COMMENTS

The Admissibility of Cell Site Location Information in Washington Courts

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I. INTRODUCTION

The date is January 17, 2008. Two hunters, searching for coyotes, stumble across a frozen, shirtless, and lifeless body on a little-used dirt road near Lawton, Iowa, about ten miles east of Sioux City.[1] It's the body of Zachary Cooper.[2]

Two days earlier, Samuel Wright, Jeremy Williams, Nick Perez, Ray Dukes, and three others gathered in Perez's Sioux City apartment.[3] The group decided to purchase some marijuana, and Perez volunteered to contact Zachary Cooper, his source for the drug.[4] Cooper was nervous about dealing to these individuals, but he agreed to meet Perez and Williams to discuss the transaction.[5] Cooper explained that he "wanted to make sure things go straight," and "[i]f things boil down wrong . . . he would have to do something to [Williams] and his family"; Williams replied, "[d]ude, don't threaten my . . . family."[6]

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1. Nick Hydrek, *Investigators Search for Motive in Cooper's Slaying*, SIOUX CITY J. (Jan. 28, 2008), http://www.siouxcityjournal.com/news/investigators-search-for-motive-in-cooper-s-slaying/art icle_3cb52f0f-fb40-56e2-82e0-cdc9174cc571.html.

2. State v. Wright, No. 08-1737, 2010 WL 200052, at *1 (Iowa Ct. App. Jan. 22, 2010).

3. *Id.*

4. *Id.*

5. *Id.*

6. *Id.*

Cooper arrived at Perez's apartment around 6:30 or 7:00 p.m., but he never returned home.[7] As Cooper entered the apartment, Williams produced a handgun and started punching Cooper in the face.[8] Wright and Williams led Cooper into a car, and they coaxed both Dukes and Perez to join them.[9] They drove the car into rural Woodbury County, where Wright and Williams forced Cooper to kneel down in front of the car and put his hands on the hood.[10] Wright[11] manually loaded a .380 caliber handgun and shot Cooper before passing the gun to Williams, who reloaded the weapon, stood over Cooper's body, and shot him a second time.[12]

On the way back to Sioux City, Williams stopped for gas at a Kum & Go.[13] Surveillance footage captured Williams and Perez inside the store, but the four individuals standing next to Williams's car could not be readily identified.[14] At trial, Perez and Dukes identified Wright as one of the individuals in the surveillance images.[15] Wright took the stand in his own defense, claiming that although he did stop by Perez's apartment on the evening of January 15, 2008, he left by foot prior to Cooper's arrival and never saw Cooper that evening.[16]

Without additional evidence, the jury's determination with respect to Wright's participation in the crime would amount to a credibility assessment—would the jurors believe Perez and Dukes, or would they believe Wright? These credibility assessments are often grounded in a juror's individual valuation of a witness's demeanor.[17] And jury determina-

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7. *Id.* at *2.

8. *Id.*

9. *Id.*

10. *Id.*

11. The trial testimony conflicted on who fired the first shot. Perez testified Wright shot Cooper first and Williams second, while Dukes testified Williams shot first and Wright second. *See id.* at *2–3. The jury convicted Wright of first-degree murder, first-degree robbery, and first-degree kidnapping, and a separate jury convicted Williams of lesser assault and kidnapping charges. Molly Montag, *Jury Finds Man Guilty of Murder*, SIOUX CITY J. (Aug. 25, 2008), http://www.siouxcityjournal.com/news/jury-finds-man-guilty-of-murder/article_3552f6e9-bf61-515b-9d34-e3517c09b3fe.html.

12. *Wright*, 2010 WL 200052, at *2. Apparently, Cooper did not die immediately, and he was able to walk three quarters of a mile before collapsing face down in the snow, where the hunters located him two days later. *Id.* at *3.

13. *Id.*

14. *Id.*

15. *Id.*

16. *Id.* at *5.

17. *See, e.g.*, Olin G. Wellborn III, *Demeanor*, 76 CORNELL L. REV. 1075, 1078 (1991) ("The appearance and nonverbal behavior of a witness might bear upon the witness's credibility in two ways: first, as an indicator of sincerity—the willingness of the witness to tell the truth—and, second,

tions of witness credibility, though critical to the jury's ability to weigh evidence and find facts, can be flawed by inherent biases.[18] But in *Wright*, the jury had more information from which to draw conclusions about Wright's whereabouts on the evening in question. Namely, Wright's cell phone received an unanswered text message at 7:07 p.m. on January 15, 2008, and his cell phone records indicated that the communication transmitted through the east sector of a cell tower in Lawton, Iowa.[19] Wright received a second text message at 7:16 p.m. that transmitted through the west sector of the same tower.[20] While these records only revealed the location of Wright's phone, and not necessarily Wright himself,[21] they substantially undermined Wright's testimony that he stayed in Sioux City after leaving Perez's apartment in order to help a friend move.[22] The jury convicted Wright of murder, robbery, and kidnapping in the first degree.[23]

As cell site location information becomes more common in criminal investigations such as the one in *Wright*, advocates and judges face emerging questions about the information's admissibility and potential evidentiary objections. This Comment provides a blueprint to admit cell site location information in Washington state courts that balances the public interest in promoting truth and accountability with the criminal defendant's interest in a fair and impartial trial. Specifically, this Comment concludes that cell site location information is admissible, provided that the State lays an adequate foundation for both the underlying data collection—via expert testimony—and the secondary mapping technology. Programs that illustrate data contained in call records should also be independently verified to establish their accuracy.

For the purposes of this Comment, cell site location information is information maintained by a cellular provider that is used to determine the physical location from which a cell phone sent a communication or at

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as evidence of the quality of the witness's perceptions and memory—his or her capacity to know the truth.").

18. *E.g.*, Bennett L. Gershman, *How Juries Get It Wrong—Anatomy of the Detroit Terror Case*, 44 WASHBURN L.J. 327, 327–28 (2005) (noting that "a jury's determination of the facts may be influenced by sympathy, passion, and prejudice" and "a witness's credibility may be distorted by the jury's subjective assessment of the witness's background, narrative, language, and demeanor").

19. *Wright*, 2010 WL 200052, at *4.

20. *Id.*

21. In an effort to explain why his cell phone was in Lawton during this time, Wright testified that he "inadvertently left that phone behind" and later recovered it from Williams's car later in the evening. *Id.* at *5.

22. *Id.*

23. Montag, *supra* note 11.

which it received a signal.[24] Part II provides an overview of how cellular providers collect location information using either triangulation or satellite positioning technology and an overview of how trial advocates can map the information to demonstrate the approximate location of the person's phone.

This Comment principally explores when and how a party can successfully admit cell cite location information into evidence. Beginning with the threshold inquiry of relevance, Part III examines when cell site location information is relevant and in what circumstances the information, though relevant, could be unfairly prejudicial, cumulative, or confusing. Part IV provides the bulk of the analysis, which centers on the substantive foundation necessary to establish the information's credibility and authenticity. Part V looks at three ancillary issues: hearsay, a criminal defendant's Sixth Amendment confrontation rights, and the introduction of a summary of voluminous records. Finally, Part VI offers a summary of and conclusion to this Comment's analysis.

The legal showing necessary to obtain cell phone records is beyond the scope of this Comment.[25] The analysis evaluates the evidentiary ob-

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24. Cell site location information is also sometimes referred to as "historical cellular tower data." *E.g.*, *In re* Application for a Court Order Authorizing AT&T to Provide Historical Cell Tower Records, Misc. No. ST-11-WS-08, ST-11-WS-09, ST-11-WS-10, ST-11-WS-12, 2011 WL 7092589, at *2 (V.I. Super. Ct. Apr. 29, 2011).

25. The Supreme Court recently held the attachment of a GPS tracking device to a suspect's vehicle constitutes a search within the meaning of the Fourth Amendment. United States v. Jones, 132 S. Ct. 945, 949 (2012). Thus, the Government must obtain a warrant in order to track a person of interest in real time by attaching a locating device to his or her property. *Id.* ("The Government physically occupied private property for the purpose of obtaining information. We have no doubt that such a physical intrusion would have been considered a 'search' within the meaning of the Fourth Amendment when it was adopted."). This holding does not address whether a warrant is required to obtain a person's call records after a crime has occurred, however. At least one federal judge has expressly held that "[w]hen the government requests records from cellular services, data disclosing the location of the telephone at the time of particular calls may be acquired only by a warrant issued on probable cause," and "the date, time, called number, and location of the telephone when the call was made" are "constitutionally protected from . . . intrusion." Order on Objections, *In re* Applications of the United States for Historical Cell Site Data, Misc. No. H-11-223 (S.D. Tex. Nov. 11, 2011), *available at* http://online.wsj.com/public/resources/documents/hughesorder1116.pdf. For further discussion about the privacy interests implicated by the Government's use of cell tower location tracking technology, see Laurie Thomas Lee, *Can Police Track Your Wireless Calls? Call Location Information and Privacy Law*, 21 CARDOZO ARTS & ENT. L.J. 381, 383 (2003) (exploring the extent to which call location information is protected by constitutional and statutory provisions, and articulating "legislative solutions for clarifying and bolstering call location privacy rights"); *see also* Note, *Who Knows Where You've Been? Privacy Concerns Regarding the Use of Cellular Phones as Personal Locators*, 18 HARV. J.L. & TECH. 307 (2004) [hereinafter *Who Knows Where You've Been?*]; Briana Schwandt, *Is the Government in My Pocket? An Overview of Government Location Tracking of Cell Phones Under the Federal System and in Montana*, 72 MONT. L. REV. 261, 286 (2011) (arguing cell phone location tracking technology "implicates an informational privacy interest" under the Montana State Constitution).

stacles to admitting cell site location information *after* the records have been lawfully acquired. While this Comment focuses on cell site location information within the context of criminal proceedings, the information could also be used in civil cases. The physical location of a party to a civil dispute would be relevant, for example, when the doctrine of frolic and detour could relieve an employer's liability for the actions of its employee,[26] or to provide evidence that the driver of an automobile violated a safety statute in a negligence action.[27]

II. BACKGROUND

Wireless communication is firmly entrenched in the daily lives of a large and growing number of Americans. In fact, CTIA-The Wireless Association (CTIA), an international association representing the wireless industry, reports that the number of active, data-capable wireless devices in the United States reached 278.3 million in 2010.[28] This number represents roughly 89% of the U.S. population.[29] The wireless industry also saw a 16% increase in the use of SMS messages, more commonly known as text messages, between 2010 and 2011.[30]

The federal government responded to this increase in wireless communication by requiring cellular providers to provide cell site location information to emergency first responders.[31] In the 1990s, 911 operators became increasingly "alarmed they could not determine the location of distressed cell phone callers."[32] For example, a Florida woman was able to dial 911 from her cell phone after her car skidded off the turnpike and into a canal, but rescue emergency personnel could not determine her precise location, and by the time they found her, she had died.[33] The Federal Communications Commission (FCC) has since im-

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26. While civil parties do not share the vast subpoena powers of the state government, a civil party could serve a cellular provider with a *subpoena duces tecum* in order to produce cell site location information outside the control of the opposing party.

27. For a discussion of the criminalization of driving while using a cellular phone, see Douglas R. Richmond, *Drunk in the Serbonian Bog: Intoxicated Drivers' Deaths as Insurance Accidents*, 32 SEATTLE U. L. REV. 83 (2008).

28. Press Release, CTIA-The Wireless Ass'n, CTIA-The Wireless Ass'n Semi-Annual Survey Reveals Historical Wireless Trend (Oct. 11, 2011), *available at* http://www.ctia.org/media/press/body.cfm/prid/2133.

29. The U.S. Census Bureau reported 311,591,917 people living in the United States in the year 2010. *USA QuickFacts*, U.S. CENSUS BUREAU, http://quickfacts.census.gov/qfd/states/00000.html (last visited Apr. 1, 2012).

30. CTIA-The Wireless Ass'n, *supra* note 28.

31. *Wireless 911 Services*, FED. COMM. COMM'N (May 26, 2011), http://www.fcc.gov/guides/wireless-911-services.

32. Schwandt, *supra* note 25, at 264.

33. Lee, *supra* note 25, at 381.

plemented rules requiring wireless service providers to transmit information about a phone's location to public safety answering points in order to improve emergency response times.[34] Section A of this Part provides an overview of how cellular providers are able to discern a particular cell phone's location when it sends or receives a communication. Section B describes the modern call detail record, an automatically generated record of location data that advocates can use to illustrate a cell phone's location.

A. Determining a Cell Phone's Location

Cellular providers obtain locating information primarily in two ways: (1) by using Global Positioning System (GPS) technology; or (2) by triangulating the phone's location using either the time difference of arrival or angle of arrival techniques.[35]

1. Global Positioning System

The United States Air Force maintains at least twenty-four operational GPS satellites orbiting Earth at any given time.[36] These satellites transmit one-way signals to constantly update their position and time in space.[37] On the ground, devices equipped with GPS technology receive the signals from the satellites and calculate, based on each satellite's distance to the receiver, the device's position on the globe.[38] The accuracy of the GPS device's location varies depending on the type of receiver, but GPS is generally estimated to determine the device's location within ten to twenty meters.[39]

GPS data is available only to cell phones "enabled with GPS technology,"[40] meaning the cell phone contains a GPS receiver that com-

34. *See Wireless 911 Services*, *supra* note 31.

35. Schwandt, *supra* note 25, at 264.

36. *How Does GPS Work?*, SMITHSONIAN NAT'L AIR & SPACE MUSEUM, http://www.nasm.si.edu/exhibitions/gps/work.html (last visited Nov. 23, 2011).

37. *The Global Positioning System*, GPS.GOV, http://www.gps.gov/systems/gps/ (last visited Apr. 1, 2012).

38. *Id.*

39. *How Does GPS Work?*, *supra* note 36. The FCC's regulations seek to establish "accuracy and reliability standards of 100 meters for 67 percent of calls and 300 meters for 95 percent of calls for network-based (non-GPS) technologies, and 50 meters for 67 percent of calls and 150 meters for 95 percent of calls for handset-based (GPS) technologies." *In re* Application of United States for an Order Authorizing Disclosure of Location Info. of a Specified Wireless Tel., 849 F. Supp. 2d 526, 532–33 (D. Md. 2011) (citing 47 C.F.R. § 20.18(h) (2011)).

40. Schwandt, *supra* note 25, at 264.

municates with the positioning satellites.[41] When the cell phone receives signals from at least four satellites, the receiver calculates the phone's location.[42] This is the technology that enables real time navigation and turn-by-turn directions.[43]

2. Time Difference of Arrival and Angle of Arrival Methods

Even without GPS technology, cellular providers can still estimate a phone's location by using mathematical triangulation.[44] "Cellular telephone networks are divided into geographic coverage areas known as 'cells,' which range in diameter from many miles in suburban or rural areas to several hundred feet in urban areas."[45] When a cell phone is switched "on," it periodically transmits a signal to all tower antennae within the phone's range.[46] The time distance of arrival method essentially tracks a phone's longitude and latitude when a communication is sent or received, and a triangulation algorithm produces an estimate of the phone's location by measuring the time it takes for different cell towers' signals to reach the phone.[47] Like the time distance of arrival method, the angle of arrival method relies on transmissions between the phone and a tower, but the algorithm uses the angles of the signals, rather than a measurement of time, to approximate the phone's location.[48] The calculation's accuracy depends to some degree on the number of cell towers within the phone's range.[49] For example, the triangulation methods are generally less accurate in rural areas with fewer cell towers.[50]

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41. Cell phones equipped with GPS technology are increasingly common. According to one 2012 survey, half of the wireless customers in the United States are now using so-called smartphones, which universally utilize GPS technology for navigation and other applications. *See* Davindra Hardawar, *The Magic Moment: Smartphones Now Half of All U.S. Mobiles*, VENTUREBEAT.COM (Mar. 29, 2012, 7:00 AM), http://venturebeat.com/2012/03/29/the-magic-moment-smartphones-now-half-of-all-u-s-mobiles/.

42. Schwandt, *supra* note 25, at 264.

43. *Id.*

44. *See, e.g.*, Schwandt, *supra* note 25, at 264–65; *Who Knows Where You've Been?*, *supra* note 25, at 308–10.

45. *In re* Application of the United States for an Order for Prospective Cell Site Location Info. on a Certain Cellular Tel., 460 F. Supp. 2d 448, 450 (S.D.N.Y. 2006) [hereinafter *Application for Cell Site Location Info.*].

46. *Id.*

47. Schwandt, *supra* note 25, at 265; Lockwood, *supra* note 25, at 308–09.

48. Schwandt, *supra* note 25, at 265; *see also Application for Cell Site Location Info.*, 460 F. Supp. 2d at 451 ("[I]n some instances, depending upon the characteristics of the particular network and its equipment and software, it is possible to determine not only the tower receiving a signal from a particular phone at any given moment, but also in which of the three 120-degree arcs of the 360-degree circle surrounding the tower the particular phone is located.").

49. *See* Schwandt, *supra* note 25, at 265.

50. *Id.*

B. The Call Detail Record

Law enforcement agencies rely on the cellular provider's call detail record to determine a cell phone's location during a specific time. The data in the record is often classified as prospective or historical.[51] "A prospective order is sought when law enforcement officials wish to obtain [cell site location information] 'as it happens in real time,'" whereas historical data "allows the government to learn about a suspect's past and often relatively recent whereabouts."[52] When a cell phone sends or receives a communication, the cellular provider automatically records a data set corresponding to each call or text message for billing purposes.[53] Most standard call detail records show the time of the call, the duration of the call, the tower from which the call was sent or received, and the specific "face" of the tower from which the call was sent or received.[54] This face represents one of three separate directional vectors that look like "120 degree slices of a full 360 degree pie."[55]

Once a party has obtained the call detail record for the relevant dates and times, the information can be synthesized to map the vectors approximating the phone's location when it sent or received a communication, producing a visual graphic for the courtroom.[56] For example, some law enforcement offices use a program called Advanced Cell Tracking Systems to simplify this process.[57] A division of Air Systems, LLC, Advanced Cell Tracking Systems provides a subscription-based service to law enforcement agencies.[58] The program uses data from the call detail record to map the approximate location of the phone during each communication on a Google Earth overlay.[59] Unlike the call detail record, which is generated automatically, this process requires an officer to manually input the data points into the program.[60] Figure 1 is an ex-

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51. Patrick T. Chamberlain, *Court Ordered Disclosure of Historical Cell Site Location Information: The Argument for a Probable Cause Standard*, 66 WASH. & LEE L. REV. 1745, 1747–49 (2009).

52. *Id.* at 1748.

53. Laurie Thomas Lee, *Location-Based Communication Systems: A Look at Intelligent Networking and Privacy Concerns*, GLOBAL MEDIA J., Oct. 1, 2011, at 2.

54. State v. Wright, No. 08-1737, 2010 WL 200052, at *4 (Iowa Ct. App. Jan. 22, 2010).

55. *Id.*

56. *E.g.*, *id*.

57. *See* ADVANCED CELL TRACKING SYSTEMS, http://www.advancedcelltrackingsystems.com/cms/ (last visited Nov. 23, 2011).

58. *Id.*

59. *Id.*

60. *Id.*

ample of a map generated using Advanced Cell Tracking Systems.[61] Figure 1 depicts two vectors emanating from two different cell towers that received a communication from a particular cell phone number.[62] The vectors span outward from the face of the tower that received the signal; thus, the communication originated from a location within the diamond-shaped area where the two vectors overlap.[63]

Figure 1

III. THRESHOLD QUESTIONS: RELEVANCE AND ITS LIMITS

Before determining under what circumstances a party can offer cell site location information into evidence, a court must first decide whether the information is relevant and, if so, whether the relevant evidence should be excluded to avoid unfair prejudice, confusion, redundancy, or a waste of time. This Part examines these two threshold questions in turn.

A. Relevance of Cell Site Location Information

All relevant evidence is admissible except as limited by other constitutional, statutory, or rule provisions.[64] Washington Rule of Evidence 401 defines "relevant evidence" as "evidence having any tendency to

61. *Service Advertisement*, ADVANCED CELL TRACKING SYSTEMS, http://www.advancedcelltrackingsystems.com/ cms/images/PDFs/flier.org (last visited Apr. 2, 2012).

62. *Id.*

63. *See id.*

64. WASH. R. EVID. 402.

make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence."[65] In other words, cell site location information is admissible if it makes a consequential fact more or less probable as long as other statutory and rule provisions do not limit the evidence's admissibility.

Washington courts, like most jurisdictions, have established a low bar to satisfy the relevance requirement: "[T]he threshold to admit relevant evidence is low and even minimally relevant evidence is admissible."[66] Under this permissive standard, cell site location information should be relevant whenever it makes a person's whereabouts more or less probable, and the person's whereabouts is of consequence to the determination of the litigation. In nearly every circumstance, a party can advance a coherent argument that cell site location information tends to make a person's whereabouts more or less probable because the location of the person's cell phone, while not wholly dispositive, tends to indicate the location of the person himself.

Because cell site location information affects the probability of a person's whereabouts, the relevance inquiry really hinges on whether that person's whereabouts is of consequence to the ultimate outcome of the case. This is true when the person's location is a material fact that is in dispute.[67] The rule also limits the scope of call records and their corresponding demonstratives, which can be introduced against an opposing party.[68] For instance, courts should refuse to admit cell site location information corresponding to calls that do not assist the trier of fact in any meaningful way—such as calls made or received during a time period unrelated to events in the case. In summary, cell site location information will generally be relevant when a person's location is material to the outcome of the litigation. This standard preserves a trial judge's discretion

65. WASH. R. EVID. 401.

66. *E.g.*, Kappelman v. Lutz, 217 P.3d 286, 290 (Wash. 2009) (citing State v. Gregory, 147 P.3d 1201, 1241 (Wash. 2006)).

67. This includes third parties whose whereabouts may, in some circumstances, be material to the outcome of the litigation; for example, if a defendant testifies to having spent the day of the crime with a friend, and the friend is unable to testify, the friend's cell phone records might be relevant to determine the location of the defendant. Note that "privacy rights are personal rights that cannot be vicariously asserted," State v. Francisco, 26 P.3d 1008, 1010 (Wash. Ct. App. 2001), and a defendant seeking to suppress a third party's records would have the burden to prove the government intrusion violated his own privacy rights, *see* State v. Cardenas, 47 P.3d 127, 129–30 (Wash. 2002).

68. Not all of a person's records will be relevant to the litigation, and irrelevant records will be excluded. WASH. R. EVID. 402.

while maintaining a liberal relevance threshold that is consistent with Washington case law.[69]

B. Limits on Relevant Cell Site Location Information

Even if cell site location information is relevant in a particular case, a court's analysis does not end here. The next question is whether the relevant evidence should be excluded or limited by another constitutional, statutory, or rule provision.[70] The primary limit on relevant evidence is articulated in Washington Rule of Evidence 403: "Relevant evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."[71]

Determining whether relevant evidence is unfairly prejudicial is far from a scientific endeavor. Washington courts have looked to the identical federal rule's[72] advisory committee notes to help define unfairly prejudicial evidence.[73] The notes indicate that inciting emotion in the jury often causes unfair prejudice.[74] Some commentators have suggested that courts rely too heavily on emotion to detect unfair prejudice, and the analysis should focus on the "end product of the prejudice, not just on the process by which the prejudice might be created"—namely, fact finding and fairness.[75] Irrespective of potential drawbacks to a court's "gut-check" balancing test, Washington courts continue to characterize unfairly prejudicial evidence as evidence that is "more likely to arouse an emotional response than a rational decision by the jury."[76] Relevant evidence is presumed admissible under this rule,[77] and the burden of showing unfair prejudice is on the party seeking to exclude the evidence.[78]

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69. *See Kappelman*, 217 P.3d at 290.

70. *See* WASH. R. EVID. 402.

71. WASH. R. EVID. 403.

72. The language of the federal rule is equivalent to the Washington rule. *Compare* FED. R. EVID. 403, *with* WASH. R. EVID. 403.

73. City of Auburn v. Hedlund, 201 P.3d 315, 319 (Wash. 2009).

74. *Id.*

75. *See* Victor J. Gold, *Federal Rule of Evidence 403: Observations on the Nature of Unfairly Prejudicial Evidence*, 58 WASH. L. REV. 497, 498, 503 (1983) (noting most courts have "failed to develop a coherent definition of unfair prejudice," reducing judges to an "'I know it when I see it'" approach that relies too heavily on emotion).

76. *E.g.*, *Hedlund*, 201 P.3d at 319 (internal quotation marks omitted); State v. Cronin, 14 P.3d 752, 760 (Wash. 2000) (quoting State v. Gould, 791 P.2d 569, 573 (Wash. Ct. App. 1990)).

77. State v. Burkins, 973 P.2d 15, 25 (Wash. Ct. App. 1999), *review denied*, 989 P.2d 1142 (Wash. 1999).

78. Hayes v. Wieber Enterprises, Inc., 20 P.3d 496, 500 (Wash. Ct. App. 2001).

In the context of cell site location information, the evidence is probably most probative when the guilt or innocence of the accused is dependent upon a showing that the accused was physically present to commit the crime. In *Wright*, for example, the State argued that Wright shot Cooper, placing him in Lawton sometime between 6:30 and 7:30 p.m., while Wright argued he remained in Sioux City during this time.[79] In these situations, cell site location information is highly probative evidence for the jury to decide which testimony is more credible, and the value of the cell tower data outweighs any prejudice suffered by the defendant.

Cell site location information should be subject to greater scrutiny when the State introduces the information to prove an ancillary fact, such as a pattern of movement,[80] rather than to place the accused at the scene of the crime. The State, for example, might seek to establish a defendant's intent to distribute narcotics by using cell site location information to show a consistent and prolonged pattern of movement between the defendant's home and a suspected drug manufacturing or distribution center. The evidence is fairly probative because the State has a valid interest to prove the defendant's intent, but the defendant should not be unfairly prejudiced by his own zip code. The defendant might simply reside in an area fraught with narcotics dealing, for example. The introduction of cell site location information in this instance requires greater judicial scrutiny because this information could trigger an emotional reaction in the jury that presupposes the defendant's guilt.[81]

Relevant cell site location information should be excluded as unfairly prejudicial when the defendant's location is not substantially consequential to the outcome of the case, and the location could incite unfavorable emotions in the jury.[82] For example, if the State seeks to introduce evidence that the defendant made or received calls from an adult entertainment establishment, gambling house, or seedy neighborhood before or after committing an unrelated crime, the cell site location information's prejudicial effect would likely outweigh its probative value.

In addition to limiting unfairly prejudicial relevant evidence, the rule also gives the trial judge discretion to exclude otherwise relevant evidence that is confusing, misleading, or cumulative, that wastes time,

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79. State v. Wright, No. 08-1737, 2010 WL 200052, at *5 (Iowa Ct. App. Jan. 22, 2010).

80. *See* WASH. R. EVID. 406 ("Evidence of the habit of a person or of the routine practice of an organization, whether corroborated or not and regardless of the presence of eyewitnesses, is relevant to prove that the conduct of the person or organization on a particular occasion was in conformity with the habit or routine practice.").

81. *See* Gershman, *supra* note 18, at 327.

82. WASH. R. EVID. 403.

or that would cause undue delay.[83] Cell site location information is cumulative and a waste of time if the State has adequately proved, through other testimony, that the defendant was in a certain location during a certain time, or if the defendant admits to being in a location that is consistent with the call record data. Practitioners should seek to admit the underlying call records before any demonstrative maps plotting a cell phone's location.[84] Therefore if the map is excluded from evidence, it could at least be offered for illustrative purposes only,[85] whereas call records have no illustrative value.

IV. FOUNDATIONAL QUESTIONS: ESTABLISHING ACCURACY AND RELIABILITY

Once a court is satisfied that the cell site location information is relevant and will not unduly prejudice the opposing party, the court must determine whether there is an adequate foundation to admit the information into evidence. While some jurisdictions have blurred the foundational testimony for the collection of cell site location information with the process of mapping the data,[86] Washington courts should be more precise.[87] A trial court should require the party seeking to admit cell site location information to lay two distinct foundations: (1) the accuracy and reliability of the underlying GPS or triangulation methodology, and (2) the accuracy and reliability of the program used to map the data for demonstrative purposes. Section A of this Part explores whether expert testimony is required to provide either or both of these foundations. Section B then examines a party's burden to establish that the technology is reliable and properly authenticated.

A. Expert Testimony

Jurisdictions differ on whether expert testimony is necessary to admit cell site location information.[88] In *United States v. Sanchez*, a Mi-

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83. *Id.*

84. *See* 5D KARL B. TEGLAND, WASHINGTON PRACTICE SERIES: COURTROOM HANDBOOK ON WASHINGTON EVIDENCE ER 901 (2011–2012 ed.).

85. *See, e.g.*, Feldmiller v. Olson, 450 P.2d 816, 818 (Wash. 1969) (noting illustrative material is subject to less onerous scrutiny than material offered into evidence).

86. *See, e.g.*, Perez v. State, 980 So. 2d 1126, 1131 (Fla. Dist. Ct. App. 2008), *review denied*, 994 So. 2d 305 (Fla. 2008), *cert. denied*, 129 S. Ct. 1618 (2009); Wilson v. State, 195 S.W.3d 193, 200–02 (Tex. Ct. App. 2006).

87. A more precise foundational probe promotes consistency among trial courts and minimizes the opportunity for reversible error.

88. *Compare* United States v. Sanchez, 586 F.3d 918, 929 (11th Cir. 2009) (no expert required), *with* Wilder v. State, 991 A.2d 172, 200 (Md. Ct. App. 2010) (expert required).

ami–Dade detective testified that he reviewed the call records of two defendants charged with conspiracy to possess a controlled substance with intent to distribute.[89] Without qualifying as an expert, the detective explained how the location information had been gathered in general terms, which the court held was sufficient to admit the call records into evidence and illustrate the phone's location during the calls for the jury.[90]

Maryland, on the other hand, expressly rejected this approach: "[W]e believe that the better approach is to require the prosecution to offer expert testimony to explain the functions of cell phone towers, derivative tracking, and the techniques of locating and[] or plotting the origins of cell phone calls using cell phone records."[91] In *Wilder v. State*, the court reasoned Maryland's evidence rules prohibited "the admission of 'lay opinion' testimony based upon specialized knowledge, skill, experience, training, or education," and the defendant's argument that "[a]n expert from the cell phone company or an engineer familiar with cell phone technology [is] the proper person to testify" ultimately prevailed.[92]

Washington courts should adopt Maryland's standard and require a qualified expert to provide foundation testimony for the underlying cell data collection method. Under Washington's Rules of Evidence, a lay witness's testimony is similarly limited to opinions and inferences that do not rely on technical or other specialized knowledge.[93] "Expert testimony is required when an essential element in the case is best established by an opinion that is beyond the expertise of a layperson."[94] In the context of cell site location information, one can anticipate that GPS and mathematical triangulation are topics beyond the expertise of most lay jurors. Accordingly, the State should proffer qualified expert testimony to explain the cell tower location methodologies and the information embedded in the call detail record.

With respect to the secondary mapping technology, however, the need for an expert is less clear. Most jurors are probably familiar with, or at least recognize, modern mapping software that is widely available online. On the other hand, some level of training and technical expertise is required to run the software that creates visual representations of a cell phone's movement. While courts should ensure that the person laying the

89. *Sanchez*, 586 F.3d at 929.

90. *Id.* The State did not seek to admit the illustrations into evidence. *Id.*

91. *Wilder*, 991 A.2d at 198.

92. *Id.* at 196 (citing the appellant's brief) (internal quotation marks omitted).

93. *See* WASH. R. EVID. 701.

94. Seybold v. Neu, 19 P.3d 1068, 1074 (Wash. Ct. App. 2001) (citing Harris v. Robert C. Groth, M.D., Inc., 663 P.2d 113 (Wash. 1983)) (holding that expert testimony is required to establish the standard of care and most aspects of causation in a medical negligence action).

foundation to introduce the reproductions has adequate training in the software, expert testimony should not be required for this purpose. Given the prevalence of this kind of technology in everyday life, the essential elements of the secondary mapping function are not better established "by an opinion that is beyond the expertise of a layperson."[95]

If Washington courts require expert testimony to lay the foundation for the collection and storage of cell site location information, the parties should be afforded some guidance as to who is qualified to give this testimony. There are two general approaches. The State could seek to qualify as an expert a law enforcement officer with training in the subject area, or the State could seek to qualify as an expert one of the cellular provider's employees.[96] Within this second category, a separate question is raised with respect to whether a cellular provider's records custodian is able to provide an adequate foundation for both the data collection methodology and the contents of the records themselves, or if a radio frequency engineer is the more appropriate person to lay this foundation.[97]

1. Law Enforcement Officer

A witness, qualified as an expert, may testify in the form of an opinion "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue."[98] When considering the admissibility of evidence under Washington Rule of Evidence 702, courts accordingly consider whether the witness qualifies as an expert and whether the witness's testimony would be helpful to the trier of fact.[99]

Washington courts have held that a witness may qualify as an expert based on knowledge, skill, training, or education.[100] The requisite knowledge is not limited to formal training, however, and practical experience may suffice.[101] In *State v. McPherson*, a Washington trial court allowed a city detective to testify in detail about the process of manufacturing methamphetamine.[102] The defendant contested the detective's qualifications as an expert because, although the detective attended a forty-hour DEA course on the "assessment, analysis, and cleanup of meth-

95. *Id.*

96. The party seeking to admit the cell site location information is free to call any qualified expert to introduce the data collection method; these two options are simply the most practical.

97. *See infra* Part IV.A.2.

98. WASH. R. EVID. 702.

99. State v. Guilliot, 22 P.3d 1266, 1271 (Wash. Ct. App. 2001).

100. *E.g.*, State v. McPherson, 46 P.3d 284, 292 (Wash. Ct. App. 2002).

101. *Id.*

102. *Id.* at 288.

amphetamine labs,"[103] he did not hold a formal degree in chemistry.[104] The court of appeals concluded that the detective properly qualified as an expert because he completed the DEA course, attended several conferences, and had extensive experience investigating methamphetamine labs—factors that collectively satisfied the special knowledge requirement.[105]

As cell site location information becomes more common in criminal prosecutions, select law enforcement personnel will likely receive training on inputting information from a call detail record into the applicable software in order to produce a visual graphic of a particular cell phone's location during specific times.[106] While the State might advance a *McPherson*-type argument—that the officer's training and experience qualifies the officer as an expert—to allow the officer to provide the requisite foundation for cell site location information in its entirety, the officer's expertise is really limited to the secondary mapping technology.[107] For this reason, most law enforcement personnel probably lack the knowledge and experience necessary to "explain the functions of cell phone towers, derivative tracking, and the techniques of locating and[] plotting the origins of cell phone calls using cell phone records."[108] One of the cellular provider's employees (or a third person with relevant expertise), therefore, is better suited to provide this foundational testimony, and most jurisdictions that have addressed the issue follow this approach.[109]

2. Records Custodian vs. Radio Frequency Engineer

Some jurisdictions permit a cellular provider's custodian of records to lay foundation for *both* the contents of the call detail record *and* the underlying data collection methodology.[110] Other jurisdictions have instead required testimony from one of the cellular provider's radio fre-

103. *Id.* (internal quotation marks omitted).

104. *Id.* at 292–93.

105. *Id.* at 293.

106. For example, Deputies in King County, Washington, have begun using Advanced Cell Tracking Systems.

107. *Id.*

108. Wilder v. State, 991 A.2d 172, 198 (Md. Ct. App. 2010).

109. *See* Perez v. State, 980 So. 2d 1126, 1131–32 (Fla. Ct. App. 2008); Pullin v. State, 534 S.E.2d 69, 71 (Ga. 2000); State v. Wright, No. 08-1737, 2010 WL 200052 (Iowa App. Jan. 22, 2010); State v. Manzella, 128 S.W.3d 602, 608–09 (Mo. Ct. App. 2004); Wilson v. State, 195 S.W.3d 193, 200–02 (Tex. App. 2006).

110. *See Wilson*, 195 S.W.3d at 200–02 (allowing a Sprint custodian of records to lay the appropriate foundation for the business records exception to the hearsay rule and to provide an expert opinion explaining how the tower data indicates the phone's location).

quency engineers.[111] Washington courts should allow records custodians to perform both functions.

A records custodian is an employee responsible for keeping call detail records in the ordinary course of business,[112] whereas radio frequency engineers typically have more extensive background in wireless engineering.[113] A radio frequency engineer is "a professional who designs radio frequency components, circuits and devices," and often manages the production of radio frequency devices.[114] While records custodians have less technical engineering expertise than radio frequency engineers, a records custodian is an appropriate employee to introduce cell site location information as a qualified expert. In *Wilson v. State*, for example, the defendant contested a Texas trial court's admission of testimony from a Sprint records custodian, who explained the information contained in the call records and offered an expert opinion with respect to the interpretation of those records.[115] The court of appeals, rejecting the defendant's assertion, reasoned that the custodian's "skill, experience, training and knowledge" would adequately assist the trier of fact to understand a core issue in the case.[116] The *Wilder* court in Maryland followed this line of reasoning as well: "In the case before us, [the record custodian's] testimony implicated much more than mere telephone bills. He elaborated on the information provided by the cell phone records . . . ."[117] In Iowa, on the other hand, prosecutors subpoenaed the "radio frequency engineering manager" to explain Wright's call records and identify the location of his phone during the murder.[118]

While radio frequency engineers can probably be expected to better understand the inner workings of cell phone towers and the process of determining a phone's location using either GPS or triangulation, Wash-

111. *See Wright*, 2010 WL 200052, at *4, *6.

112. *See Records Custodian Law & Legal Definition*, USLEGAL.COM, http://definitions.uslegal.com/r/records-custodian/ (last visited Apr. 4, 2012).

113. Lucy Friend, *RF Engineer Job Description*, EHOW MONEY, http://www.ehow.com/facts_6718798_rf-engineer-job-description.html (last visited Nov. 24, 2011).

114. *Id.*

115. *Wilson*, 195 S.W.3d at 200–02 (rejecting the defendant's claim that the records custodian was not qualified to opine on cell site location information).

116. *Id.* at 202 (internal quotation marks omitted).

117. Wilder v. State, 991 A.2d 172, 199 (Md. Ct. App. 2010). The custodian's ability to plot the cell phone's location using the information in the call detail record "clearly required some specialized knowledge of skill . . . that is not in the possession of the jurors." *Id.* at 200 (citing Ragland v. State, 870 A.2d 609, 725 (Md. 2005) (internal quotation marks omitted)).

118. State v. Wright, No. 08-1737, 2010 WL 200052, at *4 (Iowa App. Jan. 22, 2010) (holding the radio frequency engineering manager was able to provide the necessary foundation for cell tower technology and method of storing data in call detail records even though he himself did not maintain the records).

ington courts should permit a records custodian to provide this information as a qualified expert. This approach comports with Washington's expert testimony jurisprudence, reduces the burden on cellular providers, and streamlines the trial process. First, a party's expert witness "does not have to be a rocket scientist,"[119] and a records custodian should qualify, provided he or she can demonstrate a general and sufficient knowledge of the way in which the data in a call detail record are gathered.[120] Second, radio frequency engineers have substantial training and expertise, and they are integral to wireless infrastructure.[121] For these reasons, subpoenaing a cellular provider's radio frequency engineer places a more substantial burden on the wireless provider because it has to supplement the managerial and technical functions of the engineer while he or she appears in court. Furthermore, because radio frequency engineers are less numerous than records custodians, scheduling the engineer for testimony runs a higher risk of delay, wasting valuable time and further congesting the state trial courts.

In summary, Washington courts should require expert testimony to lay the foundation for cell site location information, but law enforcement officers or other witnesses need not qualify as experts to introduce any secondary mapping technology used to illustrate the call records. One of the cellular provider's employees, rather than a law enforcement agent, is best suited to provide foundation for the underlying testimony, but courts should not insist that the employee be a radio frequency engineer. The cellular provider's records custodian should suffice to provide this foundation. Finally, the expert's testimony should be limited to explaining the data collection methodology, the accuracy of the tracking procedures, and offering an opinion on the interpretation of the data. It is well settled that experts may not offer an opinion with respect to the innocence or guilt of the defendant.[122]

B. Establishing Reliability

When a records custodian or other qualified expert takes the stand to explain the call detail record and underlying locating methodology, he or she will also need to establish the reliability of cell site location in-

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119. State v. McPherson, 46 P.3d 284, 292 (Wash. Ct. App. 2002) (internal quotation marks omitted).

120. *Id.* at 293 (holding the "lack of a complete and formal college education in the field" did not disqualify the expert).

121. *See* Heather Head, *What Is an RF Engineer?*, HARRIS COMM. (Nov. 16, 2009), http://harriscommunications.net/expert-advice/what-is-an-rf-engineer/.

122. *See, e.g.*, State v. Black, 745 P.2d 12, 19 (Wash. 1987); State v. Garrison, 427 P.2d 1012, 1015 (Wash. 1967); *McPherson*, 46 P.3d at 293.

formation. In other words, the State must lay a proper foundation that the call records accurately reflect the cell phone's location. This Section explores whether the expert's testimony should be subject to a *Frye* hearing and how the expert must authenticate both the call detail records and any secondary mapping technology.

1. Is *Frye* Implicated?

Frye v. United States first announced that the proponent of scientific evidence must demonstrate that the theory or method relied upon is generally accepted within the scientific community.[123] While the Supreme Court has since held Federal Rule of Evidence 702 supersedes *Frye* in federal courts,[124] Washington courts continue to use the standard enunciated in *Frye* to evaluate new scientific evidence.[125] Under this standard, both the scientific theory underlying the evidence and the technique or method used to implement the theory must be generally accepted in the scientific community.[126] Evidence that "does not involve new methods of proof or rely on new scientific principles," however, is not subject to a *Frye* hearing.[127] When considering whether *Frye* is implicated, the court's role is not to evaluate the merits of a particular theory, but rather to determine whether a legitimate dispute exists about the scientific reliability of the evidence.[128]

No Washington court has expressly held that GPS or network-based location tracking (using angle of arrival or time distance of arrival principles) constitutes a novel scientific theory, but the Washington Department of Corrections employs GPS technology to monitor sex offend-

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123. Alice B. Lustre, Annotation, *Post-Daubert Standards for Admissibility of Scientific and Other Expert Evidence in State Courts*, 90 A.L.R. 5th 453 (2001); *accord* Frye v. United States, 293 F. 1013 (D.C. Cir. 1923), *superseded by* Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 597 (1993).

124. *See Daubert*, 509 U.S. 597.

125. *E.g.*, State v. Martin, 684 P.2d 651, 654 (Wash. 1984) (affirming Washington's adherence to the *Frye* standard); State v. Woo, 527 P.2d 271, 272 (Wash. 1974) (adopting the *Frye* test in Washington); State v. Strauss, (*In re Det. of Strauss*), 20 P.3d 1022, 1025 (Wash. Ct. App. 2001) (rejecting the *Daubert* test and again affirming *Frye* in Washington); *see also* Hon. Jack Nevin, *Conviction, Confrontation, and Crawford: Gang Expert Testimony as Testimonial Hearsay*, 34 SEATTLE U. L. REV. 857, 887 n.122 (2011) ("Under *Frye*, an expert's testimony cannot exceed the underlying scientific or technical understanding. It must be accepted in the scientific community. . . . In *State v. Baity* . . . the Washington State Supreme Court reaffirmed that *Frye* would continue to be the Washington standard for acceptance of scientific or technical evidence.").

126. State v. Gregory, 147 P.3d 1201, 1238 (Wash. 2006).

127. State v. Roberts, 14 P.3d 713, 740 (Wash. 2000) (citing State v. Baity, 991 P.2d 1151, 1157 (Wash. 2000)) (internal quotation marks omitted).

128. State v. Phillips, 98 P.3d 838, 841–42 (Wash. Ct. App. 2004) ("Mere disagreement as to the conclusions or weight to be given the results [of scientific evidence] . . . does not amount to a significant dispute.").

ers,[129] and the use of the technology has not generated any litigation disputing its scientific reliability.[130] At least one Washington court has expressly held that radio tracking device technology does not implicate *Frye*, however.[131] In *State v. Vermillion*, the defendant robbed a Seattle bank, and the bank teller handed the defendant "a bag containing money, a confidential tracking device, and bait money."[132] The court held the tracking system did not "involve a novel scientific theory," and "a *Frye* inquiry is unnecessary" if the evidence "does not involve a novel scientific theory or principle."[133] The tracking system in *Vermillion* used "the transmission and reception of radio signals between the tracking device, receiving unit, and transmission towers," which the court characterized as "common technology."[134] The court reasoned the system "only required objective observation of information relayed from the tracking device to the receiving unit," analogizing to other scientific devices that are not subject to *Frye*—such as police radar and the colposcope.[135]

Like the radio tracking tool used in *Vermillion*, GPS and network-based locating tools rely on similar principles, which require objective observation of information relayed between the cell phone and cell towers or satellites in order to estimate the device's physical location.[136] The technology does not rely on a new or unusual scientific theory—the technology relies on math.[137] Washington courts have held that mathematical calculations, such as statistical analysis used in DNA profiles and actuarial instruments used to predict the future dangerousness levels of sex offenders, do not implicate *Frye*.[138] Similarly, because cell site loca-

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129. *See* Andrew Garber & Jennifer Sullivan, *State to Electronically Monitor Sex Offenders*, SEATTLE TIMES (Sept. 27, 2007), http://seattletimes.nwsource.com/html/localnews/2003906581_predators27m.html.

130. The weight of authority suggests electronic monitoring systems are reliable and do not need to be substantiated by expert testimony.

131. State v. Vermillion, 51 P.3d 188, 198 (Wash. 2002).

132. *Id.* at 191.

133. *Id.* at 198 (citing State v. Hayden, 950 P.2d 1024 (Wash. Ct. App. 1998)).

134. *Id.*

135. *Id.* (relying on City of Bellevue v. Lightfoot, 877 P.2d 247 (Wash. Ct. App. 1994) (concluding radar evidence does not require a *Frye* hearing); State v. Noltie, 786 P.2d 332 (Wash. Ct. App. 1992), *aff'd*, 809 P.2d 190 (Wash. 1991) (concluding the colposcope, a device used to examine the cervix, does not rely on a novel theory and is not subject to *Frye*)).

136. *See supra* Part II.A.

137. *Id.*

138. *See* State v. Bander, 208 P.3d 1242, 1254–55 (Wash. Ct. App. 2009) (concluding the trial court did not err when it declined to hold a *Frye* hearing on the reliability of DNA statistical calculations because a number of scientific articles and other state jurisdictions considered the methods to be generally accepted in the scientific community despite some critics and explaining that "*Frye* does not require unanimity"); *In re* Det. of Taylor, 134 P.3d 254, 259 (Wash. Ct. App. 2006) (noting actuarial tests are generally accepted in the scientific community).

tion information does not rely on a novel scientific theory, it should not require a *Frye* hearing. At the very least, the reliability of cell site location information is not subject to a legitimate scientific dispute provided the expert acknowledges that the records reflect "approximate" locations of the phone itself.[139]

The next question is whether demonstrative evidence mapping the cell phone's location is based on novel scientific principles and therefore subject to a *Frye* inquiry.[140] Washington courts have articulated that a *Frye* hearing is necessary to substantiate the general acceptance of "computer-generated simulations used as substantive evidence."[141] The party seeking to admit these simulations as substantive evidence must show the following:

> (1) the computer is functioning properly; (2) the input and underlying equations are sufficiently complete and accurate (and disclosed to the opposing party so that they can be challenged); and (3) the program is generally accepted by the appropriate community of scientists for use in the particular situation at hand.[142]

The need to subject mapping programs, like Advanced Cell Tracking Systems, to a *Frye* hearing depends on whether the program constitutes a "computer-generated simulation"[143] or "nothing more than [a] sophisticated record-keeping system."[144] In *State v. Sipin*, the court held "computer-generated simulations used as substantive evidence or as the basis for expert testimony regarding matters of substantive proof must have been generated from computer programs that are generally accepted by the appropriate community of scientists."[145] The State's expert testified that a vehicle crash simulation program "would create a predictive image of the vehicle movement, based on the laws of physics" by "inputting variables from the scene and the vehicle, such as steering, braking, and speed."[146] By contrast, another Washington court held *Frye* was not

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139. *See* State v. Wright, No. 08-1737, 2010 WL 200052, at *4 (Iowa Ct. App. Jan. 22, 2010) ("[The radio frequency engineer] acknowledged that the locations on the chart were only 'approximate areas' where the cell phone would have been at the times in question.").

140. *See* State v. Roberts, 14 P.3d 713, 740 (Wash. 2000) (citing State v. Baity, 991 P.2d 1151, 1157 (Wash. 2000)).

141. *See* State v. Sipin, 123 P.3d 862, 868 (Wash. Ct. App. 2005).

142. *Id.* The court invalidated the program under the third prong of the *Frye* test because the scientific community disagreed about the program's usefulness. *Id.* at 871.

143. *Id.* at 864.

144. State v. Russell, 882 P.2d 747, 776 (Wash. 1994) (holding expert testimony referring to computer programs listing various characteristics of homicides in Washington did not involve novel scientific principles).

145. *Sipin*, 123 P.3d at 868–69.

146. *Id.* at 865 (internal quotation marks omitted).

implicated when computer programs utilized databases to isolate the characteristics of Washington and nationwide homicides.[147] In that instance, the State used these programs to show the "rarity of posed murder victims" using statistical analysis.[148]

Basic software that uses coordinates to superimpose vectors upon a map does not rely on novel scientific principles. These mapping software simply display data that was recorded at the time of the communication; they do not predict a course of events like vehicle crash simulators. They are also not "used as substantive evidence"[149]—they are generally used to illustrate substantive evidence contained in the call detail record. Therefore, the technology at issue here is closer to the technology under review in *Roberts* than in *Sipin*, and the secondary mapping programs should not be subject to *Frye*. While a defendant might object to the introduction of cell site location information on the ground that it is not generally accepted in the scientific community, this objection is somewhat misguided because the technology does not rely on new or unusual scientific principles. But defense counsel can and should demand a showing that the information going into the computer program—and the illustrations coming out of the program—accurately reflect the location of the cell phone. This issue is explored in the next subsection.

2. Authentication and Calibration

Although a *Frye* inquiry is probably unnecessary for the introduction of cell site location information, the party seeking to admit cell site location information must establish that the records are authentic.[150] By way of illustration, Washington Rule of Evidence 901 provides ten examples of how evidence could be appropriately authenticated.[151] First, the records custodian could authenticate the call detail records by way of his or her oral testimony.[152] As Tegland points out, this is a relatively straightforward process: "The requirement of authentication or identifi-

147. *Russell*, 882 P.2d at 776–77.

148. *Id.* at 776.

149. *Sipin*, 123 P.3d at 868.

150. *See* WASH. R. EVID. 901(a) ("The requirement of authentication or identification as a condition precedent to admissibility is satisfied by evidence sufficient to support a finding that the matter in question is what its proponent claims.").

151. WASH. R. EVID. 901(b) ("By way of illustration only, and not by way of limitation, the following are examples of authentication or identification conforming with the requirements of this rule.").

152. *See* WASH. R. EVID. 901(b)(1) (illustrating that the testimony of a witness with knowledge can authenticate evidence).

cation is easily satisfied in most situations."[153] All one needs to show is that the records offered into evidence are, in fact, the records collected and maintained by the cellular provider that correspond to the defendant's cell phone number.

Authenticating maps that illustrate the call records, however, is somewhat more involved. The key to authenticating maps is to offer proof of their accuracy, reliability, fairness, and completeness.[154] The party offering the evidence must make a prima facie showing that would "permit a reasonable juror to find in favor of authenticity or identification."[155] Because the records custodian or the law enforcement officer presumably did not accompany the defendant while he used his cell phone, these witnesses cannot truly "authenticate" the maps' reliability through oral testimony. A more precise approach would be to authenticate the maps by presenting evidence that they were prepared using a process or system that consistently produces an accurate result.[156]

Cell site location "plotting programs" often utilize existing technology, such as Google Earth, that enables users to view satellite images and maps of the globe.[157] A Pennsylvania court has considered law enforcement's reliance on Google Earth to indicate the distance between a school zone and an alleged drug transaction.[158] The court concluded that the "use of the Google Earth technology was properly authenticated when [the detective] testified about his familiarity with the Google Earth system and his independent verification of Google Earth's accuracy using two known points."[159] The detective verified Google Earth's accuracy by inputting two known locations and comparing the program's estimated distance to his own physical measurements.[160] "Google Earth's measurement was within one foot" of the distance measured by hand.[161]

Washington courts should require a showing that any illustrations of a cell phone's location have been prepared using a process or system that produces an accurate result. At least one Washington case reinforces

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153. 5D TEGLAND, *supra* note 84.

154. 44 AM. JUR. 2D *Proof of Facts* § 707 (1986).

155. State v. Payne, 69 P.3d 889, 893 (Wash. Ct. App. 2003); *see also* 5C KARL B. TEGLAND, WASHINGTON PRACTICE: EVIDENCE LAW & PRACTICE § 901.1 n.3 (5th ed. 2007).

156. *See* WASH. R. EVID. 901(b)(9) (illustrating that a process or system that produces an accurate result can authenticate evidence).

157. *What Is Google Earth?*, GOOGLE, http://earth.google.com/support/bin/answer.py?hl=en&answer=176145 (last updated Sept. 27, 2011).

158. Commonwealth v. Suarez-Irizzary, Nos. CP-38-CR-1204-2009, 1206-2009, 1207-2009, & 1217-2009, 2010 WL 5312257, at *108, *109 (Pa. D. & C.5th Aug. 6, 2010).

159. *Id.* at *117.

160. *Id.* at *111–12.

161. *Id.* at *112.

this principle.[162] In *State v. Bashaw*, the court found error in admitting testimony about the results of a measuring device without proper authentication.[163] The *Vermillion* court's conclusion that evidence derived from a radio tracking device did not require a *Frye* hearing also seems to be influenced by proper authentication: "The record reflects that police witnesses properly authenticated the system by showing that it was working properly at the time police located the device."[164]

In the context of cell site location information, authentication can be achieved by demonstrating that the program is calibrated to ensure operational accuracy. For example, an officer could make a call from a fixed location, input that call's data into the program, and validate whether the location on the map reflects the location of the call. If the program is independently verified, the court can be assured that the information in the illustrations is, in fact, what the State purports it to be.

V. OTHER EVIDENTIARY CHALLENGES: HEARSAY, CONFRONTATION RIGHTS, AND SUMMARY OF VOLUMINOUS RECORDS

There are a number of objections a party seeking to suppress cell site location information might advance beyond the relevance and foundational questions. This Part addresses three noteworthy objections—hearsay, violation of the defendant's confrontation rights, and the improper admission of summary evidence.

A. Hearsay

A party seeking to suppress cell site location information might object on the ground that the call records constitute inadmissible hearsay evidence. Hearsay is not admissible except as provided by the Washington Rules of Evidence, by other court rules, or by statute.[165] The first question is whether the cell site location information constitutes hearsay in the first instance. Hearsay is defined as "a statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted."[166] The term "state-

162. State v. Bashaw, 234 P.3d 195, 199–200 (Wash. 2010), *overruled on other grounds by* State v. Nunez, 285 P.3d 21 (Wash. 2012) ("[R]esults of a mechanical device are not relevant, and therefore are inadmissible, until the party offering the results makes a prima facie showing that the device was functioning properly and produced accurate results.").

163. *Id.*

164. State v. Vermillion, 51 P.3d 188, 198 (Wash. Ct. App. 2002).

165. WASH. R. EVID. 802.

166. WASH. R. EVID. 801(c).

ment" is further defined as either "an oral or written assertion" or "nonverbal conduct" if the person intends his conduct to be an assertion.[167]

The "statements" at issue in the context of cell site location information are the call records themselves. These records would be introduced to prove the truth of the matter asserted, namely, the truth of the phone's location. But the records are subject to the hearsay rule only if they constitute "written assertions" within the meaning of the rule. The time of the call, the duration of call, and the cell tower activated are probably not "assertions" within the meaning of the rule.[168] Therefore, the call detail records are probably not "statements" and hearsay is not implicated in the first instance.

Even if Washington courts assume the call records do constitute hearsay, the records are admissible under the business records exception to the hearsay rule.[169] This statutory exception provides,

> A record of an act, condition or event, shall in so far as relevant, be competent evidence if the custodian or other qualified witness testifies to its identity and the mode of its preparation, and if it was made in the regular course of business, at or near the time of the act, condition or event, and if, in the opinion of the court, the sources of information, method and time of preparation were such as to justify its admission.[170]

If these statutory requirements are met, computerized records are treated the same as any other business records and considered admissible hearsay.[171] The data included in a call detail record are records of acts, conditions, or events because they reflect the act of transmitting a cellular communication from tower to phone; the time and place of the call and the cell tower activated are conditions associated with each transmission. The call detail records are automatically generated at the time of the

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167. WASH. R. EVID. 801(a).

168. The term "assertion" is not defined by statute, but courts give undefined words "their ordinary meaning" and "the court may look to the dictionary for such meaning." State v. Gonzalez, 226 P.3d 131, 134 (Wash. 2010). The word "assertion" is defined as "[a] declaration or allegation." BLACK'S LAW DICTIONARY 48 (3d pocket ed. 2006).

169. *See* State v. Ben-Neth, 663 P.2d 156, 159–60 (Wash. Ct. App. 1983) (articulating the standard to admit computer-generated evidence under the business records exception to the hearsay rule); *see also* State v. Smith, 558 P.2d 265, 270–71 (Wash. Ct. App. 1976) (admitting an exhibit prepared by a bank employee from computer printouts under the business records exception to the hearsay rule); Seattle v. Heath, 520 P.2d 1392, 1396–97 (Wash Ct. App. 1974) (admitting teletype printed material from a teletype printer connected to a central computer under the business records exception to the hearsay rule).

170. WASH. REV. CODE § 5.45.020 (2010).

171. State v. Quincy, 95 P.3d 353, 354 (Wash. Ct. App. 2004).

communication,[172] and they are kept in the regular course of business.[173] Moreover, "[i]t is not necessary that the person who actually made the record provide the foundation" for the record, so general testimony from the cellular provider's records custodian about how the records are kept in the normal course of business should satisfy the rule.[174]

All other jurisdictions that have considered the question of hearsay have admitted cell site location information under the business records exception.[175] For instance, one Nebraska court reasoned that printing computer-stored records "for evidentiary purposes" did not "deprive" the printouts of their status as business records.[176] Because call detail records properly fall under the business records exception, Washington courts should overrule a challenger's hearsay objection as long as the State has laid a sufficient foundation to show that the records are generated at the time of the call and kept for business purposes.

B. Confrontation Rights

If a court concludes the call records are not hearsay, then offering the records into evidence will not implicate the defendant's confrontation rights.[177] But if the court concludes the records are admissible hearsay under the business records exception to the hearsay rule, the defendant's confrontation rights warrant further review. The Confrontation Clause of the Sixth Amendment provides, "In all criminal prosecutions, the accused shall enjoy the right . . . to be confronted with the witnesses against him."[178] The Clause only bars "testimonial" hearsay evidence,

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172. *E.g.*, State v. Wright, No. 08-1737, 2010 WL 200052, at *7 n.6 (Iowa Ct. App. Jan. 22, 2010) (noting the radio frequency engineer testified that "the call detail records were business records that were automatically created every time a transmission was made").

173. *E.g.*, United States v. Chatman, 994 F.2d 1510, 1516 (10th Cir. 1993). In *Chatman*, the court upheld the admission of the defendant's call records into evidence; the court reasoned:

> We conclude that the district court did not abuse its discretion by admitting the call record under the business records exception to the hearsay rule. The call record was admitted through a witness employed by Cellular One as a District Client Service Supervisor. She testified that the call record was kept in the normal course of business with Cellular One, used for billing purposes, and created routinely based on the amount of air time a customer used during the billing period.

Id. at 1516 (citation omitted).

174. *Quincy*, 95 P.3d at 355.

175. *E.g.*, *Wright*, 2010 WL 200052, at *7; Wilson v. State, 195 S.W.3d 193, 200 (Tex. App. 2006).

176. State v. Robinson, 724 N.W.2d 35, 66 (Neb. 2006), *abrogated on other grounds by* State v. Thorpe, 783 N.W.2d 749 (Neb. 2010).

177. DAVID ALLEN SKLANSKY, EVIDENCE: CASES, COMMENTARY, AND PROBLEMS 72 (2d ed. 2008).

178. U.S. CONST. amend. VI.

however, when the defendant has not been afforded a prior opportunity to cross-examine the absent witness.[179] While Washington's constitution does not directly mirror the language of the Sixth Amendment,[180] and "arguably gives broader protection to the defendant,"[181] Washington courts have treated *Crawford v. Washington* and its progeny as controlling precedent.[182] The Supreme Court of Washington has since adopted the four-factor "primary purpose" test first announced in *Davis v. Washington* to determine whether a statement is testimonial.[183] Under this test, Washington courts evaluate the timing of the statement relative to the events discussed, "the threat of harm posed by the situation," the need for information to resolve a present emergency, and the "formality of the interrogation."[184]

The Court of Appeals for the Eleventh Circuit has expressly held that cell site location information is nontestimonial.[185] In *United States v. Green*, the State of Georgia subpoenaed a defendant's call records from Metro PCS, and an expert other than a Metro PCS employee testified about the documents' meaning and accuracy.[186] The district court admitted the records into evidence, and on appeal the defendant argued that this action violated his Sixth Amendment right to confront witnesses against him.[187] The court concluded the cellular provider generated the defendant's call records "for the administration of Metro PCS's business, and not for the purpose of proving a fact at a criminal trial."[188] Therefore,

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179. *See* Crawford v. Washington, 541 U.S. 36, 68 (2004); *see also* Marc McAllister, *Evading Confrontation: From One Amorphous Standard to Another*, 35 SEATTLE U. L. REV. 473, 479–92 (2012) (summarizing the Supreme Court's distinction between testimonial and nontestimonial hearsay).

180. *See* WASH. CONST. art. I, § 22 ("In criminal prosecutions the accused shall have the right . . . to meet the witnesses against him face to face.").

181. *See* 5C TEGLAND, *supra* note 155, § 1300.2.

182. *See* State v. Pugh, 225 P.3d 892, 895–96 (Wash. 2009).

183. *See* State v. Beadle, 265 P.3d 863, 869 (Wash. 2011); State v. Ohlson, 168 P.3d 1273, 1277–79 (Wash. 2007).

184. State v. Reed, 278 P.3d 203, 210 (Wash. Ct. App. 2012) (drawing on principles articulated in *Davis v. Washington*, 547 U.S. 813, 827 (2006)).

185. *See, e.g.*, United States v. Green, 396 F. App'x 573, 573–75 (11th Cir. 2010).

186. *Id.* at 573–74.

187. *Id.*

188. *Id.* at 575; *see also Crawford*, 541 U.S. at 56 ("Most of the hearsay exceptions covered statements that by their nature were not testimonial—for example, business records or statements in furtherance of a conspiracy."); United States v. Sanchez, 586 F.3d 918, 928–29 (11th Cir. 2009) (holding cell phone records and cell tower locations are business records within the meaning of FED. R. EVID. 803(6)). *But see* United States v. Melendez-Diaz, 557 U.S. 305, 310–12 (2009) (holding affidavits that contain the results of forensic analysis are testimonial and require Sixth Amendment confrontation).

the records were nontestimonial, and their admission did not offend the defendant's constitutional rights.[189]

If Washington courts decide that cell site location information does constitute hearsay, and a witness other than the declarant introduces the records (in this case the cellular provider), the court should determine whether the evidence is testimonial hearsay and therefore barred by the Confrontation Clause. Historical call records—those sought after the commission of a crime or pattern of movement[190]—are nontestimonial because they are not prepared in anticipation of trial.[191] A defendant could advance a more credible argument that prospective call records—those sought in real time[192]—are testimonial, but the cellular provider would record the same information irrespective of any interest from the government.[193] In *Crawford*, the Court specifically mentioned that business records are "by their nature" nontestimonial.[194] Because cell site location information gathered from cellular providers in the normal course of business is nontestimonial, Washington courts should hold that testimony introducing the records by an expert other than the person who actually prepared the records does not violate the principles of the Confrontation Clause.

C. Summary Evidence

Finally, a defendant might object to the admission of maps or exhibits summarizing cell site location information on the ground that only the records constitute evidence. In *Sanchez*, the judge instructed the jury that certain maps depicting the location of the defendant's cell phone "were not evidence, and that the evidence consisted of MetroPCS's database and the call records reflecting information contained in the database."[195] It is unclear whether the Government sought to admit the maps into evidence or merely provide an illustration of the evidence.[196]

Regardless, Washington's Rules of Evidence provide that "the contents of voluminous writings, recordings, or photographs which cannot be conveniently examined in court may be presented in the form of a

189. *Green*, 396 F. App'x at 375.

190. Chamberlain, *supra* note 51, at 1748.

191. *See Crawford*, 541 U.S. at 56.

192. Chamberlain, *supra* note 51, at 1748.

193. Call detail records are generated automatically. If the government successfully obtains a warrant for this information in real time, the cellular provider does not have to change its pattern of behavior or change the makeup of the records themselves.

194. *Crawford*, 541 U.S. at 56.

195. United States v. Sanchez, 586 F.3d 918, 929 (11th Cir. 2009).

196. *Id.*

chart, summary, or calculation."[197] Moreover, a summary of complicated or voluminous records admitted pursuant to Washington Rule of Evidence 1006 "is substantive evidence that does go to the jury room."[198] For example, one Washington court concluded that a spreadsheet summarizing numerous credit card statements was properly admitted, and the trial judge did not err in sending the exhibit into the jury room for deliberation.[199] Under this reasoning, Washington courts may properly admit into evidence summaries of cell site location information, in the form of maps or charts, if the records are "voluminous" and cannot be conveniently examined.

VI. CONCLUSION

As cell phones become a way of life for more and more Americans, courts can anticipate that law enforcement agencies will bolster their efforts to use cell site location information in criminal prosecutions. This information is most commonly used to prove that the defendant's cell phone, and presumably the defendant, was in the vicinity of the crime when it occurred. To date, cell site location information has generated significant scholarship and attention with respect to privacy protections and the legal showing necessary to obtain the information.[200] However, relatively few courts have addressed the evidentiary standards to offer cell site location information into evidence. This Comment attempts to provide a working roadmap for judges and practitioners in the State of Washington when confronted with questions surrounding the admissibility of this evidence.

In summary, cell site location information is relevant when a person's specific location is material to the outcome of the case and revealing the person's whereabouts will not unfairly prejudice the jury. Washington courts should require separate foundations for the underlying data collection methodology and the secondary mapping technology, and a qualified expert is necessary to provide the former. The cellular provider's records custodian should satisfy this requirement. With respect to reliability, a *Frye* inquiry is unnecessary, but law enforcement agents who have prepared maps or illustrations of a cell phone's location must

197. WASH. R. EVID. 1006.

198. State v. Lord, 822 P.2d 177, 194 n.5 (Wash. 1991) (citing 5B KARL B. TEGLAND, WASHINGTON PRACTICE: EVIDENCE LAW & PRACTICE § 495 (4th ed.)).

199. *See* State v. Dudley, No. 50459-2-1, 2003 WL 21689989, at *1–*2 (Wash. Ct. App. July 21, 2003). This is an unpublished opinion; thus, the opinion has no precedential value. *See* WASH. REV. CODE § 2.06.040. It is provided simply as an example of a summary of records that might warrant admission into evidence as opposed to serving purely illustrative purposes.

200. *See supra* note 25 and accompanying text.

authenticate these demonstratives by independently verifying the software's accuracy. Finally, hearsay, confrontation challenges, and objections to summary evidence can all be overcome with relative ease. Cell site location information will only become more widely used in criminal trials, and judges and advocates alike should be well prepared to confront these issues when they arise.