

1 This is an excerpt from a Motion *in Limine* I wrote at the San Francisco Public
2 Defender's office to exclude the testimony of an FBI agent regarding Cell Site Location
3 Information. It also argued in favor of excluding the maps and visual aids he had created
4 to complement the location information. In order to protect attorney-client
5 confidentiality, some of the facts have been altered and the defendant is referred to as J.
6 H.

7 8 **Statement of the Case**

9 Defendant J. H. is charged with murder pursuant to Penal Code section 187(a),
10 discharging a firearm under Penal Code section 12022.53(d), inflicting great bodily
11 injury under Penal Code section 12022.55, and discharging a firearm from a vehicle
12 under Penal Code section 190(d).

13 14 **3. Under *Daubert* Evidence and Testimony Relating to Cell Site Location** 15 **Information Must Be Excluded**

16 Cell Site Location Information is not scientific fact, and is inadmissible under
17 *Daubert*. There are several theories proposed by Special Agent Michael Easter regarding
18 Cell Site Location Information (CSLI) and analysis of those data for the purpose of
19 determining the physical location of J. H.'s and M. D.'s cell phones. Agent Easter
20 explained that each number is associated with a particular tower whose latitude and
21 longitude is known to the service provider (Sprint and MetroPCS/T-Mobile), then
22 described how a cell phone connects to a tower in the Sprint network and how a phone
23 connects to a tower in the T-Mobile network.

24 Sprint cell phones connect to Sprint towers based on signal quality.¹ A Sprint phone
25 will scan the area and will use radio frequency waves to connect to the tower which has
26 the "best and brightest" signal.² Agent Easter noted that while a phone typically connects

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¹ RT 101:8-9 Vol. II

28 ² RT 101:17-18 Vol. II

1 to the closest tower this is not always the case. In fact, Agent Easter attempted to portray
2 a phone that could not connect to a tower because there was a “mountain” in the way, and
3 so connected instead to a tower “slightly further away.”³ In reality, there is a whole litany
4 of reasons a phone will not connect to the closest tower including topography and
5 physical obstructions,⁴ whether the phone is being used inside or outside, and even what
6 side of the street a call is placed.⁵ It doesn’t need to be a “mountain,” as Easter
7 contended, and the next tower doesn’t need to be only “slightly further away.” Easter
8 testified, “[t]he tower with the best power is the tower that’s the most attractive” to the
9 phone.

10 The Special Agent set forth several theories about how to locate a cell phone by using
11 the CSLI. There is the “70 percent rule,” which has to do with the overlap of cell site
12 coverage. There is the theory called “breathing,” where a Sprint cell tower’s coverage
13 area grows and shrinks depending on how many phones connect to that particular tower.
14 These and other theories combine to create a grand methodology which allows the
15 Special Agent to look at which tower is being used, when it is being used, and in which
16 120 degree direction the tower is facing to try to determine roughly where a cell phone is
17 at a given time. This grand methodology is not explicitly named in Easter’s testimony, so
18 for the purposes of this motion this methodology will be referred to as Easter’s Cell
19 Phone Location Methodology.

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21 **A. The Methodology is Not Based In Scientific or Other Specialized Knowledge**
22 **that Has Been or Can Be Tested**

23 The Cell Phone Location Methodology (CPLM) that Easter testified to using in his
24 analysis is without merit. In order for the court to admit this type of specialized
25 knowledge, it must have more information about CPLM. Easter never addressed the

26 ³ RT 101:10-16 Vol. II

27 ⁴ *U.S. v. Evans*, 892 F. Supp. 2d 949 (N.D. Ill. 2012).

28 ⁵ RT 143:10-12 Vol. II

1 testing of this knowledge throughout the entire preliminary hearing. He cited no scientific
2 studies or other reliable, objective research done to bolster the reliability of his testimony.
3 In fact, the only reliability the Agent was able to offer was his own personal history with
4 this methodology. Quantity is not an adequate substitute for quality in this or any case
5 relying on the *Daubert* standard of review.

6 The Court in *Daubert* extricated knowledge discovered with “scientific methodology”
7 from all other fields of human inquiry precisely because the scientific method is reliable,
8 repeatable, and reviewable.⁶ Repeatability, or testability, is a key facet of the scientific
9 method required by scientists. In fact, *Daubert* holds the knowledge or methodology to
10 an even higher standard than testable: tested.

11 In this instance, while CPLM may be testable, the Agent did not offer any information
12 based on his testing of this methodology, nor did he cite tests that others had done in
13 furtherance of this methodology. The Agent’s history and *Curriculum Vitae* cannot make
14 up for the lack of missing evidence that the scientific method was ever used.

16 **B. The Methodology Has Not Been Subjected to Peer Review and Publication**

17 According to *Daubert*, “[p]ublication (which is but one element of peer review) is not
18 a *sine qua non* of admissibility.”⁷ The fact that there is none suggests that this
19 methodology is problematic. There are several publications that suggest the methodology
20 is neither accurate nor reliable. In this case, there are several publications that actually
21 refute this methodology and its use in expert testimony.⁸ Of the documents and

22 ⁶ *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 593 (1993).

23 ⁷ *Id.*

24 ⁸ Among the publications and learned treatises are: Alexander Galicki, *The End of Smith*
25 *v. Maryland?: The NSA’s Bulk Telephony Metadata Program and the Fourth Amendment*
26 *in the Cyber Age*, 52 Am. Crim. L. Rev. 375 (2015); Andrew Crocker, *Trackers That*
27 *Make Phone Calls: Considering the First Amendment Protection for Location Data*, 26
28 *Harv. J. Law & Tec* 619 (2013); Brad Leneis, *Mapping a Way Out: Protecting Cellphone*
Location Information Without Starting Over on the Fourth Amendment, 50 Am. Crim. L.
Rev. 499 (2015); Chris Conley, *Non-Content is Not Non-Sensitive: Moving Beyond the*
Content/Non-Content Distinction, 54 Santa Clara L. Rev. 821 (2014); Daniel J. Solove,
The First Amendment as Criminal Procedure, 82 N.Y.U. L. Rev. 112 (2007); Katherine
J. Strandburg, *Freedom of Association in a Networked World: First Amendment*

1 publications in favor of using the methodology to suggest physical location, including the
2 trainings and certification courses in which the Special Agent took part, are produced not
3 by objective third parties as demanded by the scientific method but in fact are offered by
4 law enforcement agencies, including the Special Agent's own Federal Bureau of
5 Investigation.⁹

6 There are reasons for peer review. It helps to ensure accuracy in testing methodology,
7 and to root out cognitive biases such as confirmation bias and selection bias. Confirmation bias is "the tendency to search for, interpret, favor, and recall information
8 in a way that confirms one's beliefs or hypotheses."¹⁰ Selection bias is sometimes also
9 called *cherry picking*. This occurs when the tester, in making their report, only selects the
10 studies which demonstrate the outcome the tester expects or prefers.¹¹

12 Law enforcement officers have a vested interest in the admissibility of this kind of
13 information and expert testimony. It appears damning, and its weaknesses are not readily
14 apparent to jurors. This vested interest is significant because it creates a substantial
15 danger of cognitive bias. When it comes to issues like CPLM, the scientific studies are
16 not concerned primarily with the pursuit of knowledge for its own sake; they are
17 concerned primarily with the inferences to be drawn at criminal trials in an effort to prove
18 physical location beyond a reasonable doubt. This in turn places many people accused of
19 crimes at risk of losing their freedom, and the Court in this case should consider the
20 severe consequences of admitting this type of inadequately-substantiated information to
21 that effect. This is more serious than the admission of merely incorrect information: a

22 *Regulation of Relational Surveillance*, 49 B.C. L. Rev. 741 (2008); Orin Kerr, *The*
23 *Mosaic Theory of the Fourth Amendment*, 111 Mich. L. Rev. 311 (2012); Steven M.
24 Bellovin, *When Enough is Enough: Location Tracking, Mosaic Theory, and Machine*
Learning, 8 N.Y.U. J.L. & Liberty 556 (2014).

25 ⁹ *Curriculum Vitae* of Special Agent Michael Easter; RT 96:17, 97:1-5, 98:12-99:2, 99:3-
26 4, 21-24, 100:3-6.

27 ¹⁰ *Confirmation Bias*, https://en.wikipedia.org/wiki/Confirmation_bias (Last Accessed
28 July 10, 2015)

¹¹ *Selection Bias*, https://en.wikipedia.org/wiki/Selection_bias (Last Accessed July 10,
2015)

1 human life is at stake, and this deserves no less than absolute scientific rigor in the
2 Easter's methodology and analysis.

3 4 **C. The Methodology Has a 30 Percent Known Rate of Error**

5 Agent Easter testified that field tests to determine the absolute range of each tower
6 had not been conducted at all in this case. Instead, Agent Easter referred to the "70
7 percent rule."¹² The Agent drew a metaphor to the Olympic Rings, which "slightly
8 intersect each other but they don't cover each other."¹³ This is, in name and effect, an
9 acknowledged rate of error. The 70 percent refers to the fact that a coverage area for a
10 cell tower is reached only by that tower, and that 30 percent of the area is reached by
11 overlapping coverage areas shared with another tower. Without having done any field
12 tests, the coverage area relied on by the Agent is based on his training and experience
13 only.¹⁴ This assumption is not reliable, and has already been rejected by a federal court in
14 Illinois in *U.S. v. Evans*.¹⁵

15 The known rate of error for determining that a cell phone is connected to a particular
16 tower and not an adjacent or nearby tower is 30 percent. Here, we have a stated error rate
17 of 30 percent, which means that if a cell phone is connected to a tower, nearly a third of
18 the time there is no way to definitively tell whether the cell phone is connected to the
19 tower because it *had to* (i.e. the phone is in the 70 percent area) or because it has options
20 and *happened to* (i.e. it is in the 30 percent area of overlap). Having acknowledged this,
21 the FBI cannot be allowed to rely on a result that is incorrect 30 percent of the time in
22 order to show precisely where a phone was located in relation to a crime scene at a given
23 time, or even to suggest such a result.

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26 ¹² RT 130:27 Vol. II.

27 ¹³ RT 131:3-4 Vol. II.

28 ¹⁴ RT 131:10-12 Vol. II.

¹⁵ *U.S. v. Evans*, 892 F. Supp. 2d 949 (2012).

1 **D. The Methodology Has Not Achieved Widespread or General Acceptance**

2 Agent Easter's methodology, including reference to his "70 percent rule," is
3 unreliable. This rule essentially allows an analyst to estimate the range of a tower based
4 on the proximity of one tower to another, and the overlap of coverage areas between the
5 two. This rule, which more closely resembles a rule of thumb than anything else, is also
6 sometimes referred to as "granulization theory."¹⁶ The theory of granulization was used
7 by Special Agent Raschke in the prosecution of Antonio Evans for the charge of
8 kidnapping. In *U.S. v. Evans*, there was a *Daubert* hearing that referred to expert
9 testimony from Agent Raschke, who had similar qualifications to Agent Easter. Agent
10 Raschke was qualified as an expert to instruct the finder of fact in determining the
11 physical location of a cell phone by using CSLI. The court in that case held that Agent
12 Raschke could testify as a lay person regarding the call data records and the location of
13 the cell towers in relation to other locations relevant to the crime alleged, but that
14 testimony regarding how cell phones and towers interact and how granulization theory
15 works was subject to the requirements of *Daubert*.¹⁷

16 The issue in *Evans* was that granulization theory was not adequately reliable or
17 accepted or tested. The court found several flaws with Agent Raschke's testimony, which
18 are shared by Agent Easter's testimony here. First, both Agent Raschke's and Agent
19 Easter's testimony assume that the defendant's cell phone accessed the cell tower closest
20 to it, a fallacious assumption.¹⁸ Agent Raschke, like Agent Easter, "relied on his training
21 and experience to estimate the coverage overlap between the two [cell towers]." Both
22 Agent Raschke and Agent Easter tried to overcome the problem that there is no definitive
23 way to determine coverage area without doing a field test by relying on their respective
24 trainings and experiences.¹⁹ Neither Agent conducted a field test during the course of

25 ¹⁶ *Evans*, 892 F. Supp. 2d 949.

26 ¹⁷ *Id.* at 954.

27 ¹⁸ *Id.* at 956.

28 ¹⁹ *Id.*

1 their respective investigations, analyses, and testimony preparations. Field tests are
2 conducted by physically determining the range of a particular tower by driving repeatedly
3 back and forth across its border and plotting the border on a map. Neither Agent testified
4 to scientific calculations, and neither Agent considered the vast array of relevant factors
5 that determine which tower a phone connects to.²⁰ According to *Evans*, “[g]ranulization
6 theory has not been subject to scientific testing or formal peer review and has not been
7 generally accepted in the scientific community.”²¹

8 Given the significant parallels between Agent Raschke’s methodology, theories, and
9 testimony and Agent Easter’s methodology, theories, and testimony, the court in this case
10 must come to the same conclusion as the court in *Evans*. Agent Easter must not be
11 allowed to testify regarding the physical proximity of either J. H.’s or M. D.’s cell phone
12 to a cell tower using his methodology, and any expert testimony that relies on this
13 methodology must be excluded.

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²⁰ *Id.*

28 ²¹ *Id.* at 957.