

## **CELL TOWER JUNK SCIENCE**

by Michael Cherry, Edward J. Imwinkelried, Manfred Schenk, Aaron Romano, Naomi Fetterman, Nicole Hardin and Arnie Beckman.

Investigators frequently use cell phone Call Detail Records to place a suspect near a crime scene, and for years prosecutors have successfully convinced jurors that the Call Detail Information from cell tower assigned to the call can reliably specify a person's location at the time of a call. But in reality it takes simultaneous information from at least three different locations to locate or track a caller and to determine his or her latitude and longitude. Prosecution experts acknowledge that the use of accounting department call detail records are not precise as the caller need not be immediately adjacent to the cell tower, but they suggest that the accounting data proves that the caller was within a mile -- or five miles -- or ten miles -- of the tower. The problem is that their underlying claim is false even when it is combined with boxes of the following accurate information:

- Cell tower latitude and longitude and street address;
- Telephone company drive test maps that validate cell phone reception within the intended coverage areas;
- Maps showing radio frequency (RF) coverage for each cell tower; and
- PowerPoint representation of defendant's travels based on multi-tower tracking.

The Federal Communications Commission understands the relevant science. That is one of the reasons why they have mandated that wireless carriers provide Emergency 911 location information by one of two methods<sup>1</sup>: **handset-based**, where location information is generated by GPS or similar technology installed in the caller's handset, or **network-based**, where location information is generated by triangulating the caller's wireless signal in relation to nearby cell sites in the carrier's network. The FCC's rules require wireless carriers to identify the caller's location for a specified percentage of 911 calls within a range of 50 to 150 meters for carriers that use handset-based GPS triangulation, and 100 to 300 meters for carriers that use network-based triangulation. No one who understands the relevant science would ever claim that data from a single cell phone tower is adequate.

The following cases were won by hard working defenders: Nicole Hardin, Aaron Romano, Naomi Fetterman and Arnie Beckman. They were forced to rely on their cross examination skills as the company typically deletes the data within a few weeks -- well before the defense counsel has an opportunity to seek to discover the data.

### **NICOLE HARDIN, Ocala Public Defender**

The first time I came across cell tower evidence was in the first trial of State v. Adrian Brown [2008-CF-4862-A]. I was part of a phenomenal team of public defenders (Tricia Jenkins and John Tedder). We had a case with an eyewitness with a multitude of weaknesses and inconsistencies and cell phone tower evidence. The first trial was for First Degree Murder and the State was seeking the death penalty. I remember getting assigned the phone records because I seemed the most adept at technology. I had piles and piles of phone records, and cell tower locations, and longitude and latitude numbers. It felt overwhelming.

And it was not only overwhelming - it appeared to be damning evidence, placing our client in the area right after the murder and tracking him from Ocala to Miami in the hours following the murder.

Then the Assistant State Attorney listed a “network engineer” affiliated with Sprint the day of jury selection and the Judge refused to exclude him. I had a crash course in cell phone technology in the 36 hours before the deposition. I read blogs and tech articles from science sites that chipped away at the “science” of pinpointing a location through cell phone “pings” from single towers. I learned a lot in only 36 hours, but I did not count on how much the State would oversell the “science” to the jury. Our first trial resulted in a hung jury. We underestimated how much the prosecution was relying on the cell phone tower evidence - and how much they were overselling the technology. The State Attorney called the Sprint phone worker as their last witness, he gave a power point presentation, and the State’s rebuttal closing argument relied almost exclusively on how the “pings” of the defendant’s cell phone had proved their case. The Assistant State Attorney actually walked around the courtroom saying “ping, ping, ping” and tracking the phone in evidence to the defense table.

In the retrial we were much more prepared. I focused heavily on winning big concessions on cross from their engineer. Relying on federal cases, I filed a motion to suppress the evidence for retrieving the records without a warrant to track the defendant. When we lost that motion on standing because the phone was registered in someone else’s name. We then focused on fighting the technology and finding a way to make the jury see the limits. We brought in experts, hiring Cherry Biometrics. We consulted constantly with them, and I worked extensively on preparing a cross with their help. The State’s “smoking gun” ping evidence wasn’t anywhere close to conclusive - I learned it was shaky evidence that did not prove much at all. In the retrial, the State waived the death penalty.

When they called the engineer, I crossed him with questions on all the factors that affect which tower picks up a call. This time, I won important concessions on cross examination. Their “engineer” admitted other towers would pick up a call if there was tower updates or maintenance going on -and he had no idea if that was happening when the calls were placed. He admitted that GPS or triangulation (the use of determining location through multiple towers) was far more accurate than the method he was presenting. He admitted that which tower picked up a call was determined by at least 20 different factors, and he had no idea if any of those were a factor in our case. He admitted that this was not at all an “exact science” and the biggest concession was that he admitted that you could be picked up by one tower when you were not even using the phone in the radius of that tower. In plain English, his whole report could mean nothing - he could not say for certain that the phone was used in the radius of the tower that registered the ping. After Tricia Jenkins (lead counsel) tore apart the eyewitness, the jury returned a verdict of not guilty. We got to walk our client out of the courtroom - an amazing fight and outcome. Part of that victory was challenging the State on attempting to convict our client on shaky technology. We were able to show the jury that the tower evidence was not the smoking gun - and it wasn’t enough to convict our client. There are tools in our arsenal for this fight - from recent decisions requiring warrants to use the technology, and an emerging

understanding that cell tower tracking has enormous limitations. And juries are willing to listen - and acquit.

AARON ROMANO and NAOMI FETTERMAN, AARON ROMANO P.C. Four co-defendants were testifying against him and the State claimed to have indisputable scientific evidence placing him at the crime scene, but still our client refused to plead guilty. Charged with home invasion, robbery, burglary, assault, larceny, accessory to kidnapping with a firearm, and conspiracy, he faced a potential one hundred and forty-five (145) prison sentence. The four co-defendants each had long criminal records and had made deals with the prosecution in exchange for their testimony against our client. With their conflicting stories and blatant personal motivation, the co-defendants could be challenged, their credibility undermined; however, there remained the evidence that the State trumpeted would conclusively demonstrate our client's participation in the crime: cell phone tower "ping" data. Complete with propagation maps and tower locations, the State purported our client could be tracked by his phone calls to persons he knew as he progressed from his home to the site of the home-invasion, a concept that the State likened to a game of leap-frog.

This facile explanation of cellular technology, using a series of single cell towers as a tracking mechanism, aroused the suspicion of court appointed attorney, Aaron J. Romano of Bloomfield, Connecticut. After contacting Michael Cherry of Cherry Biometrics and speaking with Manfred Schenk, an engineer employed by Cherry Biometrics, the fallacy of the State's argument was swiftly revealed. Contrary to the State's assertion, a cell phone call does not have to use the closest tower or the nearest tower.

Armed with this information, Attorney Romano demanded a Porter Hearing, Connecticut's equivalent of a Daubert Hearing, to test the validity of the State's theory. At the hearing the State presented its expert witnesses, a former telephone company employee, while Mr. Schenk testified on behalf of the defense. At the hearing and subject to a blistering cross-examination, the State's expert was forced to admit what Attorney Romano already knew: that a cell phone call does not have to use the closest tower or the nearest tower. Ultimately though, the Court deemed the cell phone ping evidence admissible, despite its inherent flaws, and so the case proceeded to trial.

At trial, the State again proposed that our client's movements could be ascertained simply through examining cell tower location. Attorney Romano countered with Mr. Schenk who explained to the jury that the State's postulations were substantially contradicted by the scientific realities of cellular technology. In his closing, Attorney Romano emphasized that the only accurate way to determine an individual's location is through the use of a Global Positioning System (GPS). Unlike cellular phones, GPS operates using satellites. Pursuant to FCC regulations, cell phones are now required to contain GPS chips as part of an E911 initiative. This is so that emergency responders can accurately locate a caller in distress. If the methodology proposed by the State was at all accurate, there would be no need for the government to require GPS chips in phones. In fact, the only context in which this sort of tracking system is employed is criminal prosecutions. All other commercial industries and scientific communities, such as the trucking industry, eschew this process because it is unreliable in praxis and unsound in technique. *Even police departments employ GPS technology with their own employees.* A methodology that has been

determined by independent government agencies not to be able stake a caller's life on should not now be accepted as reliable enough to risk a defendant's liberty.

In the end, the jury viewed the "ping" data as precisely what it was: manufactured evidence designed to imply our client's guilt. It did not work. On December 15, 2010, our client heard the jury forewoman pronounce "Not Guilty" on all seven charges.

\* Pursuant to Connecticut law, a case resulting in an acquittal is not subject to disclosure.

Therefore, our client's name has been redacted from this article. If anyone is interested in obtaining copies of pleadings, transcripts, or desires further information, please do not hesitate to contact us at (860)286-9026.

### **Arnie A. Beckman, Deputy Public Defender, Denver, CO**

In the first State v. Johnson Murder Trial the prosecution utilized an "expert" in the area of historical cell phone data records analysis to place our client near the crime scene on the night of the killing.

During his power point presentation we felt helpless as we watched a red dot moving around a map as a demonstration of our client's movements on the night of the offense. Although this demonstrative evidence was disclosed to us in advance, the persuasive power of its moving dot did not strike us until we were watching it with the jury. After hanging 11 to 1 in favor of guilt on felony murder and 6 to 6 on murder after deliberation we knew the areas we had to improve upon included confronting the cell records expert on retrial.

We retained Cherry Biometrics and Michael Cherry began working with us in July explaining the technology underlying cell phone communication and the fallacy of historical cell phone data records analysis in locating individuals. Our preparation assumed the prosecution's expert, a police detective who had attended about 80 hours of cell phone training in GPS, geo-location and historical records, did not understand the technology since he simply omitted from his first trial presentation any information regarding the process by which cell sites are selected to handle calls at a particular time. This omission left the jury and us with the impression that the proximity from the cell phone to the cell site was the determining factor. Therefore, he concluded in the first trial, a cell site near the crime scene that handled a call attributed to our client necessarily located our client in that area.

Armed with the knowledge we received from Cherry Biometrics and with Manfred Schenk in the courtroom, the prosecution's expert presented much more complete and accurate information about cell signal site selection. On cross examination he revealed that he actually possessed some knowledge on how the technology of a signal ends up a particular site. From there he had to admit that some calls he analyzed and presented during his direct testimony were utilizing sites 3 to 4 miles apart in a single 30 second call, that this was common and possible for every call presented (including those attributed to our client who lived 15 blocks from the crime scene), and that he did not have the recorded information

to determine why those particular sites were utilized since he did not have records from the sites showing traffic volume on the night in question. We neutralized the prosecution's expert during the cross examination to such a degree that we did not need to call Manfred Schenk to explain the technology and the fallacy of using these records to determine location. Despite this his presence in the courtroom contributed greatly to the people's expert's toned down and more complete and accurate presentation of information on how historical cell phone records cannot locate a cell phone at a particular time.

In closing the DA conceded that the cell phone record and tower analysis did not show our client's location. They said the opposite in the first trial. The next step in Colorado is to get a Shreck (Daubert) hearing on this evidence. I think given what the people's expert gave me on cross there is little chance a good judge would ever allow this in front of a jury if he/she had the chance to hear it flushed out at a pretrial hearing.

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<sup>i</sup> [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2011/db0713/FCC-11-107A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db0713/FCC-11-107A1.pdf)