

GPS TRACKING TECHNOLOGY: THE CASE FOR REVISITING *KNOTT* AND SHIFTING THE SUPREME COURT'S THEORY OF THE PUBLIC SPACE UNDER THE FOURTH AMENDMENT

Abstract: The Fourth Amendment to the U.S. Constitution guarantees freedom from government intrusion into individual privacy. More than two hundred years after the time of the Framers, however, the government possesses technologies, like GPS tracking, that allow law enforcement to obtain ever-greater amounts of detail about individuals without ever setting foot inside the home—the area where Fourth Amendment protections are highest. Despite the dangers GPS tracking and other technologies present to individual privacy, the U.S. Supreme Court's Fourth Amendment jurisprudence frequently fails to acknowledge any semblance of privacy in the public sphere. This Note argues that rather than defining Fourth Amendment privacy based on purely physical boundaries, a proper analysis would protect those features of society that provide privacy. By recognizing that features other than physical boundaries can generate privacy, this analysis would ensure the Fourth Amendment continues to preserve individual privacy even in the face of sophisticated new technologies.

INTRODUCTION

Generations before the dawn of the twenty-first century, many predicted the technological age would diminish the ability of ordinary citizens to take refuge in their privacy—to remain secure from unwarranted government intrusion.¹ Technological advances that allowed police to “bug” phone lines and record conversations, for instance, caused some to assert that George Orwell was on target in 1984 when

¹ See, e.g., *Osborn v. United States*, 385 U.S. 323, 341 (1966) (Douglas, J., dissenting) (expressing concern that “[w]e are rapidly entering the age of no privacy, where everyone is open to surveillance at all times”); *Olmstead v. United States*, 277 U.S. 438, 473–74 (1928) (Brandeis, J., dissenting) (arguing that modern advancements meant “[s]ubtler and more far-reaching means of invading privacy” than physical intrusion were available).

he described Oceania, a totalitarian society where Big Brother was always watching and listening.²

When Orwell published his novel in 1949, the world lacked the technological skill to effectuate much of his ominous vision.³ Orwell's Telescreen, which enabled the Thought Police to monitor movements and listen to conversations, likely seemed far-fetched in the 1950s.⁴ What made Oceania alarming from a technological viewpoint, then, was the suggestion that the government could possess the ability to watch and record people's movements, words, and thoughts.⁵ In that kind of world, privacy was nonexistent, and one constantly censored one's behavior to align with accepted norms.⁶

Orwell wrote in a time long before the Internet enabled the widespread collection of data, before closed-circuit cameras were regularly installed in public places, before computer databases provided for the seemingly endless cataloguing of data, and before the Global Positioning System (the "GPS") permitted the continuous, precise tracking of one's movements.⁷ Such technological develop-

² See, e.g., S. REP. NO. 90-1097, at 161, 164-65 (1968), reprinted in 1968 U.S.C.A.N. 2112, 2223, 2226-27 (including comments by two senators who compared proposed federal law authorizing some government use of wiretapping to the launching of Orwell's 1984 society); Arthur J. Goldberg, *Can We Afford Liberty?*, 117 U. PA. L. REV. 665, 667-69 (1969) (describing wiretapping and other forms of electronic surveillance, when not limited, as creating a society marked by the presence of Big Brother). See generally GEORGE ORWELL, 1984 (1949); David P. Hodges, Note, *Electronic Visual Surveillance and the Fourth Amendment: The Arrival of Big Brother?*, 3 HASTINGS CONST. L.Q. 261 (1975) (discussing privacy implications of electronic snooping technology).

³ See, e.g., Rand Richards Cooper, *The Big Brother Test: When You Add It All Up, Does It Come to 1984?*, HARTFORD COURANT, Sept. 7, 2003, at 5; David Shenk, *Watching You: The World of High-Tech Surveillance*, NAT'L GEOGRAPHIC, Nov. 1, 2003, at 2; Eric Zorn, *Commentary: Orwellian Days Could Be Just Around Corners*, CHI. TRIB., July 15, 2003, at C1. See generally ORWELL, *supra* note 2.

⁴ See ORWELL, *supra* note 2, at 4; Cooper, *supra* note 3, at 5; Shenk, *supra* note 3, at 2; Zorn, *supra* note 3, at C1.

⁵ See Cooper, *supra* note 3, at 5; Shenk, *supra* note 3, at 2.

⁶ See Cooper, *supra* note 3, at 5; Shenk, *supra* note 3, at 2.

⁷ See generally Shawn C. Helms, *Translating Privacy Values with Technology*, 7 B.U. J. SCI. & TECH. L. 288 (2001) (discussing the effect of the Internet on personal privacy); John Shattuck, *In the Shadow of 1984: National Identification Systems, Computer-Matching, and Privacy in the United States*, 35 HASTINGS L.J. 991 (1984) (describing new technologies that made the author wonder whether the society of 1984 had, in fact, arrived); Christopher Slobogin, *Public Privacy: Camera Surveillance of Public Places and the Right to Anonymity*, 72 MISS. L.J. 213 (2002) (discussing privacy and the monitoring of closed-circuit television cameras); Toby Solomon, *Personal Privacy and the "1984" Syndrome*, 7 W. NEW ENG. L. REV. 753 (1985) (describing the impact of the computer on personal privacy); Waseem Karim, Note, *The Privacy Implications of Personal Locators: Why You Should Think Twice Before Voluntarily Availing Yourself to GPS Monitoring*, 14 WASH. U. J.L. & POL'Y 485 (2004) (discussing privacy implications of GPS devices).

ments have made it entirely possible, it seems, for many aspects of people's lives to be monitored and recorded.⁸ One might wonder, then, how much room is left for personal privacy—and the liberty privacy affords.⁹

The Fourth Amendment to the U.S. Constitution was drafted by the Framers to protect one aspect of personal privacy fundamental to individual liberty: the freedom from unwarranted intrusion by the government.¹⁰ Without probable cause and a warrant, the government cannot enter and search a home or seize personal property.¹¹ But technology has made it easier for the government to acquire just as much information about a person without ever setting foot inside a home.¹² Thus, the question becomes whether technology has eroded the protections provided by the Fourth Amendment, as interpreted by the U.S. Supreme Court.¹³ So far, the answer seems to be yes, because the Court continues to focus less on safeguarding the features that enable people to maintain privacy, and more on the traditional physical boundaries that separate private from public.¹⁴

GPS tracking is one technology that has raised privacy concerns and the fear that the Fourth Amendment would fail to provide protection from indiscriminate police use.¹⁵ Because GPS tracking devices collect continuous, real-time location information, they offer detailed descriptions of one's movements over time.¹⁶ Although one's movements generally occur within the public space, the resulting catalogue of location data reveals a great deal about one's preferences, friends, associations, and habits—and GPS tracking enables data collection of a magnitude not feasible through mere visual surveillance.¹⁷ Under the Supreme Court's current analysis, however, the Fourth Amendment generally does not apply to activities occurring in the

⁸ See generally Helms, *supra* note 7; Shattuck, *supra* note 7; Slobogin, *supra* note 7; Karim, *supra* note 7.

⁹ See generally Helms, *supra* note 7; Shattuck, *supra* note 7; Slobogin, *supra* note 7; Karim, *supra* note 7.

¹⁰ See *Katz v. United States*, 389 U.S. 347, 350 (1967); see also U.S. CONST. amend. IV; *Olmstead*, 277 U.S. at 478–79 (Brandeis, J., dissenting); Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193, 205 (1890) (describing overall right to privacy, not just that found in the Fourth Amendment, as a general “right to be let alone”).

¹¹ See *infra* notes 67–73 and accompanying text.

¹² See *infra* note 263 and accompanying text.

¹³ See *infra* notes 87, 212–214, 263 and accompanying text.

¹⁴ See *infra* notes 162–202 and accompanying text.

¹⁵ See *infra* notes 42–66 and accompanying text.

¹⁶ See *infra* notes 30–46, 254–256 and accompanying text.

¹⁷ See *infra* notes 146–156, 247–256 and accompanying text.

public space.¹⁸ Thus, GPS tracking provides a case for shifting the Supreme Court's definition of public and private to an analysis that recognizes not only that technology has broken down traditional boundaries between public and private, but also that it is possible to maintain some privacy within the public space.¹⁹

Part I of this Note introduces GPS tracking technology and describes the various privacy concerns and potential law enforcement uses of GPS devices.²⁰ Part II outlines the framework of the Fourth Amendment, highlighting the Supreme Court's reasonable expectation of privacy doctrine.²¹ Part III begins to evaluate GPS tracking devices under the Fourth Amendment and focuses on two Supreme Court cases addressing the constitutionality of the use of beepers, a more primitive tracking device.²² Part IV discusses how the Supreme Court has addressed the idea of privacy within the public space and provides the basic criticisms privacy advocates have leveled against the Court's Fourth Amendment jurisprudence, including criticism that the Court's analysis has not kept pace with technological advances.²³

Part V then offers an argument for why GPS tracking should be considered a search under the Fourth Amendment.²⁴ Part V.A distinguishes GPS devices from beepers.²⁵ Part V.B proposes a shift in the Court's Fourth Amendment jurisprudence to reflect better the idea that privacy can exist within the public space.²⁶ This argument, based in part on language in the Supreme Court's most recent Fourth Amendment case, suggests that the Fourth Amendment should protect not only the physical areas people expect to be kept private, but also those features of society that make possible the level of privacy society expects.²⁷ Such an analysis would better prevent technological advances from further impinging on the freedom from government intrusion guaranteed by the Fourth Amendment.²⁸ Finally, Part V.C

¹⁸ See *infra* notes 162–202 and accompanying text.

¹⁹ See *infra* notes 226–279 and accompanying text.

²⁰ See *infra* notes 30–66 and accompanying text.

²¹ See *infra* notes 67–87 and accompanying text.

²² See *infra* notes 88–156 and accompanying text.

²³ See *infra* notes 157–225 and accompanying text.

²⁴ See *infra* notes 226–287 and accompanying text.

²⁵ See *infra* notes 233–253 and accompanying text.

²⁶ See *infra* notes 254–279 and accompanying text.

²⁷ See *infra* notes 254–262 and accompanying text.

²⁸ See *infra* notes 263–270 and accompanying text.

develops, as an alternative to Fourth Amendment protection, a statutory framework for regulating police use of GPS technology.²⁹

I. THE NATURE OF GPS TRACKING TECHNOLOGY

A. How GPS Works

Originally designed by the Department of Defense for use by the U.S. military, the GPS provides continuous, highly accurate, and reliable positioning and timing information to users.³⁰ The system functions through at least twenty-four satellites that broadcast precise time signals while orbiting the earth.³¹ A GPS receiver processes the signals of at least four satellites at any given time to determine mathematically the receiver's location, velocity, and time—anywhere in the world, under any weather conditions.³²

Although the most accurate positioning information initially was reserved for military uses such as guiding missiles, the U.S. government in 2000 granted civilian access to this capability, which pinpoints latitude and longitude with an accuracy of between forty-eight and sixty feet.³³ Using a common process called differential GPS, which incorporates additional correction signals to account for problems like atmospheric interference, many GPS receivers have an accuracy of between one and three meters.³⁴ Satellite improvements expected in 2005 and again in 2012 eventually could make differential GPS accurate to within thirty to fifty centimeters.³⁵

²⁹ See *infra* notes 280–287 and accompanying text.

³⁰ AHMED EL-RABBANY, INTRODUCTION TO GPS, THE GLOBAL POSITIONING SYSTEM 1 (2002).

³¹ SCOTT PACE ET AL., THE GLOBAL POSITIONING SYSTEM: ASSESSING NATIONAL POLICIES 1 (1995). Twenty-nine satellites currently are in use. EL-RABBANY, *supra* note 30, at 5.

³² EL-RABBANY, *supra* note 30, at 1–2, 8–9.

³³ Mark Grossman & Allison K. Hift, *GPS Technology: Know Where You Stand*, LEGAL TIMES, Aug. 7, 2000, at 24; Kevin Washington, *Locator System Draws Bead on Better Accuracy*, BALTIMORE SUN, May 8, 2000, at 1C, 2000 WLNR 1071694.

³⁴ Grossman & Hift, *supra* note 33, at 24; Washington, *supra* note 33, at 1C. Some GPS receivers have limited capability inside buildings or in dense urban environments dotted by skyscrapers, however, because the receivers have difficulty connecting to the satellites. Thomas J. Fitzgerald, *Cart 54, Where Are You? The Tracking System Knows*, N.Y. TIMES, Oct. 30, 2003, at G7. To circumvent this problem, some systems use technologies other than or in combination with GPS, such as Wi-Fi, infrared, or radio frequency technologies to pinpoint locations in these areas. *Id.*

³⁵ Loring Wirbel, *Communications in Focus: GPS and Satellite*, ELEC. ENG'G TIMES, Sept. 20, 2004, at 51.

Since President Ronald Reagan first granted civilian access to GPS in 1983, civilian uses for the technology have exploded.³⁶ A primary initial civilian use was land surveying, but other applications quickly followed in land, marine, and air navigation.³⁷ Most relevant to privacy concerns, civilian inventors developed technology that can track the location of individuals, vehicles, and objects.³⁸

The market for GPS services is growing rapidly; more than 5 million consumer GPS units were shipped in 2003, up from 3.2 million units in 2002.³⁹ In fact, the global consumer GPS market now is expected to surpass \$22 billion by 2008.⁴⁰ At least 42 million Americans are expected to use some kind of "location-aware" technology in 2005.⁴¹

B. GPS Tracking and Privacy

The pervasiveness and wide variety of uses of GPS-based tracking devices has prompted concern from privacy advocates.⁴² Even though the technology has many beneficial uses, such as allowing emergency services to locate those in need of assistance or family members to monitor the whereabouts of relatives suffering from Alzheimer's disease, privacy advocates question the full extent of the technology's capabilities.⁴³ Parents wanting to keep track of their children can give them GPS-enabled cellular phones and use software to track their lo-

³⁶ PACE ET AL., *supra* note 31, at 2. The military continues to use the system through encrypted satellite signals reserved exclusively for the government. Seth Schiesel, *On the Ground in Iraq, the Best Compass Is the Sky*, N.Y. TIMES, Apr. 17, 2003, at G1.

³⁷ EL-RABBANY, *supra* note 30, at 10; PACE ET AL., *supra* note 31, at 2.

³⁸ See EL-RABBANY, *supra* note 30, at 10; PACE ET AL., *supra* note 31, at 2.

³⁹ Wirbel, *supra* note 35, at 51.

⁴⁰ *Global Market to Top \$22 Billion*, GPS WORLD, Feb. 1, 2004, at 46.

⁴¹ Amy Harmon, *Lost? Hiding? Your Cellphone Is Keeping Tabs*, N.Y. TIMES, Dec. 21, 2003, at A1. The use of location-aware technology is due in part to federal regulations requiring cell phone service providers to be able to pinpoint the location of 911 callers. See Wireless Communications and Public Safety Act of 1999, 47 U.S.C. § 615 (2000) (ordering the Federal Communications Commission to "encourage and support" state efforts to build wireless 911 service); FCC 911 Service, 47 C.F.R. § 20.18 (2004) (requiring wireless carriers to choose among various location-based technologies, including GPS, to enable phones on their networks to pinpoint a caller's location within fifty meters for two-thirds of all calls, and within one hundred fifty meters for ninety-five percent of all calls); Jeffrey Selingo, *What's Next: Protecting the Cellphone User's Right to Hide*, N.Y. TIMES, Feb. 5, 2004, at G7.

⁴² See, e.g., Becky Diercks, *Location-Based Services: Finding Their Place in the Market*, WIRELESS WK., Mar. 15, 2003, at 56; Fitzgerald, *supra* note 34, at G7; Harmon, *supra* note 41, at A1; Robert O'Harrow, Jr., *Privacy Eroding, Bit by Byte*, WASH. POST, Oct. 15, 2004, at E1; Selingo, *supra* note 41, at G7.

⁴³ See, e.g., Harmon, *supra* note 41, at A1; Richard Willing, *Surveillance Gets a Satellite Assist*, USA TODAY, June 10, 2004, at 3A.

cations, relying on the services to track them as long as the cell phone is on—but some are concerned that others with more dangerous intentions could obtain this information.⁴⁴ Employers can give GPS-equipped cell phones to their employees to determine if employee on-site hours are accurate—but employees lament the lack of trust.⁴⁵ Drivers can use GPS vehicle navigation systems to plot directions—but a domestic abuser could attach a covert GPS device to his target's vehicle and use it to terrorize her with how well he knows her location.⁴⁶

One area of concern for privacy advocates regarding this technology is its covert surveillance potential on behalf of law enforcement.⁴⁷ For instance, police could approach a suspect's vehicle, magnetically attach a GPS tracking device to the vehicle's undercarriage, and view data from the device over an Internet website—all unbeknownst to the suspect.⁴⁸ Because such systems can last for weeks at a

⁴⁴ Harmon, *supra* note 41, at A1. Because such systems typically provide access to location information through the Internet, the data may be susceptible to hacking. *See id.*

⁴⁵ Christopher Elliott, *Some Rental Cars Are Keeping Tabs on the Drivers*, N.Y. TIMES, Jan. 13, 2004, at C6; Harmon, *supra* note 41, at A1.

⁴⁶ John Schwartz, *This Car Can Talk. What It Says May Cause Concern*, N.Y. TIMES, Dec. 29, 2003, at C1. For instance, a defendant was convicted in Kenosha, Wisconsin, in June 2003 for stalking his ex-girlfriend; he used a tracking device to obtain accurate location information. *Id.* The police report indicated the woman "could not understand how the defendant always knew where she was in her vehicle at all times." *Id.* Upon inspection of her vehicle, police found a small black box near the radiator; the defendant had accessed her location data by logging onto the Internet. *Id.* A similar stalking case occurred in Colorado. *See* *People v. Sullivan*, 53 P.3d 1181, 1183–84 (Colo. App. 2002) (affirming conviction for stalking by concluding the defendant's monitoring of a GPS device attached to the victim's vehicle constituted placing the victim "under surveillance" within the meaning of the state's stalking statute, although the defendant did not physically follow the victim).

⁴⁷ *See, e.g.*, Richard C. Balough, *Global Positioning System and the Internet: A Combination with Privacy Risks*, 15 CHI. BAR ASS'N REC. 28, 32–33 (2001); Laurie Thomas Lee, *Can Police Track Your Wireless Calls? Call Location Information and Privacy Law*, 21 CARDOZO ARTS & ENT. L.J. 381, 382–83 (2003); Karim, *supra* note 7, at 501–05; Harmon, *supra* note 41, at A1; O'Harrow, *supra* note 42, at E1; Schwartz, *supra* note 46, at C1.

⁴⁸ *See, e.g.*, Elliott, *supra* note 45, at C6 (indicating that because of the nature of some GPS devices, rental car customers often have no way to determine physically whether their rented vehicle is equipped with such a device). Companies manufacturing GPS tracking devices often tout their small size and covert nature as part of their marketing schemes. *E.g.*, COUNTER INTELLIGENCE TECHS., INC., GPS SATELLITE TRACKING/LOCATION SYSTEMS, at <http://www.spooktech.com/trackingeqmt/datalogger.shtml> (last modified July 22, 2004) (describing Datalogger II: The Scout, a covert GPS vehicle tracker that can operate for eighteen days on four AA batteries, is 3" by 5" by 1.5", attaches magnetically to a vehicle undercarriage, and provides location data every ten seconds to an Internet website); COVERT GPS VEHICLE TRACKING SYS., INC., GPS-WEB VEHICLE TRACKING SYSTEMS, at <http://www.covert-gps-vehicle-tracking-systems.com> (last updated Apr. 6, 2005) (describing the GPS-Web system, equipped with a GPS-Stealth antenna that can be placed deep under a vehicle because it

time, depending on the type of battery used, police could acquire constant, real-time, precise location information about that vehicle for much longer than they practically might be able to maintain round-the-clock visual surveillance.⁴⁹

Another kind of GPS device available to law enforcement is the personal tracking device, which is designed and priced for the average citizen and often marketed as a way to quickly locate a person in an emergency or to monitor young children.⁵⁰ Individuals wear the device like a wristwatch; location information can be accessed through the Internet.⁵¹ The cellular phone also is a personal locator and one of the fastest-growing markets for GPS and other location-based technologies.⁵² The growth is spurred in part by the federal government's requirement that cell phone service providers equip the cell phones on their networks with technology that can locate 911 callers within fifty to one hundred meters.⁵³

C. Law Enforcement Uses of GPS

Law enforcement officials have been loathe to discuss the frequency with which their agencies use GPS tracking devices and the purposes such devices are serving, although specific cases have come to light.⁵⁴ Perhaps the most highly publicized instance of GPS tracking

functions without maintaining a line of sight to satellites, and boasting a thirty-second magnetic installation and a fourteen-month battery life).

⁴⁹ See *State v. Jackson*, 76 P.3d 217, 223 (Wash. 2003) (en banc) (arguing it was improbable that law enforcement could have engaged in uninterrupted, twenty-four-hour visual surveillance of the defendant); COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

⁵⁰ Karim, *supra* note 7, at 486, 488–92.

⁵¹ *Id.* at 489–90 (detailing information about Wherify Wireless, Inc.'s Personal Locator devices and Digital Angel Corp.'s Digital Angel tracking device); Will Wade, *Keeping Tabs: A Two-Way Street*, N.Y. TIMES, Jan. 16, 2003, at G1 (describing personal locator options).

⁵² Selingo, *supra* note 41, at G7.

⁵³ *Id.*; see Wireless Communications and Public Safety Act of 1999, 47 U.S.C. § 615 (2000); FCC 911 Service, 47 C.F.R. § 20.18 (2004).

⁵⁴ Brendan L. Koerner, *Your Cell Phone Is a Homing Device*, LEGAL AFFAIRS, July–Aug. 2003, (citing difficulty in obtaining information about law enforcement GPS use from the New York City Police Department and the U.S. Department of Justice), http://www.legalaffairs.org/issues/July-August-2003/feature_koerner_julaug03.html (last visited Apr. 15, 2005); Brendan Lyons, *GPS Does the Legwork as Cops Track Suspects*, TIMES UNION (Albany, N.Y.), Oct. 5, 2004, at A1 (discussing difficulty of obtaining information about how the Bureau of Alcohol, Tobacco, and Firearms uses GPS devices), 2004 WLNR 659983; Willing, *supra* note 43, at 3A (noting that no national records of law enforcement use of GPS exist).

There is some indication, however, that GPS technology is readily available to law enforcement agencies from the federal government if local law enforcement intends to use the technology in drug investigations. See U.S. WHITE HOUSE OFFICE OF NAT'L DRUG CON-

occurred in connection with the Laci Peterson slaying case in California.⁵⁵ During the criminal investigation of that case, police attached GPS tracking devices between January and April 2003 to several vehicles used by Scott Peterson, the primary suspect in the case.⁵⁶ The devices captured Peterson's movements as he traveled around California, including to a marina near where his wife Laci's body later washed ashore.⁵⁷ At trial, prosecutors argued that this fact suggested, circumstantially, that Peterson was connected to her death.⁵⁸ In another prominent case, police in Spokane, Washington, used GPS devices to track a murder suspect's movements in his vehicle for eighteen days.⁵⁹ Information from the devices revealed the suspect's travels to a location fifty miles away, where police found the body of the nine-year-old girl the suspect later would be convicted of killing.⁶⁰ Moreover, police have used GPS devices to track the location of "bait" cars, which police set up to attract car thieves and catch them in the act.⁶¹ The GPS devices in the "bait" cars can be rigged to alert police when a

TROL POLICY, COUNTERDRUG TECH. ASSESSMENT CTR., NATIONAL DRUG CONTROL STRATEGY: COUNTERDRUG RESEARCH AND DEVELOPMENT BLUEPRINT UPDATE E-1, E-9 to E-10 (2003), available at <http://www.whitehousedrugpolicy.gov/publications/policy/ctac03/ctac03.pdf> (last updated Feb. 13, 2003). GPS tracking devices are available through the federal government's Technology Transfer Program, which provides technology equipment and training free of charge to local law enforcement agencies fighting drug trafficking and drug use. See *id.* at E-1 to E-5, E-9 to E-10. The program offers two kinds of GPS equipment, the Advanced Vehicle Tracking System, which allows officers to "tag" and track vehicles in real time, and the Sentinel Global Positioning System, which tracks and logs vehicle location data. *Id.* at E-9 to E-10.

⁵⁵ See Stacy Finz & Michael Taylor, *Peterson Tracking Device Called Flawed, Defense Wants Evidence Shut Out of Trial*, SAN FRAN. CHRON., Feb. 12, 2004, at A17, 2004 WLNR 7620927.

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ *Id.* At Peterson's trial for the murder of his wife and unborn child, the defense attempted to block admission into evidence of the GPS tracking information, arguing it was too unreliable to be admitted. *Id.* The tracking information revealed at least three glitches during the time GPS devices were placed on Peterson's vehicles, amounting to eleven minutes of faulty information in hours of location data. *Id.* After a hearing, the trial judge decided to admit the evidence—the first time, according to analysts, that GPS tracking device evidence was used in a criminal trial in California. Stacy Finz et al., *Groundbreaking Rule in Peterson Trial; Tracking Device Evidence Can Be Presented*, SAN FRAN. CHRON., Feb. 18, 2004, at A11, 2004 WLNR 7622924. A jury later convicted Peterson of the two murders and sentenced him to death for the crimes. Dean Murphy, *Jury Says Scott Peterson Deserves to Die for Murder*, N.Y. TIMES, Dec. 14, 2004, at A20.

⁵⁹ Finz & Taylor, *supra* note 55, at A17.

⁶⁰ *Id.*

⁶¹ E.g., Heather Ratcliffe, *Police Sting Targets Cold-Weather Car Thieves*, ST. LOUIS POST-DISPATCH, Jan. 15, 2005, at 7 (describing St. Louis, Missouri's program), 2005 WLNR 609624.

door is opened or the car moves.⁶² Finally, law enforcement and corrections officers use GPS tracking devices to monitor the location of nonviolent offenders released on parole or defendants released pending trial; they can engineer the devices to warn themselves when an individual travels to prohibited locations.⁶³

Thus, law enforcement may find GPS technology useful in a variety of contexts and for a variety of purposes, but what concerns privacy advocates is the tracking of suspects and those who have not yet been convicted of any crime.⁶⁴ Privacy advocates draw parallels between such GPS tracking and the Orwellian state—one where the average citizen must live and move about while knowing the government may be watching and scrutinizing the individual's every movement.⁶⁵ If law enforcement discretion in using GPS devices can be checked by the U.S. Constitution, such a safeguard must derive from the Fourth Amendment, which, according to Justice Louis Brandeis in his famous description of privacy, protects "the right to be let alone" from government intrusion—"the most comprehensive of rights and the right most valued by civilized men."⁶⁶

II. THE FRAMEWORK OF THE FOURTH AMENDMENT

The Fourth Amendment to the U.S. Constitution grants people the right "to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures."⁶⁷ The threshold inquiry under the Fourth Amendment is whether police activities constituted

⁶² *Id.*

⁶³ *E.g.*, Kris Axtman, *The Move to High-Tech Tracking of Inmates*, CHRISTIAN SCI. MONITOR, May 7, 2004, at 2.

⁶⁴ See Wade, *supra* note 51, at G1 (outlining variety of uses of GPS technology).

⁶⁵ See Shaun B. Spencer, *Reasonable Expectations and the Erosion of Privacy*, 39 SAN DIEGO L. REV. 843, 882–85 (2002) (suggesting a variety of privacy-invasive police uses of GPS technology); Schwartz, *supra* note 46, at C1. See generally ORWELL, *supra* note 2.

⁶⁶ See *Olmstead v. United States*, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting); see also U.S. CONST. amend. IV; Warren & Brandeis, *supra* note 10, at 205 (describing overall right to privacy, not just that found in the Fourth Amendment, as a general "right to be let alone").

⁶⁷ The Fourth Amendment provides the following:

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

U.S. Const. amend. IV.

a search or seizure.⁶⁸ If no search or seizure occurred, the Fourth Amendment does not apply.⁶⁹ If the activity was a search or seizure, then it must have been reasonable in order to comply with the Fourth Amendment.⁷⁰ In most cases, a search of private property is reasonable if it occurred pursuant to a warrant, based on probable cause and issued by a neutral and detached magistrate.⁷¹ If, however, a search occurred absent a valid warrant, its evidence must be excluded at the defendant's subsequent criminal trial.⁷² Therefore, whether police action constitutes a search yields significant implications for police investigative techniques and procedure, as well as the conduct of any resulting criminal trial.⁷³

Until the late 1960s, the U.S. Supreme Court repeatedly interpreted the Fourth Amendment to provide only the right to be free from physical governmental trespass onto one's person or property.⁷⁴

⁶⁸ See, e.g., *Kyllo v. United States*, 533 U.S. 27, 31 (2001); *Smith v. Maryland*, 442 U.S. 735, 739-40 (1979); *Katz v. United States*, 389 U.S. 347, 352-53 (1967).

⁶⁹ See, e.g., *Dow Chem. Co. v. United States*, 476 U.S. 227, 239 (1986); *California v. Ciraolo*, 476 U.S. 207, 214-15 (1986); *Oliver v. United States*, 466 U.S. 170, 177-79 (1984); *Smith*, 442 U.S. at 745-46.

⁷⁰ See, e.g., *New Jersey v. T.L.O.*, 469 U.S. 325, 337 (1985); *Terry v. Ohio*, 392 U.S. 1, 24-25 (1968); *Silverman v. United States*, 365 U.S. 505, 511 (1961).

⁷¹ See, e.g., *Groh v. Ramirez*, 540 U.S. 551, 558-60 (2004); *Kyllo*, 533 U.S. at 31; *Illinois v. Rodriguez*, 497 U.S. 177, 181 (1990); *Katz*, 389 U.S. at 356-57; *Johnson v. United States*, 333 U.S. 10, 13-14 (1948). Although the Supreme Court generally maintains its position that searches conducted without a warrant are presumptively unreasonable, the Court has recognized numerous exceptions to the warrant requirement, where a search will be reasonable even without a warrant. See, e.g., *Groh*, 540 U.S. at 572 (Thomas, J., dissenting) (discussing exceptions to the warrant requirement). For instance, the Court has recognized that both an individual's lesser expectation of privacy in his automobile and the mobility of the vehicle make it impracticable to require a warrant to search an automobile; thus, a search of a vehicle can be reasonable without a warrant, so long as officers had probable cause to believe the vehicle contained contraband. *United States v. Ross*, 456 U.S. 798, 800 (1982); *Carroll v. United States*, 267 U.S. 132, 151-53 (1925). Moreover, searches conducted in officers' good faith that a valid warrant exists, even when the warrant is deficient, also are constitutional. *United States v. Leon*, 468 U.S. 897, 907-09 (1984). Finally, the Court has dispensed with the warrant requirement for limited, brief searches and seizures of a person, when officers have reasonable suspicion the individual is armed. *Terry*, 392 U.S. at 24-27.

⁷² *Mapp v. Ohio*, 367 U.S. 643, 655 (1961) (applying exclusionary rule to state criminal prosecutions); *Weeks v. United States*, 232 U.S. 383, 393-94 (1914) (crafting exclusionary rule and applying it to federal criminal prosecutions).

⁷³ See *Mapp*, 367 U.S. at 655; *Weeks*, 232 U.S. at 393-94.

⁷⁴ See, e.g., *Silverman*, 365 U.S. at 509-10 (holding the Fourth Amendment was violated where police officers' eavesdropping techniques involved a physical penetration into the defendants' premises); *Olmstead v. United States*, 277 U.S. 438, 465-66 (1928) (holding no Fourth Amendment violation occurred where officers intercepted the defendants' wire telephone calls by tapping wires located outside of the defendants' home).

Regarding searches, the Court simply determined the location of law enforcement officers at the time they acquired information about the defendant; if officers had not committed a physical trespass into persons, houses, papers, or effects, their actions were not considered a search and thus did not violate the Fourth Amendment.⁷⁵

This reliance on physical trespass shifted in 1967 with the seminal Supreme Court case *Katz v. United States*, where the Court held for the first time that the Fourth Amendment "protects people, not places."⁷⁶ Even though the language of the Fourth Amendment contains no explicit reference to privacy, the Court indicated that the heart of the Fourth Amendment protects an individual's reasonable expectation of privacy from government intrusion.⁷⁷ Under the Court's analysis, sharpened by Justice John M. Harlan's concurring opinion, there were two requirements to find an individual had a reasonable expectation of privacy worthy of protection.⁷⁸ First, a person must have exhibited a subjective expectation of privacy, and second, the expectation must be one that society is prepared to recognize as reasonable.⁷⁹

By this logic, the *Katz* majority attempted to make Fourth Amendment jurisprudence reflect societal notions of privacy.⁸⁰ The context of the case suggests the Justices were mindful of the effect of technological advances, which gave police access to information with no physical intrusion required.⁸¹ In *Katz*, FBI agents installed an electronic listening and recording device on the outer wall of the phone booth in which the defendant had made a telephone call.⁸² The Court held that by entering the phone booth and closing the door, the de-

⁷⁵ See, e.g., *Silverman*, 365 U.S. at 509-10 (holding that physical penetration into the defendants' home constituted a Fourth Amendment violation); *Goldman v. United States*, 316 U.S. 129, 134-36 (1942) (holding no Fourth Amendment violation occurred where officers did not physically enter the defendant's office); *Olmstead*, 277 U.S. at 456-66 (holding no Fourth Amendment violation occurred when officers did not penetrate the defendants' home); *Hester v. United States*, 265 U.S. 57, 58-59 (1924) (holding no Fourth Amendment violation occurred when officers trespassed onto the defendant's land but did not trespass into his home).

⁷⁶ 389 U.S. at 351.

⁷⁷ See *id.* at 351-53; see also *id.* at 361 (Harlan, J., concurring).

⁷⁸ See *id.* at 351-53; *id.* at 361 (Harlan, J., concurring).

⁷⁹ See *id.* at 351-53; *id.* at 361 (Harlan, J., concurring).

⁸⁰ See *id.* at 351-53, 359; see also *id.* at 360 (Harlan, J., concurring). In articulating the contours of privacy protected by the Fourth Amendment, the Court distinguished Fourth Amendment privacy from a general societal right to privacy. *Id.* at 350-51. The Fourth Amendment protects an individual only against certain kinds of governmental intrusions, whereas state law protects a person's general "right to be let alone by other people." *Id.*

⁸¹ See *Katz*, 389 U.S. at 352-53.

⁸² *Id.* at 348.

fendant sought to exclude others, and his actions allowed him to presume his conversations would not be "broadcast to the world."⁸³ The government's conduct in recording that conversation, then, violated his justifiable expectation of privacy—even absent physical intrusion into the phone booth.⁸⁴ By Justice Harlan's more precise articulation, not only did the defendant's actions show he had a subjective expectation of privacy regarding his phone booth conversation, but his expectation was one society was prepared to recognize as reasonable.⁸⁵

The Court has followed this standard in subsequent cases by recognizing that physical intrusion does not completely control the Fourth Amendment analysis.⁸⁶ Nevertheless, in its attempt to define what constitutes a reasonable expectation of privacy, the Court often has turned to definitions of place and physical intrusion, particularly when grappling with the challenging privacy issues raised by the constant march of technology.⁸⁷

⁸³ *Id.* at 352.

⁸⁴ *See id.* at 353.

⁸⁵ *Id.* at 361 (Harlan, J., concurring). Neither the Court nor Justice Harlan elaborated further on why the defendant's expectation of privacy in the phone booth was reasonable. *See id.* at 352; *id.* at 361 (Harlan, J., concurring). Indeed, the fact that *Katz* failed to provide further guidance on what makes an expectation of privacy "reasonable" lies at the heart of the debate about the applicability of the Fourth Amendment. *See, e.g.,* Orin S. Kerr, *The Fourth Amendment and New Technologies: Constitutional Myths and the Case for Caution*, 102 MICH. L. REV. 801, 808 (2004); David A. Sklansky, *Back to the Future: Kyllo, Katz, and Common Law*, 72 MISS. L.J. 143, 157-60 (2002).

⁸⁶ *See, e.g.,* *Kyllo*, 533 U.S. at 34 (finding that a Fourth Amendment search occurred, even absent physical intrusion into the defendant's home); *Rakas v. Illinois*, 439 U.S. 128, 143 (1978) (noting that Fourth Amendment analyses are not tied to invasions of property interests recognized at common law); *Cardwell v. Lewis*, 417 U.S. 583, 589-92 (1974) (holding that taking paint scrapings from tires of car parked in public parking lot did not amount to a search, despite police physical manipulation of tires).

⁸⁷ *See, e.g.,* *Kyllo*, 533 U.S. at 29-30 (holding the use of a thermal imager directed at the defendant's home was a search, despite a lack of a physical intrusion, because the technology allowed access to information otherwise unobtainable without a physical intrusion); *Florida v. Riley*, 488 U.S. 445, 448-52 (1989) (holding the aerial observation of curtilage by officers on a helicopter flying four hundred feet above the area was not a search because no physical intrusion occurred); *California v. Greenwood*, 486 U.S. 35, 40-41 (1988) (holding no search occurred, despite the physical intrusion into trash bags left at the curb outside a home); *Dow Chem.*, 476 U.S. at 235-39 (1986) (holding the aerial observation of the area surrounding a factory was not a search because no physical intrusion occurred); *Ciraolo*, 476 U.S. at 213-15 (holding the aerial observation of the curtilage of a home was not a search because it occurred in a "physically nonintrusive manner" from an airplane flying at an altitude of one thousand feet); *United States v. Karo*, 468 U.S. 705, 715-16 (1984) (holding the monitoring of a beeper tracking device while the beeper was inside a home constituted a search, even absent the physical intrusion into the home); *see also* Sherry F. Colb, *What Is a Search? Two Conceptual Flaws in Fourth Amendment Doctrine and Some Hints of a Remedy*, 55 STAN. L. REV. 119, 120-24 (2002) (arguing that the Supreme Court

III. GPS TRACKING UNDER THE FOURTH AMENDMENT

The U.S. Supreme Court has not yet evaluated the installation or monitoring of GPS tracking devices under the Fourth Amendment.⁸⁸ The Court has, however, analyzed "beepers," an earlier, simpler form of tracking device.⁸⁹ The Court's cases involving several other technologies used in law enforcement also could influence a constitutional analysis of GPS tracking.⁹⁰

The use of a GPS tracking device in the criminal investigation of a suspect requires two steps on the part of police.⁹¹ First, police must install the device on the suspect's vehicle or on an item belonging to the suspect, and second, police must monitor the functioning of the device or otherwise access the location information the GPS device collects.⁹² If the installation of the device constitutes a search or seizure implicating the Fourth Amendment, a court would not reach the monitoring issue because a search warrant is required for the installa-

has struggled to develop a consistent analysis in light of technology); Lewis R. Katz, *In Search of a Fourth Amendment for the Twenty-First Century*, 65 IND. L.J. 549, 562-65 (1990) (arguing that the Court's subsequent application of the *Katz* test has failed to fulfill the original goals of that decision); Ric Simmons, *From Katz to Kyllo: Adapting the Fourth Amendment to Twenty-First Century Technology*, 53 HASTINGS L.J. 1303, 1312-21 (2002) (suggesting that Supreme Court cases post-*Katz* have improperly focused on the methods and location of the search, rather than its results, as the *Katz* decision suggested); Christopher Slobogin, *Peeping Techno-Toms and the Fourth Amendment: Seeing Through Kyllo's Rules Governing Technological Surveillance*, 86 MINN. L. REV. 1393, 1406-07 (2002) (discussing Supreme Court cases highlighting the importance of the place observed by law enforcement); Daniel McKenzie, Note, *What Were They Smoking?: The Supreme Court's Latest Step in the Long, Strange Trip Through the Fourth Amendment*, 93 J. CRIM. L. & CRIMINOLOGY 153, 183-87 (2003) (noting the difficulties with the application of the *Katz* test); Paul St. Lawrence, Note, *Kyllo: As Libertarian Defense Against Orwellian Enforcement*, 1 GEO. J.L. & PUB. POL'Y 155, 159-62 (2002) (same).

⁸⁸ See, e.g., Matthew Mickle Werdegar, Note, *Lost? The Government Knows Where You Are: Cellular Telephone Call Location Technology and the Expectation of Privacy*, 10 STAN. L. & POL'Y REV. 103, 107 (1998) (noting the lack of a Supreme Court decision on GPS technology).

⁸⁹ See *United States v. Karo*, 468 U.S. 705, 708-10 (1984) (beeper); *United States v. Knotts*, 460 U.S. 276, 277-79 (1983) (beeper). For details about how beepers function, see *infra* notes 98-100 and accompanying text.

⁹⁰ See *Kyllo v. United States*, 533 U.S. 27, 29-30, 34 (2001) (thermal imager); *Florida v. Riley*, 488 U.S. 445, 448-50 (1989) (helicopter); *Dow Chem. Co. v. United States*, 476 U.S. 227, 229-31 (1986) (small plane and aerial mapping camera); *California v. Ciraolo*, 476 U.S. 207, 209, 213 (1986) (small plane); *Karo*, 468 U.S. at 708-11 (beeper); *Knotts*, 460 U.S. at 277-79, 281 (beeper); *Smith v. Maryland*, 442 U.S. 735, 737, 741 (1979) (pen register recording telephone numbers dialed by the defendant on his telephone).

⁹¹ See *Karo*, 468 U.S. at 713; *Knotts*, 460 U.S. at 279 & n.**; Note, *Tying Privacy in Knotts: Beeper Monitoring and Collective Fourth Amendment Rights*, 71 VA. L. REV. 297, 299-300 (1985).

⁹² See *Karo*, 468 U.S. at 713; *Knotts*, 460 U.S. at 279 & n.**; Note, *supra* note 91, at 299-300.

tion.⁹³ If the installation does not constitute a search, or if police attempt to obtain information from a tracking device pre-installed on a vehicle or item, then a court would reach the monitoring issue.⁹⁴ This Note focuses on whether the monitoring of a GPS tracking device is a search under the Fourth Amendment.⁹⁵

A. U.S. Supreme Court Case Law: Beepers and the Fourth Amendment

In 1983, in *United States v. Knotts*, the U.S. Supreme Court addressed for the first time whether the monitoring of a tracking device constitutes a search.⁹⁶ In that case, police used a beeper tracking device to track contraband possessed by suspects.⁹⁷ The *Knotts* beeper was a battery-operated radio transmitter that issued an intermittent signal which police could pick up with a radio receiver.⁹⁸ To receive the signal and thereby determine the beeper's location, police used a receiver within the physical range of the beeper; absent police presence in the vicinity, the tracking device provided no location data.⁹⁹ GPS tracking devices, alternatively, generally do not require police to remain nearby to monitor a receiver because location information gathered by GPS tracking devices usually can be accessed simply by visiting an Internet web site.¹⁰⁰

In *Knotts*, the respondent's codefendant purchased a drum of chloroform, into which officers had installed a beeper, and placed it into his car.¹⁰¹ Police officers then followed the car, using a combination of visual surveillance and a monitor in their vehicle that received the signals emitted by the beeper.¹⁰² After the drum was transferred to the vehicle of another codefendant and that codefendant made evasive maneuvers, police lost visual contact with the car.¹⁰³ They re-

⁹³ See *Karo*, 468 U.S. at 713; *Knotts*, 460 U.S. at 279 & n.**; Note, *supra* note 91, at 299-300.

⁹⁴ See *Karo*, 468 U.S. at 713; *Knotts*, 460 U.S. at 279 & n.**; Note, *supra* note 91, at 299-300.

⁹⁵ See *infra* notes 96-156 and accompanying text.

⁹⁶ 460 U.S. at 277.

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ See *id.* at 277-78 (describing how police monitored the beeper to acquire location information).

¹⁰⁰ See, e.g., COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

¹⁰¹ *Knotts*, 460 U.S. at 278. The respondent did not challenge the warrantless installation of the beeper into a five-gallon drum of chloroform. *Id.* at 279 & n.**. Before installing the device, police obtained the consent of the chloroform producer; the respondent's codefendants purchased the beeper-laden drum from the company. *Id.* at 278.

¹⁰² *Id.*

¹⁰³ *Id.*

gained contact later, after a monitoring device in a helicopter picked up the signal.¹⁰⁴ The signal revealed the beeper was stationary, indicating the drum was located in the vicinity of a cabin.¹⁰⁵ At this point, police stopped monitoring the beeper.¹⁰⁶ Relying on the location information acquired by the beeper and additional visual surveillance of the cabin, police obtained a warrant to search the cabin, which revealed an illicit drug laboratory.¹⁰⁷

To determine whether the monitoring of the beeper violated the Fourth Amendment, the Court employed the *Katz v. United States* test.¹⁰⁸ The Court concluded that although the respondent may have had a subjective expectation of privacy in his movements, demonstrated by his evasive maneuvers, this was not an expectation society would recognize as reasonable.¹⁰⁹ Reasoning that monitoring the beeper was analogous to following the vehicle on public streets and highways, the Court held the codefendant "voluntarily conveyed to anyone who wanted to look" both his movements and the nature of the stops he made.¹¹⁰

In essence, the Court equated the use of a tracking device with the mere physical observation of the vehicle to hold there was no reasonable expectation of privacy in one's movements in public.¹¹¹ Although the tracking device allowed police to continue surveillance even when they lost visual contact, the Court said this fact did not change the analysis because the Fourth Amendment does not prohibit the police from enhancing the capabilities of their senses with new technology.¹¹²

The respondent had argued that such a holding would allow police to conduct, outside of judicial knowledge, twenty-four-hour surveillance of anyone, but the Court was unconvinced of the possibility absent specific examples of police abuse.¹¹³ The Court stated, however, that if such "dragnet-type law enforcement practices" should occur, that would be the time to reevaluate its reasoning.¹¹⁴ Until then, the mere fact that the beeper allowed law enforcement to be more

¹⁰⁴ *Id.*

¹⁰⁵ *Id.* at 278-79.

¹⁰⁶ *Knotts*, 460 U.S. at 278-79.

¹⁰⁷ *Id.* at 279.

¹⁰⁸ *Id.* at 280-81.

¹⁰⁹ *See id.* at 281.

¹¹⁰ *Id.* at 281-82; *see also* *Michigan v. Chesternut*, 486 U.S. 567, 574-75 (1988) (holding that police following a suspect to determine where he was going and driving alongside him for a short distance was not a seizure under the Fourth Amendment).

¹¹¹ *Knotts*, 460 U.S. at 282.

¹¹² *Id.*

¹¹³ *Id.* at 283.

¹¹⁴ *Id.* at 284.

effective or efficient in conducting vehicle surveillance did not raise Fourth Amendment concerns.¹¹⁵

The *Knotts* Court specifically left open the question of whether monitoring the beeper after the chloroform drum had entered the cabin would have violated the Fourth Amendment.¹¹⁶ The Court addressed that issue a year later in 1984 in *United States v. Karo*.¹¹⁷ The fact that the case involved a home shifted the Court's analysis.¹¹⁸

In *Karo*, agents from the federal Drug Enforcement Agency (the "DEA") reacted to a tip from an informant that the defendants had ordered, from the informant's company, fifty gallons of ether, an ingredient often used in cocaine production.¹¹⁹ With the informant's consent, DEA agents substituted their own can of ether, in which they had installed a beeper, for one can of the ten-can shipment.¹²⁰ The agents watched the respondent pick up the ether shipment from the informant and then followed the respondent to his house, using a combination of visual and beeper surveillance.¹²¹

At times relying on only the beeper signal, agents tracked the can of ether as it was moved among codefendants' homes and eventually to a commercial storage facility.¹²² Realizing the beeper was not sensitive enough to reveal which storage locker contained the ether can, agents subpoenaed storage company records to learn which locker a codefendant had rented.¹²³ Agents continued to use the beeper to locate the ether as the respondent and his codefendants moved the can among storage facilities; eventually, using a combination of beeper and visual surveillance, the agents tracked the ether can to a house the codefend-

¹¹⁵ *Id.* at 284-85. Justice John Paul Stevens, joined by Justices William Brennan and Thurgood Marshall, expressed concern in a concurring opinion over the Court's sweeping language related to increased law enforcement efficiency due to technology. *Id.* at 288 (Stevens, J., concurring). Justice Stevens noted that *Katz* involved a technological enhancement used in a manner that violated the Fourth Amendment. *See id.* (Stevens, J., concurring). Thus, although Justice Stevens thought the beeper was used appropriately in *Knotts*, "it by no means follow[ed] that the use of electronic detection techniques does not implicate especially sensitive concerns." *Id.* (Stevens, J., concurring).

¹¹⁶ *See Knotts*, 460 U.S. at 285. The Court noted the record did not indicate the beeper was used to reveal information about the movement of the drum inside the cabin. *Id.*

¹¹⁷ 468 U.S. at 707.

¹¹⁸ *Id.* at 714-15.

¹¹⁹ *Id.* at 708.

¹²⁰ *Id.*

¹²¹ *Id.* When the officers lost visual contact, they relied solely on the beeper to assist them in regaining location information. *Id.*

¹²² *Karo*, 468 U.S. at 708-10.

¹²³ *Id.* at 708.

dants had rented.¹²⁴ At that point, because the agents wanted to avoid detection, they relied on the beeper to determine periodically if the ether can still was in the house.¹²⁵ Based in part on information obtained through the beeper monitoring, agents secured a warrant to search the codefendants' homes, where they found evidence sufficient to arrest the respondent on drug charges.¹²⁶

In evaluating whether the monitoring of the beeper was a search, the Court first implicitly accepted *Knott's* rationale regarding the constitutionality of DEA officers' monitoring of the beeper as it moved on public thoroughfares.¹²⁷ The monitoring of the beeper while it was in a private residence, however, raised different concerns.¹²⁸ After noting that there is a heightened expectation of privacy inside a home, the Court stated that the beeper allowed the DEA agents to obtain information about activities occurring inside a private residence—namely, whether the beeper-laden ether can was present inside the home.¹²⁹

Even though the electronic monitoring was less intrusive than a physical search, the Court reasoned, it still revealed information about the inside of a home that the DEA agents could not have known without entering the residence.¹³⁰ Therefore, monitoring the beeper while it was inside the home constituted a search.¹³¹ Because the search was conducted without a warrant, it violated the Fourth Amendment.¹³²

¹²⁴ *Id.* at 709.

¹²⁵ *Id.* at 709–10.

¹²⁶ *Id.* at 710.

¹²⁷ *See Karo*, 468 U.S. at 713–14.

¹²⁸ *Id.* at 714.

¹²⁹ *Id.* at 714–15. The Court noted that the monitoring of the beeper while it was inside the storage facility did not violate the Fourth Amendment because the beeper did not reveal which locker contained the beeper and ether can. *Id.* at 720. Thus, unlike the monitoring of the beeper while it was in the home, this monitoring did not tell the DEA agents anything about the contents of the locker. *Id.* at 715, 720–21.

¹³⁰ *Id.* at 715.

¹³¹ *Id.* at 716.

¹³² *Karo*, 468 U.S. at 719. The government also asserted that requiring a warrant to monitor a beeper while it was inside a home amounted to requiring a warrant for all beeper uses, because law enforcement could not know prior to monitoring whether the beeper would travel inside a home. *Id.* at 718. The Court rejected this argument, saying it was not convincing enough to dispense with the warrant requirement. *Id.* The Court also indicated that law enforcement officers should have no difficulty describing with sufficient particularity the place to be searched as they apply for a warrant. *Id.* Although police would not know, before monitoring, where the beeper would travel, they could specify on the warrant application the object in which the beeper would be placed, the circumstances leading officers to desire using a beeper, and the time period they would monitor the beeper. *Id.*

B. Federal Statute on Tracking Devices

After the Supreme Court's decisions in *Knotts* and *Karo*, Congress in 1986 addressed jurisdictional aspects of the use of tracking devices through a federal statute.¹³³ The statute provides no guidance as to when the use of a tracking device is justified; instead, it states that courts otherwise authorized to issue a warrant or other order for the installation of such a device can authorize the use of the device outside the court's own jurisdiction.¹³⁴ Thus, because the statute does not require police to obtain court orders before installing or monitoring a tracking device, it does not guide law enforcement usage of tracking devices but merely solves jurisdictional problems that arise when police track individuals across state lines.¹³⁵

In fact, at least two lower courts have concluded the statute does not specifically prohibit police from installing and monitoring a tracking device without a court order, nor does the statute mandate exclusion of evidence obtained through use of a tracking device in contravention of the statute.¹³⁶ Finally, the statute's definition of "tracking device" may be somewhat outdated, given that GPS technology can be included in devices that have purposes besides tracking, such as cell phones.¹³⁷ Therefore, the federal statute concerning tracking devices

¹³³ See 18 U.S.C. § 3117 (2000).

¹³⁴ See *id.* § 3117(a).

¹³⁵ See *id.*; see also *United States v. Gbemisola*, 225 F.3d 753, 757 n.2 (D.C. Cir. 2000) (explaining the rationale behind § 3117 as curing jurisdictional problems that accompanied the use of tracking devices).

¹³⁶ *United States v. Forest*, 355 F.3d 942, 950 (6th Cir. 2004) (holding that even if a cell phone constituted a tracking device under § 3117, the statute provided no basis for excluding evidence derived from its use without a § 3117 court order), *vacated on other grounds sub nom. by Garner v. United States*, 125 S. Ct. 1050 (2005); *Gbemisola*, 225 F.3d at 758 (holding that § 3117 contains a basis for authorizing the use of tracking devices but does not bar uses of tracking devices that do not comply with that statute and further holding that § 3117 does not exclude evidence acquired without a § 3117 order).

¹³⁷ See *Forest*, 355 F.3d at 950. In *United States v. Forest*, DEA agents obtained a court order to intercept cellular communications between the two defendants. *Id.* at 947. The agents also followed defendants' vehicles periodically. *Id.* When law enforcement lost visual contact with the defendants' vehicle, they dialed one defendant's cell phone without letting it ring and used data obtained from the defendant's cellular service provider to ascertain which cellular transmission towers had just been "hit" by signals from the defendant's phone. *Id.* at 947. The cell-site data showed the location of the cell phone, allowing the federal agents to resume visual tracking of the defendants. *Id.* At trial and on appeal, the defendants claimed that this use of the cell phone converted the phone into a tracking device. *Id.* at 948. Even though interception of wire and oral communications is governed by Title III of the Omnibus Crime Control and Safe Streets Act of 1968, which prohibits law enforcement interception of communications except under controlled circumstances, the U.S. Court of Appeals for the Sixth Circuit held the use of cell-site data was not a

is not intended to provide guidance for law enforcement's use of GPS devices, nor does it prevent abuse of the technology.¹³⁸

C. Case Law Addressing GPS Tracking

Only a few courts have specifically considered whether the monitoring of GPS tracking devices is distinguishable from the monitoring of the beepers used in *Knotts* and *Karo*.¹³⁹ Moreover, only a few courts have mentioned the possible constitutional implications of the monitoring of GPS tracking devices.¹⁴⁰ Two federal courts have ignored or declined to address the monitoring issue, another federal court has held monitoring a GPS device was not a search by relying on the *Knotts* reasoning, and two state courts have held monitoring a GPS device constituted a search on state law grounds.¹⁴¹

In perhaps the most prominent case addressing GPS tracking, the Washington Supreme Court held in 2003 in *State v. Jackson* that the monitoring of a GPS tracking device constitutes a search requiring a

"communication" within the meaning of the statute and that, at any rate, the Act specifically excluded information derived from tracking devices. *Id.* at 948-50; see also Title III of the Omnibus Crime Control and Safe Streets Act of 1968, Pub. L. No. 90-351, 82 Stat. 197 (codified as amended in scattered sections of 42 U.S.C. and 18 U.S.C.).

¹³⁸ See 18 U.S.C. § 3117; *Forest*, 355 F.3d at 950; *Gbemisola*, 225 F.3d at 758.

¹³⁹ See *United States v. Moran*, 349 F. Supp. 2d 425, 467-68 (N.D.N.Y. 2005) (finding monitoring of GPS device directly analogous to monitoring of beepers used in *Knotts*); *United States v. Berry*, 300 F. Supp. 2d 366, 367-68 (D. Md. 2004) (noting similarities and differences between beepers and GPS tracking devices, but declining to decide whether monitoring of GPS device constituted search); see also *People v. Lacey*, No. 2463N/02, 2004 WL 1040676, at *4-8 (N.Y. Nassau County Ct. May 6, 2004) (unpublished decision) (reviewing GPS case law but declining to address similarities between GPS devices and beepers); *State v. Jackson*, 76 P.3d 217, 222-24 (Wash. 2003) (en banc) (declining to consider *Karo* and *Knotts* because GPS tracking devices constituted search on state-law grounds); cf. *Forest*, 355 F.3d at 950-51 (holding use of cell-site data to determine location did not constitute search because data revealed defendants' movements on public roads; defendant lacked a reasonable expectation of privacy in his movements and in his cell-site data).

¹⁴⁰ See *United States v. McIver*, 186 F.3d 1119, 1123, 1127 (9th Cir. 1999) (evaluating the constitutionality of the installation of a GPS device); *Moran*, 349 F. Supp. 2d at 467-68 (holding monitoring a GPS device was not a search because police could have attained the same information through visual surveillance); *Berry*, 300 F. Supp. 2d at 368 (declining to decide whether monitoring a GPS tracking device on a vehicle constituted a search); *Lacey*, 2004 WL 1040676, at *7-8 (holding monitoring a GPS device attached to a vehicle was a search under the New York constitution); *Jackson*, 76 P.3d at 224 (holding monitoring a GPS device attached to a vehicle was a search under the Washington constitution).

¹⁴¹ See *McIver*, 186 F.3d at 1123, 1127 (ignoring monitoring issue); *Moran*, 349 F. Supp. 2d at 467-68 (relying on *Knotts* to conclude the monitoring of a GPS device was not a search); *Berry*, 300 F. Supp. 2d at 368 (declining to decide the monitoring issue); *Lacey*, 2004 WL 1040676, at *7-8 (holding monitoring a GPS device was a search under the state constitution); *Jackson*, 76 P.3d at 264 (same).

warrant under the Washington State Constitution.¹⁴² In *Jackson*, police obtained warrants to impound and search two vehicles belonging to the defendant, who was suspected of murdering his daughter.¹⁴³ While the vehicles were impounded, police installed GPS tracking devices; officers then returned the vehicles to the defendant without informing him the tracking devices had been installed.¹⁴⁴ By downloading data from the GPS devices through the Internet, police learned of the defendant's movements to a location where he had dumped the child's body.¹⁴⁵

Acknowledging that the Washington version of the Fourth Amendment is broader in scope than the federal Fourth Amendment, the Washington court held that GPS tracking required a warrant under the state constitution.¹⁴⁶ The court reasoned that GPS was a "particularly intrusive method of surveillance" because it did not merely augment the senses; rather, it served as a total substitute for visual tracking and therefore was distinguishable from other sense-augmenting devices like binoculars.¹⁴⁷ Also pointing out that police obtained GPS data over the course of two and one-half weeks, the court stated it was unlikely police could have continued such constant twenty-four-hour visual surveillance throughout that period.¹⁴⁸ In this vein, the court explicitly rejected the notion that GPS tracking equated to following the defendant as he traveled on public roads.¹⁴⁹

¹⁴² See 76 P.3d at 224.

¹⁴³ *Id.* at 220.

¹⁴⁴ *Id.* at 220–21. Police obtained the following three warrants for the defendant's vehicles: (1) a warrant to impound and search the vehicles, (2) a ten-day warrant to install the GPS devices, and (3) a ten-day warrant to maintain the GPS devices. *Id.* Because police had relied on valid warrants, their use of GPS devices did not violate the state constitution. *Id.* at 220.

¹⁴⁵ *Id.* at 221.

¹⁴⁶ *Id.* at 220, 222.

¹⁴⁷ *Jackson*, 76 P.3d at 223–24. Under Washington case law, no search occurs if police officers acquire information from a lawful vantage point through their senses. *Id.* at 222. "However, a substantial and unreasonable departure from a lawful vantage point, or a particularly intrusive method of viewing, may constitute a search." *Id.* (quoting *State v. Young*, 867 P.2d 593, 598 (Wash. 1994) (alteration in original)). Furthermore, Washington case law looks to the kind of information gathered by police in the given situation; this analysis assists Washington courts in determining whether a given expectation of privacy is "one which a citizen of this state should be entitled to hold." *Id.*

¹⁴⁸ *Id.* at 223.

¹⁴⁹ *Id.* The United States District Court for the District of Maryland hinted at similar reasoning in *United States v. Berry*. See 300 F. Supp. 2d at 368. That court did not directly reach the issue of whether the monitoring of the GPS device police had placed on the defendant's vehicle constituted a search because police had obtained a court order to install the device. *Id.* The court noted, however, that the U.S. Supreme Court's beeper

The court bolstered its reasoning by holding that the information available through a GPS device is extensive.¹⁵⁰ A GPS tracking device can show a detailed record of the individual's life—everywhere the person has been, when, and for how long, which in turn reveals preferences, habits, associations, and eccentricities.¹⁵¹ Given this level of detail, the *Jackson* court held that a check on police power, through the warrant requirement, was necessary to protect Washington citizens' right to be free from this kind of government intrusion.¹⁵²

Thus, even though GPS devices are a kind of location tracking device, they may be different from the beeper version because they last longer, are much more accurate (currently to within one to three feet), and do not require police presence in the vicinity to provide data.¹⁵³ So, GPS tracking devices might represent the kind of "drag-net-type" twenty-four-hour surveillance capabilities to which the Court alluded, with some disapproval, in *Knotts*.¹⁵⁴ At the heart of this inquiry under the federal Constitution, however, is whether the information a GPS tracking device collects is the kind of information in which an individual has a reasonable expectation of privacy.¹⁵⁵ Because the U.S. Supreme Court in *Knotts* relied significantly on the notion that one has no reasonable expectation of privacy in one's travels along public streets, any evaluation of GPS tracking technology relates

analysis under *Knotts* and *Karo* may not apply to GPS devices. *Id.* at 367–68. On the one hand, the particular GPS device used was distinguishable from beepers because it did not provide real-time location information and thus did not assist authorities in following the defendant's vehicle. *Id.* at 368. Authorities in *Berry* accessed the location data by downloading it from the GPS device; such a device or more sophisticated versions, the court said, could store movements continually over days, weeks, or years—potentially making the device more intrusive than a beeper. *Id.* On the other hand, the court reasoned, a GPS "merely records electronically what the police could learn if they were willing to devote the personnel necessary to tail a car around the clock," so GPS might simply constitute a more sophisticated version of the beeper. *Id.*

¹⁵⁰ *Jackson*, 76 P.3d at 223.

¹⁵¹ *Id.*

¹⁵² *Id.* at 224; see also *Lacey*, 2004 WL 1040676, at *7–8 (finding that the installation and monitoring of GPS tracking device installed on vehicle undercarriage violated the New York version of the federal Fourth Amendment). The *Lacey* court reasoned that "individuals must be given the constitutional protections necessary to their continued unfettered freedom from a 'big brother' society. Other than in the most exigent circumstances, a person must feel secure that his or her every movement will not be tracked except upon a warrant based on probable cause . . ." *Id.* at *7.

¹⁵³ See *Berry*, 300 F. Supp. 2d at 367–68; *Jackson*, 76 P.3d at 223–24; EL-RABBANY, *supra* note 30, at 1–2, 5, 8–9; PACE ET AL., *supra* note 30, at 1; Grossman & Hift, *supra* note 33, at 24; Washington, *supra* note 33, at 1C; Wirbel, *supra* note 35, at 51.

¹⁵⁴ See *Knotts*, 460 U.S. at 284.

¹⁵⁵ See *supra* notes 67–79 and accompanying text.

to the base issue of whether citizens reasonably can expect a measure of privacy within the public space.¹⁵⁶

IV. EXPECTATIONS OF PRIVACY WITHIN THE PUBLIC SPACE

Whether one can possess a legitimate expectation of privacy within the public space was highlighted by the U.S. Supreme Court for the first time in *Katz v. United States*.¹⁵⁷ The Court stated that what a person "knowingly exposes" to the public cannot be the subject of Fourth Amendment protection, but what one attempts to keep private, even in areas readily accessible to the public, can be protected.¹⁵⁸ Thus, the *Katz* Court recognized that the distinction between the public and the private realm may not always be a bright line, nor may it always be determined by purely physical boundaries.¹⁵⁹ The contours of this distinction bear on an analysis of GPS tracking because one's location, except one's location within a home or other structure, technically is exposed to the public.¹⁶⁰ Therefore, it is helpful to turn to an analysis of how the Court has interpreted *Katz*'s "knowingly expose[d]" language, how it has addressed Fourth Amendment protections in the public space, and the common criticisms of the Court's approach, particularly in relation to new forms of technology.¹⁶¹

A. Defining "Public" and "Private" Based on Physical Boundaries

Even though *Katz* indicated the Fourth Amendment "protects people, not places," the U.S. Supreme Court since *Katz* has placed much weight on physical boundaries in determining whether an individual has a reasonable expectation of privacy.¹⁶² In analyzing police's

¹⁵⁶ See *Knotts*, 460 U.S. at 280–84; *Katz v. United States*, 389 U.S. 347, 351–52 (1967).

¹⁵⁷ See 389 U.S. 347, 351–52 (1967).

¹⁵⁸ *Id.*

¹⁵⁹ See *id.*

¹⁶⁰ See *id.*; see also *United States v. Knotts*, 460 U.S. 276, 281–82 (1983).

¹⁶¹ See 389 U.S. at 351–52; see also *supra* notes 157–160 and accompanying text.

¹⁶² See *Katz*, 389 U.S. at 351; e.g., *Kyllo v. United States*, 533 U.S. 27, 34 (2001) (holding a reasonable expectation of privacy just exists inside the home); *California v. Greenwood*, 486 U.S. 35, 39–41 (1988) (holding no reasonable expectation of privacy existed in trash bags left outside a home at a curb accessible to the public); *California v. Ciraolo*, 476 U.S. 207, 213–14 (1986) (holding no reasonable expectation of privacy exists in a fenced-in backyard, where the backyard was visible to the public from a plane flying overhead); *United States v. Karo*, 468 U.S. 705, 714–16 (1984) (holding a reasonable expectation of privacy exists in an item's travels inside a home, because the indoor travels were withdrawn from public view); *Oliver v. United States*, 466 U.S. 170, 178–79 (1984) (holding no reasonable expectation of privacy exists in open fields that were not immediately adjacent to a home); *Knotts*, 460 U.S. at 281–82 (holding no reasonable expectation of privacy exists in

use of beepers in *United States v. Knotts* and *United States v. Karo*, the Supreme Court distinguished between public and private activities, relying on physical boundaries to demarcate the line between the two.¹⁶³ Monitoring the beeper used in *Karo* became a search only when the container in which it was placed entered a home—a private place delineated by its physical boundaries.¹⁶⁴ Conversely, the monitoring of the beeper in *Knotts* never constituted a search because government agents monitored the beeper only as it traveled on roads and streets—public places existing outside physical boundaries.¹⁶⁵

The Court's distinction between public and private thus focuses heavily on whether police action has crossed physical boundaries.¹⁶⁶ In turn, the analysis also assumes that whatever exists outside those boundaries is not private.¹⁶⁷ The constitutionality of a GPS tracking device, then, might center on the fact that much of the location information obtained by GPS tracking devices is "public" by this definition.¹⁶⁸ Like the tracking information provided by the beeper in *Knotts*, the location information obtained by a GPS tracking device attached to a vehicle would concern the device's movement in public places—along roads and streets.¹⁶⁹ By contrast, a GPS personal locator device worn on a wristband would concern activities and movements occurring in public, as the person traveled along roads and streets, as

travels over public roads because a car's occupants and contents are in plain view of the public); *Cardwell v. Lewis*, 417 U.S. 583, 590 (1974) (plurality opinion) (holding a lesser expectation of privacy exists in a motor vehicle because a car has "little capacity for escaping public scrutiny" in its use on public roads); cf. *Smith v. Maryland*, 442 U.S. 735, 743–44 (1979) (holding no reasonable expectation of privacy exists in phone numbers dialed from a private telephone in a home, because the numbers are voluntarily conveyed to a third party outside the home—the phone company).

¹⁶³ See *Karo*, 468 U.S. at 714–15; *Knotts*, 460 U.S. at 281–82.

¹⁶⁴ See 468 U.S. at 714–16.

¹⁶⁵ See *Knotts*, 460 U.S. at 281–82.

¹⁶⁶ See *supra* notes 162–165 and accompanying text.

¹⁶⁷ See Marc Jonathan Blitz, *Video Surveillance and the Constitution of Public Space: Fitting the Fourth Amendment to a World That Tracks Image and Identity*, 82 TEX. L. REV. 1349, 1371–74 (2004) (outlining the Supreme Court's focus on physical location since *Katz*); St. Lawrence, *supra* note 87, at 163–64 (suggesting that the pre-*Kyllo* Court treated privacy as an absolute that exists or does not exist based on physical boundaries, despite the amount of detail provided by forms of enhanced visual surveillance); *supra* note 162.

¹⁶⁸ See *Karo*, 468 U.S. at 714–16; *Knotts*, 460 U.S. at 281–82; see also Blitz, *supra* note 167, at 1384–88 (evaluating *Karo* and *Knotts* and suggesting that although tracking technology has changed since the two cases, a court still would grapple with their reasoning).

¹⁶⁹ See 460 U.S. at 281–82.

well as movements occurring in, private, as the person moved about inside a home.¹⁷⁰

Commentators have criticized the rationale that physical boundaries determine the line between public and private for a variety of reasons, but perhaps the most frequent objection is based on a sense that American citizens likely do not expect to lose virtually all privacy when they step outside their front doors and outside the physical boundaries of their homes.¹⁷¹ By contrast, the commentators note, there can be such a thing as finding privacy in public—taking refuge in the anonymity a public space provides.¹⁷² Therefore, they argue, if the “reasonable

¹⁷⁰ See *Karo*, 468 U.S. at 714–16; *Knott*, 460 U.S. at 281–82; see also Lee, *supra* note 47, at 392–94 (analyzing cell phone location data under the Fourth Amendment); Karim, *supra* note 7, at 509–12 (analyzing GPS personal locators under the Fourth Amendment); Werdegarr, *supra* note 88, at 106–09 (analyzing cell phone location data under the Fourth Amendment).

¹⁷¹ E.g., Blitz, *supra* note 167, at 1406–13 (noting a series of objections to the Supreme Court’s holdings finding no expectation of privacy in public); Colb, *supra* note 87, at 120–26 (arguing that degrees of privacy exist, in contrast to the Court’s all-or-nothing approach); Katz, *supra* note 87, at 565–66 (suggesting that although people expose numerous aspects of their daily lives to others each day, they do so believing their information will be restricted to a certain purpose and group of people); Werdegarr, *supra* note 88, at 111 (suggesting that people expect to be anonymous in a crowd while moving about in public).

Even while privacy advocates condemn the Court’s place-based distinctions between the public and private spheres, they also acknowledge the difficulties of creating a workable Fourth Amendment jurisprudence if the line between public and private were less demarcated by place. See Blitz, *supra* note 167, at 1412–13; Katz, *supra* note 87, at 562–63. If the Court’s focus on place and physical boundaries fails to protect privacy fully, in their view, at least it delineates recognized private spaces, such as the home. See Blitz, *supra* note 167, at 1412. Moreover, privacy advocates also indicate that any Fourth Amendment analysis of public and private must consider the fact that much legitimate police investigation occurs in the public space—the one area where police may be free to be the most vigorous in their pursuit of criminals. See *id.* at 1413; see also *Ciraolo*, 476 U.S. at 213 (suggesting that observation from a public place is “precisely what a judicial officer needs to provide a basis for a warrant”). To preserve police investigative ability, police would need strong guidance regarding the permissibility of their actions under the Fourth Amendment; such guidance is easier to provide if public and private spaces are defined by physical boundaries. See Blitz, *supra* note 167, at 1413.

¹⁷² See, e.g., Blitz, *supra* note 167, at 1419–20 (noting that the physical environment of the public space can provide substantial opportunity for privacy, such as by merging into a crowd or by interacting with different groups of people in different contexts); Helen Nissenbaum, *Protecting Privacy in an Information Age: The Problem of Privacy in Public*, 17 LAW & PHIL. 559, 575–76 (1998) (suggesting that before information technology, there was such a thing as being “[s]een by hundreds, noticed by none” while in public and assuming either that one has not been noticed or that each observer only possesses a discrete bit of information about any one individual). Professor Lewis Katz also argues that because much of one’s personal life is lived outside the home, the fact that the Court recognizes little to no Fourth Amendment privacy in the public space means that most aspects of modern life are denied the protections of the Fourth Amendment. Katz, *supra* note 87, at 568.

expectation of privacy" concept is supposed to ensure that societal notions about privacy are incorporated into Fourth Amendment jurisprudence, then the Court's method of differentiating between public and private seems to fall short.¹⁷³

B. *Knowing Exposure to the Public*

That an individual's reasonable expectation of privacy can depend so significantly on physical boundaries distinguishing public from private combines with the Supreme Court's knowingly exposed rationale to constitute a major limitation on an individual's reasonable expectation of privacy under the Fourth Amendment.¹⁷⁴ The reason the knowingly exposed rationale has had a major effect on the scope of the Fourth Amendment is that the Court considers nearly everything that lies outside physical boundaries as knowingly exposed to the public.¹⁷⁵ Since the Court articulated its knowingly exposed logic in *Katz*, it has used this language, explicitly and implicitly, to conclude that people have virtually no expectation of privacy in most areas, items, or information exposed to the public in some way.¹⁷⁶

Commentators have criticized this rationale for many of the same reasons they disapprove of the Court's method of distinguishing between public and private.¹⁷⁷ They also observe, however, that the initial premise of the Court's knowingly exposed rationale is sound: When a person takes something that otherwise is personal and reveals it in public, that individual invites a degree of public scrutiny, such as a series of fleeting glances from other members of the public while one is driving down the street.¹⁷⁸ Yet these commentators then point out that even though an individual knows some attention from others is likely, the level of scrutiny the person expects and risks merely by being in public is not the kind of highly individualized, targeted scrutiny imparted by law enforcement.¹⁷⁹ Moreover, social graces—the

¹⁷³ See *supra* note 172.

¹⁷⁴ See *supra* notes 162–173 and accompanying text; *infra* notes 175–202 and accompanying text.

¹⁷⁵ See *supra* note 162; see also *Katz*, *supra* note 87, at 564 (arguing that the result of the knowingly exposed rationale has been to "strip the fourth amendment of its normative values which were intended to regulate and limit the powers of government").

¹⁷⁶ See *supra* note 162.

¹⁷⁷ E.g., *Katz*, *supra* note 87, at 565.

¹⁷⁸ See, e.g., *Colb*, *supra* note 87, at 125; *Katz*, *supra* note 87, at 565–68; *Nissenbaum*, *supra* note 172, at 575–76.

¹⁷⁹ See *Blitz*, *supra* note 167, at 1408–11; *Colb*, *supra* note 87, at 136–37; *Katz*, *supra* note 87, at 565–66. Privacy advocates argue that privacy results not simply by preventing expo-

idea that one can stare back at someone who is staring—prevent the fleeting glances one expects in public from becoming more intrusive and lengthier stares.¹⁸⁰ Thus, finding an individual has no expectation of privacy whatsoever whenever one knowingly exposes something to the public seems too simple for these commentators.¹⁸¹ Such an analysis fails to account for gradations in one's expectations of privacy—the fact that being in public may diminish expectations of privacy, but not eliminate them altogether, as the Court's precedent would hold.¹⁸²

An example of the U.S. Supreme Court's all-or-nothing approach to its knowingly exposed rationale is found in the Court's holding in 1988 in *California v. Greenwood*.¹⁸³ In *Greenwood*, the Court held the defendants had no reasonable expectation of privacy in the opaque trash

sure to others, but by controlling the nature of that exposure. See Blitz, *supra* note 167, at 1408–10; Katz, *supra* note 87, at 565–66. Although individuals are not able to control what people think about them when their activities are observed in public, they can manage the image presented to others in the hope that the appearance presented is accurate. See Blitz, *supra* note 167, at 1408–10; see also Nissenbaum, *supra* note 172, at 581–86 (arguing that one aspect of privacy is ensuring one's personal information is presented in the appropriate context—that information is not simply freely shifted to a variety of uses).

Moreover, commentators argue that although an individual is unconcerned about his or her public activities being viewed in isolation, that same individual may feel his or her privacy has been violated when such details are collected in the aggregate because that likely reveals much more information. Blitz, *supra* note 167, at 1408–10. Finally, the targeted, permanent recording of one's activities and movements over time itself may impinge on privacy; commentators argue that such a record limits one's ability to be unencumbered by one's past. E.g., Blitz, *supra* note 167, at 1411; see also Nissenbaum, *supra* note 172, at 577–78 (describing technology as providing the ability to accumulate "ordered, systematized, and . . . permanent" records of what once was "scattered . . . transient" information in the public sphere).

¹⁸⁰ E.g., Blitz, *supra* note 167, at 1415–17; Colb, *supra* note 87, at 137–39. As Professor Sherry Colb argues, "if someone stares at us . . . in a public place, we tend to notice. Having noticed, we can take measures to put a stop to the staring. . . . Our ability to observe our observers thus gives us the power to rebuff, confront, and escape invasions of our privacy. Knowledge is power." Colb, *supra* note 87, at 137–38.

¹⁸¹ See *supra* notes 178–180 and accompanying text.

¹⁸² See, e.g., Colb, *supra* note 87, at 120–26, 153–59 (arguing that the Supreme Court's jurisprudence improperly equates risk of exposure, for which someone still expects a measure of privacy, with the renunciation of all privacy); Katz, *supra* note 87, at 565–66 (suggesting that the Court incorrectly assumes that information disclosed for a limited use amounts to a complete renunciation of a privacy interest in that information); Andrew E. Taslitz, *The Fourth Amendment in the Twenty-First Century: Technology, Privacy, and Human Emotions*, 65 LAW & CONTEMP. PROBS. 125, 153–57 (2002) (arguing that because one generally has power to control aspects of the self that are exposed to others and one can limit such disclosures, it is possible to maintain privacy in public).

¹⁸³ See 486 U.S. at 39–41.

bags they had placed for collection at the curb outside their home.¹⁸⁴ Although the defendants had demonstrated a subjective expectation of privacy in their trash by using opaque bags, this was not a reasonable expectation because the defendants had knowingly exposed their trash to the public by placing it at the curb.¹⁸⁵ The Court reasoned that it was widely recognized that anyone could come across a trash bag left at a curb and decide to open it.¹⁸⁶ Therefore, the Court concluded, the defendants assumed the risk that police officers might choose to rummage through what the defendants knowingly placed in public.¹⁸⁷ Without a reasonable expectation of privacy in their trash, police action to acquire the trash was not a search.¹⁸⁸

The *Greenwood* dissenting Justices, however, took a more measured approach to the kind of privacy one can expect in a public space.¹⁸⁹ They argued that the issue was not where the trash was placed, but the details about the defendants that the trash contained.¹⁹⁰ Moreover, the only thing the defendants knowingly exposed to the public was the outside of the opaque, sealed trash bags.¹⁹¹ In the view of the dissenting Justices, the simple possibility that any member of the public *might* decide to rummage through the trash bags did not mean the bags' owners relinquished all expectations of privacy in their contents.¹⁹² In their view, that possibility might lessen the bag owners' expectation of privacy, but it did not eliminate it altogether.¹⁹³

Twelve years later, in 2000, in *Bond v. United States*, the Court seemed to shift slightly toward the more measured view of the *Greenwood* dissenting Justices.¹⁹⁴ In *Bond*, the Court held that a law en-

¹⁸⁴ *Id.*

¹⁸⁵ *Id.*

¹⁸⁶ *Id.* at 40.

¹⁸⁷ *Id.* at 40-41.

¹⁸⁸ See *Greenwood*, 486 U.S. at 40-41.

¹⁸⁹ See *id.* at 53-54 (Brennan, J., dissenting).

¹⁹⁰ *Id.* at 50-51 (Brennan, J., dissenting). Justice Brennan reasoned as follows:

A single bag of trash testifies eloquently to the eating, reading, and recreational habits of the person who produced it. . . . Like rifling through desk drawers or intercepting phone calls, rummaging through trash can divulge the target's financial and professional status, political affiliations and inclinations, private thoughts, personal relationships, and romantic interests.

Id. at 50 (Brennan, J., dissenting).

¹⁹¹ *Id.* at 53 (Brennan, J., dissenting).

¹⁹² *Id.* at 54 (Brennan, J., dissenting).

¹⁹³ *Greenwood*, 486 U.S. at 54 (Brennan, J., dissenting).

¹⁹⁴ See *Bond v. United States*, 529 U.S. 334, 335 (2000); *Greenwood*, 486 U.S. at 54 (Brennan, J., dissenting)

forcement officer's physical manipulation of the defendant's closed, opaque, soft-sided piece of luggage during a routine border search of a bus constituted a search under the Fourth Amendment.¹⁹⁵ The Court observed that the defendant knowingly exposed his luggage to the public by taking it on the bus, and thus he could expect his bag might be handled or moved by others.¹⁹⁶ He did not expect, however, the particular kind of physical manipulation the border patrol officer conducted—squeezing the soft-sided luggage specifically to detect hard objects.¹⁹⁷ In this case, the Court acknowledged that knowing exposure to the public did not translate necessarily into knowing exposure to all law enforcement practices—even though the Court's reasoning in *Greenwood* seemed to say the opposite.¹⁹⁸ Thus, unlike in *Greenwood*, the *Bond* Court recognized, at least in that limited context, that knowing exposure to the public did not eliminate all expectation of privacy.¹⁹⁹

Regarding GPS tracking devices, a person or vehicle whose location is tracked likely is exposing his activities and movements to the public.²⁰⁰ If there is no expectation of privacy in a public place, then an individual certainly has no expectation of privacy in his activities and movements tracked by the GPS device.²⁰¹ If, instead, knowing exposure to the public diminishes, but does not eliminate, an individual's expectation of privacy, then that person may maintain some kind of expectation of privacy in the accumulation of detail about his activities and movements.²⁰²

C. An Individual's Steps to Keep Information Private

Implicit in the Court's knowingly exposed rationale, however, is the notion that a defendant's steps to ensure something is not exposed to the public inform the decision that the defendant's expecta-

¹⁹⁵ *Id.* at 335–36.

¹⁹⁶ *Id.* at 338.

¹⁹⁷ *Id.* at 336, 338–39.

¹⁹⁸ *See id.*; *Greenwood*, 486 U.S. at 40–41; *supra* notes 183–193 and accompanying text; *see also* Taslitz, *supra* note 182, at 147–50 (discussing rationale of *Bond* decision).

¹⁹⁹ *See Bond*, 529 U.S. at 338–39; *Greenwood*, 486 U.S. at 40–41.

²⁰⁰ *See Karo*, 468 U.S. at 714–16; *Knotts*, 460 U.S. at 281–82.

²⁰¹ *See Knotts*, 460 U.S. at 281–82.

²⁰² *See Bond*, 529 U.S. at 338–39; Katz, *supra* note 87, at 565–66 (highlighting the notion of a limited or proportional disclosure—the exposure of information to some but not to all, or for only a limited purpose).

tion of privacy was reasonable.²⁰³ Thus, concerning GPS tracking, the case for holding the monitoring of such a device constitutes a search would be stronger if the person being tracked took steps to keep his location and movements private.²⁰⁴ Given that GPS tracking is useful precisely because it allows users to pinpoint a person's location as he travels about in open public spaces, this task is virtually impossible.²⁰⁵

The practical impossibility of protecting against exposure to the public, however, does not necessarily insulate an individual from government monitoring.²⁰⁶ For instance, in *Dow Chemical Co. v. United States* in 1986, the U.S. Supreme Court held that no search occurred when Environmental Protection Agency (the "EPA") officials flew over the 2000-acre tract adjacent to a Dow Chemical plant and used a sophisticated mapping camera to take pictures.²⁰⁷ Even though Dow Chemical could not feasibly erect an opaque cover over all 2000 acres in order to thwart aerial monitoring—meaning it had done all it possibly could to prevent monitoring—the Court held the industrial acres were knowingly exposed to the public.²⁰⁸ Because the area was knowingly exposed to the public, the Court reasoned, government inspectors could fly overhead to view the area just as any member of the public might have.²⁰⁹ The Court also discounted the fact that EPA officials had used a highly sophisticated commercial mapping camera to take detailed pictures of the area, stating that the simple fact that human vision was enhanced to a degree did not itself create constitutional concerns.²¹⁰

²⁰³ See, e.g., *Dow Chem. Co. v. United States*, 476 U.S. 227, 236–38 (1986) (holding the area surrounding a factory was knowingly exposed to the public through aerial observation, even though the factory's owners could not feasibly take steps to prevent such observation); *Ciraolo*, 476 U.S. at 211–13 (holding that curtilage was knowingly exposed to the public through aerial observation because the defendant took no steps to prevent such observation, though he did erect fences to prevent observation from the ground); *Katz*, 389 U.S. at 352 (noting specifically that the defendant closed the door to the phone booth before engaging in conversation).

²⁰⁴ See *Dow Chem.*, 476 U.S. at 236–38; *Ciraolo*, 476 U.S. at 211–13; *Katz*, 389 U.S. at 352.

²⁰⁵ See Elliott, *supra* note 45, at C6; Harmon, *supra* note 41, at A1; Schwartz, *supra* note 46, at C1; Selingo, *supra* note 41, at G7; see also Blitz, *supra* note 167, at 1406–08 (suggesting that much evidence of people's private lives is available in the public space and that people often have little choice but to engage in private activities in public); *supra* notes 43–53 and accompanying text.

²⁰⁶ See *Dow Chem.*, 476 U.S. at 236–38. But see *Kyllo*, 533 U.S. at 29–31, 34 (holding that the fact that the defendant could not prevent the public exposure of heat waves was not dispositive to whether government action amounted to a search).

²⁰⁷ 476 U.S. at 229.

²⁰⁸ See *id.* at 236–38.

²⁰⁹ *Id.* at 237–38.

²¹⁰ *Id.* at 238.

Thus, in *Dow Chemical*, even though the technology of airplanes and sophisticated cameras virtually prevented the company from blocking the knowing exposure of its activities, the Court was unwilling to take this fact into account when finding the company had no expectation of privacy in the area surrounding its factory.²¹¹

D. *Kyllo v. United States: An Alternative Fourth Amendment Test?*

Nonetheless, the U.S. Supreme Court may be recognizing the difficulty of continuing to apply the aspect of its knowingly exposed rationale that places significance on a person's steps to maintain privacy.²¹² The Court in its most recent Fourth Amendment case, *Kyllo v. United States*, seemed to acknowledge that as technology presents ever-greater possibilities for intrusion, it also continually decreases the ability of individuals to keep something private.²¹³ Accordingly, in addressing whether a reasonable expectation of privacy existed in *Kyllo*, the Court relied less on the knowingly exposed rationale when addressing the law enforcement use of a new form of technology.²¹⁴

In 2001, in *Kyllo*, the Court concluded that a search occurred when law enforcement officials used a thermal imager to detect heat waves emanating from the defendant's home.²¹⁵ As in *Dow Chemical*, in which the company could not feasibly cover its industrial acreage, it was nearly impossible for the *Kyllo* defendant to have prevented the knowing exposure of heat waves coming from his home.²¹⁶ Also as in *Dow Chemical*, in which agents flew over Dow Chemical's acreage, government agents in *Kyllo* engaged in their activities from a vantage point that required no physical intrusion; *Kyllo* agents were stationed across the street and simply aimed the device at the defendant's home.²¹⁷ Finally, in both cases, government agents used technological

²¹¹ See *id.* at 236–39.

²¹² See *infra* notes 213–214 and accompanying text.

²¹³ See 533 U.S. at 33–36.

²¹⁴ See *id.* at 33–38.

²¹⁵ *Id.* at 29, 40. A thermal imager is a device that detects infrared radiation invisible to the naked eye. *Id.* at 29. The imager converts the radiation it detects into an image reflecting the relative amount of heat present in each area; shades of gray deepen as heat lessens. *Id.* at 29–30. When law enforcement used the thermal imager at the defendant's home, it detected a high level of heat along one wall of his home, which allowed agents to conclude the defendant was using high-intensity heat lamps to grow marijuana in that part of his home. *Id.* at 30. Agents then applied for a warrant to search the defendant's home based in part on data obtained from the thermal imaging scan. *Id.*

²¹⁶ See *id.* at 29–31; *Dow Chem.*, 476 U.S. at 236.

²¹⁷ See *Kyllo*, 533 U.S. at 30; *Dow Chem.*, 476 U.S. at 237.

devices that provided them much more information than that observable with the naked eye.²¹⁸ Despite these apparent similarities, the Court reached a different result in *Kyllo* than it had in *Dow Chemical*.²¹⁹

Although the *Kyllo* Court did distinguish itself from *Dow Chemical* by noting that *Kyllo* involved the home, where Fourth Amendment protections are heightened, the *Kyllo* Court also acknowledged more definitively that it could not ignore the fact that the Fourth Amendment privacy analysis has been affected by technological advances.²²⁰ After noting that the *Katz* test is difficult to apply to government uses of technology, Justice Antonin Scalia wrote for the Court that a reasonable expectation of privacy simply *exists* within the home—so the government's use of technology to acquire information about activities in the home is necessarily a search.²²¹ Although law enforcement officials did not physically intrude into the defendant's home and only detected heat waves that were outside physical boundaries and arguably knowingly exposed to the public, the Court reasoned that use of the technology was like a physical intrusion into the home.²²²

Thus, the Court held that using sense-enhancing technology to obtain information about activities inside the home—information that could be obtained only through physical intrusion absent the technology—constituted a search, just as a physical intrusion into a home also would be a search.²²³ The Court added a caveat, however, to this holding, by indicating that its reasoning worked for technology, such as the

²¹⁸ See *Kyllo*, 533 U.S. at 29; *Dow Chem.*, 476 U.S. at 238–39. Admittedly, the sophisticated mapping camera used in *Dow Chemical* enhanced only visual observation, whereas the thermal imager used in *Kyllo* revealed what the eye cannot detect. See *Kyllo*, 533 U.S. at 29; *Dow Chem.*, 476 U.S. at 238–39. In distinguishing *Dow Chemical*, the *Kyllo* Court said in part that *Dow Chemical* stands for the idea that “visual observation is no ‘search’ at all.” *Kyllo*, 533 U.S. at 32.

²¹⁹ See *Kyllo*, 533 U.S. at 40; *Dow Chem.*, 476 U.S. at 239.

²²⁰ 533 U.S. at 33–34, 37.

²²¹ *Id.* at 34. The *Kyllo* Court assumed that all details inside a home are intimate and thereby worthy of protection. *Id.* at 37–38; see also *Karo*, 468 U.S. at 714 (reasoning that “private residences are places in which the individual normally expects privacy free of governmental intrusion not authorized by a warrant, and that expectation is plainly one that society is prepared to recognize as justifiable”); *United States v. United States District Court*, 407 U.S. 297, 313 (1972) (noting that the “physical entry of the home is the chief evil against which the wording of the Fourth Amendment is directed”); *Silverman v. United States*, 365 U.S. 505, 511 (1961) (noting that “[a]t the very core” of the Fourth Amendment is the “right of a man to retreat into his own home and there be free from unreasonable government intrusion”).

²²² See *Kyllo*, 533 U.S. at 34–35, 40.

²²³ *Id.* at 31, 34–35, 40.

thermal imager, that was not in the "general public use."²²⁴ Yet on the whole, *Kyllo* shows that when confronted with technology that could provide more information than the government could have obtained through mere visual observation, the Court felt it necessary to develop an alternative test of constitutionality—a test that may or may not modify a Fourth Amendment analysis of GPS tracking.²²⁵

V. ANALYSIS: RECOGNIZING PRIVACY IN PUBLIC

At first blush, it may seem the constitutionality of the warrantless monitoring of a GPS tracking device, at least while the device remained on public roads and in public places, is not an open question.²²⁶ In fact, a cursory analysis of GPS tracking under the Fourth Amendment would equate GPS tracking devices with the less sophisticated beeper devices addressed in *United States v. Knotts* and *United States v. Karo*.²²⁷ Then, given *Knotts*'s pronouncement that a person traveling in a car in public has no reasonable expectation of privacy in his movements, one would conclude that warrantless GPS tracking is not a search and thus takes place outside the scope of the Fourth Amendment.²²⁸

But there are several reasons such an analysis would be misguided.²²⁹ First, GPS tracking devices can be distinguished from beepers in several ways that make them both more intrusive and more likely

²²⁴ *Id.* at 34, 40. The Court provided no indication of when a technology becomes sufficiently pervasive to be considered "in general public use" but, rather, assumed that the thermal imagers at issue in the case were not in public use. *See id.*; *see also id.* at 47 (Stevens, J., dissenting). As Justice Stevens pointed out in his dissent in *Kyllo*, however, thermal imagers of the kind used in *Kyllo* were readily available through toll-free phone numbers and from half a dozen national companies; tens of thousands of units had been sold nationally. *Id.* at 47 n.5 (Stevens, J., dissenting). *See generally* Douglas Adkins, Note, *The Supreme Court Announces a Fourth Amendment "General Public Use" Standard for Emerging Technologies but Fails to Define It: Kyllo v. United States*, 27 U. DAYTON L. REV. 245 (2002) (suggesting various definitions for a "general public use" standard).

²²⁵ *See* 533 U.S. at 33–34, 40. Whether the Court intended to articulate an entirely new Fourth Amendment test in *Kyllo*, to be used in future Fourth Amendment cases, is an open question. *See, e.g.,* McKenzie, *supra* note 87, at 185–87 (suggesting *Kyllo* developed a new test because its reasoning deviated from previous Fourth Amendment precedent). Notably, however, Justice Scalia's majority opinion in *Kyllo* criticized and then did not apply the *Katz* reasonable expectation of privacy test to the thermal imager at issue in the case. *Kyllo*, 533 U.S. at 34–35.

²²⁶ *See* *United States v. Karo*, 468 U.S. 705, 714–16 (1984); *United States v. Knotts*, 460 U.S. 276, 281–82 (1983).

²²⁷ *See Karo*, 468 U.S. at 714–16; *Knotts*, 460 U.S. at 281–82.

²²⁸ *See Karo*, 468 U.S. at 714–16; *Knotts*, 460 U.S. at 281–82.

²²⁹ *See infra* notes 230–232 and accompanying text.

to be subject to police abuse than are beepers.²³⁰ In one sense, GPS tracking devices create the potential for the twenty-four-hour "dragnet-type" surveillance alluded to in *Knotts*, where the Court said such constant surveillance would present a different constitutional question than the beepers at issue.²³¹ But more importantly, GPS tracking devices are a technology highlighting the need for the Fourth Amendment to offer protection even within the public space—and language in *Kyllo v. United States* suggests the Court is beginning to recognize that technology often antiquates a Fourth Amendment analysis based purely on physical boundaries.²³²

A. GPS Tracking Versus Beepers

At a base level, GPS devices and beepers are similar; both are external devices that can be covertly installed on something whose location is to be tracked.²³³ Though GPS devices and beepers can produce similar results—they both reveal the tracking device's location at any given moment—GPS devices possess much greater potential for accuracy.²³⁴ More importantly, GPS devices track location regardless of whether a GPS receiver, which processes the tracking device's signal to reveal location information, is in the vicinity.²³⁵ Thus, it is not necessary for police to remain in the vicinity with a receiver to obtain the GPS device's location information.²³⁶

²³⁰ See *Knotts*, 460 U.S. at 277–78, 283–84; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

²³¹ See 460 U.S. at 284; *State v. Jackson*, 76 P.3d 217, 223 (Wash. 2003) (en banc); Elliott, *supra* note 45, at C6; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48; see also *Blitz*, *supra* note 167, at 1386–88 (suggesting that current location tracking technology means such constant monitoring no longer is a vision of an "unlikely future").

²³² See *Kyllo v. United States*, 533 U.S. 27, 33–36 (2001); *infra* notes 254–279 and accompanying text.

²³³ See *Knotts*, 460 U.S. at 277–78; *Jackson*, 76 P.3d at 223; Elliott, *supra* note 45, at C6; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

²³⁴ See *Knotts*, 460 U.S. at 277–78; *Jackson*, 76 P.3d at 223; Elliott, *supra* note 45, at C6; Grossman & Hift, *supra* note 33, at 24; Washington, *supra* note 33, at 1C; Wirbel, *supra* note 35, at 51; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

²³⁵ See *Jackson*, 76 P.3d at 223; Balough, *supra* note 47, at 32–33; Elliott, *supra* note 45, at C6; O'Harrow, *supra* note 42, at E1; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

²³⁶ See *Jackson*, 76 P.3d at 223; Elliott, *supra* note 45, at C6; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

This high level of efficiency distinguishes GPS tracking from beeper usage and, indeed, is one of the reasons GPS tracking is attractive to law enforcement.²³⁷ The device does the surveillance work for the police—and makes a computer record of the tracking device's movements at the same time.²³⁸ It is theoretically possible, then, especially as the technology improves, for police to attach a GPS tracking device on an individual's vehicle and leave it for months at a time, checking the computer records periodically for suspicious behavior.²³⁹ For this reason, GPS tracking devices have been compared to having a police officer sitting in a vehicle's back seat twenty-four hours a day, seven days a week—except the driver never knows the officer is there.²⁴⁰

The technological differences between GPS technology and beeper technology are relevant to a Fourth Amendment analysis for two reasons.²⁴¹ First, that the technology functions completely without police presence makes it less limited by the practical constraints of available human resources—and thus increases the potential for police abuse.²⁴² Even though increased efficiency does not automatically mean the use of a technology is a Fourth Amendment search, it does suggest a court should approach the technology with greater skepticism.²⁴³

²³⁷ See *supra* notes 47–63 and accompanying text.

²³⁸ See *Jackson*, 76 P.3d at 223; *Elliott*, *supra* note 45, at C6; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

²³⁹ See *Jackson*, 76 P.3d at 223; *Elliott*, *supra* note 45, at C6; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.

²⁴⁰ See *Chau Lam, A Secret Weapon, Follow That Car!, Man Is Challenging Nassau Police Evidence Gathered by Planting a GPS Device on His Car, While Officials Contend No Warrant Is Required*, *NEWSDAY*, May 1, 2004, at A3 (quoting Barbara Bernstein, executive director of the Nassau County, New York, chapter of the American Civil Liberties Union), 2004 WLNR 1082491; Associated Press, *Police Need Warrant to Track with GPS*, *SEATTLE TIMES*, Sept. 12, 2003, at B1 (quoting Doug Honig, a spokesman for the American Civil Liberties Union of Washington), 2003 WLNR 2392338.

²⁴¹ See *infra* notes 242–253 and accompanying text.

²⁴² See *Jackson*, 76 P.3d at 223; *Elliott*, *supra* note 45, at C6; *Selinger*, *supra* note 41, at G7; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48; *supra* notes 55–63 and accompanying text; see also *Taslitz*, *supra* note 182, at 165–69 (suggesting that because technologies make the monitoring of individuals less burdensome, law enforcement may disproportionately use such techniques to target racial and ethnic minorities and others subject to negative stereotypes).

²⁴³ See *Dow Chem. Co. v. United States*, 476 U.S. 227, 238 (1986) (reasoning that “[t]he mere fact that human vision is enhanced somewhat, at least to the degree here, does not give rise to constitutional problems”); *Knotts*, 460 U.S. at 282 (explaining that “[n]othing in the Fourth Amendment prohibited the police from augmenting the sensory faculties bestowed upon them at birth with such enhancement as science and technology afforded them in this case”). But see *Kyllo*, 533 U.S. at 36 (explaining that “[w]hile the technology used in the present case was relatively crude, the rule we adopt must take account of more sophisticated systems that are already in use or in development”).

Second, and more importantly, the differences between GPS tracking and beeper tracking are relevant to a Fourth Amendment analysis because they indicate GPS tracking is less like visual surveillance, to which the U.S. Supreme Court analogized beeper tracking in *Knotts* and *Karo*.²⁴⁴ The *Knotts* Court believed beeper tracking was a more efficient form of visual surveillance; because visual surveillance was not a search, the Court's reasoning proceeded, an efficient form of visual surveillance also was not a search.²⁴⁵ Police, after all, should not have to avert their eyes from what the rest of the public can see.²⁴⁶

Although this is persuasive reasoning, it fails to take into account the full nature of what GPS tracking allows an officer to accomplish.²⁴⁷ GPS tracking is a form of prolonged surveillance that provides law enforcement with a comprehensive, detailed, and lengthy record of someone's movements—a kind of record virtually impossible to obtain through visual surveillance or even beeper-attendant surveillance, unless police resources were unlimited.²⁴⁸ The Court's language in *Knotts*, that the vehicle driver exposed his movements to "anyone who wanted to look," merely encapsulates the idea that one in public normally experiences a series of fleeting glances by a variety of individuals over time.²⁴⁹

Such reasoning fails to grasp that tracking and recording movements—a kind of license to stare—constitutes an entirely different invasion of privacy.²⁵⁰ Even though one may expect fleeting glances in public, and police should not have to avert their eyes from what they can see in public, one does not thereby expect the kind of targeted aggregation of data a GPS device collects on one's movements, particularly a kind of surveillance the individual neither can detect nor

²⁴⁴ See *Karo*, 468 U.S. at 714–16; *Knotts*, 460 U.S. at 281–82.

²⁴⁵ See 460 U.S. at 281–82; see also *Boyd v. United States*, 116 U.S. 616, 628 (1886) (noting that visual surveillance is lawful because "the eye cannot by the laws of England be guilty of a trespass") (quoting *Entick v. Carrington*, 19 How. St. Tr. 1029, 1066, 95 Eng. Rep. 807 (K.B. 1765)); *Blitz*, *supra* note 167, at 1384–86 (analyzing the Court's comparison of beeper tracking technology to an enhanced form of visual surveillance).

²⁴⁶ See, e.g., *California v. Ciraolo*, 476 U.S. 207, 213 (1986) (explaining that the Fourth Amendment has never required police "to shield their eyes when passing by a home on public thoroughfares").

²⁴⁷ See *infra* notes 248–253 and accompanying text.

²⁴⁸ See *supra* notes 234–240 and accompanying text; see also *Jackson*, 76 P.3d at 223.

²⁴⁹ See 460 U.S. at 281–82; see also *Colb*, *supra* note 87, at 134–36.

²⁵⁰ *Blitz*, *supra* note 167, at 1416; *Colb*, *supra* note 87, at 134–36; *Taslitz*, *supra* note 182, at 169–71.

prevent.²⁵¹ An individual walking or driving in public engages in proportional disclosure analogous to the Court's reasoning in *Bond v. United States*: That person knowingly exposes to others bits and pieces of his movements and activities, but he does not knowingly expose his movements and activities to all law enforcement practices.²⁵² In this way, the kind of sophisticated surveillance provided by GPS tracking devices is fundamentally different, for privacy purposes, from visual surveillance.²⁵³

B. *A Proposal for a Changed Definition of Public and Private*

What is most intuitively bothersome about GPS tracking technology is not so much that it allows police to obtain location information per se, but that it enables police to do so for a much longer period of time, with much less chance for detection, and with little idea of the justifications prompting such monitoring.²⁵⁴ The resultant lengthy, detailed record of one's location then provides a comprehensive picture of one's life.²⁵⁵ Location information reveals everything from daily habits like stopping at the same coffee shop on the way to work, to associations with other people, to visits to locales that reveal much more about a person's particular characteristics, affiliations, or beliefs—such as a gay bar; a doctor's office, HIV testing facility, or abor-

²⁵¹ See JEFFREY ROSEN, *THE UNWANTED GAZE: THE DESTRUCTION OF PRIVACY IN AMERICA* 15–16 (2000) (noting that social norms—such as the fact that it is considered rude to stare—guide both individuals' conduct and their expectations of others' conduct while both are in public); Taslitz, *supra* note 182, at 170 (suggesting that a person can sanction others' staring when he is aware of it; the person "may glare back, grimace, express distaste, or verbally protest").

²⁵² See 529 U.S. 334, 338–39 (2000); Blitz, *supra* note 167, at 1358 (noting that much of life is lived in public and though some details are private, their exposure to others is limited and unlike how law enforcement would use such information); Colb, *supra* note 87, at 135–36 (arguing that people perceive visual surveillance and tracking movements as entirely different activities); Katz, *supra* note 87, at 565–66 (suggesting that people share information with limited groups and for limited purposes—and that police would apply a more focused and less expected examination of the information).

²⁵³ See *supra* notes 244–252 and accompanying text.

²⁵⁴ See Elliott, *supra* note 45, at C6; Grossman & Hift, *supra* note 33, at 24; Washington, *supra* note 33, at 1C; Wirbel, *supra* note 35, at 51; COUNTER INTELLIGENCE TECHS., INC., *supra* note 48; COVERT GPS VEHICLE TRACKING SYS., INC., *supra* note 48.; see also Jackson, 76 P.3d at 224 (holding GPS tracking constituted a "particularly intrusive method of surveillance" because of the kind of detail it records); Blitz, *supra* note 167, at 1407 (arguing that mass tracking gathers a great amount of detail about people's lives by taking advantage of the fact that much evidence of people's private lives exists outside physical boundaries).

²⁵⁵ See Harmon, *supra* note 41, at A1; O'Harrow, *supra* note 42, at E1; Selingo, *supra* note 41, at G7; see also Jackson, 76 P.3d at 223.

tion clinic; a certain church, synagogue, or mosque; a strip club; or various political and civic organizations.²⁵⁶

1. Protecting the Features of Society That Preserve Privacy

For this reason, simply claiming one has no expectation of privacy in one's travels on public roads misses the point.²⁵⁷ Rather than merely providing an account of one's travels on public roads, GPS tracking also offers a significant amount of detail about one's life.²⁵⁸ It is the accumulation of those personal details that the Fourth Amendment should protect, despite the fact that they are not shielded from public view by physical boundaries.²⁵⁹ Taking seriously the Court's pronouncement in *Katz v. United States* that the Fourth Amendment protects people instead of places, the Fourth Amendment would encompass the features of society that protect the personal information recorded by GPS tracking devices.²⁶⁰ Without providing protection for those features, the behavior of individuals would

²⁵⁶ See *Jackson*, 76 P.3d at 223 ("In this age, vehicles are used to take people to a vast number of places that can reveal preferences, alignments, associations, personal ails and foibles. The GPS tracking devices record all of these travels, and thus can provide a detailed picture of one's life.").

²⁵⁷ See *supra* notes 254–256 and accompanying text.

²⁵⁸ See Blitz, *supra* note 167, at 1363 (suggesting that the Fourth Amendment protects the privacy of people in places, not the privacy of the places themselves—so that its protections should move with people as they leave their homes and move about in public); Jeffrey H. Reiman, *Driving to the Panopticon: A Philosophical Exploration of the Risks to Privacy Posed by the Highway Technology of the Future*, 11 SANTA CLARA COMP. & HIGH TECH. L.J. 27, 33–34 (1995) (proposing that tracking data about one's movements would be combined with existing databases, creating a much more significant threat to privacy).

²⁵⁹ See *Kyllo*, 533 U.S. at 34 (indicating that because technology has affected the Fourth Amendment, the issue to be addressed in the case was "what limits there are upon this power of technology to shrink the realm of guaranteed privacy"); *Boyd*, 116 U.S. at 630 (remarking that "[i]t is not the breaking of his doors, and the rummaging of his drawers, that constitutes the essence of the offence; but it is the invasion of his indefeasible right of personal security, personal liberty, and private property" that is to be prevented); Blitz, *supra* note 167, at 1363–65 (arguing that the best way to secure privacy in public is to identify and protect the features of society, and of the public space, that encapsulate the kind of privacy expected under the Fourth Amendment); Nissenbaum, *supra* note 172, at 593 (arguing that physical boundaries should not define privacy because "values placed in jeopardy from invasions of the intimate realm are also jeopardized by various forms of public surveillance practiced today"); Reiman, *supra* note 258, at 29 (suggesting that "[i]f we direct our privacy-protection efforts at reinforcing our doors and curtains, we may miss the way in which modern means of information collection threaten our privacy by gathering up the pieces of our public lives and making them visible from a single point").

²⁶⁰ See 389 U.S. 347, 352–53 (1967) (holding that the reach of the Fourth Amendment does not turn upon the presence or absence of physical intrusion into an enclosure and is not limited to searches and seizures of tangible property); *supra* note 259.

change; one no longer could assume one's activities are not being watched and recorded for later analysis by government officials.²⁶¹ Therefore, a Fourth Amendment analysis better equipped to handle changes brought about by technology would focus less on physical boundaries and more on whether allowing the law enforcement practice at issue would alter the degree of privacy experienced by society before the technology existed.²⁶²

2. A *Kyllo*-Based Rationale

More generally, technology has changed traditional distinctions between public and private by breaking down physical boundaries that once shielded the private from the public, thereby increasing the ability of law enforcement to obtain such information and decreasing individuals' ability to maintain privacy.²⁶³ In the context of GPS track-

²⁶¹ Anthony G. Amsterdam, *Perspectives on the Fourth Amendment*, 58 MINN. L. REV. 349, 403 (1974) (arguing that unchecked surveillance means "the amount of privacy and freedom remaining to citizens would be diminished to a compass inconsistent with the aims of free and open society"); Katz, *supra* note 87, at 562 (suggesting that knowing one's actions are being watched keeps one on guard, limiting the fulfillment of the human potential); Reiman, *supra* note 258, at 37-38 (arguing that knowing one's actions may be observed and recorded eliminates the individual's sense of freedom to act spontaneously).

²⁶² See *supra* notes 257-261 and accompanying text. This view is similar to that advocated by Justice Harlan in 1971 in his dissent to the U.S. Supreme Court's decision in *United States v. White*. See 401 U.S. 745, 786-87 (1971) (Harlan, J., dissenting). Rather than referring to the reasonable expectation of privacy test he had outlined in *Katz*, Justice Harlan indicated that a better test of Fourth Amendment protections required an assessment of "the nature of a particular practice and the likely extent of its impact on the individual's sense of security balanced against the utility of the conduct as a technique of law enforcement." *Id.* at 786 (Harlan, J., dissenting). In *White*, Justice Harlan argued that bugging a suspect's conversations with a government informant should require a warrant under the Fourth Amendment because should such a practice become widespread, people would begin to measure their words—"smother[ing] that spontaneity—reflected in frivolous, impetuous, sacrilegious, and defiant discourse—that liberates daily life." *Id.* at 787 (Harlan, J., dissenting). Thus, only a few years after *Katz*, Justice Harlan moved away from a physical boundary-based analysis of the Fourth Amendment to focus on how police practices could alter the nature of the freedoms and privacy the Amendment secures. See *id.* at 786-87 (Harlan, J., dissenting).

²⁶³ See Nissenbaum, *supra* note 172, at 564, 575-76 (noting that traditional legal and philosophical theories of privacy have been ill-equipped to deal with technology and threats to privacy in public because they focus on notions of intimate, private realms); Reiman, *supra* note 258, at 29, 33 (describing the kind of informational picture of an individual provided by computer databases collecting a variety of personal data); McKenzie, *supra* note 87, at 153-54 (suggesting the advancement of technology has provided access to information otherwise obtainable only through physical intrusion). Not only does technology help break down physical boundaries, but people in modern society also conduct more of their activities in public. Katz, *supra* note 87, at 568. The fact that more of one's

ing, technological advancements in general suggest that a Fourth Amendment analysis should not assume that all information available outside physical boundaries necessarily is "public" information, available for the taking.²⁶⁴ This point is contemplated, to an extent, by Justice Scalia's majority opinion in *Kyllo*.²⁶⁵

Even though Justice Scalia's ultimate conclusion was that all details within the home merit protection—a location-based decision—he may have paved the way for a more expansive way of thinking about the Fourth Amendment where technology is concerned.²⁶⁶ Instead of conceiving of the Fourth Amendment as protecting only what physical boundaries shield from government intrusion, the *Kyllo* Court recognized that the Fourth Amendment, at a minimum, protects those characteristics and features of life and society that provide and ensure privacy—one of which, in that case, was the physical boundary surrounding the home.²⁶⁷

Therefore, drawing from *Kyllo*, although a Fourth Amendment analysis can continue to rely on physical boundaries to demarcate those places whose physical features guarantee privacy (hence, Justice Scalia's insistence that the home simply is protected), it simultaneously also must protect the features of society that provide the level of privacy originally contemplated by the Framers—or at least, that degree of privacy experienced before the technology existed.²⁶⁸ Technology has allowed law enforcement to gain easy access to information that the Framers (or modern society before the technology was invented) would have expected to keep private because of physical boundaries or otherwise.²⁶⁹ Therefore, to maintain a consistent level of privacy in the face of continued advances in technology, the Fourth

life is lived in public, given the characteristics of modern society, only adds to the need to recognize some privacy in public. *See id.*

²⁶⁴ *See supra* notes 254–263 and accompanying text.

²⁶⁵ *See* 533 U.S. at 33–34 (indicating that *Kyllo* involved more than naked-eye surveillance, that the question was how much technological enhancement was too much, and that technology has affected the level of privacy secured by the Fourth Amendment).

²⁶⁶ *See Kyllo*, 533 U.S. at 34, 37; *see also* St. Lawrence, *supra* note 87, at 169–73 (arguing the *Kyllo* decision provides a first step toward rebuilding principles of privacy first established in *Katz*). *But see* McKenzie, *supra* note 87, at 179 (suggesting the *Kyllo* test is unworkable and only creates further confusion).

²⁶⁷ *See* 533 U.S. at 33–34. The test the *Kyllo* Court created, prohibiting the use of technology to obtain information that otherwise only would have been accessible through physical intrusion, implicitly acknowledges that technology has made it possible to permeate boundaries absent physical intrusion. *See id.*

²⁶⁸ *See id.*; *see also supra* note 259 and accompanying text.

²⁶⁹ *See Kyllo*, 533 U.S. at 33–34; *supra* notes 259–262 and accompanying text.

Amendment must preserve not merely those physical boundaries but also those less physical features that also provide privacy.²⁷⁰

3. Why Monitoring a GPS Tracking Device Would Be a Search

If such a Fourth Amendment analysis were applied to GPS tracking, the monitoring of a GPS tracking device, even while it moved along open roads and streets, would be considered a search.²⁷¹ The technology allows for an extensive accumulation of detail about a person's life, beyond what is practically possible to obtain through visual surveillance, and that detail is recorded in a computer database accessible to law enforcement at any time.²⁷² Widespread use of such a powerful technology, without judicial supervision, could trigger the assumption that one's movements are being tracked and recorded at any given moment—creating the potential that individuals would alter their behavior to accommodate this perception.²⁷³ Such a result demonstrates that GPS technology impinges on the aspects of the public space that people now rely upon to establish a degree of privacy as they move about in public.²⁷⁴ Because the Fourth Amendment under this proposed interpretation protects the features of society that preserve privacy, the Fourth Amendment would consider the monitoring of a GPS tracking device to be a search, requiring a warrant based on probable cause.²⁷⁵ In that event, judges would ensure that police track a suspect's location with GPS devices only when they possess sufficient justification and only for a time period appropriate to the purposes of the investigation.²⁷⁶

²⁷⁰ See *Kyllo*, 533 U.S. at 33–34. As commentator Jonathan Blitz argues,

[J]ust as the device of "constitutionally-protected zones" in twentieth-century Fourth Amendment jurisprudence gave individuals the power to decide for themselves what to shield in a home, office, or a suitcase, so twenty-first century Fourth Amendment jurisprudence should similarly recognize that the object of Fourth Amendment protections in public space is . . . to guarantee that the public sphere retains a character that continues to provide individuals the opportunities to preserve privacy where they believe they need it.

Blitz, *supra* note 167, at 1414–15; see *supra* note 259 and accompanying text.

²⁷¹ See *infra* notes 272–276 and accompanying text.

²⁷² See *supra* notes 254–258 and accompanying text.

²⁷³ See *supra* notes 259–262 and accompanying text.

²⁷⁴ See *supra* notes 259–262 and accompanying text.

²⁷⁵ See *supra* notes 254–270 and accompanying text.

²⁷⁶ See *supra* notes 71–72 and accompanying text; see also Katz, *supra* note 87, at 577 (noting that the Fourth Amendment guarantees "important decisions like search and seizure . . . are determined by neutral and detached judges"). Providing constitutional protections in public also does not mean that police could not engage in public surveillance;

Of course, whether the Supreme Court will continue to expand on the rationale expressed in the *Kyllo* decision is an open question, and the extent to which the Court's "general public use" caveat will affect future cases also is unknown.²⁷⁷ For a technology like GPS tracking, which is used widely by the public, this caveat could prevent GPS tracking from constituting a search if the Court takes seriously its language in *Kyllo*.²⁷⁸ GPS technology is used daily by millions of Americans—a level meeting any definition of "general public use."²⁷⁹

C. An Alternative Proposal: Statutory Protection

Fourth Amendment applicability to one's movements in public, in relation to GPS tracking, is uncertain under the U.S. Supreme Court's existing precedent.²⁸⁰ Accordingly, until the Court addresses the issue, a statutory framework could fulfill some of the same privacy-protecting goals through provisions that would guide the circumstances in which federal and state law enforcement agencies can employ GPS tracking devices.²⁸¹ Though tracking devices currently are

rather, it simply means the government must justify its actions when it does so—and that "the default position is no [public] surveillance." Taslitz, *supra* note 182, at 174.

²⁷⁷ See *supra* note 224 and accompanying text; see also Slobogin, *supra* note 87, at 1394–96 (examining various implications for interpretation of the "general public use" exception); McKenzie, *supra* note 87, at 179 (suggesting that the *Kyllo* test is unworkable in the long run and to different types of technology and was a missed opportunity to clarify the Fourth Amendment's relation to technology).

²⁷⁸ See *Kyllo*, 533 U.S. at 34; Slobogin, *supra* note 87, at 1394–96; Adkins, *supra* note 224, at 252; McKenzie, *supra* note 87, at 179; see also *Global Market to Top \$22 Billion*, *supra* note 40; Harmon, *supra* note 41; Selingo, *supra* note 41; Wirbel, *supra* note 35, at 51. As Justice Stevens' dissent in *Kyllo* pointed out, however, a "general public use" exception to the Court's test in *Kyllo* would lead to perverse results—allowing police use of technology and thereby increasing the threat to privacy as the use of intrusive, high-tech equipment becomes more widespread. *Kyllo*, 533 U.S. at 47 (Stevens, J., dissenting). Given this potential result and the majority opinion's lack of clarity of the "general public use" exception, it is unclear how much weight the Court would grant this exception in a future Fourth Amendment analysis. See Slobogin, *supra* note 87, at 1394–96, 1402–06 (analyzing and suggesting definitions for "general public use" exception); Adkins, *supra* note 224, at 252–53 (highlighting the lack of clarity of the "general public use" exception).

²⁷⁹ See *Global Market to Top \$22 Billion*, *supra* note 40; Harmon, *supra* note 41; Selingo, *supra* note 41; Wirbel, *supra* note 35, at 51; see also *supra* note 278 and accompanying text.

²⁸⁰ See *supra* notes 226–232 and accompanying text.

²⁸¹ See Blitz, *supra* note 167, at 1420–21 (highlighting reasons to prefer statutory protections over constitutional protections against privacy infringement from technology used by police); Kerr, *supra* note 85, at 838, 858–60 (articulating reasons the Fourth Amendment cannot provide sufficient protection of privacy); Lee, *supra* note 47, at 402–03 (suggesting legislatures should act to protect location data, absent a change in Fourth Amendment jurisprudence); Slobogin, *supra* note 87, at 1433–37 (suggesting a legislative approach to ensure privacy from public surveillance technology).

addressed in a federal statute, that statute does not direct or restrict law enforcement use of the technology.²⁸²

At a minimum, a more comprehensive statute would require police to justify their actions to a judge or magistrate, based on probable cause or some lesser degree of suspicion that the suspect's movements would lead police to evidence of a crime.²⁸³ The judge, then, could allow a tracking device to be installed for a limited period of time—perhaps ten days—with renewals possible if the judge finds police continue to have sufficient justification for monitoring.²⁸⁴ Finally, such a statute would provide for the sealing and eventual destruction of location information when the investigation ended, in an attempt to prevent the unnecessary accumulation of such information.²⁸⁵

This kind of statutory protection at least would ensure some records were kept of police usage of tracking devices and provide that a neutral, detached magistrate—rather than an “officer engaged in the often competitive enterprise of ferreting out crime”—decides when such governmental intrusion is justified.²⁸⁶ Nevertheless, holding the monitoring of a GPS tracking device is a search under the Fourth Amendment is preferable to a statutory scheme because such a result would signal a shift in how the Fourth Amendment applies to other technologies that collect information available in the public sphere.²⁸⁷

²⁸² See 18 U.S.C. § 3117 (2000); *United States v. Forest*, 355 F.3d 942, 950 (6th Cir. 2004), *vacated on other grounds sub nom. by Garner v. United States*, 125 S. Ct. 1050 (2005); *United States v. Gbemisola*, 225 F.3d 753, 758 (D.C. Cir. 2000).

²⁸³ See *Katz*, *supra* note 87, at 568–69 (arguing that without judicial supervision, society relies only on government officials voluntarily to respect privacy—and that “[r]eliance alone on government self-restraint is a very weak foundation on which to support a commodity as fragile as individual freedom”).

²⁸⁴ See *Kerr*, *supra* note 85, at 850–55 (describing Title III of the Omnibus Crime Control and Safe Streets Act of 1968, and arguing its provisions governing the use of wiretapping—which include procedures for proving justification, a time limit for a single wiretap placement, and a requirement for the sealing and destruction of recorded evidence—show how a statute can address privacy concerns not abated by the Fourth Amendment).

²⁸⁵ See *id.* at 851–52.

²⁸⁶ See *Johnson v. United States*, 333 U.S. 10, 13–14 (1948) (explaining that the warrant requirement exists to interpose a neutral and detached magistrate between the citizen and the officer—a step necessary to protect Fourth Amendment privacy interests); see also *Katz*, 389 U.S. at 356–57 (holding that although law enforcement agents in the case acted with restraint in conducting the search, that restraint was imposed by the agents themselves, not by a judicial officer—and agents’ restraint could not substitute for a lack of judicial process).

²⁸⁷ See *supra* notes 254–279 and accompanying text.

CONCLUSION

GPS tracking technology constitutes a threat to personal freedom from government intrusion precisely because it involves the collection of data about one's movements in the public space—an area where, under current Fourth Amendment jurisprudence, individuals lack a reasonable expectation of privacy such that police action must occur pursuant to a warrant. Although the U.S. Supreme Court generally has held that individuals lack a reasonable expectation of privacy in activities occurring within the public space or knowingly exposed to the public, GPS tracking presents a case for shifting this rationale because of the sheer amount of personal information such devices gather from the public space. In light of GPS tracking and other technologies functioning in the public space, the Supreme Court should shift its Fourth Amendment analysis to one that preserves some privacy within the public space and guarantees that technology does not further increase the capacity of police to collect personal data without any kind of physical intrusion. Such an analysis would avoid definitions of privacy based on physical boundaries, but instead would protect those features of society that provide privacy—and ensure privacy is maintained to the degree it existed before such technologies like GPS tracking. In this way, the Fourth Amendment once again will begin to secure the kind of privacy that truly sustains liberty.

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