effective form of biological material for producing usable DNA profiles.

- ❑ Biological material collected by forensic technicians was no more likely to result in a suspect being identified than biological material collected by patrol officers.

Many experts were surprised by the statistics in the study that show biological evidence to be more effective in yielding identifiable suspects than fingerprint evidence. Overall, suspects were identified by biological evidence in 16 percent of the cases. However, suspects were identified by fingerprints in only 3 percent of the cases. Among all crime scenes where biological evidence was collected and tested, DNA evidence was five times more likely to lead to a suspect identification and nine times more likely to lead to an arrest than cases where fingerprints were collected and analyzed. Equally important, suspects identified using DNA evidence

In property-crime cases where DNA evidence is processed, twice as many suspects are identified, twice as many suspects are arrested, and more than twice go to court.

had substantially more serious criminal histories than those identified through traditional investigation.

Getting back the money ...as well as the peace of mind

Roman noted that catching a thief could prevent future crime and save citizens money in the long run. "If you figure the average loss in a burglary is \$2,500 and they're doing hundreds of these things a year, that's a lot of loss," said Roman. "And it is not just the homeowner who is affected. It is also the neighbors who must now worry more about security and other things."

The DNA Field Experiment report identified two specific areas where DNA analysis added expense to the criminal-justice system: First, laboratory costs and related expenses of processing a single case with DNA evidence added approximately \$1,400. Second, the added cost for identifying and arresting a suspect was \$4,502.

In the face of that price tag, DNA supporters are quick to note that suspects that would have otherwise not been identified would almost certainly continue to steal. If this is a serial burglar who commits 100 crimes a year, failing to jail him could represent an annual loss of \$250,000.

"This procedure doesn't save the police money," Roman said. "But it does save the citizens money."

Kimrough in Denver said the city estimated that for every dollar spent on DNA testing for property crimes, the police and community actually saved \$63 because of the crimes that did not occur when serial criminals were off the street and behind bars. "That was a

heck of a return," Kimrough noted. "And that's why we are going to find money to continue this. You couldn't say, 'Gosh, the federal funds are gone so we can't do this any more.'"

Approaching DNA as a team effort

Jurisdictions that are thinking about expanding their use of DNA as an investigation tool in property crimes should recognize that DNA examination involves many players in a complicated process: crime laboratories, police, and prosecutors. Cooperation between all parties involved was highly recommended by the authors of the report.

Part of the cooperative effort includes getting first-responders involved in the collection of DNA evidence. One notable finding of the report was that, with proper training, front-line police officers collect the evidence as well as laboratory technicians.

Denver District Attorney Mitchell R. Morrissey said law enforcement officers there proved to be very adept at learning this new technique. "We had an extensive training program and our officers were very quick to pick this up," he said. "It is a different mindset. Instead of fingerprints, you start looking for things like a discarded cigarette or a half-eaten bagel that hadn't been in the kitchen before the burglary."

Simply telling officers to go out and swab a scene for potential DNA evidence may not be the best approach, however. The study found that in order to maximize the probability of obtaining a DNA profile, evidence collectors should acquire whole items rather than swab items for evidence. Patience is also important to getting a DNA profile from a crime scene: The study found that success rates dropped during peak periods when officers were most busy.

Building support for added workload and expense

The biggest hurdle in utilizing this procedure may be simply convincing the public that DNA evidence is worth the trouble for property crimes. Like police officers, the community at large will need to be sold on the idea of this added step and its associated expenses. Morrissey noted that the Denver jurisdiction's experience with this study showed that community support can come with surprising ease.

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"Where it was most effective was when a sergeant-level detective saw the results and said, 'Hey, this is helping us reduce burglary in our district.' We knew if we could get someone to understand how it would help them, it would catch fire," said Morrissey. "And it did."

Heather Fairchild, forensic scientist with the Phoenix Police Department, saw a similar response in her jurisdiction. "Our officers really took to this," she said. "As the training was going on, there were calls where they would really jump to it because they knew that DNA evidence might help them put someone away. Once you see that reaction, it really builds."

In two of Denver's heaviest areas for burglaries, work done as part of the DNA Field Experiment solved or helped solve several series of crimes. This included one individual who received a 48-year sentence because he was charged and convicted at trial as a habitual criminal. Another case involved a husband-and-wife burglary team. The husband confessed to more than 1,000 burglaries after being confronted with the DNA evidence.

"When we put those two away, that neighborhood saw a 26-percent drop in burglaries," Morrissey said. "Those are the kind of cases where you get a lot of bang for your buck."

Dean Gialamas, director of forensic sciences for Orange County, California,

agreed. "It is more costly," he said. "There are additional expenses. But if you have the kind of case that needs this attention, it's worth the money."

Lessons learned from processing DNA

The sources that resulted in good DNA profiles during the experiment were almost stories in themselves. Fairchild said that her area's hot summers make it worthwhile to examine anything that can hold a drink. "Because it's so hot here, the burglars bring water bottles with them, or they will drink items in the victim's residence," she said. "It was interesting because during the winter our samples really slowed and it took us a while to figure out why: They weren't as thirsty!"

In one Denver case, a victim was at home during the break-in and a confrontation ensued. In this case, blood shed during the fight helped track down the perpetrator. Other common places where investigators found biological evidence included broken windows that cut the burglar's hand, or food items and silverware where a burglar had dined on something taken from the victim's refrigerator and inadvertently left behind a bit of saliva. Cigarettes are also common DNA carriers.

Although larger DNA samples (such as visible blood stains) received the most focus, the study also noted several instances of far smaller traces that

yielded DNA profiles, including one where tiny bits of skin tissue were found in a jewelry box.

Gialamas said Orange County has been using DNA in property crimes since 2000, and one of his agency's early questions was whether trace samples could produce usable results. The answer was Yes.

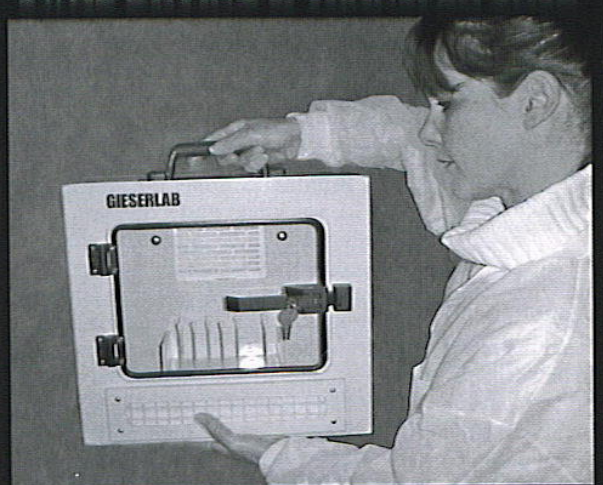
"Our first case was a cold hit where we entered the information into the database and it came back with a named, known offender," Gialamas recalled. "We had recovered his DNA from the felt liner of a jewelry box. There was no blood or anything that was obvious. He had just removed his gloves for a moment and left tiny amounts of tissue."

In all five jurisdictions involved in the study, limited resources had created a barrier to expanding the use of DNA evidence. Although existing staffing and other laboratory resources varied from one agency to the next, all found some limit to the effort due to a lack of personnel and equipment. Several sites relied heavily on outsourcing to keep up with the demand. Others had to make staffing changes.

"We found we needed a second, dedicated analyst to help handle this," Morrissey said. "That was probably the biggest thing that we underestimated."

Other strains on resources could result even after the analysis phase is complete. Collecting DNA from property crimes will undoubtedly increase

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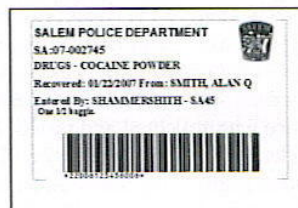
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the number of suspects that detectives need to track and arrest, as well as increase the number of defendants prosecuted by the district attorneys and represented by public defenders. Ultimately, the more efficient arrest and prosecution of offenders would create an increase in the number of felons entering incarceration in a penal system that is already overloaded.

Roman noted that in practical terms laboratories will still have a need to prioritize which DNA samples receive attention first, weighing the importance of samples from property crimes against those from violent crimes. "Before we can go far we will have to make a substantial investment in laboratory capacity to be able to use this evidence on a nationwide basis," he said.

Some benefits may be more difficult to quantify. Morrissey noted that in the Denver portion of the study, a stronger relationship was built between investigators and laboratory personnel thanks to increased cooperation. Another potential advantage is the opportunity for less-experienced police and prosecutors to actually work with DNA-related evidence in crimes that do not involve serious injury or death.

"The study got more DNA cases into our system," he said. "Most of my younger prosecutors had not handled those before. I now have a whole group of deputies that have dealt with DNA and are ready for a big rape or murder

case where they have to put on DNA evidence and the stakes are higher. I think that is a real advantage."

Thanks to a training program that was incorporated into this project, the Phoenix Police Department gained a large cadre of officers skilled in DNA collection. "It really increased the number of people who were aware of the sources of DNA," Fairchild said. "We trained a lot of officers and that is going to pay off in a lot of ways."

Gialamas saw something similar in Orange County. "It really takes a multi-jurisdictional, collaborative effort," he said. "The numbers show us that we can improve some areas, and we will do that. But working on this definitely moved us in the right direction."

More DNA in our future

If law-enforcement agencies are to increase their use of DNA analysis in property crimes, the necessary changes will revolve as much around politics as science. Roman said that a follow-up study will focus on conviction and incarceration costs that are the result of the DNA hits. Other issues that need to be addressed involve the practical threshold and cost effectiveness of advanced laboratory equipment.


Ultimately, it will be the taxpayers and political leaders who have the final say in this matter.

"We have shown that you can apply DNA to property crime and put serial

criminals away," Gialamas said. "Clearly, DNA can have a substantial impact on the safety of our communities."

Others noted that there should be at least some economy of scale as the applications become more widespread. Fairchild also noted that just as in violent crimes, DNA collected at the scenes of property crimes is the "evidence that keeps on giving."

"We now have a lot of profiles in there and we will get a lot of additional hits from our files as we go forward," she noted. "There are challenges, but you can count on building your record of success with this kind of evidence. That's significant."

Roman also discounted the idea that property crimes such as burglaries are inherently minor. "Burglary is a lot like surgery," he concluded. "It is only minor if it is on someone else." 

About the Author

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For more information

You can read more about the DNA Field Experiment and download a copy of the 164-page report at this website:

<http://www.ojp.usdoj.gov/nij/topics/forensics/dna/property-crime/evaluating-experiment.htm>



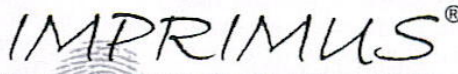
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