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**Prolonged GPS Surveillance and the Fourth Amendment:
A Critical Analysis of the D.C. Circuit’s “the-whole-is-greater-
than-the-sum-of-its-parts” Approach in *United States v. Maynard***

JOSHUA A. LUNSFORD

I. INTRODUCTION

Given the numerous advents in technology over the last decade, there are serious concerns regarding the extent to which members of society can maintain privacy in their daily activities, from checking email to making daily commutes to and from work. Since technology has provided the means of exposing nearly every act and movement to the public sphere, citizens are now left with the unrealistic alternative of foregoing any action that they do not want to become publicly exposed in an attempt to be free from unwanted government oversight. As this article argues, there must be a plausible alternative to provide each and every citizen with the ability to engage in their daily actions without the fear that “Big Brother” is watching their every step—an alternative that can be derived from the meaning of the Fourth Amendment.

The legitimacy of these concerns is made apparent by an occurrence in Santa Clara, California in late 2010. Yasir Afifi, a twenty-year-old United States citizen and son of an Islamic-American community leader, discovered an “odd device” mounted to the undercarriage of his vehicle after taking the car to a mechanic for an oil change.¹ When the mechanic placed the vehicle on the hydraulic lift, he observed, inspected, and removed a wire coming from the right rear of the vehicle.²

Having no idea what it was that he discovered, pictures of the device were uploaded on an Internet website, which subsequently created a chain of events that Afifi could have never foreseen.³ Soon after the initial post, a website reader identified the device as an Orion Guardian ST820 tracking unit.⁴ Later that same week, Afifi encountered “two sneaky-looking people” in the parking lot outside his apartment complex who awkwardly

1. Kim Zetter, *Caught Spying on Student, FBI Demands GPS Tracker Back*, WIRED.COM (Oct. 7, 2010), <http://www.wired.com/threatlevel/2010/10/fbi-tracking-device>.

2. *Id.*

3. *Id.*

4. *Id.*

commented to him that his license plate was expired.⁵ As he got into his car and exited the parking lot, two vehicles quickly pulled up behind him and effectuated a traffic stop, asserting that they came to recover the device he had recently removed from his vehicle.⁶ Other than some remarks concerning comments made by one of Afifi's friends on an Internet website, the officers that came to recover the device never provided any justification for placing the unit on the vehicle.⁷

The Fourth Amendment's premise that society has a legitimate fear of unwarranted government intrusion is depicted by Mr. Afifi's situation.⁸ Because we are left to speculate as to the true reasons why the government placed the device on his vehicle, one can only believe that Afifi was being targeted solely because of his Middle-Eastern decent.⁹ Such uncorroborated fears are arguably sufficient (from the government's perspective) to justify the indefinite, warrantless observation of each and every movement made by a private citizen. And to the extent that the government's position is "correct" under current case law, can the very amendment that was adopted as a method of preventing our government from becoming the "Orwellian Big Brother" be interpreted in such a manner so as to permit the continuous oversight of every citizen just because technological advances have made it economically feasible? To this question, and many others, my answer is simple: No. If there was ever a time to give meaning to Justice Brandeis' declaration for the "right to be let alone[,]"¹⁰ that time is now—as advents in technology have provided the government with countless, highly-intrusive methods of overlooking its citizens.

5. *Id.*

6. Zetter, *supra* note 1.

7. *Id.*

8. See U.S. CONST. amend. IV.

9. Prior to the discovery of the GPS device, federal agents tried to contact Afifi regarding information that he was a threat to national security. Zetter, *supra* note 1. After informing the federal agent that he would participate in answering questions if his lawyer was present, neither Afifi nor his lawyer heard anything more from the government prior to discovering the tracking device on his vehicle. *Id.*

10. See *Olmstead v. United States*, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting). Justice Brandeis stated, in pertinent part, that:

The makers of our Constitution undertook to secure conditions favorable to the pursuit of happiness. They recognized the significance of man's spiritual nature, of his feelings and of his intellect. They knew that only a part of the pain, pleasure and satisfactions of life are to be found in material things. They sought to protect Americans in their beliefs, their thoughts, their emotions and their sensations. *They conferred, as against the Government, the right to be let alone—the most comprehensive of rights and the right most valued by civilized men.*

Id. (emphasis added).

Part II of this Article explores the advent and use of GPS-related technology in the 21st century. Part III addresses the post-*Katz* development of the term “search” within the meaning of the Fourth Amendment. Part IV discusses the approaches employed by various courts in addressing whether prolonged GPS surveillance constitutes a “search,” including the “whole-is-greater-than-the-sum-of-its-parts” approach employed by the D.C. Circuit in *United States v. Maynard*.¹¹ Part V addresses the question that the Supreme Court is yet to consider—whether the use of GPS technology to conduct continuous observation of a citizen’s public commutes constitutes a “search” within the meaning of the Fourth Amendment. This Article takes the position that a search occurs within the context of the Fourth Amendment when on-going surveillance of an individual is conducted for a period of time sufficient to give rise to a heightened expectation of privacy. Accordingly, the government must obtain a warrant prior to employing GPS-related technology as a means of prolonged surveillance.

II. GPS SURVEILLANCE IN THE TWENTY-FIRST CENTURY

The Global Positioning System (“GPS”) is a satellite-based technology that employs a set of continuously orbiting satellites to transmit signals to and from earth.¹² Initially intended for military purposes, the United States Department of Defense launched its first GPS-intended satellite during the late 1970s.¹³ Since 1994, the GPS system has consisted of 24 satellites that orbit the earth at nearly 7,000 miles per hour, with each satellite orbiting the earth nearly two times in a span of less than twenty-four hours.¹⁴

Prior to GPS becoming a household item in present society, the technology was relatively limited in its commercial use.¹⁵ In essence, there are two types of transmissions made by GPS: encrypted and unencrypted.¹⁶ The encrypted transmissions are strictly for military use, whereas the unencrypted signals are for civilian purposes.¹⁷ Until May 2000, through a process called “Selective Availability” (“SA”),¹⁸ the Department of Defense

11. 615 F.3d 544 (D.C. Cir. 2010).

12. Renee McDonald Hutchins, *Tied Up in Knotts? GPS Technology and the Fourth Amendment*, 55 UCLA L. REV. 409, 414 (2007); *What is GPS?*, GARMIN, <http://www8.garmin.com/aboutGPS/> (last visited Dec. 30, 2011).

13. Hutchins, *supra* note 12, at 414; *What is GPS?*, *supra* note 12.

14. Hutchins, *supra* note 12, at 414; *What is GPS?*, *supra* note 12.

15. Hutchins, *supra* note 12, at 414-15.

16. *Id.* at 414-15.

17. *Id.* at 414-15.

18. *What is GPS?*, *supra* note 12 (Selective Availability, or the “intentional degradation” of civilian-based GPS signals, was abandoned by the government, thereby permitting much more precise civilian GPS transmissions).

intentionally imputed errors into the unencrypted transmissions to assure that civilian-based GPS systems were not as accurate as their military counterparts.¹⁹ However, as of this writing, the accuracy of civilian, or non-military, GPS signals could range anywhere from fifteen meters (approximately fifty feet) to one or two centimeters.²⁰

Due to the extremely accurate results of GPS-based technology and the removal of the “human element”²¹ in criminal investigations, the importance of these technologies to law enforcement efforts is easily apparent. However, even prior to the advent of these more sophisticated satellite-based tracking devices, law enforcement employed other devices as a means of tracking items of interest—most notably, “beeper” transmitters.²²

“A beeper is a radio transmitter, usually battery operated, which emits periodic signals that can be picked up by a radio receiver.”²³ Employed by law enforcement personnel during the latter portion of the twentieth century, these devices transmitted varying frequencies (or “beeps”) depending upon its relative distance and direction to a nearby operator.²⁴ While these frequencies are undetectable from the initial point of transmission, the beeper devices—once attached to a particular object or vehicle—allow law enforcement personnel, either by air or roadway, to trail the target from a safe distance and track its whereabouts.²⁵

The beeper transmitter provided law enforcement with a tremendous advantage over the methods employed prior to the advent of any technological aides. “Tailing” or “shadowing,” the practice of having others physically follow a target from destination to destination, has been the historical method of investigating the whereabouts of a particular target.²⁶ Thus, once an individual or object was deemed to be a target of interest for investigation purposes, law enforcement personnel would “tail” the target, usually by vehicle, with the goal of keeping a safe distance away so as to eliminate suspicions but still maintaining visual contact to gather pertinent information.²⁷

19. *Id.*; Hutchins, *supra* note 12, at 415.

20. See Glancy, *supra* note 12; Hutchins, *supra* note 12, at 417-18; Dorothy J. Glancy, *Privacy on the Open Road*, 30 OHIO N.U. L. REV. 295, 309 (2004).

21. The term “human element” is continuously referenced throughout this Article. For my purposes, this term refers to the phenomenon that, regardless of the technological advancement, there is at least some degree of human involvement required when actually conducting surveillance of a target.

22. See Glancy, *supra* note 20, at 315-16.

23. *United States v. Knotts*, 460 U.S. 276, 277 (1983).

24. Glancy, *supra* note 20, at 315-16.

25. *Id.*

26. *Id.* at 300.

27. *Id.* at 300.

Not only did this historical method prove to be logistically difficult, but also it was extremely costly. Depending upon the nature of the investigation, a physical surveillance generally requires the participation of at least two investigators.²⁸ Assuming hourly rates of \$65, a twenty-four hour surveillance of a suspect would cost an agency roughly \$3,120 with only two investigators employed.²⁹ Having no assurance that an investigation would prove to be fruitful within a particular twenty-four hour time frame, it is safe to assume that physical surveillance was limited by both logistical and monetary concerns.³⁰

While beeper technology provided law enforcement with a viable alternative to physical surveillance, this technique was still riddled with inherent flaws. Being only an aid and not a replacement to physical surveillance, beeper devices still required the “human element.”³¹ Because of the need of an individual to track the transmissions, the beeper’s location, and the target’s whereabouts, beeper surveillance still mandated a substantial investment of manpower.³² Aside from being able to maintain the general whereabouts of the target after losing visual contact, beeper transmitters still failed to make surveillance an effective crime-fighting tactic.³³

The ability of law enforcement to employ surveillance as an effective and viable investigatory tool was dramatically altered with the advent of GPS-related tracking devices. First and foremost, GPS technology allows law enforcement to remove, for the most part, the “human element.”³⁴ No longer are officers required to visually tail a target, or even follow nearby while listening to transmissions from beeper devices; rather, the sole effort required of participating officers is to “mount” or install the device to the target and monitor the data received during the surveillance.³⁵ However, even this required level of officer participation, albeit minimal, has been reduced in light of technological advances.³⁶ For example, while a GPS

28. See John S. Ganz, *It’s Already Public: Why Federal Officers Should Not Need Warrants to Use GPS Vehicle Tracking Devices*, 95 J. CRIM. L. & CRIMINOLOGY 1325, 1357 (2005); see also Glancy, *supra* note 20, at 300.

29. Ganz, *supra* note 28, at 1357. Ganz assumed these hourly rates based upon the national average for a private investigator. *Id.* at 1358. These figures are not used to suggest an accurate cost-benefit analysis of physical surveillance, but as a mere illustration of the consequences of the “human element.”

30. See Glancy, *supra* note 20, at 300.

31. Ganz, *supra* note 28, at 1328.

32. *Id.* See Glancy, *supra* note 20, at 315-16.

33. See Glancy, *supra* note 20, at 315-16; Ganz, *supra* note 28, at 1328.

34. See *supra* notes 28-30 and accompanying text.

35. Hutchins, *supra* note 12, at 418-19.

36. *Id.* at 418-19.

tracking device is typically installed by physically mounting it to the exterior of a vehicle,³⁷ officers working for the Los Angeles Police Department have been equipped with air guns that are capable of launching GPS-enabled “darts” at nearby vehicles.³⁸ Similarly, technological advancements regarding the method in “retrieving” surveillance data has also reduced, if not eliminated, the need of human involvement.³⁹

In light of these advances, law enforcement agencies nationwide now have the ability to conduct in-depth surveillance as a viable and cost-efficient alternative to traditional investigatory tools. Assuming that GPS-based tracking devices cost the same as a twelve or even twenty-four hour physical surveillance,⁴⁰ the physical tailing and beeper surveillance methods of the past cannot compare.⁴¹ While the information (intelligence) gathered during physical tailing and beeper surveillance is limited to the particular time frame of the surveillance, GPS-related surveillance allows an investigation to proceed for a longer period of time.⁴² Thus, law enforcement can conduct longer periods of surveillance, thereby collecting more relevant intelligence at only a fraction of the cost that traditional surveillance methods would yield for investigation of similar duration.⁴³ In addition, the inherent flaws regarding the accuracy of physical surveillance—e.g., losing visual site of the target, potentially alerting the

37. *Id.* at 418-19.

38. *Id.* at 418-19; Richard Winton, *LAPD Pursues High-Tech End to High-Speed Chases*, L.A. TIMES, Feb. 3, 2006, at B1; *LAPD to Chase GPS Darts*, TECHTREE (Feb. 4, 2006), http://www.techtree.com/techtree/jsp/article.jsp?article_id=71159&cat_id=549. As Professor Hutchins explains, these “darts” consist of the receiver, transmitter, and batteries needed to track the vehicle, all of which are embedded in a “sticky compound material.” Hutchins, *supra* note 12, at 419. This material, once launched from the air gun, allows the dart to adhere to the target, thereby enabling police to track the vehicle. *Id.* at 419. While this technology was employed as an alternative to high-speed chases, this technology could theoretically be employed in non-chase-related surveillance scenarios. *Id.* at 419.

39. *Id.* at 418-19.

40. This assumption yields in favor of GPS being extremely costly. Ganz suggests that GPS-based tracking devices can range anywhere from a few hundred dollars to \$2,500. Ganz, *supra* note 28, at 1357. Given the rise and availability of GPS in today’s society, there are a number of private companies selling similar GPS-based tracking devices. *See, e.g., GPS Tracking Devices*, BRICKHOUSESECURITY, <http://www.brickhousesecurity.com/gps-car-tracking-vehicle-logging.html> (last visited Dec. 30, 2011); *GPS Tracking: GPS Vehicle Tracking Devices Live GPS Trackers*, SPYVILLE.COM, <http://www.spyville.com/gps-unit.html#top> (last visited Dec. 30, 2011); *GPS Vehicle Tracking System*, LANDAIRSEA, <http://www.vehicle-tracking.com/category/gps-tracking.html> (last visited Dec. 30, 2011). While these devices are not likely as sophisticated as those employed by law enforcement agencies, they provide a good basis for comparison. *See* BRICKHOUSESECURITY, *supra* (prices ranging from \$200 to \$700); SPYVILLE.COM, *supra* (prices ranging from \$200 to \$600); LANDAIRSEA, *supra* (prices ranging from \$200 to \$600).

41. *See* Hutchins, *supra* note 12, at 418-19.

42. *See id.* at 418-19.

43. *See* Ganz, *supra* note 28, at 1357.

target that they are being “tailed,” etc.⁴⁴—are significantly, if not completely, removed.⁴⁵

As a result of these benefits, the use of GPS-based surveillance has been on the rise. From internal investigations to murder investigations, the use of GPS as an investigatory tool for law enforcement has caught tremendous attention in the media.⁴⁶ For example, investigators in Washington used a GPS-based tracking device to discover the body of a murder victim dumped in the woods.⁴⁷ After a dog returned human bones from a nearby wooded area, officers equipped the dog’s collar with a GPS device, allowing the officers to later track the dog’s path in the woods and discover the body.⁴⁸ Similarly, following a series of physical and sexual assaults on women, officers equipped the vehicle of a known sex offender that lived within the vicinity of where the offenses occurred with a GPS tracking device.⁴⁹ Thereafter, officers were able to observe the van drive in and out of various neighborhoods—i.e., “hunting” for victims—which was ultimately used to help ascertain the individual’s assault patterns and obtain a conviction.⁵⁰

Given the rise of GPS and other tracking-related technologies, today’s society finds itself in an environment where one’s every move can be monitored and tracked by the government and private industries, for both law and non-law enforcement purposes. In regards to law enforcement, there are a number of other tracking technologies that the government employs as a crime-fighting strategy—e.g., roadway/traffic cameras, license plate readers, cell phones, and video/audio recording devices.⁵¹ However, government uses of monitoring and surveillance technologies are not employed solely for law enforcement purposes.⁵² For example, the United States Department of Transportation, in conjunction with local and regional government agencies, funds an elaborate and sophisticated Intelligent Transportation System (“ITS”) that is capable of “track[ing] the locations a

44. See Hutchins, *supra* note 12, at 418.

45. Cf. Zetter, *supra* note 1.

46. See Ganz, *supra* note 28, at 1330-32.

47. Maureen O’Hagan, *Court to Rule if Police Need Warrant for GPS Tracking*, SEATTLE TIMES, May 20, 2003, at B1, available at <http://community.seattletimes.nwsources.com/archive/?date=20030520&slug=gps20m>.

48. *Id.*

49. See Ben Hubbard, *GPS Tracking: Law Enforcement’s Latest Secret Weapon*, WASHINGTON POST, Aug. 17, 2008, available at http://www.signonsandiego.com/uniontrib/20080817/news_1n17gps.html (last visited Jan. 29, 2011); *Foltz v. Commonwealth*, 698 S.E.2d 281, 283-85 (Va. Ct. App. 2010).

50. See Hubbard, *supra* note 49; *Foltz*, 698 S.E.2d at 283-85.

51. See Glancy, *supra* note 20, at 301-20.

52. See *id.* at 301-04.

traveler visits and maintain itineraries of an individual's past travel . . . [and] predict[ing] the individual's future movements and activities."⁵³

Private industries have also resorted to tracking-related technologies as an aide in conducting business.⁵⁴ For example, businesses responsible for collecting tolls have adopted the use of electronic transponders, attached to the outside of a vehicle, to automatically charge for the amount of the toll due.⁵⁵ While the essence of this technology is to provide a hassle-free method of making toll payments, the operating system maintains "a log of where and when each customer passes through a participating toll plaza[, albeit] for billing purposes, [and] thus providing "yet another means of determining an individual's exact whereabouts at a given time."⁵⁶

III. TRACKING AND TECHNOLOGICAL ADVENTS UNDER THE FOURTH AMENDMENT

A. Tracking-related concerns

In pertinent part, the Fourth Amendment provides that "[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated."⁵⁷ Thus, any question regarding the availability of Fourth Amendment protection essentially begins with an analysis regarding whether the government's conduct constituted a "search" within the meaning of the text.⁵⁸ It follows that if there is no search, the Fourth Amendment's admonition against *unreasonable* searches is not applicable.⁵⁹

The Supreme Court's decision in *Katz* has proven to be the guiding doctrine in determining when Fourth Amendment protections are triggered. Therein, FBI agents, without a warrant, "attached an electronic listening and recording device to the outside of [a] public telephone booth" that the defendant was suspected of using in his illegal gambling operations.⁶⁰ Accordingly, the government sought to introduce conversations in the telephone booth that were recorded by this "eavesdropping" device.⁶¹ The Court held that the conversations made in the phone booth were a search

53. *Id.* at 302-03.

54. *See id.* at 301-04; Ganz, *supra* note 28, at 1343-47.

55. Ganz, *supra* note 28, at 1346.

56. *Id.* at 1346.

57. U.S. CONST. amend. IV.

58. *See Katz v. United States*, 389 U.S. 347, 360-61 (1967) (Harlan, J., concurring).

59. *See id.*

60. *Id.* at 348 (majority opinion).

61. *Id.*

within the meaning of the Fourth Amendment.⁶² Justice Harlan, in a separate concurrence, went on to explain that a search arises where the individual has “exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as ‘reasonable.’”⁶³

Following Justice Harlan’s concurrence in *Katz*, the Supreme Court heard two cases in the early 1980s that provides the baseline for the present debate. First, in *Knotts*, the Court determined whether Fourth Amendment protection was applicable to an instance where officers installed a “beeper device” inside a container of chloroform that was recently purchased by members of the defendant’s illicit drug enterprise.⁶⁴ This container was eventually placed in the vehicle of one of the co-defendants, allowing the officers to follow the vehicle as it traveled through public streets.⁶⁵ Initially, the officers were able to maintain visual surveillance of the vehicle for a large part of their “trail,” but the co-defendant, fearing that officers were following, began driving erratically and the trailing officers fell back, ultimately losing contact with the vehicle.⁶⁶ However, because the officers installed the beeper device in the container, a helicopter was able to receive signals that were being emitted from the device, which placed the vehicle outside of the defendant’s secluded cabin in Shell Lake, Wisconsin.⁶⁷ Determining that the defendant’s cabin was a place of interest for their investigation, officers continued to conduct visual surveillance, which inevitably led to the issuance of a search warrant.⁶⁸ This warrant allowed the officers to search the cabin where they discovered Knotts’ meth lab.⁶⁹

Knotts argued that the observations and conduct involved in the tracking of the beeper device constituted a search within the meaning of the Fourth Amendment.⁷⁰ Adopting the *Katz* framework, the Court agreed that a reasonable expectation of privacy existed in the cabin itself.⁷¹ However, the beeper surveillance did not extend into the cabin; rather, the officers’ observations revealed nothing more than an “automobile arriving [at a] . . . premises after leaving a public highway[.]”⁷² Because “[v]isual surveillance

62. *See id.* at 359.

63. *Katz*, 389 U.S. at 361 (Harlan, J., concurring).

64. *Knotts*, 460 U.S. at 277-79.

65. *Id.* at 277-78.

66. *Id.* at 278.

67. *Id.*

68. *Id.* at 278-79.

69. *Knotts*, 460 U.S. at 278-79.

70. *See id.* at 279-80.

71. *Id.* at 281-82.

72. *Id.* at 282.

from public places along [the co-defendant's] route or adjoining Knotts' premises would have sufficed to reveal all of these facts to the police[.]”⁷³ the Court held that “[a] person traveling in an automobile on public thoroughfares has no reasonable expectation of privacy in his movements from one place to another.”⁷⁴

While many would argue that *Knotts* can be interpreted to prevent the applicability of Fourth Amendment protection in *any* case involving visual surveillance of an individual's public movements, the express language of *Knotts* itself suggests that the Court was already worried about such a broad interpretation.⁷⁵ In response to Knotts' argument that this would essentially permit the government to conduct a “twenty-four hour surveillance of any citizen . . . without judicial knowledge or supervision[.]”⁷⁶ the Court refused to decide an argument based on facts that were not then before it; rather, “if such dragnet-type law enforcement practices . . . should eventually occur, there will be time enough then to determine whether different constitutional principles may be applicable.”⁷⁷

In addition to the fear that the majority opinion in *Knotts* would be read to permit non-stop police surveillance, there appeared to be a facial incongruity with the Court's earlier decision in *Katz*. Specifically, in *Katz*, the Court held that the employment of a listening and recording device *outside* of a public telephone booth constituted a search because, *inter alia*, the defendant exerted his reasonable expectation of privacy by closing the door as he entered the booth.⁷⁸ However, the Court in *Knotts* stated that the Fourth Amendment does not prevent “the police from augmenting the sensory faculties bestowed upon them at birth with such enhancement as science and technology afforded them[.]”⁷⁹ Assuming the latter to be dispositive of a claim for Fourth Amendment protection, the mere closing of a door to a telephone booth does not prevent the noises and sounds made within from being detected by the “sensory faculties” of an individual outside the phone booth, which is especially true where the sensory-enhancing device that captures those noises is installed on the *outside* of the phone booth. Thus, *Knotts*, if anything, did nothing more than increase the difficulty of understanding when a Fourth Amendment “search” had occurred.⁸⁰

73. *Id.*

74. *Knotts*, 460 U.S. at 281.

75. *See id.* at 283-84.

76. *Id.* at 283 (quoting Brief for Respondent at 9).

77. *Id.* (citing *Zurcher v. Stanford Daily*, 436 U.S. 547, 566 (1978)).

78. *See Katz*, 389 U.S. at 361 (Harlan, J., concurring).

79. *Knotts*, 460 U.S. at 282; *see also id.* at 288 (Stevens, J., concurring).

80. *See generally Knotts*, 460 U.S. at 282; *see also id.* at 288 (Stevens, J., concurring).

While the discrepancy that exists between *Katz* and *Knotts* still remains, the Court went on to further clarify how the demands of the Fourth Amendment are altered when dealing with the home. As referenced above, in *Knotts*, the Court stated that, had the officers observed matters *inside* the home, the outcome would have been different because the movements would have no longer been exposed to public observation.⁸¹ This was the exact issue before the Court in *United States v. Karo*.⁸² Similar to *Knotts*, law enforcement officers in *Karo* employed a beeper device inside a can of ether that was suspected of being used in an illicit drug trade.⁸³ After one of the co-defendants placed the can into his vehicle, officers followed the vehicle to Karo's residence and learned that the can had been taken inside the residence.⁸⁴ Thereafter, the officers were able to constantly monitor the movement of the ether through the use of the beeper device, which ultimately disclosed a number of other residences and storage facilities that Karo and the other co-defendants were using in their drug enterprise.⁸⁵

Holding that the installation of the beeper device itself was neither a search nor a seizure within the meaning of the Fourth Amendment, the Court focused on the issue of whether Fourth Amendment rights were nevertheless implicated by the *subsequent observation* of a lawfully-installed beeper device.⁸⁶ To emphasize the importance of warrantless intrusions into a private dwelling, the Court analogized between actual physical intrusions and the intrusion of the beeper device.⁸⁷

[H]ad a DEA agent thought it useful to enter the . . . residence to verify that the ether was actually in the house . . . without a warrant, there is little doubt that he would have engaged in an unreasonable search [And] the result is [the] same where . . . the Government surreptitiously employs an electronic device to obtain information that it could not have obtained by observation from outside the curtilage of the house.⁸⁸

81. *See Knotts*, 460 U.S. at 282.

82. *United States v. Karo*, 468 U.S. 705, 707 (1984).

83. *Id.* at 708.

84. *Id.*

85. *Id.* at 708-09.

86. *See id.* at 711-13 (stating that “[w]e conclude that no Fourth Amendment interest of Karo or of any other respondent was infringed by the installation of the beeper . . . [, as] any impairment . . . that may have occurred was occasioned by the monitoring of the beeper.”).

87. *Karo*, 468 U.S. at 715.

88. *Id.*

Because information within a private dwelling is not “voluntarily conveyed to anyone who wanted to look[.]”⁸⁹ the subsequent observations made after the object entered the dwelling constituted a “search” within the meaning of the Fourth Amendment.⁹⁰

B. Other technological concerns

Outside of tracking-related technologies, the Supreme Court has had the opportunity to determine the protection offered by the Fourth Amendment when the government employs other technological advances to discover information during the course of its investigation that it would not have been able to observe by merely standing on the street and conducting a plain-sight observation.

First, in *California v. Ciraolo*,⁹¹ the Court addressed whether an aerial observation made by law enforcement concerning the area immediately adjacent to a home constitutes a search.⁹² After failing to make a street-level observation of a suspect’s backyard due to a ten-foot tall fence, the government employed a private plane and flew over the suspect’s house at an altitude of one thousand feet, ultimately taking photographs of marijuana growing in the backyard with a 35mm camera (i.e., the observations were capable of being made with “the naked eye”).⁹³ Thus, Ciraolo argued that the observation constituted a search, and that without a warrant, his Fourth Amendment rights had been violated.⁹⁴

While the Court acknowledged that the employment of a ten-foot tall fence around his property constituted an assertion of a subjective expectation of privacy, the Court dismissed any Fourth Amendment protection on the grounds that his expectation of privacy was one in which society does not recognize as reasonable.⁹⁵ And even though this constituted the area immediately around the home that gets similar constitutional protections (i.e., the “curtilage”), the Court emphasized that the “protection of the home has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares.”⁹⁶ Since the officers were flying at an altitude that any

89. *Knotts*, 460 U.S. at 281.

90. *See Karo*, 468 U.S. at 715.

91. 476 U.S. 207 (1986).

92. *Id.* at 209.

93. *Id.* at 209, 213 (stating the issue as “whether *naked-eye observation* of the curtilage by police from an aircraft lawfully operating at an altitude of 1,000 feet violates an expectation of privacy . . .”) (emphasis added).

94. *See id.* at 210.

95. *Id.* at 211, 214 (footnote omitted).

96. *Ciraolo*, 476 U.S. at 213.

member of the public could have similarly accessed (i.e., publically navigable airspace), a mere “naked-eye observation” from such a lawful vantage point is not a search within the meaning of the Fourth Amendment—as society is not willing to recognize an expectation of privacy in anything that the public eye could have easily observed itself.⁹⁷

During the same term it decided *Ciraolo*, the Court issued its opinion in *Dow Chemical Co. v. United States*.⁹⁸ In *Dow Chemical*, the EPA, after failed efforts of conducting street-level observations of Dow’s facilities, employed the efforts of a commercial aerial photographer to engage in flybys of the facility from various altitudes.⁹⁹ Once airborne, the photographer would use aerial-mapping cameras that were mounted to the bottom of the aircraft to take still images of Dow’s entire facility.¹⁰⁰ Just as in *Ciraolo*, the Court acknowledged that, even though Dow took the subjective measures to ensure privacy by employing highly-sophisticated security measures to shield its facility from street-level observations, the expectation of privacy is one that is not objectively reasonable.¹⁰¹ It follows that, because the observations were made within the public thoroughfares (i.e., publically navigable airspace), “[t]he mere fact that human vision is enhanced *somewhat* . . . does not give rise to constitutional problems.”¹⁰²

While the Court in *Dow Chemical* found little need to focus on the “slightly advantageous” mapping camera that the officers employed to conduct its aerial surveillance of Dow’s industrial complex,¹⁰³ the Court did not find reason to draw any boundaries on when the aide of technological advances goes so far as to give rise to Fourth Amendment concerns until 2001.¹⁰⁴ In *Kyllo*, the Court held that a street-level observation made with the use of thermal imaging to determine the extent of heat radiating from various portions of a private dwelling constitutes a “search” within the meaning of the Fourth Amendment.¹⁰⁵ Having suspected that marijuana was being grown within Kyllo’s residence, officers employed the use of a thermal-imaging device to detect whether heat was emanating from any portion of the home.¹⁰⁶ Because the ability to grow marijuana indoors is dependent upon the use of high intensity, specialized heating lamps, officers

97. *Id.* at 213-14.

98. 476 U.S. 227 (1986).

99. *Id.* at 229.

100. *Id.*

101. *See id.* at 236-39.

102. *Id.* at 238 (emphasis added).

103. *See Dow Chemical*, 476 U.S. at 238.

104. *See generally* *Kyllo v. United States*, 533 U.S. 27 (2001).

105. *Id.* at 40-41.

106. *Id.* at 29-30.

suspected that, if *Kyllo* was engaged in this practice, there would be various portions of the home that would be substantially and unusually warmer than the rest of the home.¹⁰⁷ Confirming the officers' suspicions, the thermal-image reading—which disclosed that the roof and a wall to *Kyllo's* residence radiated more heat than other portions of his home and nearby homes—was used to obtain a warrant to search the residence.¹⁰⁸

While acknowledging that street-level observations by law enforcement generally do not rise to the level of constituting a “search,” the Court distinguished the facts of *Kyllo* on the basis of the technological device used in revealing the relevant information.¹⁰⁹ Accordingly, the Court emphasized the fact that thermal-imaging technology was not subject to regular public use and thus the government's ability to employ hyper-technological devices to observe matters which are otherwise outside the scope of lawful, public observation constitutes a “search.”¹¹⁰ In so holding, the Court went well beyond all of its previous decisions and appeared to reaffirm the principle outlined in *Katz*: just because an observable fact (i.e., heat radiating from a home or sound emanating from a phone booth) escapes the private atmosphere in which it was originally created and enters into the realm of permissible public observation does not, itself, determine the applicability of Fourth Amendment protection.¹¹¹

IV. CURRENT APPROACHES TO PROLONGED GPS SURVEILLANCE

The overwhelming majority of courts that have addressed the issue regarding GPS surveillance have interpreted the decision in *Knotts* broadly, holding that an individual's movements through public thoroughfares are not subject to Fourth Amendment protection because of the degree that those movements are exposed to public observation.¹¹² However, the approach adopted by the D.C. Circuit in *United States v. Maynard*¹¹³ seriously discredits the merit of these decisions.

In *Maynard*, the government attached a GPS tracking device to the vehicle of an individual suspected of involvement in an illicit drug

107. *Id.*

108. *Id.*

109. *See Kyllo*, 533 U.S. at 34-35.

110. *Id.* at 34 (citation omitted).

111. *See id.* at 35-39; *id.* at 35-37 nn.2-4 (addressing the lack of validity between an off-the-wall and a through-the-wall analysis).

112. *See, e.g.*, *United States v. Pineda-Moreno*, 591 F.3d 1212 (9th Cir. 2010); *United States v. Garcia*, 474 F.3d 994 (7th Cir. 2007); *cf. United States v. Cuevas-Perez*, No. 10-1473, 2011 U.S. App. LEXIS 8675 (7th Dist., Apr. 28, 2011) (calling into question the *Garcia* decision); *State v. Weaver*, 909 N.E.2d 1195 (N.Y. Ct. App. 2009).

113. *United States v. Maynard*, 615 F.3d 544 (D.C. Cir. 2010).

trafficking operation.¹¹⁴ After monitoring his movements for a four-week period (twenty-eight days), the investigating officers requested a warrant to search the defendant's home on the basis of the information obtained from the surveillance.¹¹⁵ While the trial court agreed that an individual generally lacks an expectation of privacy in their movements in the public sphere, it held that the defendant's Fourth Amendment rights were violated because the surveillance continued after the suspect entered into a private garage.¹¹⁶ As such, the court analogized to *Karo*, holding that the reduced expectation of privacy principle that came from *Knotts* ends once an individual enters into a private dwelling.¹¹⁷

Despite what the lower court termed a "concession" by the government regarding the fact that a search occurred once the defendant's car entered the private garage,¹¹⁸ the D.C. circuit took exception to the longevity of the search itself.¹¹⁹ Accordingly, the court began by distinguishing the applicable Supreme Court precedent. First, the court pointed to the fact that prolonged GPS surveillance was not contemplated by the Court's earlier decisions in *Karo* and *Knotts*.¹²⁰ As the Court acknowledged in *Knotts*, "if such dragnet-type law enforcement practices . . . should eventually occur, there will be time enough then to determine whether different constitutional principles may be applicable."¹²¹ Next, the court argued that *Knotts* does not stand for the overly broad principle that all public movements are barred from Fourth Amendment protection, but rather that *Knotts* only applied to "movements from one place to another[.]"¹²²

Having determined that *Knotts* was not controlling, the D.C. Circuit differentiated between short- and long-term surveillance on two grounds. First, it adopted "the-whole-is-greater-than-the-sum-of-its-parts" analysis, arguing that long-term GPS surveillance poses unique and increased privacy concerns.¹²³ Unlike short-term surveillance that merely tracks movements to and from a particular destination, GPS surveillance that is conducted twenty-four hours a day, seven days a week has the ability to expose an

114. *Id.* at 549.

115. *Id.* at 555.

116. *United States v. Jones*, 451 F. Supp. 2d 71, 88 (D.D.C. 2006).

117. *Id.* (citations omitted).

118. *See id.* (stating that "as the government here essentially concedes, the data obtained from the GPS device when the Jeep Cherokee was parked in the garage adjoining the Moore Street property must be suppressed") (citation omitted).

119. *See Maynard*, 615 F.3d at 564-65.

120. *See id.* at 556-57.

121. *Knotts*, 460 U.S. at 283-84 (citing *Zurcher*, 436 U.S. at 566).

122. *Maynard*, 615 F.3d at 557 (quoting *Knotts*, 460 U.S. at 281) (emphasis added).

123. *See id.* at 561.

individual's entire life.¹²⁴ Thus, while individual trips may be devoid of constitutional significance, the whole picture that is portrayed by prolonged surveillance raises more significant privacy concerns.¹²⁵

Given these heightened concerns, the court turned to its second question: whether the movements were "truly" exposed.¹²⁶ Again, unlike isolated movements in public that are actually exposed to public observation, the court held that long-term travel is not subject to the same standard.¹²⁷ The doctrine of public exposure, the court argues, stems from the fact that a "nosey onlooker" can easily observe such isolated movements.¹²⁸ However, once the movements become more continuous and prolonged, the onlooker no longer has the *actual* capability of observing such prolonged activities.¹²⁹ While it may be theoretically possible for an individual to be followed every time they enter their vehicle and conduct their weekly travel, this is not what *actually* occurs and is not something that society is willing to accept as reasonable.¹³⁰ In addition to the inability of a layperson to conduct prolonged surveillance, the court recognized that even the government lacks the *actual* ability to track individual movement for such an extended duration.¹³¹ Because the only exposure that prolonged movements and travel amongst public roadways receives is a product of theoretical and not actual possibilities, there is no basis to remove the otherwise reasonable expectation of privacy that an individual has in the "whole" of his or her movements on public thoroughfares.¹³²

V. ANALYSIS

A. *The-Whole-Is-Greater-Than-The-Sum-Of-All-Its-Parts Approach*

The concern that is echoed throughout the entire opinion in *Maynard* stems from the fact that there is something truly different between surveillance that is conducted for only a short or minimal period and that which tracks an individual's movements and whereabouts for an extended,

124. *See id.* at 560-62.

125. *See id.*

126. *See id.* at 559-62.

127. *See Maynard*, 615 F.3d at 560.

128. *See id.* at 560-62.

129. *See id.* at 560-61.

130. *See id.* at 566 (citing *Kyllo*, 533 U.S. at 35 n.2) (stating that "[t]he fact that equivalent information could sometimes be obtained by other means does not make lawful the use of means that violate the Fourth Amendment") (italics omitted).

131. *See id.* at 565 (citing the former Chief of the LAPD, stating that "constant and close surveillance [is] not only more costly than any police department can afford, but in the vast majority of cases it is impossible.").

132. *See Maynard*, 615 F.3d. at 566.

indefinite duration.¹³³ On the one hand, isolated movements in public, which are capable of being observed by an onlooker, only expose what an individual is doing at that particular moment and on that particular occasion.¹³⁴ For example, a single trip to a gas station is easily observable, which discloses just that—i.e., that someone made a trip to a gas station. On the other hand, as the D.C. circuit explained:

Repeated visits to a church, a gym, a bar, or a bookie tell a story not told by any single visit, as does one's not visiting any of these places over a course of a month. The sequence of a person's movements can reveal still more; a single trip to a gynecologist's office tells little about a woman, but that trip followed a few weeks later by a visit to a baby supply store tells a different story.¹³⁵

Thus, prolonged surveillance of an individual allows a more in-depth analysis into the life of the person being observed, allowing one to “deduce whether [that person] is a weekly church goer, a heavy drinker, a regular at the gym, an unfaithful husband, an outpatient receiving medical treatment, [or] an associate of particular individuals or political groups[.]”¹³⁶

The premise that the whole is greater than the sum of all its parts has been used in other areas to recognize the increased expectations of privacy that one has in the “whole” of the information being disclosed. For example, in *United States v. National Reporters Committee*,¹³⁷ the Supreme Court considered a news agency's request under the Freedom of Information Act (“FOIA”) for a “rap sheet” of an individual involved in political corruption.¹³⁸ This rap sheet consisted of an entire “snapshot” of an individual's criminal record, consisting of arrests, convictions, and other court events and public information all compiled into one report.¹³⁹ Ultimately denying the release of information as a violation of a personal privacy exemption under the FOIA, the Court explained that there is a “distinction, in terms of personal privacy, between scattered disclosure of the bits of information contained in a rap sheet and revelation of the rap

133. *See id.* at 565-66.

134. *Id.* at 562.

135. *Id.*; *see also Weaver*, 909 N.E.2d at 1199-1200 (stating that prolonged GPS surveillance “yields . . . a highly detailed profile, not simply of where we go, but by easy reference, of our associations—political, religious, amicable and amorous, to name only a few—and of the pattern of our professional and vocational pursuits”); *State v. Jackson*, 76 P.3d 217, 223 (Wash. 2003) (describing the capabilities of GPS as providing “a detailed picture of one's life.”).

136. *Maynard*, 615 F.3d. at 562.

137. *United States v. Nat'l Reporters Comm.*, 489 U.S. 749 (1989).

138. *Id.* at 751-53.

139. *Id.* at 753.

sheet as a whole.”¹⁴⁰ Thus, there is a true distinction between piecemeal information that may be viewed by the public individually and information that discloses an entire picture of private acts that are not otherwise readily observable.¹⁴¹ As to the latter, neither the individual nor society is ready to relinquish the expectation of privacy that it retains in its continuous movements throughout public thoroughfares, and the mere fact that this expectation is diminished as it relates to single, isolated movements in the same public sphere does not hinder the ability of society to grasp what is left of its privacy and prevent unwanted government intrusion.

B. Actual vs. Theoretical Exposure

Given that one of the only consistent principles of Fourth Amendment jurisprudence is that an individual generally lacks a reasonable expectation of privacy in movements that are exposed to public observation, most courts would argue that long-term GPS surveillance does not constitute a search, regardless of the privacy interest that exists in the whole, because of the fact that such movements are readily observable in the public sphere.¹⁴² Again, however, the D.C. circuit’s approach distinguishing between actual and theoretical public exposure/observation is enlightening.

In addition to the increased privacy expectations in long-term public movements, the *Maynard* court argued that, unlike short-term surveillance, such prolonged movements are not *actually* exposed to public observation.¹⁴³ Accordingly, the court pointed to the difference between actual and theoretical exposure as being the crux of Fourth Amendment concern.¹⁴⁴ While it is actually possible that individual, isolated movements in public will be observed by a nosey onlooker, there is no realistic expectation that such an onlooker would take the exhausting measures to *actually* observe another’s movements for an indefinite duration.¹⁴⁵

The easiest way to see the strengths of the D.C. Circuit’s argument is to examine the opposite position. In *Garcia*, officers installed a GPS “memory unit” that could have potentially stored the individual movements of a person for up to three-weeks.¹⁴⁶ Analogizing the means employed in

140. *Id.* at 764.

141. *See id.*

142. *See supra* note 113 and accompanying text.

143. *See Maynard*, 615 F.3d at 559-61.

144. *See id.*

145. *See id.*

146. *Garcia*, 474 F.3d at 995-96; *see also* United States v. Garcia, No. 05-CR-155-C, 2006 U.S. Dist. LEXIS 29596 (W.D. Wis., May 10, 2006); *Morton v. Nassau Cnty. Police Dep’t*, 2007 WL 4264569, *1 (E.D.N.Y. Nov. 27, 2007) (noting that a “GPS transmitter is approximately the size of a pack of cigarettes, and is powered by batteries, which last approximately two to three weeks.”).

Garcia to an earlier Supreme Court decision, Judge Posner wrote that “the planting of an undercover agent in a criminal gang does not become a search just because the agent has a transmitter concealed on his person, even though the invasion of privacy is greater when the suspect’s words are recorded and not merely recollected.”¹⁴⁷ Because the isolated movements of an individual are subject to public observation, the surveillance of those movements, in Judge Posner’s opinion, does not become a search by the mere attachment of a tracking device.¹⁴⁸

Despite Judge Posner’s assurance that there is not a difference between the various means employed, the Supreme Court has consistently suggested otherwise.¹⁴⁹ “The fact that equivalent information could sometimes be obtained by other means does not make lawful the use of means that violate the Fourth Amendment.”¹⁵⁰ For example, in *Kyllo*, the Court determined that use of thermal-imaging technology to observe heat radiating from various portions of a private residence was a violation of the Fourth Amendment despite the fact that such observations could have easily been made by other less intrusive (or lawful) measures.¹⁵¹ Specifically, officers could have made these same observations if, for instance, it was winter time and various parts of the roof/home had portions that were not covered by snow because of the heat causing it to melt or by placing their hand on various portions of the roof/home to make a “touch” observation regarding the respective heat radiating from within.¹⁵² Moreover, the same observations that were deemed a search in *Katz* could have been made by someone standing close enough to the phone booth to hear the conversation of the speaker within, especially given the fact that the recording device was placed on the *outside* of the phone booth and only recorded noises that traveled beyond closed doors.¹⁵³ Additionally, while it is *possible* for an airplane to travel at increasingly low altitudes and regularly conduct aerial observation of ground-level activity, Justice O’Connor has warned that “[i]f the public rarely, if ever, travels overhead at such altitudes, the observation cannot be said to be from a vantage point generally used by public and [one] cannot be said to have knowingly exposed [its property] to public view.”¹⁵⁴ Thus, the inquiry is one of actual observation, not theoretical possibilities.¹⁵⁵

147. *Garcia*, 474 F.3d at 998 (citing *Lopez v. United States*, 373 U.S. 427 (1963)).

148. *See id.*

149. *See Kyllo*, 533 U.S. at 35 n.2.

150. *Id.*

151. *Id.*

152. *See id.*

153. *Katz*, 389 U.S. at 348-50.

154. *Florida v. Riley*, 488 U.S. 445, 455 (O’Connor, J., concurring) (internal quotations omitted).

155. *See id.*; *Katz*, 389 U.S. at 348-50; *Kyllo*, 533 U.S. at 35 n.2.

The fact that individual information may be publically available while an entire compilation of the same information may not be has also been acknowledged by the Supreme Court. Specifically, in *National Reporters Committee*, the Court stated that “there is a vast difference between the public records that might be found after a diligent search of courthouse files, county archives, and local police stations throughout the country and a computerized summary located in a single clearinghouse of information.”¹⁵⁶ While each of the individual items are *actually* subject to public access, the total report itself (i.e., the “rap sheet”) is not actually exposed, but rather only theoretically exposed based on the possibility that someone will go to each individual courthouse and gather the information.¹⁵⁷ Moreover, “[t]he very fact that federal funds have been spent to prepare, index, and maintain these criminal-history files demonstrates that the individual items of information in the summaries would not otherwise be freely available [without the government’s involvement.]”¹⁵⁸

Just like the rap sheets above, the collective whole of an individual’s movements on public streets are not *actually* exposed to public observation. Specifically, there is a vast difference between isolated movements in public, which are actually exposed to observation, and prolonged movements for a continuous duration. As to the latter, the only possibility that such movements would be subject to public exposure, just like the rap sheets, is a fruitful exercise of theoretical possibilities—e.g., that a layperson would get in their car and conduct a non-stop surveillance of another private citizen. And the very fact that government has gone to extensive lengths to employ GPS surveillance as an alternative to conduct real-time, in-person observation goes to prove this very fact—the movements would not otherwise be publically exposed without the government’s involvement.

VI. CONCLUSION

Since the decision in *Katz*, our society has sat front row to the creation and use of technological advances that have given rise to serious concerns regarding our ability to maintain privacy. This is especially true where the government threatens to use GPS-related tracking devices for an indefinite duration to track the whereabouts and movements of each citizen. Despite these concerns, many scholars and courts are reluctant to interpret the meaning of a “search” to include the indefinite surveillance of private

156. *Nat’l Reporters Comm.*, 489 U.S. at 764.

157. *See id.*

158. *Id.* (internal quotations omitted).

citizens.¹⁵⁹ While there may be merit to the assertion that each citizen assumes the risk that his or her movements are publically exposed to a certain degree, this does not give the government carte blanche authority to trample upon the privacy of its citizens. As with every question involving the scope of Fourth Amendment protections, there must be a balance between public concerns and private needs.¹⁶⁰ This balancing calculus, however, stops far short of allowing “Big Brother” to observe our movements twenty-four hours a day, seven days a week.

159. See, e.g., *Knotts*, 460 U.S. at 283-84; *Maynard*, 615 F.3d at 557-58; Kaitlyn A. Kerrane, *Keeping up with Officer Jones: A Comprehensive Look at the Fourth Amendment and GPS Surveillance*, 79 *FORDHAM L. REV.* 1695, 1740-41 (2011).

160. See *Katz*, 389 U.S. at 361 (Harlan, J., concurring); see also *Kyllo*, 533 U.S. at 28.