

# Geographic Profiling

*Following is the first of two articles on forensic profiling. This article deals with geographic profiling. The second article will deal with psychological profiling.*

WHEN INTERNATIONAL NEWS MEDIA focused attention on the series of sniper killings in suburban Washington, DC, last fall, it sparked renewed interest in forensic profiling, the science of utilizing psychology as well as a newer technique called geographic profiling to identify, locate and capture serial criminals.

Psychological profiling involves studying the behavior characteristics of a serial killer, arsonist, bomber, rapist or burglar to establish a composite "profile" that provides police with valuable clues about the kind of person they are looking for.

Geographic profiling is the ultimate high-tech, computer-driven, satellite-assisted extension of the traditional "pins-in-the-map" system we all saw in old homicide films or TV dramas. It essentially narrows the search area to one where the perpetrator probably lives and/or operates.

As one forensic specialist puts it, "Psychological profiling tells us "who," geographic profiling tells us "where."

## Finding the "Where"

The latest high-tech geographic profiling system is the brainchild of Kim Rossmo, Ph.D., a former Vancouver (British Columbia) detective inspector and onetime constable, currently director of research at the Police Foundation in Washington, DC.

Dr. Rossmo worked with the joint task force investigating the Washington, DC, area sniper shooting spree, during which 10 persons were killed and three wounded. After two suspects were apprehended, Dr. Rossmo declined to give details of his involvement with the search process because of the confidentiality of his work and the ongoing investigation. But Montgomery County, Maryland, Assistant Police

Chief Deidre Walker issued a statement declaring, "The joint task force found geographic profiling a helpful and useful tool in strategically prioritizing information in this investigation."

While doing research for his doctorate in Canada, Dr. Rossmo developed a mathematical algorithm that became the basis for geographic-profiling software currently being manufactured by a Vancouver firm, Environmental Criminology Research, Inc. (ECRI), under the name Rigel. Rossmo is chief scientist of the firm.

Essentially, Rigel makes investigators' tasks easier in serial crime cases by drastically reducing their search area. For example, if they suspect that a serial killer is somewhere within a 100 square-mile area, Rigel will narrow the search area to approximately 10 square miles. The system is based on the principle of triangulation, or "connecting the dots," but with highly sophisticated software.

The process begins with the concept that a serial criminal lives and commits the crimes within a given area, as indicated by the crime sites. The coordinates of those sites are obtained either through specific addresses or by satellite photography and fed into a computer database. The computer then produces what is variously called a "probability map" or a "jeopardy map" that resembles a color-coded topographical map that highlights what is called the "anchor point."

As Philip MacLaren, an executive of ECRI, explains, the anchor point "could be the suspect's home, which in most cases it is. But it could also be his place of work or his girlfriend's residence. The key to the success of this system is the investigators' preliminary work. They must have done their homework and established that the various crime sites are definitely linked."



*Dr. Kim Rossmo:  
He brought geographic  
profiling to a new level.*

Dr. Rossmo and MacLaren said that the Rigel geographic profiling system has been used in approximately 500 serial crime cases with “an extremely high success rate.” Dr. Rossmo puts it at close to 85 percent.

Dr. Rossmo says, “Geographic profiling is best thought of as an information management strategy to assist in serial violent investigations. It doesn’t give you an ‘X’ that marks the spot, but it does allow you to focus investigative efforts, and it should be thought of as a support service, a type of analysis, as well as an investigative procedure on its own.”

Can a serial criminal foil geographic profiling by choosing his sites at random? “Not really,” MacLaren says. “Even seemingly random sites usually have a pattern of their own.”

Dr. Rossmo expands on that point: “Often we hear about what the newspapers might call a ‘random crime.’ To a mathematician, randomness has a very specific meaning. I would suggest that while most such crimes might seem strange and motiveless in terms of our understanding of what’s going on in the offender’s head, they are not random. There’s usually a pattern, a certain logic, there if we can discern it.”

He continues: “When an offender tries to select random sites, that means he has no control over where those sites are. There might not be any potential victims there, or it might be next to a police station. In other words, everything that an offender looks for is part of his selection process, and if he attempts to randomize, he will lose control over that process and it probably will be worse for him.”

He explained that geographic profiling is concerned with what is called “distance to K” functions. “This means,” he said, “that most individuals will travel fairly limited distances to do certain things. There’s a large body of research called “journey to crime” that shows that criminals tend to commit their crimes fairly close to where they live. There are variations. Older offenders will travel farther than young offenders, and bank robbers will travel farther than burglars. This principle applies to us all. We don’t want to travel farther than we have to, to accomplish our goals. Psychologists call this the “least effort” principle;

geographic profilers call it the “nearness” principle.

“There is an important difference. It’s what we call a buffer zone—the existence of an area, like an offender’s home. If you get too close to it, the probability of crime interaction goes down. So, at the point where the offender’s desire for anonymity and his desire to operate in a comfort zone come into balance, that’s your area of peak probability.”

## **Geographic profiling establishes that point**

When Dr. Rossmo was working on the recent series of sniper killings in the Washington, DC, suburban area, he was particularly disturbed by the proliferation of “talking heads” on TV, described as experts and offering a wild variety of analysis and speculation.

“So many of these people,” he said, “seemed to have some expertise that I’ve never heard of before in the geography of crime. There’s an ethical issue here. They were talking without knowing all the details of the crimes, because they didn’t have inside confidential access—like a doctor making a diagnosis without reading the patient’s medical charts.

“At the worst,” he added, “you can end up in a situation where, as a talking head, you’re going to press an offender’s button, so to speak, and cause something that not only is not desirable, but can be dangerous, because you don’t have all the information and therefore don’t know what you’re talking about. I think that these people really need to think about what’s more important: apprehension of the perpetrator or their own career.”

*Sources for this article included Dr. Kim Rossmo, POLICE CHIEF magazine article, “Geographic Profiling: A New Tool for Law Enforcement,” December 1999; and the book “Geographic Profiling” by Kim Rossmo.*