

THE CRIME REPORT

YOUR COMPLETE CRIMINAL JUSTICE SOURCE

Crime Mapping Grows Up

Friday, May 8th, 2009 8:35 am



Police agencies and media across the nation are increasingly using geocoding software to provide a multi-dimensional, computer-based look at key statistics. But is it all it's cracked up to be?

Los Angeles Times reporter Ben Welsh and his colleagues weren't looking for a gotcha story when they started parsing the data inside the LAPD's online crime map. Like many tech-savvy reporters, Welsh was simply hoping to take advantage of what seemed to be a vivid, dependable instrument for turning up urban trends, such as crime patterns, and producing hard-to-beat stories.

But Welsh stumbled across a glitch in the LAPD's computer crime mapping system that has revealed some glaring imperfections in geocoding, a technology currently being used to track crime in many of the nation's cities. Geocoding, which links places on a map (like a police station or shopping center) to a specific geographical code, such as latitude and longitude, has commonly been employed to pin-point high crime neighborhoods where police need to marshal extra resources.

Welsh, who joined the paper in 2007, had been using computer mapping to great effect. Over the past year, he and a team had compiled multimedia databases on local casualties of the wars in Iraq and Afghanistan and the victims of last year's Metrolink rail crash in Chatsworth, Calif., and they'd mapped California schools and drug war-related deaths in Mexico.

"There was a desire among the editors to take these databases and turn them into news products on the web," says Welsh.

In the fall of 2008, Welsh began examining the LAPD's crime data with the intent of building a web database for the paper's readers. But during his analysis, Welsh found several flaws: "I did routine checks of the data, and realized there was one point on the map that had dozens of dots."

It turned out that the neighborhood, which happened to be the area around City Hall and the new LAPD headquarters in downtown Los Angeles, *wasn't* actually a hot-spot for crime. Rather, the location had simply become a default point for addresses the system didn't recognize. Or, as Welsh puts it, "a catch-point for locations that didn't geocode well."

The article describing the problem appeared on Sunday, April 5 and touched off discussions among law enforcement officials, crime analysts, academics and techies all across the country about the efficacy and accuracy of geocoding.

Welsh's discovery wasn't exactly welcome news. Law enforcement use of the technology has surged over the past decade. According to a study by the Gartner Group, 90 percent of U.S. police departments are expected to use GIS systems by the end of 2009. Compare that to 1998 when, according to the Crime Mapping Research Center, only about 13 percent of the 2000 police agencies surveyed in the United States used computerized crime maps, and fewer than half of those shared their maps with the public.

Digital maps have been used to redraw police districts in Tucson, Arizona and Charlotte, North Carolina, and they've been credited with helping reduce crime in East Orange, New Jersey. And unlike the system pioneered by the New York City Police Department's fabled CompStat program, today's crime maps are not limited to internal police use. Cities like Los Angeles, Savannah, Georgia, and Lincoln, Nebraska, to name just a few, make their maps available to the general public.

"Part of what we are is trying to empower citizens," says Judy Paul of the Savannah Police Department. "We hope it will help people make smarter decisions about their safety."

From Cork Board to Cyberspace

Mapping crime is nothing new. Law enforcement agencies have had two-dimensional area maps with incidents or arrests marked by push-pins on their walls for decades. Then, as now, the maps were useful in identifying and illustrating "hot spots" of crime within a particular area. They served to focus attention on specific problems (a spate of burglaries in one neighborhood; a cluster of assaults in another), and, to various extents, helped commanders make more informed decisions about deployment of resources and personnel.

But paper maps have obvious limitations. Individual officers can't exactly carry them around to reference when rolling from neighborhood to neighborhood, and there was certainly no way to for an officer to compare the incidents of, say, assault in one area to the number of probationers on a certain block, or to the income profile of the neighborhood.

Geocoding software, whether it's as accessible as Google Earth or part of an analysis package created and maintained by a private company like ESRI or Pitney Bowes' MapInfo, allows not only broad distribution of the data, but gives analysts a tool to layer databases atop one another, thus providing a more comprehensive profile of a neighborhood – what David Cook, a law enforcement specialist at ESRI, calls "an environmental approach to criminology."

Of course, even digital maps can't make decisions about data — they can only present it. Rutgers University Professor Marcus Felson points out that without trained analysts to access the data, geocoding is not terribly useful: "The idea of stats is to tell a story and make sure that story is comprehensive. Maps help with that, but analysts, and universities that train them, connect the dots."

Errors and Omissions

Most everyone you speak to about geocoding admits that accuracy is a problem, and most were also not surprised that the LAPD had such a major glitch in their system. There are many ways data can get entered incorrectly (an officer's sloppy penmanship, an accidental inversion by a tech). American University Professor Chris Simpson points out that "information in these types of systems is approximate, but masquerades itself as being precise."

Lincoln, Nebraska Police Chief Tom Casady agrees: "Geocoding by its very nature is inaccurate, it's the estimate of a spot on the earth where a crime occurred." For example, Casady says his department doesn't want to make the exact address of a rape victim public, so they'll map the block on which the crime occurred, not the actual house number.

“Overall, the maps are 98.3 percent accurate,” says Casady. “But within that margin of error could be 1000 cases you’ve missed.”

Paul Zandbergen, an associate professor of geography at the University of New Mexico, sees the accuracy issue as an outgrowth of the fact that there is no standardization of data collection or software in police departments around the country.

“Certain jurisdictions are very sophisticated, others are not,” says Zandbergen. In Florida, for example, he notes that “every single county has different software” for mapping crime. Savannah’s \$12,000 system works by dipping into the department’s computer-aided dispatch system every two hours, extracting and then plotting the data. So, instead of mapping actual arrests or locations of crime, the system maps only calls for service. In contrast, the technology used by the Lincoln, Nebraska police maps calls for calls for service, incident reports and arrests, plus parolees and sex offenders.

And nobody seems to agree about how to plot crimes for which there is no easy location, like identity theft, cyber crime and fraud .

Unlike the health field, which has mapped disease for years and developed widely used protocols for the endeavor, Zandbergen says that local law enforcement agencies are pretty much “left to their own devices” when trying to build a crime data and mapping system.

“The number of people who get trained in geo-spatial technology is very small, and many of them end up getting hired by national agencies like the CIA or Homeland Security,” observes Zandbergen. “That means that in most jurisdictions, people learn to push the button on the software without a clear understanding of how it works.”

Zandbergen, who is editing the first issue of a new journal called Crime Mapping, says the National Institute of Justice has a few scattered training seminars. Meanwhile, crime analysts across the country share tips and quirks of the technology on a national crimemap listserv. To an outsider it can sound like another language: “Is there a way to run a regression in ArcGIS 9.3?” asked a recent listserv poster.

Bud Bliss, the sole analyst at the Beaverton, Ohio police department sees his work as a resource for cops on the beat. In the training workshops he leads for new officers, he tells them that if they see something going on in their patrol district they can come to him for background information on the area. He also frequently lends his 10 years of experience to listserv members, writing detailed responses to questions posed by other analysts and interested parties.

And despite the inaccuracies he knows exist even in his own map, Lincoln’s Chief Casady is a believer. The technology, he says, is a valuable tool for police and citizens: he’s even used it to alter some personal habits.

“I used to leave my garage door open all the time, while I was cooking or just in the house on a nice evening,” says Casady. “I looked at the map one day and saw there had been robberies in my neighborhood. I knew from years of police experience that thieves often steal through the garage, so after I read that, I stopped leaving it open.”

New Media Enters the Fray

And now, police departments aren’t the only ones mapping crime. SpotCrime.com, CrimeReports.com and UCrime.com are all non-law enforcement websites that use either police data or news reports to map crime in various cities throughout the country and around the world, marking each crime with icons: at SpotCrime.com, a fist represents an assault; a cloaked man represents a burglary.

Colin Drane founded SpotCrime.com in November 2007 after having the GPS stolen out of his car and learning of a brutal rape in his Baltimore neighborhood. Drane knew Baltimore had one of the nation’s highest crime rates, but he couldn’t put all the crime into context: “I wanted a map,” says Drane.

SpotCrime.com uses Google Maps software to plot crime and distributes neighborhood reports through Twitter and RSS feeds. Drane's other crime mapping website, UCrime.com, is even training a new breed of reporters: links on the site encourage would-be watchdogs to "click here" if they want to "be a crime reporter" for their university.

"I think it encourages the police department to be more transparent, and the more transparency, the better for democracy," says Drane, who now has 30 people in several countries working for him.

With increased transparency, however, comes greater oversight – of both civilians and police.

"What is going on here is an increased ability to surveil people," says Simpson. "That is a social change that is fundamental."

But, continues Simpson, "the availability of these tools to do surveillance is in part to monitor the police. Policing becomes fairer, more modern and more just when interest groups can look at the facts of the situation and have those facts as they enter into policy making."

Chief Casady agrees.

"I've seen citizens use the map at a city council meeting to protest zoning changes," says the chief. "I couldn't help smiling, thinking, they're making good use of the data."

The LAPD did not return calls for comment on Welsh's story and the accuracy of their online map. While they are undoubtedly less than enthusiastic to talk about a problem with their system, considering the proposal by President Obama to fund modernization and upgrades of various aspects of policing, that the little glitch (which Welsh says has been remedied) may actually turn out to be a boon to the evolution of geocoding.

Julia Dahl is a writer based in Brooklyn, NY.