Police are using software to predict crime. Is it a 'holy grail' or biased against minorities?

By Justin Jouvenal November 17 at 6:13 PM

During an October shift, Los Angeles police Sgt. Charles Coleman of the Foothill Division speaks with Clarance Dolberry, wearing baseball cap, and Veronica De Leon, donning a Mardi Gras mask, at a bus stop. Software that predicts possible future crimes helps guide where he patrols. (Patrick T. Fallon for The Washington Post)

LOS ANGELES — Sgt. Charles Coleman popped out of his police SUV and scanned a trash-strewn street popular with the city's homeless, responding to a crime that hadn't yet happened.

It wasn't a 911 call that brought the Los Angeles Police Department officer to this spot, but a whirring computer crunching years of crime data to arrive at a prediction: An auto theft or burglary would probably occur near here on this particular morning.

Hoping to head it off, Coleman inspected a line of ramshackle RVs used for shelter by the homeless, roused a man sleeping in a pickup truck and tapped on the side of a shack made of plywood and tarps.

"How things going, sweetheart?" he asked a woman who ambled out. Coleman listened sympathetically as she described how she was nearly raped at knifepoint months earlier, saying the area was "really tough" for a woman.

Soon, Coleman was back in his SUV on his way to fight the next pre-crime. Dozens of other LAPD officers were doing the same at other spots, guided by the crime prognostication system known as PredPol.

"Predictive policing" represents a paradigm shift that is sweeping police departments across the country. Law enforcement agencies are increasingly trying to forecast where and when crime will occur, or who might be a perpetrator or a victim, using software that relies on algorithms, the same math Amazon uses to recommend books.

"The hope is the holy grail of law enforcement — preventing crime before it happens," said Andrew G. Ferguson, a University of District of Columbia law professor preparing a book on big data and policing.

Now used by 20 of the nation's 50 largest police forces by one count, the technologies are at the center of an increasingly heated debate about their effectiveness, potential impact on poor and minority communities, and implications for civil liberties.

Some police departments have hailed PredPol and other systems as instrumental in reducing crime, focusing scarce resources on trouble spots and individuals and replacing officers' hunches and potential biases with hard data.

But privacy and racial justice groups say there is little evidence the technologies work and note the formulas powering the systems are largely a secret. They are concerned the practice could unfairly concentrate enforcement in communities of color by relying on racially skewed policing data. And they worry that officers who expect a theft or burglary is about to

happen may be more likely to treat the people they encounter as potential criminals.

The experiments are one of the most consequential tests of algorithms that are increasingly powerful forces in our lives, determining credit scores, measuring job performance and flagging children that might be abused. The White House has been studying how to balance the benefits and risks they pose.

"The technical capabilities of big data have reached a level of sophistication and pervasiveness that demands consideration of how best to balance the opportunities afforded by big data against the social and ethical questions these technologies raise," the White House wrote in a recent report.

A seismic shift in policing

It was 6:45 a.m. on a Monday, but the sheet of paper Coleman held in his hands offered a glimpse of how Oct. 24 might go: an auto theft near the corner of Van Nuys and Glenoaks, a burglary at Laurel Canyon and Roscoe and so on.

The crime forecast is produced by PredPol at the beginning of each shift. Red boxes spread across Google maps of the San Fernando Valley, highlighting 500-by-500-square-foot locations where PredPol concluded property crimes were likely.

Sgt. Charles Coleman explains the possible sources of crime on a map for patrols using predictive policing zone maps from the Los Angeles Police

Predictive policing zone maps used by the Los Angeles Police Department in the LAPD Foothill Division show where crime may occur. (Patrick T. Fallon for The Washington Post)

Department. (Patrick T. Fallon for The Washington Post)

The forecast is cutting edge, but it is used in the service of an old-fashioned policing philosophy: deterrence. Between calls that day, Coleman and other officers were expected to spend time and engage with people in the roughly 20 boxes PredPol identified around the Foothill Division.

Coleman sat behind the wheel of his SUV, plotting which boxes to hit the way someone consulting a weather map might weigh whether to bring an umbrella.

"It's not always that we are going to catch someone in the box, but by being there we prevent crime," said Capt. Elaine Morales, who oversees the Foothill Division.

Foothill is far from the glitz of Hollywood on the northern edge of L.A., but it has been at the center of the transformation going on in policing.

The division was one of the first in the nation to adopt predictive policing five years ago and has helped refine PredPol. The technology has spread to other LAPD divisions and more than 60 other departments across the country, making it the nation's most popular predictive-policing system.

PredPol often draws comparisons to the movie "Minority Report," in which a government unit rounds up future criminals who have not yet committed crimes, but one of the software's developers said it is not a crystal ball.

UCLA anthropology Professor P. Jeffrey "Jeff" Brantingham speaks during an interview about the use of predictive-policing zone maps outside the Los Angeles Police Department headquarters on Oct. 24 in downtown. (Patrick T. Fallon for The Washington Post)

Jeff Brantingham, a professor at the University of California at Los Angeles, said crime often seems random, but it follows patterns.

"The question becomes, 'Can we build mathematical structures to understand these patterns?' The answer is yes, absolutely," Brantingham said. "The best way to capture the way we think about crime patterns . . . is to think about earthquakes."

That's not just an analogy. Brantingham said a breakthrough moment in PredPol's development came when one of his partners realized an algorithm that described seismic activity could be used to predict crime.

Just as earthquakes happen along fault lines, Brantingham explained research has shown crime is often generated by structures in the environment, like a high school, mall parking lot or bar. Additional crimes tend to follow the initial event near in time and space, like an aftershock.

PredPol uses years of crime data to establish these patterns and then the algorithm uses near real-time

crime data to predict the next property crime. Other systems use even more esoteric data — from the weather to phases of the moon — to arrive at their crime forecasts.

But does it work?

Coleman fired up his SUV and headed out to a PredPol box, as streaks of light poured over the dry hills surrounding L.A. Parents walked their kids to school, and others rushed to work in the blue-collar, largely Latino community.

Can crime be predicted?

Sgt. Charles Coleman of the Los Angeles Police Department's Foothill Division checks in on the homeless encampment of Jamie Bromley, who has been living near railroad tracks on San Fernando Road for five months with her two dogs. The area is near a zone flagged on a predictive-policing map. (Patrick T. Fallon for The Washington Post)

Coleman's SUV was one of only eight police cruisers circulating that morning in the Foothill, a 46-square-mile area that has a population of more than 180,000. It's easy to see why any system that could accurately pinpoint crime would be a major boon to the LAPD.

For decades, police have mapped crimes using pushpins on paper maps and more recently blotchy hot-spot maps on computers. The maps always lagged

crime on the street and could only offer general areas to focus police patrols.

Coleman, a strapping and gregarious 26-year veteran of the LAPD, said he and other officers were initially skeptical PredPol could anticipate a crime better than a seasoned officer — and do it in a box the size of a city block.

But he quickly became a believer.

"If you spend three hours in that box the week after you had 10 crimes, the next week you are going to see three," Coleman said as L.A.'s low-slung houses, palm trees and strip malls slid by the SUV's windows.

LAPD Cmdr. Sean W. Malinowski speaks about the use of predictive-policing zone maps at department headquarters last month. (Patrick T. Fallon for The Washington Post)

Los Angeles Police Department officers prepare to go on patrol using predictive-policing zone maps in the LAPD Foothill Division last month. (Patrick T. Fallon for The Washington Post)

LAPD Cmdr. Sean Malinowski, who pioneered PredPol's use in the department, was also convinced. He relayed a story of how two of his officers found a thief in a stolen car in an area where PredPol predicted an auto theft. The suspect escaped, but the officers found him again — in another stolen vehicle in another box where PredPol forecast a theft.

But the data on the effectiveness of PredPol — and other predictive systems — presents a murkier picture.

PredPol and the LAPD credit the system with helping bring about substantial reductions in property crime in the Foothill in 2012 through 2014, but crime has

crept back up in the past couple years as it has in the rest of Los Angeles.

A study by Brantingham and other researchers found the system was roughly twice as good at predicting where crime will occur as the LAPD's crime analysts and reduced crime 7 percent, but no independent researchers have verified those claims or looked at PredPol.

The only independent study of a place-based predictive-policing system found the software had no statistically significant impact on property crime in Shreveport, La. The system was one created by the researchers, not PredPol.

PredPol is just one iteration of predictive policing.

Police in Kansas City, Mo., and Chicago maintain lists of hundreds of people that an algorithm predicted were likely to be involved in gun violence, either as perpetrators or victims. The calculations are based on arrests, gang affiliations and other variables.

Police warn those on the list they are being watched, while social-service agencies offer help.

Chicago police said earlier this year its system was effective — more than 70 percent of the people who were shot and 80 percent of those arrested for shootings in 2016 were on the list.

But a RAND Corporation study released in the summer found individuals on a 2013 version of the list were no more or less likely to be the victim of a shooting than a comparison group. Police dispute the study's findings.

Increasing concerns

Inconclusive benefits are just one critique in an increasingly heated debate over the systems as they become more widespread.

Predictive policing has become a flash point in the discussion over race and policing that has roiled the nation in recent years. Malinowski and police officials elsewhere see PredPol and similar systems as a way to combat bias among officers by using data to guide patrols.

"Through the use of data, it's less subjective," Malinowski said. "It's objective."

But the ACLU and 16 other groups issued a statement in August outlining a range of concerns about predictive policing, saying such systems give a technological sheen to old patterns of policing.

David Robinson, a founder of the Upturn think tank, wrote in a report that accompanies the statement that predictive policing could increase police presence in poor and minority communities by creating a "ratchet effect."

"The basic problem is those forecasts are only as good as the data they are based on," Robinson said. "People in heavily policed communities have a tendency to get in trouble. These systems are apt to continue those patterns by relying on that biased data."

Brantingham said it is a valid concern, but PredPol only uses data from crimes reported to the police and that have been verified. He said drug arrests and other offenses that rely on the discretion of officers are not used because they are often more heavily enforced in poor and minority communities.

Robinson also pointed out that the public — and even the police who use the software — often do not know exactly how the systems are flagging particular locations or individuals. He said that makes accountability impossible.

Ferguson, the UDC law professor, said predictive policing raises a host of fundamental concerns and questions. He questioned how police will ensure the accuracy of the vast reams of data the systems rely on. An error could unfairly cast suspicion on a location or individual.

Ferguson also wonders how predictive systems will affect officers. He anticipates forecasts will be used as a factor in officers' decisions to reach the "reasonable suspicion" threshold to stop people on the street and could color the way officers approach stops.

"When you are told to be on the lookout for a particular crime in a particular place, that has to affect what you are going to do," Ferguson said.

Coleman arrived at his next PredPol spot around 8:20 a.m. at a busy intersection. He chatted up three homeless people sitting on a bench at a bus stop, asking a question for which PredPol had already given him an answer: "How much crime occurs around here?"