

UNITED STATES DISTRICT COURT  
DISTRICT OF CONNECTICUT

UNITED STATES OF AMERICA : Case No. 3:13-cr-00054 (MPS)  
 :  
 v. :  
 :  
 DOMINIQUE MACK, :  
 KERONN MILLER, :  
 :  
 Defendants. : November 19, 2014

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**RULING ON MOTION TO EXCLUDE EXPERT TESTIMONY**

**I. Introduction**

In this case alleging the murder of Ian Francis in furtherance of a conspiracy to tamper with a witness, Defendant Dominique Mack (ECF No. 107), joined by Defendant Keronn Miller (ECF No. 108), moves to exclude the testimony of the Government’s expert witness Special Agent Kevin Horan (“SA Horan”), a member of the FBI’s Cellular Analysis and Survey Team (“CAST”). The Government proposes to elicit from SA Horan testimony about methods that CAST uses to estimate the geographical coverage areas of certain cell phone towers and, using these methods, an opinion about the approximate areas in which Defendants Mack and Miller (or, more precisely, cell phones associated with Mr. Mack and Mr. Miller) were located when they made and received specific cell phone calls around the time that Mr. Francis was shot. The Defendants contend that SA Horan’s proposed testimony is based on unreliable methods and therefore should be excluded under Fed. R. Evid. 702, as interpreted by *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) and *Kumho Tire v. Carmichael*, 526 U.S. 137 (1999). On November 10, 2014, the Court held an evidentiary hearing in which SA Horan was questioned about his methodology, sources of information, and opinions.

Although the Defendants have raised valid questions as to the limitations of SA Horan's expert analysis, these questions go to the weight of the testimony and do not make the testimony inadmissible under Rule 702. The Defendants also argue that SA Horan's presentation of his methodology to the jury is unfairly prejudicial under Fed. R. Evid. 403, objecting both to his general depiction of the coverage area of the cell phone towers and to the content of specific PowerPoint slides to be shown during his testimony. For the reasons herein, the Court does not find that the risk of unfair prejudice from these depictions substantially outweighs their probative value. The Court does, however, find that one specific aspect of SA Horan's testimony—describing his ability to see the cell tower location from Sigourney Street during a visit to the site of the shooting in Hartford—does pose a risk of unfair prejudice that substantially outweighs its probative value.

Thus, the motion to exclude SA Horan's expert testimony is denied. SA Horan, however, will not be permitted to discuss the fact that he visited the site of the shooting at Sigourney Street and had a clear line of sight to the cell tower location, unless the Defendants open the door to such testimony.

## **II. Legal Standards for Admissibility**

Fed. R. Evid. 702 “assign[s] to the trial judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand.” *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 597 (1993). “[T]he law grants the trial judge broad latitude” to determine the appropriate measures of reliability. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 139 (1999). Although under *Daubert* and *Kumho* the trial judge must act as a gatekeeper, those cases also warn against keeping a heavy hand on the gate. The Second Circuit has made clear that “*Daubert* contemplates liberal admissibility standards,” *Town of*

*Southampton v. Suffolk County*, 367 Fed. App'x 234 (2010) (internal quotation marks omitted), and “reinforces the idea that there should be a presumption of admissibility of evidence,” *Borawick v. Shay*, 68 F.3d 597, 610 (2d Cir.1995). “[O]ur adversary system provides the necessary tools for challenging reliable, albeit debatable, expert testimony.” *Amorgianos v. Amtrak*, 303 F.3d 256, 267 (2002). As the Advisory Committee itself has noted, “[a] review of the caselaw after *Daubert* shows that the rejection of expert testimony is the exception rather than the rule.” Advisory Committee Notes, 2000 Amendments to Fed. R. Evid. 702.

Fed. R. Evid. 403 permits a court to exclude evidence whose probative value is substantially outweighed by a danger of unfair prejudice, undue delay, confusing the issues, or misleading the jury. “This balancing test necessarily affords the trial court considerable discretion.” *PRL USA Holdings, Inc. v. U.S. Polo Ass’n, Inc.*, 520 F.3d 109, 119 (2d Cir. 2008).

### **III. SA Horan’s Testimony at the *Daubert* Hearing**

During the November 10, 2014 evidentiary hearing, SA Horan first testified as to his qualifications as an expert. Although this ruling does not address SA Horan’s qualifications as an expert *per se* (which the Defendants have not challenged), SA Horan’s testimony about his history at the FBI—in particular, his experience applying the methodology at issue—is also central to the Court’s assessment of the reliability of his methodology.

SA Horan testified that he has been an agent with the FBI since 1995. For several years, he has been a member of the FBI’s CAST team, whose agents are tasked with assisting federal and local law enforcement with analysis of cell phone records, including mapping coverage areas. He has been trained in both historical and real-time tracking of cell phones, and he now trains other law enforcement officers in those methods. In addition to testifying about historical cell phone data—for which he has been qualified as an expert by many courts—he also assists in

real-time attempts to locate fugitives, kidnapping victims, and other missing persons using cell phone location data. He and other members of CAST regularly communicate with industry engineers and experts within the cell phone companies about methods of data analysis. SA Horan does not himself have an engineering background.

SA Horan then explained the various analytical methods relied upon by CAST, with a focus on the methodology that he will employ in this case. He testified that his opinion at trial will be based on four principal pillars:

(1) Records provided from Nextel and Sprint, showing a list of calls to and from various cell phones on December 21, 2010, the day that Mr. Francis was shot. These records show which cell phone tower and “sector” the three phones associated with Mr. Mack, Mr. Miller, and a third individual communicated with in order to start each call, as well as the tower and sector used to end the call. Each cell tower typically has three “sectors,” which are essentially antennas pointed in a particular direction and designed to cover a certain portion of the 360-degree area around the tower. Although Nextel and its network no longer exist, CAST obtained historical records from Nextel. In investigating Ian Francis’s homicide, Agent Ryan James provided SA Horan with a list of phone numbers relevant to the investigation. SA Horan then consulted the historical records to see which towers and sectors those phones communicated with on the day of the shooting.

(2) Data from the phone records showing the direction in which each “sector” pointed—this is called the “azimuth.”

(3) An assumption, based on his experience working with the cell phone companies and with law enforcement, that the “sectors” listed in the phone records were designed with a

“beam width” intended to provide coverage to a 120-degree portion of the area around the tower.

(4) An assumption that the cells phones would only have communicated with a particular tower if the phones were fairly close to the tower, relative to other towers, such that the tower’s signal was the best among available options. This assumption was based in part on his experience that a cell phone will connect with the strongest signal, and that urban networks are typically designed with an expectation that there will be some overlap in coverage between towers.

Thus, in estimating the coverage area for a cell tower, SA Horan testified, one can be reasonably confident in drawing an “outfield fence” for the 120-degree sector, so that it is a finite pie wedge and not an infinite v-shaped expanse. In particular, based on his experience, SA Horan proposes to draw this fence at a radius that is 70% of the distance from the relevant cell tower—that is, the tower with which each call connected—to the next closest cell tower that faces the sector with which each call is associated. Because both of those towers would be “competing” to communicate with the phone, the phone would be unlikely to choose the first tower if it was substantially closer to the second tower, although that is not a certainty because of the possibility of obstructions. The number 70%, instead of 50%, is an estimate that is designed to account for the overlapping area in which either of the two competing towers could, depending on topography, conceivably provide the best signal—that is, a phone may be slightly closer to the second tower but still choose to communicate with the first.

Using this information, SA Horan will testify as to the *approximate* coverage areas representing where a cell phone would *likely* have been in order to communicate with the cell

towers that appear in the phone records for the date of the shooting. These approximations can be depicted as pie-shaped wedges superimposed on a map. SA Horan acknowledged that this method of estimation is less exact than other methods of mapping a cell tower's coverage area. According to his testimony, the ideal method is to conduct a "drive test" to determine the locations from which a cell phone will *actually* connect to a particular tower when driven around the potential coverage area. But SA Horan was unable to conduct a drive test in this case because Nextel's cell network no longer exists.

In cross-examining SA Horan at the evidentiary hearing, defense counsel questioned why additional parameters were not used to refine the estimate—in particular, (1) the specific power/wattage of the tower's signal, (2) the actual, rather than likely, "beam width," (3) the height of the cell tower, (4) and the "down-tilt" of the antenna (the specific angle at which it was pointed downwards). SA Horan responded that these parameters would be very difficult, if not impossible, to obtain from Nextel and would, in any event, not substantially alter his estimates. Defense counsel also questioned the reliability of SA Horan's two assumptions: the assumption about a 120-degree span and the assumption about a radius extending 70% of the distance to the next facing tower. SA Horan admitted that these estimates, although very accurate in his experience and widely used by law enforcement and the cell phone industry, were not scientific and had not been the subject of formal validation studies published in peer-reviewed journals.

SA Horan also testified that he had visited the location of the former Nextel cell tower with which the Defendants' phones communicated around the time of the shooting. He determined the location using the latitude and longitude listed for the tower in the phone records obtained from Nextel. Those coordinates corresponded with the present-day location of a church steeple, which led SA Horan to conclude that the steeple was likely where the cell tower had

been housed. He then testified that he visited the site of the shooting on Sigourney Street, from which he had a clear line of sight to the church steeple, thereby confirming that the cell phones allegedly used by the Defendants could have been at the site of the shooting while communicating with the tower.

#### **IV. The Reliability of SA Horan's Methodology**

SA Horan's methods are reliable under the *Daubert* standard, notwithstanding the valid questions raised by the Defendants about the limitations of his analysis. Those questions are appropriate topics for cross-examination but do not justify preventing the jury from hearing his testimony.

SA Horan's methods are not rendered unreliable merely because they have not been validated by scientific peer review. Peer review is but one of many factors to be considered in judging the reliability of expert testimony. And, as the Advisory Committee Note for the 2000 Amendment to Rule 702 points out, the rule itself and the *Kumho Tire* opinion contemplate that the foundation for an expert's testimony may be based on experience alone. *See* Fed. R. Evid. 702, Advisory Committee Note. SA Horan repeatedly testified that his estimation procedures—including the use of a 120-degree span and radius at the 70% mark—are commonly relied upon by law enforcement and the cell phone industry when more precise methods of estimation are unavailable. He also testified that he himself has used those methods many times with good results, including in kidnapping and missing-persons investigations, where the stakes may be just as high as they are in this case. He testified that, in his experience, it is an unusual case in which the actual coverage area of a cell tower differs greatly from the estimation derived from this method. His inability to provide a precise numerical error rate does not negate his qualitative testimony.

Similarly, the fact that SA Horan was not able to use additional parameters, such as wattage, beam width, tower height, and down-tilt, may lower the precision of his estimate, but it does not make the estimate altogether unreliable. *United States v. Jones*, 918 F. Supp. 2d 1, 5 (D.D.C. 2013) (“[T]he mere existence of factors affecting cell signal strength that the expert may not have taken into account goes to the weight of the expert’s testimony and is properly the subject of cross-examination, but does not render the fundamental methodology of cell site analysis unreliable.”).

The Court’s conclusion that SA Horan’s methodology is reliable is consistent with other cases that have considered the same methodology. *United States v. Machado-Erazo*, 950 F. Supp. 2d 49, 55-56 (D.D.C. 2013) (“S.A. Magnuson obtains call data from the service provider that identifies which network tower and which antenna on that tower were utilized for any given call . . . . Then, ‘using a 120–degree pie shape and extending approximately 50% to 70% of the way to the nearest cell tower,’ S.A. Magnuson maps ‘the sector of radio-frequency energy emanating from the antenna on the cell tower.’ . . . Thus, using telephone company records, S.A. Magnuson reports that he is able to determine that a given cell phone, at a particular time, was in use within the 120–degree pie shape going out from the specific antenna on a specific tower. . . . [T]his methodology employed by S.A. Magnuson clears the hurdle imposed by *Daubert* and Rule 702.”); *United States v. Davis*, No. 11-60285-CR, 2013 WL 2156659, at \*5-6 (S.D. Fla. May 17, 2013) (“‘estimated sectors’ of cell phone coverage ‘using a 120–degree pie shape and extending approximately 50% to 70% of the way to the nearest cell tower’ were reliable even if not ‘precise scientific calculations’”).



## V. Risk of Unfair Prejudice in SA Horan’s Presentation

### A. Pie-Wedge Depictions in General

The Court does not find that SA Horan’s proposed PowerPoint presentation to the jury poses a danger of unfair prejudice that substantially outweighs its probative value. *See* Fed. R. Evid. 403. In his *Daubert* motion, Mr. Mack points to the *Jones* case, where the court found that showing the jury pie-shaped wedges with a limited radius (that is, with an “outfield fence”) posed a problem under Rule 403 and remedied it by permitting the expert to depict only open-ended 120-degree vectors. *Jones*, 918 F. Supp. 2d at 6. But the *Jones* court’s finding of potential confusion and prejudice was premised on the fact that the Government’s expert witness “d[id] not purport to portray the ‘coverage area’ of any particular cell tower or antenna.” *Id.* at 5. Thus, the depiction of the pie-shaped wedges as being closed-in at a particular radius would invite the jurors to draw conclusions beyond the expert’s offered opinion.

The case at bar is different from *Jones*. SA Horan, unlike the expert in *Jones*, proposes to testify that a radius set at the 70% mark provides a reliable estimate of the cell coverage area.<sup>1</sup> SA Horan’s proposed testimony is more similar to the testimony at issue in *Machado*, where the court considered and rejected a challenge under Rule 403. *Machado*, 950 F. Supp. 2d at 56. As long as SA Horan explains the 70% methodology and makes clear to the jury—as he did repeatedly during the *Daubert* hearing—that any depiction of the wedges represents an *estimate* of the coverage area, there is no significant risk that the jury will be misled by those depictions.

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<sup>1</sup> As the Defendants have argued, the limited nature of the expert testimony offered in *Jones*—testimony that did not purport to provide an “outfield fence”—also means that *Jones*’s holding as to the reliability of that testimony is less on-point than the holdings in *Machado-Erazo*, 950 F. Supp. 2d 49, and *Davis*, 2013 WL 2156659, where an estimated 50-70% radius was used.

## **B. Specific PowerPoint Slides to Be Presented by SA Horan**

The Defendants seek to preclude specific PowerPoint slides that SA Horan plans to present to the jury during his testimony. In particular, they object to the first ten slides that provide a description of the FBI's CAST program, arguing that these slides exaggerate SA Horan's expertise and the soundness of his methodology. *See* Def.'s Mot. Preclude Expert Cell Phone Test., Ex. A (ECF No. 107-1), at 1-10. The Court perceives no such risk in these slides, which are clearly intended only as demonstrative background to illustrate SA Horan's testimony and not as a substitute for a proper foundation.

During the *Daubert* hearing, counsel for Mr. Mack also questioned SA Horan extensively about Slide 18, which depicts several calls made between 1:20 and 6:45 PM on December 21, 2010, by a phone allegedly used by Mr. Mack. *See id.* at 18. This slide depicts estimated coverage areas for three cell towers all superimposed on a single map. Defense counsel raised doubts about whether the pie-shaped wedge for the cell tower labeled "60806" was drawn in accordance with the 120-degree, 70%-radius methodology outlined by SA Horan's earlier testimony.

The Court agrees that it is not self-evident how accurately Slide 18 depicts the methodology that SA Horan described. But "[t]here is no requirement that demonstrative evidence be completely accurate." *Roland v. Langlois*, 945 F.2d 956, 963 (7th Cir. 1991); *see also Cohen v. Kindlon*, 366 F.2d 762, 764 (2d Cir. 1966) ("The judge correctly advised the jury that the exhibit was offered merely to illustrate in *approximate* fashion the testimony of Mrs. Kindlon, and that it was for the jury to appraise its probative value.") (emphasis added). As long as SA Horan is able to explain why the slides, including Slide 18, are drawn as they are, the

question is whether the illustration's value to the jury is substantially outweighed by a danger of unfair prejudice under Rule 403.

The risk of unfair prejudice is of little weight in the case of Slide 18, given that the slide depicts calls made only between the hours of 1:20 and 6:45 PM, well before the approximate time of the shooting at 8:23 PM. SA Horan indicated that Slide 18 was not the focus of his analysis, which is why it depicts so many phone calls in a single slide, rather than separating them out into separate slides. Furthermore, the Defendants have been apprised of SA Horan's methods in advance of trial and are well-equipped to cross-examine him and draw the jury's attention to any potential inaccuracy in the slides.

The potential prejudice would be greater if any inaccuracies existed in Slides 19 and 22, as these slides cover the time period in which the shooting took place and were the focus of SA Horan's analysis. But these slides appear to represent SA Horan's methodology faithfully, and the Court sees no reason to exclude them at this time. As with Slide 18, the Defendants are free to question the slides' accuracy on cross-examination.

### **C. SA Horan's Testimony about Visiting the Site of the Shooting**

The Court separately addresses one final aspect of SA Horan's proposed testimony: his narrative describing a visit to the sites of the former cell tower and of the shooting at Sigourney Street. The Court finds no risk of unfair prejudice in permitting SA Horan to testify that he visited the latitude and longitude of the former tower and observed a church steeple that likely housed the tower. This testimony is relevant because SA Horan's site visit demonstrates the thoroughness of his investigation and the relevance of his methodology to the facts of the case; it will also help the jury to grasp the concept of physical cell towers and to understand SA Horan's testimony about the specific cell tower at issue.

But his testimony about having a clear line of sight to the steeple from the site of the shooting on Sigourney Street has little or no probative value and creates a significant risk of unfair prejudice to the Defendants. SA Horan's testimony about the line of sight is not wholly irrelevant; it could potentially impact the jury's assessment of the probability that the cell tower's coverage area included the site of the shooting, which is a material fact. But the methodology that SA Horan outlined for estimating the coverage area employs a limited number of parameters and does not take account of lines of sight. There would therefore be no proper basis for the jury to conclude that the line of sight makes it more likely that the site of the shooting was within the tower's coverage area.

Jurors may also consider the line of sight from the site of the shooting as being relevant to a different question: whether the phones allegedly used by the Defendants did in fact connect with the tower. That question, however, is not in dispute; the phone records themselves already establish the connection, and the Defendants have at no time suggested that the calls in question did not actually communicate with the towers and sectors shown in the cell phone records. This suggests that the testimony would have little probative value.

At the same time, however, jurors may nonetheless see the line of sight as confirming that a connection occurred. There is a substantial risk that, in reaching that conclusion, jurors would *assume as a premise* that those phones were *at the site of the shooting when the calls were made*. SA Horan's testimony would not prove that, but given that it is not in dispute that the phones connected with the tower formerly housed in the steeple, jurors may infer that the purpose of the testimony is to prove something else—specifically, that the phones were themselves in the line of sight of the tower and on Sigourney Street when the calls were made.

The Court cannot predict whether jurors will actually make such an assumption, but SA Horan's testimony about visiting the site of the shooting, by its very nature, invites one to visualize a cell phone user standing at that exact spot to make a call—which goes well beyond what SA Horan's expert testimony can prove about the location of callers. His testimony about visiting Sigourney Street is therefore unfairly prejudicial because it confuses the issues and risks leading jurors to make an unproven assumption about a fact of great consequence.

Of course, if the Defendants, while cross-examining SA Horan, open the door to this issue by questioning whether SA Horan *should have* taken account of possible obstructions, then his testimony would become much more relevant, any risk of prejudice would no longer be unfair, and SA Horan would be able to respond by describing the clear line of sight that he observed from Sigourney Street.

### **Conclusion**

For the foregoing reasons, the Court DENIES Mr. Mack's (ECF No. 107) and Mr. Miller's (ECF No. 108) motions to exclude SA Horan's expert testimony. But SA Horan shall not discuss his visit to the site of the shooting at Sigourney Street unless the Defendants open the door to such testimony.

**SO ORDERED** this 19th day of November, 2014, at Hartford, Connecticut.

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/s/  
Michael P. Shea  
United States District Judge