Telephone Pole Cameras Under Fourth Amendment Law

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In a series of recent cases, police officers have mounted sophisticated surveillance cameras on telephone poles and pointed them at the homes of people suspected of a crime. These cameras often operate for months or even years without judicial oversight, collecting vast quantities of video footage on suspects and their activities near the home. Pole camera surveillance raises important Fourth Amendment questions that have divided courts and puzzled scholars.

These questions are complicated because Fourth Amendment law is complicated. This is especially the case today as Fourth Amendment law is in a transitional phase, caught between older and newer paradigms for determining the scope of the Amendment's power. This Symposium Article succinctly lays out the standards that govern modern Fourth Amendment search questions. It applies those standards to the pole camera issue—perhaps the most urgent and consequential issue in current Fourth Amendment law. The Article surveys the substantial body of caselaw addressing this question. It offers its own detailed analysis and grapples with variations in fact patterns that have confounded prior attempts to address the issue. Finally, it uses this analysis to draw vital lessons for Fourth Amendment law more broadly.

TABLE OF CONTENTS

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I. INTRODUCTION

FBI officers in Springfield, Illinois suspected that Travis Tuggle was involved in a conspiracy to sell crystal meth.[1] They installed three high-end surveillance cameras on telephone poles near his home.[2] Together, the cameras viewed the front and side of his house and an adjoining parking area.[3] Video surveillance operated constantly for a year and a half, essentially tracking Tuggle's every move in his front yard, every time he entered or left his house, everyone who visited or left his house, and numerous items that entered or left his house.[4] Following his arrest, Tuggle challenged the collection of this video footage as a violation of his Fourth Amendment rights.[5] He lost.[6]

Police officers in Brookings, South Dakota suspected that Joseph Jones was unlawfully selling marijuana.[7] They installed a pole camera on a street light across from Jones's trailer.[8] The camera captured video of the trailer and Jones's front yard for a period of fifty-five days.[9] The pole camera captured Jones's activities near his residence, when he left and returned, the activities of his visitors, and more.[10] Following his arrest, Jones challenged the collection of this video footage as a violation of his Fourth Amendment rights.[11] He won.[12]

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[1] United States v. Tuggle, 4 F.4th 505, 511 (7th Cir. 2021).

[2] *Id.* The cameras recorded around the clock, and had basic lighting technology to allow for night recording. *Id.* Officers could remotely zoom, pan, and tilt the cameras, and the video footage was stored for later viewing at the FBI's Springfield office. *Id.*

[3] *Id.*

[4] *See id.* The first camera operated for nineteen months, while the second and third cameras operated for roughly three and six months respectively. *Id.*

[5] *Id.* at 512.

[6] *Id.* at 512, 529. After losing his suppression motion, Tuggle entered a guilty plea conditional on the right to appeal the trial court's decision and lost again on appeal). *Id.* at 512.

[7] State v. Jones, 903 N.W.2d 101, 104 (S.D. 2017).

[8] *Id.*

[9] *Id.* The pole camera did not have night vision but recorded throughout the night, and could capture vehicles with lights that drove up to the residence or under the streetlight. *Id.*

[10] *Id.*

[11] *Id.* at 105.

[12] *Id.* at 113–14. His motion to suppress was ultimately denied on good faith exception grounds, however. *See id.* at 115.

Pole camera surveillance raises important constitutional questions that have confused courts and perplexed scholars.[13] These questions are complicated because Fourth Amendment law is complicated. This is especially the case today, as Fourth Amendment law is in state of flux. Following the Supreme Court's landmark decision in 2018's *Carpenter v. United States*,[14] lower courts have begun to apply *Carpenter* to address novel Fourth Amendment questions.[15] Courts routinely discuss several of the factors that were pivotal to that decision: the revealing nature of the data collected, the amount of data collected, and whether the data was voluntarily disclosed to others.[16] Yet courts also regularly apply the classic "reasonable expectation of privacy" test first described in Justice Harlan's concurrence in *Katz v. United States*.[17] The paradigms of *Katz* and *Carpenter* coexist uneasily in modern caselaw—they overlap and often conflict.[18] Judges have tried to integrate them in a variety of ways, but the path forward for courts and litigants remains unclear.[19]

This Article clearly and succinctly lays out the standards that govern modern Fourth Amendment search questions. It then applies those standards to one of the most important Fourth Amendment questions in modern caselaw—whether the police need to obtain a warrant before engaging in long-term video surveillance of a residence. It surveys the substantial body of law addressing this issue, which has arisen especially often in recent years.[20] It offers a detailed analysis and grapples with variations in fact patterns that have confounded prior attempts to address the issue. And it uses this analysis to draw lessons for Fourth Amendment law more broadly.

Ultimately, this Article concludes that long-term pole camera surveillance is a Fourth Amendment search, one that presumptively requires a warrant. This is plainly the case when the government uses pole cameras to look over a fence into an otherwise hidden yard. The use of technology to expose the home to government scrutiny is a search under any applicable Fourth Amendment

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[13] *See, e.g.*, United States v. Tuggle, 4 F.4th 505, 523–24 (7th Cir. 2021); United States v. Edmonds, 438 F. Supp. 3d 689, 693 (S.D.W. Va. 2020); Robert Fairbanks, Note, *Masterpiece or Mess: The Mosaic Theory of the Fourth Amendment Post-*Carpenter, 26 BERKELEY J. CRIM. L. 71, 106–07 (2021); 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, 1357 (2004).

[14] *See generally* Carpenter v. United States, 138 S. Ct. 2206 (2018).

[15] Matthew Tokson, *The* Carpenter *Test as a Transformation of Fourth Amendment Law*, U. ILL. L. REV. (forthcoming 2023) (manuscript at 9–10) (on file with author) [hereinafter Tokson, Carpenter *Test*].

[16] Matthew Tokson, *The Aftermath of* Carpenter*: An Empirical Study of Fourth Amendment Law, 2018–2021*, 135 HARV. L. REV. 1790, 1792, 1803–04 (2022) [hereinafter Tokson, *Aftermath of* Carpenter].

[17] *See, e.g.*, People v. Tafoya, 494 P.3d 613, 616 (Colo. 2021); Katz v. United States, 389 U.S. 347, 360–61 (1967) (Harlan, J., concurring).

[18] Tokson, *Aftermath of* Carpenter, *supra* note 16, at 1828.

[19] *See id.* at 1834–35.

[20] *See, e.g.*, *Tafoya*, 494 P.3d at 616.

standard, and the same rules apply to the "curtilage" of the home, i.e., the area immediately surrounding a residence.[21]

Pole camera surveillance of an unfenced home presents a more difficult question. Any individual activity in one's yard is in theory exposed to public view. Yet the aggregate of all activities outside one's home is not exposed, and a person could reasonably expect it to remain private, at least on some theories of the *Katz* test.

More concretely, the *Carpenter* factors indicate that long-term pole camera surveillance is a Fourth Amendment search.[22] Video surveillance can be deeply revealing of residents' lives and associations. It creates a precise record of their activities, capturing the details of their home lives, when they leave and return, who they travel with, who visits them and when they arrive and leave, familial activities in their yards, what items they bring in and out of the home, and much more.[23] Long-term video surveillance also captures large amounts of personal data, increasing the potential for invasions of the target's privacy.[24] In a recent, typical case involving pole camera surveillance of a home, the police captured roughly 219,000 minutes of video footage and stored it indefinitely in a searchable digital format.[25] Government storage of large quantities of personal data threatens citizen autonomy and likely implicates the Fourth Amendment.[26] Finally, activities in one's curtilage are often not exposed to others voluntarily, although this analysis may vary based on the particular facts of a case. Residents have little choice but to leave their home and return to it, to have visitors, to bring in items, and to do things in their yards. And many residents cannot erect fences to block all views of their yard, either because they do not own the home, lack the financial means to build a large fence, or find that fences are barred by local regulation.[27] Moreover, courts should be hesitant to penalize homeowners who do not wish to fence themselves off from the world—to do so creates an incentive to engage in costly protective behavior just to avoid government surveillance. In any event, the majority of the *Carpenter* factors compel the conclusion that pole camera surveillance of a home is a Fourth Amendment search in virtually every real-world case.

The stakes of this issue are high, and not only because pole camera surveillance appears to be more prevalent with each passing year. No less than the sanctity of the home is at stake—as well as the scope of law enforcement

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[21] For a more detailed definition, see United States v. Dunn, 480 U.S. 294, 300–01 (1987). The Supreme Court has said that the curtilage of the home "enjoys protection as part of the home itself." Florida v. Jardines, 569 U.S. 1, 6 (2013).

[22] *See* Tokson, Carpenter *Test*, *supra* note 15, at 8–9.

[23] *See infra* Part IV.C; United States v. Garcia-Gonzalez, No. 14-10296-LTS, 2015 U.S. Dist. LEXIS 116312, at *15–16 (D. Mass. Sept. 1, 2015).

[24] Matthew Tokson, *The Emerging Principles of Fourth Amendment Privacy*, 88 GEO. WASH. L. REV. 1, 18 (2020).

[25] *See infra* notes 160–161 and accompanying text.

[26] *See infra* Part IV.C.2.

[27] *See infra* Part IV.C.3.

power. This Article brings clarity to an important and difficult question, and it offers guidance for future courts confronting this increasingly ubiquitous surveillance practice.

The Article proceeds in four Parts. Part II sets out current Fourth Amendment search law and surveys the technology of modern pole cameras. Part III addresses pole camera surveillance that observes curtilage that is otherwise blocked from public view. Part IV examines video surveillance of yards and houses that are visible from public areas. Part V examines the implications of the Article's pole camera analysis for Fourth Amendment law more broadly.

II. BACKGROUND AND CONTEXT

A. *Fourth Amendment Search Law*

The government violates a person's Fourth Amendment rights when officers conduct a "search" without first obtaining a warrant (or qualifying for an exception to the warrant requirement).[28] A Fourth Amendment search can occur in either of two ways.[29] It can happen when the government physically intrudes on "a constitutionally protected area in order to obtain information."[30] However, since pole cameras are placed on public property—utility poles—and involve no physical intrusion of protected areas, this type of search is not relevant here.[31] When dealing with pole cameras, courts focus on the other type of search, which occurs when the government violates a "reasonable expectation of privacy."[32]

This reasonable expectation of privacy test is also known as the *Katz* test.[33] In its original form, the *Katz* test imposed two requirements for Fourth Amendment protection: "first that a person have exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as 'reasonable.'"[34] In practice, most courts focus on the

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[28] Matthew Tokson, *The Normative Fourth Amendment*, 104 MINN. L. REV. 741, 741 (2019).

[29] United States v. May-Shaw, 955 F.3d 563, 567 (6th Cir. 2020).

[30] United States v. Thompson, 811 F.3d 944, 948 (7th Cir. 2016) (quoting United States v. Jones, 565 U.S. 400, 407 (2012)).

[31] *See* United States v. Trice, 966 F.3d 506, 509–10 (6th Cir. 2020); *May-Shaw*, 955 F.3d at 567.

[32] Katz v. United States, 389 U.S. 347, 360–61 (1967) (Harlan, J., concurring).

[33] Orin S. Kerr, Katz *Has Only One Step: The Irrelevance of Subjective Expectations*, 82 U. CHI. L. REV. 113, 113 (2015) [hereinafter Kerr, *Subjective Expectations*].

[34] *Katz*, 389 U.S. at 361. Not all courts apply both prongs of the *Katz* test, however. In practice, some courts explicitly analyze both subjective and objective expectations while other courts ignore the distinction or acknowledge it but do not apply it. *See* Kerr, *Subjective Expectations*, *supra* note 33, at 122. This is also true of the pole camera cases. For example, *Tafoya* and *Moore-Bush* distinguish and analyze both subjective and objective expectations of privacy. *See* People v. Tafoya, 494 P.3d 613, 622 (Colo. 2021); United States v. Moore-Bush, 381 F. Supp. 3d 139, 143 (D. Mass. 2019), *rev'd en banc*, 36 F.4th 320, 320 (1st Cir.

second prong of this test, analyzing whether the government has violated a person's "reasonable expectation of privacy."[35] Courts have applied different models and theories of what makes an expectation of privacy reasonable, and which framework a given court will select is often unpredictable *ex ante*.[36]

In the 2018 decision *Carpenter v. United States*,[37] the Supreme Court expanded the scope of the Fourth Amendment, holding that individuals can retain Fourth Amendment rights in information they disclose to a third party.[38] This ruling may ultimately extend privacy protections to a large variety of sensitive digital information.[39] Indeed, as lower courts have applied *Carpenter* over the past several years, they have often used several of the principles discussed in the Supreme Court's opinion as an alternative way to determine the Fourth Amendment's scope.[40] The three most prevalent factors used by lower courts are the following: (1) the revealing nature of the data collected, (2) the amount of data collected, and (3) whether the suspect voluntarily disclosed their information to others.[41] Under these factors, if the data at issue is revealing or intimate, if a large amount of data has been collected, or if the data was not voluntarily exposed to other parties, then it is more likely to be protected by the Fourth Amendment.[42] These factors have appeared in a large proportion of substantive post-*Carpenter* cases, and their guidance correlates strongly with case outcomes.[43] Together, they form an emerging *Carpenter* test that can determine whether a person has a reasonable expectation of privacy.[44]

2022). In contrast, *Houston* does not mention the distinction at all, and *May-Shaw* mentions both requirements but does not analyze them separately. *See* United States v. Houston, 813 F.3d 282, 288 (6th Cir. 2016); *May-Shaw*, 955 F.3d at 567.

[35] *See, e.g.*, *Houston*, 813 F.3d at 288; *May-Shaw*, 955 F.3d at 567. In general, some courts explicitly analyze both subjective and objective expectations while many other courts ignore the distinction or acknowledge it but do not apply it. *See* Kerr, *Subjective Expectations*, *supra* note 33, at 122.

[36] *See* Orin S. Kerr, *Four Models of Fourth Amendment Protection*, 60 STAN. L. REV. 503, 541–42 (2007) [hereinafter Kerr, *Four Models*]; Tokson, Carpenter *Test*, *supra* note 15, at 3.

[37] *See generally* Carpenter v. United States, 138 S. Ct. 2206 (2018).

[38] *Id.* at 2217.

[39] Tokson, *Aftermath of* Carpenter, *supra* note 16, at 1800.

[40] *Id.* at 1795.

[41] *Id.* Technically, the test looks to the amount of data sought rather than the amount of data actually collected, although the amount of data sought and collected will often be identical. The *Carpenter* Court assessed the duration of surveillance based on the seven days of location information the government requested, rather than the two days of information they were ultimately able to obtain. *Carpenter*, 138 S. Ct. at 2217 n.3.

[42] Tokson, *Aftermath of* Carpenter, *supra* note 16, at 1831.

[43] *Id.* at 1821, 1825; Tokson, Carpenter *Test*, *supra* note 15, at 2.

[44] *See* Tokson, *Aftermath of* Carpenter, *supra* note 16, at 1821; Tokson, Carpenter *Test*, *supra* note 15, at 20.

B. *Pole Cameras*

Pole cameras are surveillance cameras placed on utility poles such as telephone or electric poles.[45] Such cameras are widely used throughout the country and have been employed by federal agencies as well as local police departments.[46] Common features of pole cameras include continuous recording,[47] zooming and tilting,[48] real-time viewable footage,[49] and storing footage for later review.[50]

Many pole cameras available for purchase are advertised as "rapid deployment" surveillance systems with a metal link and bolt mount to quickly attach the device to a utility pole.[51] These surveillance systems can be used for observing residences or high-crime hotspots.[52] Various models are marketed as having additional features such as ultra-low light capacity or LED lights to illuminate dark spaces, 360-degree field of vision, infrared cameras, weatherproof exterior, solar power, or large data storage capacity.[53] Another

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[45] *See* United States v. May-Shaw, 955 F.3d 563, 564 (6th Cir. 2020); Commonwealth v. Mora, 150 N.E.3d 297, 301 (Mass. 2020).

[46] Matthew Tokson, *The Next Wave of Fourth Amendment Challenges After* Carpenter, 59 WASHBURN L.J. 1, 17 (2020); Timothy Williams, *Can 30,000 Cameras Help Solve Chicago's Crime Problem?*, N.Y. TIMES (May 26, 2018), https://www.nytimes.com/2018/05/26/us/chicago-police-surveillance.html [https://perma.cc/8G3A-QRRF]; Justin Rohrlich & Dave Gershgorn, *The DEA and ICE Are Hiding Surveillance Cameras in Streetlights*, QUARTZ (Nov. 9, 2018), https://qz.com/1458475/the-dea-and-ice-are-hiding-surveillance-cameras-in-streetlights [https://perma.cc/GXG2-AEYA].

[47] *Mora*, 150 N.E.3d at 302 ("All of the cameras recorded uninterruptedly, twenty-four hours a day, seven days a week . . . ."); *May-Shaw*, 955 F.3d at 565 (continuous recording for twenty-three days); People v. Tafoya, 494 P.3d 613, 614 (Colo. 2021) (continuous recording for three months).

[48] *Tafoya*, 494 P.3d at 614 ("The camera could pan left and right, tilt up and down, and zoom in and out . . . ."); *May-Shaw*, 955 F.3d at 565; United States v. Houston, 813 F.3d 282, 286 (6th Cir. 2016); United States v. Tuggle, 4 F.4th 505, 511 (7th Cir. 2021); *Mora*, 150 N.E.3d at 302.

[49] *Mora*, 150 N.E.3d at 302 ("While the cameras were operating, investigators could view the footage remotely using a web-based browser."); *Tafoya*, 494 P.3d at 614; *Tuggle*, 4 F.4th at 511.

[50] *Tafoya*, 494 P.3d at 614 (stating that police "indefinitely stored the footage for later review"); *May-Shaw*, 955 F.3d at 565; *Tuggle*, 4 F.4th at 511; *Mora*, 150 N.E.3d at 302.

[51] *See, e.g.*, *Pole Cameras*, WCCTV, https://www.wcctv.com/products/#type=PoleCameras/ [https://perma.cc/EQ2B-LWD5].

[52] *See id.*

[53] *Id.*; *VPC 2.0 Video Pole Camera*, RSCH. ELEC.'S INT'L, https://reiusa.net/wp-content/uploads/2019/01/VPC_20_Brochure.pdf [https://perma.cc/9DD7-4WEZ]; *i2c Technologies Unveils New Low-Priced VX400 Covert Pole Camera System*, POLICE1 (Dec. 5, 2019) [hereinafter *i2c Unveils New Pole Camera*], https://www.police1.com/police-products/investigation/cameras/press-releases/i2c-technologies-unveils-new-low-priced-vx400-covert-pole-camera-system-QfoJQdtlrPbmzEMs/ [https://perma.cc/Z27F-UFDN]; *VPMax Customizable Pole Mounted Camera System*, I2C TECHS., https://i2ctech.com/product/vpmax-customizable-pole-camera-system [https://perma.cc/X4EH-D6XU].

highly promoted feature is the ability to detect and track movement by automatically following a person or object.[54]

The costs of installing and operating pole cameras will likely vary by location and circumstance. A basic outdoor surveillance camera might cost $200 or less.[55] A high-end camera may cost up to $5,000 or more.[56] The cost to police departments to use an existing camera may be little or nothing.[57] For example, state agencies or other organizations may provide cameras to municipalities free of charge.[58] Alternatively, an existing camera purchased for use in a previous investigation may simply be reused.[59] While larger police departments may have in-house employees capable of installing such a camera on a utility pole, hiring an outside contractor to install an existing camera might cost approximately $550.[60] Once installed, the cameras are inexpensive to operate, with operational costs estimated at roughly $39 per camera.[61]

This paper focuses on pole cameras aimed at the residences of suspects, rather than those used to monitor public streets or commercial properties.[62] The video monitoring of public streets or commercial areas is typically considered not to be a search under the Fourth Amendment.[63] However, pervasive camera systems capable of tracking citizens' movements everywhere they travel within

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[54] *Pole Cameras*, *supra* note 51. Video analytics also includes the ability to detect loitering and to send alerts or alarms to police to inform them of movement. *Pole Camera: 4G Multi Sensor Dome*, WIRELESS CCTV, https://www.wcctv.com/pole-camera-4g-multi-sensor-dome/ [https://perma.cc/ES3W-ARM5].

[55] *See, e.g.*, *Wireless Outdoor Camera*, BLUE BY ADT, https://www.bluebyadt.com/shop/blue-outdoor-camera.html [https://perma.cc/4WHL-XA48]; *VC800—4K UHD Vandal-Resistant Outdoor PoE Camera*, ANNKE, https://www.annke.com/products/vc800? [https://perma.cc/7P5W-7UB6].

[56] *See*, *e.g.*, *i2c Unveils New Pole Camera*, *supra* note 53.

[57] *See* Bobby Ardoin, *Opelousas Police Department Asks City for Video Surveillance Funding to Help Deter Crime*, DAILY WORLD (Aug. 12, 2021), https://www.dailyworld.com/story/news/local/2021/08/12/opelousas-police-video-surveillance-cameras-crime/8102479002 [https://perma.cc/2Z4W-KTXA].

[58] *Id.*

[59] Matthew Tokson, *A First Circuit Decision and the Future of Telephone Pole Camera Surveillance*, LAWFARE (June 24, 2022), https://lawfareblog.com/first-circuit-decision-and-future-telephone-pole-camera-surveillance# [https://perma.cc/JGG8-Q3VL].

[60] *See* Ardoin, *supra* note 57.

[61] *Id.*

[62] *See* Commonwealth v. Mora, 150 N.E.3d 297, 302, 311 (Mass. 2020) (examining use of additional pole cameras along a street suspected to be used for drug dealing by defendant and a house belonging to a non-defendant); United States v. Powell. 847 F.3d 760, 773 (6th Cir. 2017) (discussing ninety day use of pole camera surveillance on two houses, neither were defendants' residences, and one commercial warehouse); United States v. Wymer, 654 F. App'x 735, 740–41, 743–44 (6th Cir. 2016) (analyzing four months of warrantless pole camera surveillance of commercial property); *Pole Camera: 4G Multi Sensor Dome*, *supra* note 54 (describing various uses for pole cameras including observing crime "hotspots").

[63] *See, e.g.*, cases cited *supra* note 62.

a city or town likely present a different issue and may violate the Fourth Amendment.[64]

Pole cameras that constantly record video of the exterior of a residence and its curtilage present especially interesting Fourth Amendment questions.[65] Courts are split on this issue, and variations in the fact patterns of the cases complicate the legal analysis. The following Parts address pole camera surveillance of people's homes and attempt to untangle some of the complexities of this important constitutional question.

III. THE EASY CASE: A HOME WITH A FENCE

When a suspect's yard is enclosed by an opaque fence or is otherwise obscured from public view, it is clear that using a surveillance camera to monitor activities in that yard is a Fourth Amendment search, requiring a warrant.[66] Courts have uniformly reached this conclusion, and prevailing Fourth Amendment standards dictate this result.[67] Yet this easy case is still worth addressing, because the analysis below can help to clarify the more difficult case of video surveillance of an unfenced home.[68]

A. *Previous Cases*

The earliest court of appeals case addressing pole cameras addressed a surveillance camera that looked over a ten-foot fence into a suspect's back yard for a period of approximately two months.[69] The Fifth Circuit held that this was a Fourth Amendment search under the *Katz* test.[70] The suspect clearly had a subjective expectation of privacy, as evidenced by the fence.[71] This expectation was reasonable because the surveillance was intrusive, and it allowed the government to "record all activity in Cuevas's backyard."[72]

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[64] *Cf.* Leaders of a Beautiful Struggle v. Balt. Police Dep't, 2 F.4th 330, 347–48 (4th Cir. 2021) (en banc) (holding that a pervasive, citywide airplane-based surveillance program operating constantly during daylight hours violated the Fourth Amendment). The Fourth Amendment implications of pervasive location tracking in general have been addressed by courts and scholars. *See, e.g.*, Carpenter v. United States, 138 S. Ct. 2206, 2220 (2018); Matthew Tokson, *Knowledge and Fourth Amendment Privacy*, 111 NW. U. L. REV. 139, 139 (2016); Susan Freiwald, *Cell Phone Location Data and the Fourth Amendment: A Question of Law, Not Fact*, 70 MD. L. REV. 681, 745 (2011).

[65] *See* Tokson, *supra* note 46, at 17.

[66] *See, e.g.*, United States v. Cuevas-Sanchez, 821 F.2d 248, 250–51 (5th Cir. 1987); People v. Tafoya, 494 P.3d 613, 615 (Colo. 2021); United States v. Vargas, No. CR-13-6025-EFS, 2014 U.S. Dist. LEXIS 184672, at *19–20 (E.D. Wash. Dec. 15, 2014).

[67] *See, e.g.*, cases cited *supra* note 66.

[68] The discussion below addresses opaque fences surrounding the home and its curtilage.

[69] *Cuevas-Sanchez*, 821 F.2d at 250.

[70] *Id.* at 250–51.

[71] *Id.* at 251.

[72] *Id.*

Likewise, the Supreme Court of Colorado recently held that the video monitoring of a suspect's yard via a camera that looked over a six-foot fence for over three months was a Fourth Amendment search.[73] The Court applied both the *Katz* test and several concepts from *Carpenter*, ultimately concluding that the suspect had a reasonable expectation of privacy against video surveillance of his yard.[74] Such surveillance was both deeply revealing and of a "lengthy duration" that was "particularly problematic."[75]

Other courts have reached similar conclusions in cases where a pole camera was able to see more of a suspect's yard than passersby could see from the ground.[76] There are no cases known to the author in which a court upheld warrantless pole camera surveillance of curtilage that was not exposed to potential observation by members of the public.[77]

B. *Applying Current Law*

As the cases discussed above indicate, extended video surveillance of an otherwise unobserved yard presents an easy Fourth Amendment question. Under the *Katz* test, the resident of a home typically has a reasonable expectation of privacy in their activities in a fenced-in yard.[78] Indeed, a homeowner might reasonably expect a similar degree of privacy in their enclosed curtilage as they

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[73] People v. Tafoya, 494 P.3d 613, 615 (Colo. 2021).

[74] *Id.* at 622–23.

[75] *Id.* at 622.

[76] *See, e.g.*, United States v. Vargas, No. CR-13-6025-EFS, 2014 U.S. Dist. LEXIS 184672, at *4–6, *29–31 (E.D. Wash. Dec. 15, 2014) (holding that the use of an elevated camera to observe a front yard over a wire fence lined with vegetation that obscured the view from the ground was a search); *see also* United States v. Anderson-Bagshaw, 509 F. App'x 396, 404–05 (6th Cir. 2012) (ruling on harmless error grounds but indicating that video surveillance of a backyard area visible only from an adjacent vacant lot and not from the road may violate the Fourth Amendment).

[77] *Cf.* United States v. Dennis, 41 F.4th 732, 740–42 (5th Cir. 2022) (noting the presence of a fence but stating that "one can see through [the] fence and . . . the cameras captured what was open to public view from the street" in a ruling finding no plain error in a lower court ruling not suppressing pole camera evidence); United States v. Houston, 813 F.3d 282, 288 (6th Cir. 2016) (upholding the use of a pole camera and noting that both passersby and the pole camera at issue had a view "equally blocked" to some degree by foliage); United States v. Mazzara, No. 16 Cr. 576 (KBF), 2017 WL 4862793, at *2, *9 (S.D.N.Y. Oct. 27, 2017) (noting that the construction of a fence during the surveillance period did not affect the Fourth Amendment analysis because the pole camera only captured publicly available views of the driveway and sidewalk). Another district court has held that video surveillance from a neighbor's house with consent of the neighbor was not a Fourth Amendment search; this presents a different scenario than that associated with pole cameras. *See* United States v. Kubasiak, No. 18-cr-120-pp, 2018 WL 4846761, at *1–2 (E.D. Wis. Oct. 5, 2018).

[78] Katz v. United States, 389 U.S. 347, 351–52 (1967).

do inside of their home, where the Fourth Amendment's protections are at their height.[79]

Consider the two prongs of the classic *Katz* test. First, as several courts have held, it is clear that a homeowner who erects a fence obscuring their yard from view has a subjective expectation of privacy against video observation.[80] Second, this expectation is a reasonable one on virtually any theory of the meaning of *Katz*.[81] The probability of anyone taking surreptitious video footage of one's fenced yard for days or months at a time is extremely low.[82] Activities occurring near the home behind an opaque fence are not meaningfully exposed to public view.[83] Normatively, such surveillance is intrusive and is likely to "provoke[] an immediate negative visceral reaction" in a reasonable person.[84] Put simply, people do not expect to be video monitored by the government behind their fences, and that expectation is eminently reasonable.

To be sure, the Supreme Court has held that the police can briefly observe with the naked eye a fenced-in yard from an aircraft flying at a lawful height overhead.[85] Yet, as the Fifth Circuit has noted, there is a substantial difference between the minimal intrusion of a "one-time overhead flight" and the continuous video recording of all activity behind a fence.[86] Further, while the airways are in theory available to anyone, individuals cannot lawfully set up video surveillance cameras on utility poles to spy on others.[87] Activity behind a fence is not publicly exposed to such observation.

Surveillance technology that observes areas of the curtilage otherwise protected against human observation effects a Fourth Amendment search under controlling Supreme Court precedent.[88] The Supreme Court case *Kyllo v. United States* makes clear that the use of technology to capture nonexposed information

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[79] *See* Florida v. Jardines, 569 U.S. 1, 6 (2013) (addressing "the curtilage of the house, which we have held enjoys protection as part of the home itself"); Oliver v. United States, 466 U.S. 170, 180 (1984); United States v. Dunn, 480 U.S. 294, 301 (1987).

[80] People v. Tafoya, 494 P.3d 613, 622 (Colo. 2021); United States v. Cuevas-Sanchez, 821 F.2d 248, 251 (5th Cir. 1987).

[81] *See* Kerr, *Four Models*, *supra* note 36, at 507–22 (describing various theories of the meaning of the *Katz* test).

[82] *See id.* at 508–09.

[83] *See id.* at 513–14.

[84] *Cuevas-Sanchez*, 821 F.2d at 251.

[85] *See* California v. Ciraolo, 476 U.S. 207, 213–14 (1986); Florida v. Riley, 488 U.S. 445, 448–50 (1989).

[86] *See Cuevas-Sanchez*, 821 F.2d at 251.

[87] *See, e.g.*, 18 PA. CONS. STAT. § 6905 (prohibiting private actors from attaching nails and any other hard substances to utility poles).

[88] *See* Kyllo v. United States, 533 U.S. 27, 34 (2001); Florida v. Jardines, 569 U.S 1, 6 (2013). The Supreme Court has said that the curtilage of the home "enjoys protection as part of the home itself." *Id.* at 6; s*ee also* Oliver v. United States, 466 U.S. 170, 180 (1984) (noting that courts have considered the curtilage "part of the home itself for Fourth Amendment purposes").

about a home is a Fourth Amendment search.[89] Pole cameras do not directly capture information about the interior of the home. They do, however, permit easy inferences about the home, including who and often what is inside the home at any given moment. In this sense they are similar to the infrared heat cameras at issue in *Kyllo*, which did not actually collect any data from inside the home but "only heat radiating from the external surface of the house," from which an observer could infer activities taking place inside.[90]

Likewise, if we evaluate this surveillance under the *Carpenter* standard, we reach the same result. In terms of the revealing nature of the data, video footage of a person's fenced-in yard can record private and even intimate personal and family activities.[91] It can also "reflect[] a wealth of detail" about the person's life and associations.[92] With respect to the amount of data, pole camera cases typically involve long-duration surveillance which raises the specter of pervasive tracking of personal activities surrounding one's home.[93] The camera creates a comprehensive record of these activities over an extended period of time.[94] Finally, in a fenced-in yard, there is no relevant voluntary exposure to other parties.[95] The homeowner has erected an opaque fence that blocks observation by members of the public. The pole camera is plainly an intruder; there is no public exposure that might arguably justify video surveillance in other scenarios.[96] Under all three of the *Carpenter* factors, pole camera surveillance of a fenced-in yard is a search.

IV. THE HARD CASE: A HOME WITHOUT A FENCE

This Part addresses the harder, more interesting case of video surveillance of a house or yard not surrounded by an opaque fence. It summarizes existing

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[89] *Kyllo*, 533 U.S. at 34 ("We think that obtaining by sense-enhancing technology any information regarding the interior of the home that could not otherwise have been obtained without physical 'intrusion into a constitutionally protected area' constitutes a search—at least where (as here) the technology in question is not in general public use." (quoting Silverman v. United States, 365 U.S. 505, 512 (1961))); *see also Ciraolo*, 476 U.S. at 215 n.3 (noting the government's concession that technology "which discloses to the senses those intimate associations, objects or activities otherwise imperceptible to police or fellow citizens" would likely be too invasive).

[90] *Kyllo*, 533 U.S. at 35 (citation omitted).

[91] *See* People v. Tafoya, 494 P.3d 613, 622–23 (Colo. 2021); Carpenter v. United States, 138 S. Ct. 2206, 2217 (2018); *Oliver*, 466 U.S. at 180 ("At common law, the curtilage is the area to which extends the intimate activity associated with the 'sanctity of a man's home and the privacies of life.'" (quoting Boyd v. United States, 116 U.S. 616, 630 (1886))).

[92] *Tafoya*, 494 P.3d at 622 (quoting United States v. Jones, 565 U.S. 400, 415 (2012) (Sotomayor, J., concurring)).

[93] *See id.* at 622; *Carpenter*, 138 S. Ct. at 2211–12, 2214.

[94] *Tafoya*, 494 P.3d at 623. The data is also stored indefinitely, permitting the government to mine it for information years into the future. *Id.* at 622.

[95] *See Carpenter*, 138 S. Ct. at 2219–20.

[96] *See* discussion *infra* Part IV.B.

law on the subject, and then engages in a fresh analysis of the question, applying both the *Katz* and *Carpenter* frameworks. It ultimately concludes that the differences between a fenced yard and an unfenced yard should not be of constitutional significance in most cases, and that pole camera surveillance should be considered a Fourth Amendment search.

A. *A Survey of Existing Law*

Most courts have held that the video surveillance of a suspect's unfenced yard is not a Fourth Amendment search, although several other courts have held that it is.[97] The fact patterns of the cases discussed here often differ in terms of the duration of the surveillance at issue, the number of cameras used, or the precise areas of a suspect's yard observed by the pole camera. But what drives the divergent outcomes of these cases is primarily the different legal approaches taken by the courts rather than any factual differences.

1. *Cases Finding No Search*

The Sixth Circuit's opinion in *United States v. Houston* is typical of the cases denying Fourth Amendment protection against pole camera surveillance.[98] The court concluded that the Fourth Amendment did not apply to video footage of a yard that could be observed by passersby walking on nearby roads.[99] Any activities in an unfenced yard were publicly exposed and therefore unprotected from camera surveillance.[100] Similar logic has been used by the First and Tenth Circuits and several district courts.[101]

Courts resolving this issue after *Carpenter* have grappled with that decision's impact on the pole camera issue. Courts generally acknowledge that *Carpenter* compels them to analyze the amount and nature of the data collected, and that long-term, high-amount data collection is more likely to be deemed a Fourth Amendment search.[102] But several courts have differentiated

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[97] *See, e.g.*, cases cited *infra* notes 98, 101, 114, 119.

[98] United States v. Houston, 813 F.3d 282, 287–88 (6th Cir. 2016).

[99] *Id.*

[100] *Id.* at 288.

[101] *See* United States v. Bucci, 582 F.3d 108, 116–17 (1st Cir. 2009); United States v. Cantu, 684 F. App'x 703, 704–05 (10th Cir. 2017); United States v. Edmonds, 438 F. Supp. 3d 689, 693–94 (S.D.W. Va. 2020); United States v. Bronner, No. 3:19-cr-109-J-34JRK, slip op. at *24 (M.D. Fla. May 18, 2020); United States v. Tirado, No. 16-CR-168, 2018 WL 1806056, at *3 (E.D. Wis. Apr. 16, 2018); United States v. Mazzara, No. 16 Cr. 576 (KBF), 2017 WL 4862793, at *9 (S.D.N.Y. Oct. 27, 2017); United States v. Gilliam, No. 02:12-cr-93, 02:13-cr-235, 2015 WL 5178197, at *9 (W.D. Pa. Sept. 4, 2015)*; see also* United States v. Powell, 847 F.3d 760, 773 (6th Cir. 2017) (relying on United States v. Houston, 813 F.3d 282 (6th Cir. 2016)).

[102] *See* Carpenter v. United States, 138 S. Ct. 2206, 2211–12, 2214 (2018); *see, e.g.*, United States v. Moore-Bush, 36 F.4th 320, 325–26, 343–44 (1st Cir. 2022); United States v. Tirado, No. 16-CR-168, 2018 WL 3995901, at *2 (E.D. Wis. Aug. 21, 2018); People v.

comprehensive cell-phone location tracking from pole cameras on the basis that the cameras only collect data from a single location.[103]

In *Tuggle*, the Seventh Circuit took a somewhat different approach to pole camera surveillance and to *Carpenter*.[104] The court first argued that *Carpenter* did not necessarily require it to assess the duration of a surveillance practice or how much data it collected.[105] But the court also acknowledged that *Carpenter* and other recent Supreme Court cases had analyzed the duration or amount of surveillance and that such analysis was critical to the reasoning of these cases.[106] Notwithstanding this academic discussion, the court then considered the duration of the surveillance and its revealing nature in a thorough discussion.[107] The court also expressly rejected the argument that the surveillance was constitutional because law enforcement theoretically could have obtained the information by placing an agent on a telephone pole for the same amount of time.[108] It concluded that this was "a fiction that courts should not rely on to limit the Fourth Amendment's protections," one that was especially unrealistic in a case involving more than a year of continual video monitoring.[109] Rather, in practice, the surveillance could only have been accomplished via technological means, and thus whether an individual might in theory observe Tuggle's yard was constitutionally irrelevant.[110] Nonetheless, the court ultimately ruled that the type of data collected by video monitoring of the front of a person's yard was not especially revealing or comprehensive compared to the location data at issue in *Carpenter*.[111] For example, the video record of Tuggle's front yard did not reveal any details about where he traveled, where he

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Tafoya, 494 P.3d 613, 623 (Colo. 2021). One of the concurring opinions in the split case *United States v. Moore-Bush* argued that *Carpenter* did not directly apply to the use of surveillance cameras mounted on utility poles and that prior First Circuit precedent should accordingly control the issue. *Moore-Bush*, 36 F.4th at 363 (Lynch, J., concurring).

[103] United States v. Flores, No. 1:19-CR-364-MHC-JSA, 2021 WL 1312583, at *8 (N.D. Ga. Apr. 8, 2021); *Edmonds*, 438 F. Supp. 3d at 693; *Bronner*, slip op. at *22–24; United States v. Tirado, No. 16-CR-168, 2018 WL 3995901, at *2 (E.D. Wis. Aug. 21, 2018). Many of these courts also emphasize that *Carpenter* expressly declined to opine on surveillance cameras. *See, e.g.*, *Flores*, 2021 WL 1312583, at *8; *Edmonds*, 438 F. Supp. 3d at 693; *Bronner*, slip op. at *22.

[104] *See* United States v. Tuggle, 4 F.4th 505, 519–20, 528 (7th Cir. 2021).

[105] *See id.* at 519–20.

[106] *See id.* at 524; *Carpenter*, 138 S. Ct. at 2217–21; Riley v. California, 573 U.S. 373, 394 (2014).

[107] *Tuggle*, 4 F.4th at 524–25.

[108] *See id.* at 526 (discussing United States v. Houston, 813 F.3d 282, 289 (6th Cir. 2016)).

[109] *Id.*

[110] *See id.* ("We thus close the door on the notion that surveillance accomplished through technological means is constitutional simply because the government could theoretically accomplish the same surveillance—no matter how laborious—through some nontechnological means.").

[111] *Id.* at 524.

shopped, whose homes he visited, or many other intimate details of his life.[112] Based on its lengthy discussion of the revealing nature and amount concepts of *Carpenter*, the court concluded that the pole camera surveillance was not a Fourth Amendment search.[113]

2. *Cases Finding a Search*

On the other side, several courts have held that long-term video surveillance of an unfenced home or yard is a Fourth Amendment search. For example, in *State v. Jones*, the Supreme Court of South Dakota held that approximately two months of continuous video monitoring of a suspect's yard violated the Fourth Amendment.[114] The court found that Jones had a subjective expectation of privacy despite the absence of any attempt to obscure his yard from public view, because he did not anticipate the "24/7 targeted, long-term observation" at issue in the case.[115] This expectation was reasonable because the surveillance at issue was revealing, invasive, and carried out constantly over a long period.[116] The court also noted that the police had observed "something not actually exposed to public view—the aggregate of all of [the defendant's] coming and going from the home, all of his visitors, all of his cars, all of their cars, and all of the types of packages or bags he carried and when."[117] The court thus concluded that the whole of Jones's activities were not in any relevant sense exposed to the public, and remained private until the government surveilled them.[118] Other courts have reached similar holdings.[119]

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[112] *Id.*

[113] *See Tuggle*, 4 F.4th at 526.

[114] State v. Jones, 903 N.W.2d 101, 113 (S.D. 2017).

[115] *Id.* at 110–11; *see also, e.g.*, Commonwealth v. Mora, 150 N.E.3d 297, 306 (Mass. 2020) ("While people subjectively may lack an expectation of privacy in some discrete actions they undertake in unshielded areas around their homes, they do not expect that every such action will be observed and perfectly preserved for the future."); United States v. Anderson-Bagshaw, 509 F. App'x 396, 405 (6th Cir. 2012) ("Few people, it seems, would expect that the government can constantly film their backyard for over three weeks using a secret camera that can pan and zoom and stream a live image to government agents.").

[116] *See Jones*, 903 N.W.2d at 111.

[117] *Id.* (quoting United States v. Garcia-Gonzalez, No. 14-10296-LTS, U.S. Dist. LEXIS 116312, at *5 (D. Mass. Sept. 1, 2015)).

[118] *See id.*

[119] *See* United States v. Houston, 965 F. Supp. 2d 855, 891, 898 (E.D. Tenn. 2013) (holding that the use of a pole camera to observe curtilage for ten weeks violated the Fourth Amendment); Shafer v. City of Boulder, 896 F. Supp. 2d 915, 931–32 (D. Nev. 2012) (holding that the use of a pole camera for fifty-six days violated the Fourth Amendment); People v. Tafoya, 494 P.3d 613, 623 (Colo. 2021) (holding that even the portions of Tafoya's yard that were, in theory, visible through gaps in the fence or from an adjoining building were protected against pole camera surveillance because even publicly exposed information is not reasonably subject to extended and continuous surveillance); *see also Mora*, 150 N.E.3d at 304–06, 312–13 (analyzing pole cameras under both the Fourth Amendment and the Massachusetts Declaration of Rights, before ultimately ruling them unlawful without a

In *Commonwealth v. Mora*, the Massachusetts Supreme Judicial Court discussed *Carpenter* at length and applied several of the *Carpenter* factors in an opinion concluding that pole camera surveillance lasting for two months violated the state constitution.[120] The court discussed the traditional importance of the home as a site of privacy, autonomy, and freedom of association.[121] It then focused on the amount and the revealing nature of data collected by the pole cameras at issue.[122] As to amount, it concluded that prolonged video surveillance of a home "has the potential to generate far more data regarding a person's private life" than location tracking.[123] Such data is also revealing, because it exposes how a person looks and behaves, everyone they meet with at their home, and how they interact.[124] Moreover, pole camera surveillance made long-term surveillance easy and cheap; multiple months of around-the-clock surveillance by actual police officers would have been prohibitively costly.[125] Accordingly, the use of pole cameras to surveil a residence for multiple months was unlawful without a warrant.[126]

B. *Pole Cameras Under* Katz

How should courts assess pole cameras under the *Katz* test? The question, like most questions involving *Katz*, has no obvious answer.[127] Applying the first prong of the *Katz* test is relatively straightforward: people will virtually always have a subjective expectation of privacy in their yards against surreptitious, long-term video surveillance. No one expects to be observed and videotaped every time they leave their house or whenever they are in their yards, and they

warrant under state law); United States v. Garcia-Gonzalez, No. 14-10296-LTS, 2015 U.S. Dist. LEXIS 116312, at *8–9, *11–12, *27 (D. Mass. Sept. 1, 2015) (finding arguments that pole camera surveillance should be a Fourth Amendment search persuasive but ruling according to binding First Circuit precedent); United States v. Moore-Bush, 36 F.4th 320, 345 (1st Cir. 2022) (Barron, C.J., concurring) (opining in a split en banc decision that the use of pole cameras was a search under the principles of *Carpenter*).

[120] *Mora*, 150 N.E.3d at 304–06, 313. The same holding applied to two months of surveillance of another defendant. *Id.* at 305.

[121] *Id.* at 309–10.

[122] *Id.* at 310 ("[O]ur analysis . . . turns on whether the surveillance was so targeted and extensive that the data it generated, in the aggregate, exposed otherwise unknowable details of a person's life.").

[123] *Id.* at 311.

[124] *Id.*

[125] *See id.* 311–12.

[126] *Mora*, 150 N.E.3d at 312–13.

[127] *See, e.g.*, William Baude & James Y. Stern, *The Positive Law Model of the Fourth Amendment*, 129 HARV. L. REV. 1821, 1824–25 (2016); Amitai Etzioni, *Eight Nails into* Katz*'s Coffin*, 65 CASE W. RSRV. L. REV. 413, 413–15 (2014); Daniel J. Solove, *Fourth Amendment Pragmatism*, 51 B.C. L. REV. 1511, 1522–24 (2010).

certainly don't expect it to happen constantly for several months or years.[128] This is obviously, trivially true of most criminal suspects—if they expected to be observed, they would have done their incriminating activities elsewhere. Indeed, many courts simply ignore the first prong of *Katz*.[129]

The determinative question is whether a person's expectation of privacy in their yard against prolonged video surveillance is objectively reasonable. This largely depends on which model or theory of the *Katz* test a court employs.[130] Strictly in terms of probability, the expectation is a reasonable one. While a passerby or neighbor might occasionally look at one's yard, it is extremely improbable that anyone would observe it for an entire day, let alone several months or years.[131] One's yard is curtilage, which is treated as part of the home for Fourth Amendment purposes.[132] And people generally engage in a variety of personal and familial activities in their yards, reasonably expecting that such activities will not be pervasively observed or recorded by others.[133] On a probabilistic theory of *Katz*—one of the most commonly used—pole cameras are a Fourth Amendment search.

On another common theory of *Katz*, however, pole cameras are not a search.[134] The activities in one's yard and driveway, while not actually observed or recorded by others in the aggregate, are in theory exposed to public view. At least prior to *Carpenter* and *United States v. Jones*,[135] publicly exposed activities received little protection in Fourth Amendment caselaw, on the basis that *Katz* did not protect "[w]hat a person knowingly exposes to the public."[136] Arguably, anything that a person does in their yard or driveway is potentially exposed to the public, even if the aggregate of those activities may not be exposed as a practical matter. On this account, any expectation of privacy that an individual has in their yard is not reasonable.

There are essentially no guidelines in *Katz* or its progeny that would dictate which approach courts should take, which is one reason courts are split on the question. A court assessing pole camera surveillance might hold that several months' worth of activities in one's yard are probabilistically private—virtually

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[128] *Cf.* United States v. Tuggle, 4 F.4th 505, 511 (7th Cir. 2021) (eighteen months); *Mora*, 150 N.E.3d at 310–11 (up to five months).

[129] Kerr, *Subjective Expectations*, *supra* note 33, at 122.

[130] *See* Kerr, *Four Models*, *supra* note 36, at 507–22 (discussing various theories of the *Katz* test).

[131] Many courts have reached a similar conclusion. *E.g.*, *Mora*, 150 N.E.3d at 306.

[132] *See* Florida v. Jardines, 569 U.S. 1, 6 (2013).

[133] *E.g.*, Oliver v. United States, 466 U.S. 170, 180 (1984).

[134] *See* Kerr, *Four Models*, *supra* note 36, at 512–14 (discussing the "private facts" model of *Katz*).

[135] *See* United States v. Jones, 565 U.S. 400, 430 (2012) (Alito, J., concurring in judgment). Four Justices endorsed Justice Alito's concurrence, although Sotomayor did not officially join it. *See id.* at 414–15, 418 (Sotomayor, J., concurring).

[136] Katz v. United States, 389 U.S. 347, 351 (1967); *see* United States v. Knotts, 460 U.S. 276, 281 (1983) ("A person traveling in an automobile on public thoroughfares has no reasonable expectation of privacy in his movements from one place to another.").

no one expects to be observed in this fashion—and therefore are protected by the Fourth Amendment.[137] Or the court might rule that any expectation of privacy is unreasonable because activities in one's yard are publicly exposed.[138] The *Katz* test famously does not constrain courts to one theory or another, and courts seem to choose among the interpretative models of the test as they see fit.[139] Accordingly, *Katz* is often of limited use in addressing novel Fourth Amendment questions like this one.[140]

C. *Pole Cameras Under* Carpenter

The *Carpenter* framework offers more concrete guidance on the question of pole cameras, although the issue is still a difficult one. Ultimately, *Carpenter* reveals that the use of pole cameras for prolonged video surveillance of a home or yard is a Fourth Amendment search, presumptively requiring a warrant.[141] As discussed above, the most prevalent and influential *Carpenter* factors are the revealing nature of the data, the amount of data collected, and whether the data was voluntarily disclosed to others.[142] The following sections analyze pole cameras under these principles.

1. *Revealing Nature*

The video data collected by pole cameras can easily reveal private details about a target's life.[143] It can also capture somewhat intimate or familial activities and provide a detailed visual record of them.[144] Cases distinguishing *Carpenter* and finding no Fourth Amendment search typically emphasize that video surveillance by one or two pole cameras with fixed positions does not provide the comprehensive portrait of a person's life provided by cell phone location tracking.[145] But while pole camera video does not provide comprehensive data, the data it collects is more detailed and sensitive than a cell

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[137] *See* cases cited *supra* note 119.

[138] *See* cases cited *supra* note 101.

[139] *See* Matthew B. Kugler & Lior Jacob Strahilevitz, *Actual Expectations of Privacy, Fourth Amendment Doctrine, and the Mosaic Theory*, 2015 SUP. CT. REV. 205, 221–22; Kerr, *Four Models*, *supra* note 36, at 504–06.

[140] Tokson, Carpenter *Test*, *supra* note 15, at 5–6.

[141] *See* Carpenter v. United States, 138 S. Ct. 2206, 2220 (2018); Tokson, Carpenter *Test*, *supra* note 15, at 9.

[142] *See supra* notes 41–42 and accompanying text.

[143] *Cf. Carpenter*, 138 S. Ct. at 2217–18 (discussing the revealing nature of location data); Riley v. California, 573 U.S. 373, 403 (2014) (discussing the private nature of data stored on a cell phone).

[144] *See* cases cited *supra* note 143.

[145] *See, e.g.*, United States v. Flores, No. 1:19-CR-364-MHC-JSA, 2021 WL 1312583, at *8 (N.D. Ga. Apr. 8, 2021).

phone's approximate location.[146] As the Supreme Court acknowledged, cell site location information is typically less precise than GPS information, and could only place Carpenter within a wedge-shaped sector ranging from one-eighth of a mile to four square miles.[147]

By contrast, video of a person in their yard or on their porch is precise. It can also be sensitive, capturing video of a person kissing their spouse (or not their spouse) or playing with their children.[148] And it is revealing of the details of their life. It creates a detailed visual record of every time any resident leaves or returns to their home; every visitor who enters the home and exactly when they arrive and leave; the license plate numbers of their cars; every package, bag, or other item that enters or leaves the house; and a detailed visual record of everything that occurs in the yard or porch or driveway.[149] Similar to the data at issue in *Carpenter*, these video records can "generate 'a wealth of detail about [the home occupant's] familial, political, professional, religious, and sexual associations.'"[150] To be sure, government officers may have to use other information in combination with the video footage to infer some things about the target. But the same was true in *Carpenter*, where the court emphatically "rejected the proposition that 'inference insulates a search,'"[151] and acknowledged that cell phone location data was most revealing "in combination with other information."[152]

Ultimately, to gaze unceasingly with an advanced surveillance camera at a person's home gives the government remarkable insight into the details of their life—and the remarkable power that comes with such omniscience.[153] As one court eloquently put it:

> The surveillance captured all types of intimate details of life centered on [the target's] home. The agents saw when he came and went. . . . They saw with whom he traveled. They identified both his frequent and

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[146] *See* Andrew Guthrie Ferguson, *Persistent Surveillance*, 74 ALA. L. REV. (forthcoming 2023) (manuscript at 18–19) (on file with author).

[147] *Carpenter*, 138 S. Ct. at 2218.

[148] *See generally* Bignami v. Serrano, No. 18 MISC.000323 (KCL), 2020 WL 2257312, at *13–14 (Mass. Land Ct. May 7, 2020) (discussing the intrusiveness of video recordings of parents and children). Likewise, in the *Tuggle* case, the cameras recorded Tuggle urinating in his front yard. Brief for Respondent-Appellant at 21–22, United States v. Tuggle, 4 F.4th 505 (7th Cir. 2021) (No. 2:16-CR-20070-JES-JEH-1).

[149] *See* United States v. Tuggle, 4 F.4th 505, 511–12 (7th Cir. 2021).

[150] State v. Jones, 903 N.W.2d 101, 112 (S.D. 2017) (quoting United States v. Jones, 565 U.S. 400, 415 (2012) (Sotomayor, J., concurring)).

[151] *Carpenter*, 138 S. Ct. at 2218 (quoting Kyllo v. United States, 553 U.S. 27, 36 (2001)).

[152] *Id.*

[153] *See* Paul Ohm, *The Fourth Amendment in a World Without Privacy*, 81 MISS. L.J. 1309, 1334 (2012) (conceptualizing Fourth Amendment law through the lens of government and private power); Daniel J. Solove, *Privacy and Power: Computer Databases and Metaphors for Information Privacy*, 53 STAN. L. REV. 1393, 1399 (2001) (focusing on power disparities in an account of the functions of informational privacy).

> infrequent visitors. They identified the cars each of them drove. They saw how he dressed every day. They saw what he carried in and out of his home, even when he carried out his trash. They knew when he stayed home and when he did not. . . . Although the officers never entered the home, and never set foot on private property, the pole camera was akin to stationing a police officer at the front door by whom every person and object must pass.[154]

Such thorough surveillance violates the sanctity of the home and the right of an individual to retreat there and be free from unreasonable government intrusion.[155] Not only the activities within the curtilage, but the activities of the home and its occupants, are exposed to government scrutiny. Such revealing, intrusive surveillance typically implicates the Fourth Amendment.[156]

2. *Amount*

The amount of data collected by pole cameras will vary based on the particular facts of the case, including the number of cameras used and the duration of the surveillance.[157] But generally, pole camera surveillance is conducted across several weeks, months, or years and accordingly collects a great deal of data over time.[158] In *Mora*, for example, the police surveilled one suspect's home constantly for roughly five months.[159] This amounts to approximately 219,000 minutes of video footage.[160] This enormous quantity of footage was stored indefinitely and saved in a searchable format for the police to peruse via a web-based browser.[161] Under any analysis, this is a substantial quantity of data. As discussed in *Carpenter*, such large amounts of data increase

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[154] United States v. Garcia-Gonzalez, No. 14-10296-LTS, 2015 U.S. Dist. LEXIS 116312, at *15–16 (D. Mass. Sept. 1, 2015) (citations omitted).

[155] *See* Florida v. Jardines, 569 U.S. 1, 6 (2013).

[156] *See, e.g.*, *Carpenter*, 138 S. Ct. at 2217; Kyllo v. United States, 533 U.S. 27, 37 (2001); Commonwealth v. Duncan, 817 A.2d 455, 463 (Pa. 2003); State v. McKinney, 60 P.3d 46, 51 (Wash. 2002).

[157] Other variables might include whether the cameras were capable of capturing video at night or had audio recording capability. *See, e.g.*, United States v. Tuggle, 4 F.4th 505, 511 (7th Cir. 2021) (describing the use of cameras capable of recording at night though unable to capture sound); State v. Jones, 903 N.W.2d 101, 104 (S.D. 2017) (discussing the night recording capabilities of a pole camera).

[158] *See, e.g.*, Commonwealth v. Mora, 150 N.E.3d 297, 302 (Mass. 2020); *Tuggle*, 4 F.4th at 511; *Jones*, 903 N.W.2d at 104.

[159] *Mora*, 150 N.E.3d at 302.

[160] *See id.* If we ignore one-third of this quantity to account for nighttime video, that still leaves 146,000 minutes of video. Also, nighttime video would still be useful so long as headlights or streetlights provided some visibility for the camera.

[161] *Id.* at 302–03.

the potential for invasions of the target's privacy.[162] The more data the government collects about an individual, the more they can learn and infer about every aspect of their lives.[163]

Even substantially shorter periods of pole camera surveillance would likely collect enough data to indicate a Fourth Amendment search under *Carpenter*. For example, in *Shafer v. City of Boulder*, the court held that fifty-six days of constant video surveillance violated the Fourth Amendment, in part because of its "omnipresence and lengthy duration."[164] The roughly 80,640 minutes of video footage collected by this camera indeed constitutes a substantial amount of data. Under *Carpenter*, such large quantities of data threaten personal privacy and likely implicate the Fourth Amendment.[165]

3. *Voluntary Disclosure*

The third factor looks to whether a person has voluntarily disclosed information to another party or parties. This factor is less determinative than the other two in the context of pole camera surveillance. Activities conducted in an unfenced yard or driveway are in some sense exposed to other people, in that others may hypothetically view them. So when a person enters or leaves their house, or talks to someone on their porch, those activities could be considered exposed to others under a *Carpenter* analysis.[166] To be sure, the aggregate of all those activities is not exposed to any other party.[167] But assuming that a court is weighing voluntary disclosure as just one of several factors to be considered,[168]

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[162] *See* Carpenter v. United States, 138 S. Ct. 2206, 2220 (2018); Tokson, *supra* note 24, at 18; Stephen E. Henderson, *Fourth Amendment Time Machines (and What They Might Say About Police Body Cameras)*, 18 U. PA. J. CONST. L. 933, 960–61 (2016).

[163] *See Mora*, 150 N.E.3d at 311 ("The longer the surveillance goes on, the more the boundary between that which is kept private, and that which is exposed to the public, is eroded."); Tokson, *supra* note 24162, at 20; Daphna Renan, *The Fourth Amendment as Administrative Governance*, 68 STAN. L. REV. 1039, 1056 (2016); David Gray & Danielle Citron, *The Right to Quantitative Privacy*, 98 MINN. L. REV. 62, 90 (2013); Daniel J. Solove, *Digital Dossiers and the Dissipation of Fourth Amendment Privacy*, 75 S. CAL. L. REV. 1083, 1112, 1154 (2002).

[164] Shafer v. City of Boulder, 896 F. Supp. 2d 915, 932 (D. Nev. 2012). The camera at issue also had infrared capabilities and was capable of nighttime operation. *Id.*

[165] *See Carpenter*, 138 S. Ct. at 2219*; see also* United States v. Jones, 565 U.S. 400, 430 (2012) (Alito, J., concurring in judgment); U.S. Dep't of Just. v. Reps. Comm. for Freedom of the Press, 489 U.S. 749, 764, 770 (1989).

[166] *See Carpenter*, 138 S. Ct. at 2219–20.

[167] *See supra* note 131 and accompanying text. Likewise, "[a] person does not surrender all Fourth Amendment protection by venturing into the public sphere" or even traveling on public streets. *Carpenter*, 138 S. Ct. at 2217, 2220.

[168] *See* Tokson, Carpenter *Test*, *supra* note 15, at 10 (proposing that courts adopt such an approach).

it might not be unreasonable to weigh it in favor of the government in the context of an unfenced yard.[169]

However, the activities recorded by pole camera observation may not be *voluntarily* exposed, even if they are in theory viewable by others. That is, residents may have no choice but to conduct personal or revealing activities in their yards or driveways. Certainly, people living a normal life have no choice but to leave their home and then return to it; to have others visit their home and then leave it; to carry items into and out of their homes; and to spend time with their families or friends in their yards and porches. These activities are no more optional for most people than owning a cell phone.[170]

It might be objected that by declining to build a fence obscuring their entire yard, a homeowner is voluntarily disclosing their activities to others. There are several problems with such an argument. First, if courts wish to make fence construction the crux of the voluntary disclosure inquiry, they must engage in a detailed factual analysis to determine whether a target actually had the option to build a fence. There are numerous scenarios where residents of homes will not have the choice to construct a fence around the entirety of their yards. For instance, people who rent their homes rather than own them, or who reside in a home owned by someone else, likely cannot erect a fence. Likewise, some homeowners are barred by local zoning rules or HOA regulations from building fences obscuring their yards.[171] In addition, many homeowners will be unable to pay for a new fence to surround their entire property, which typically costs several thousand dollars.[172] These individuals do not voluntarily disclose their activities in the curtilage to public view; they have no real choice.

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[169] In other words, activities occurring in the curtilage of the home over long periods of time may not actually be exposed to anyone, and their privacy should not be deemed forfeit. But they are arguably not as closely guarded as the location data that users involuntarily and in most cases unknowingly transmit to their cell phone company. *See Carpenter*, 138 S. Ct. at 2220.

[170] *See id.* (discussing how people have little choice but to own cell phones).

[171] *See, e.g.*, Ilyce Glink & Samuel J. Tamkin, *If a Homeowners Association Approves a Too-Tall Fence, Neighbors Won't See Eye to Eye*, WASH. POST (June 15, 2020), https://www.washingtonpost.com/business/2020/06/15/if-homeowners-association-approves-too-tall-fence-neighbors-wont-see-eye-to-eye [https://perma.cc/98CV-8BNK] (noting that some HOAs prohibit the construction of fences); *Homeowners Association Etiquette: Fencing Tips to Avoid Disputes*, HIGNELL HOA MGMT. (Feb. 28, 2015), https://blog.hignellhoa.com/homeowners-association-etiquette-fencing-tips-to-avoid-disputes [https://perma.cc/69M3-VPXF] (noting that fencing may be prohibited in corner lots and giving a typical height limit of four feet for front yards, insufficiently high to obscure street views).

[172] *See, e.g.*, *How Much Does It Cost to Build a Fence?*, HOMESERVE (Feb. 27, 2021), https://www.homeserve.com/en-us/blog/cost-guide/fence-installation [https://perma.cc/DF78-YAPN]; Brie Greenhalgh, *How Much Does Fence Installation Cost?*, BOB VILA, https://www.bobvila.com/articles/fence-installation-cost [https://perma.cc/PN7Z-5TYN] (July 29, 2022).

Second, homeowners should not be forced to erect opaque fences in order to have some measure of privacy in the curtilage of their homes.[173] That is, Fourth Amendment law should not incentivize residents to engage in costly and unwanted measures just to avoid intrusive government surveillance.[174] Nor should homeowners forfeit their constitutional rights simply because they wish to view the world, rather than the slats of a tall fence, from their windows. Indeed, many homeowners derive substantial benefit from having a yard open to the neighborhood, unobscured by fencing.

The better approach to the voluntary disclosure inquiry is to weigh it in favor of many home residents, on the grounds that they have little choice but to disclose their comings and goings and the activities surrounding their homes. The precise analysis will vary with the facts. Residents who do not own their home likely cannot build a fence there and cannot help but expose their activities to public view. Homeowners with means who choose not to build a fence may get less credit, but still should not be penalized for failing to wall themselves off from the world. Residents who throw loud parties in their yards might be deemed to have voluntarily exposed their activities to a greater degree than residents who occasionally converse with visitors on their porch. In any event, given the difficulty of reaching a clear assessment of voluntariness in the pole camera context, the first two *Carpenter* factors should likely be given greater weight.[175] In virtually all real-world cases, those two factors point to the conclusion that pole camera surveillance is a Fourth Amendment search.

a. *A Brief Note on Cost*

In addition to the three factors addressed here, the *Carpenter* opinion also mentioned the low cost of cell phone location tracking.[176] Cost has been addressed in several lower court cases applying *Carpenter*, although substantially less often than the other three factors.[177] It is worth analyzing here, in part because it is conceptually related to amount.[178] When the government is able to capture large amounts of data at low cost, the potential for large-scale surveillance raises concerns about individual liberty and government power.[179] Assessing cost can also help courts to determine the potential for government

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[173] The curtilage of the home is generally considered to be "part of the home itself for Fourth Amendment purposes." Florida v. Jardines, 569 U.S. 1, 6 (2013) (quoting Oliver v. United States, 466 U.S. 170, 180 (1984)).

[174] *See generally* Matthew Tokson, *Inescapable Surveillance*, 106 CORNELL L. REV. 409, 433–37 (2021) (arguing that judicial reliance on concepts of inescapability in Fourth Amendment law creates harmful incentives).

[175] *See* Tokson, Carpenter *Test*, *supra* note 15, at 2.

[176] Carpenter v. United States, 138 S. Ct. 2206, 2217–18 (2018).

[177] *See* Tokson, *Aftermath of* Carpenter, *supra* note 16, at 1823–24.

[178] *Id.* at 1833.

[179] *Id.* at 1804.

abuses of new surveillance practices.[180] High-cost surveillance tends to be especially visible to other political or legal actors, whereas low-cost surveillance often operates with little oversight and is prone to overuse and abuse.[181]

The exact costs of pole camera surveillance will depend on the facts of a given case.[182] But under virtually any set of assumptions, the cost will be relatively low, especially compared to the cost of employing police officers to gather the same information in person.[183] This is particularly clear for long-term surveillance, as the cost per day of pole camera surveillance drops over time.[184] Moreover, police departments will often be able to borrow or reuse existing cameras.[185] While not dirt cheap, pole camera surveillance is a fairly low-cost form of surveillance, capable of widespread use and potential abuse. This further supports the conclusion that pole camera surveillance endangers personal security and implicates the Fourth Amendment.

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[180] Tokson, *supra* note 24162, at 24.

[181] *Id.*; *see also* United States v. Jones, 565 U.S. 400, 415–16 (2012) (Sotomayor, J., concurring) (expressing concern that GPS tracking was so "cheap in comparison to conventional surveillance techniques" that it would evade "the ordinary checks that constrain abusive law enforcement practices: 'limited police resources and community hostility'" (quoting Illinois v. Lidster, 540 U.S. 419, 426 (2004)). Low-cost surveillance can also have benefits, allowing the police to prevent crimes efficiently without necessarily increasing privacy harms to individuals. *See* RIC SIMMONS, SMART SURVEILLANCE: HOW TO INTERPRET THE FOURTH AMENDMENT IN THE TWENTY-FIRST CENTURY 19–20 (2019).

[182] *See supra* notes 55–61 and accompanying text.

[183] In many cases, police departments will be able to borrow or obtain a pole camera free of charge. *See* Ardoin, *supra* note 57. The installation and maintenance of a pole camera might cost roughly $600 per year. *See id.* Police officers employed by local governments make roughly $34 per hour on average, according to the Bureau of Labor Statistics. *Occupational Employment and Wages, May 2021*, U.S. BUREAU OF LAB. STAT., https://www.bls.gov/oes/current/oes333051.htm [https://perma.cc/7LQW-VZFE] (Mar. 31, 2022). At that wage, the cost of employing police officers to monitor a suspect's yard for a day would exceed that of installing a pole camera. Even if the department were to purchase a high-end pole camera specifically for the investigation (and then never use the camera again), that would add about $5,000 to the bill (or roughly $200 for a commercially available camera). *See* sources cited *supra* notes 55–56. A week of in-person monitoring would be more expensive than the total cost of purchasing and installing a high-end camera. The cost difference becomes dramatic over periods of a month or several months, as the cost per day of video monitoring drops. The cost of employing officers to watch the collected video later is unlikely to change the calculus much, as the officers can fast forward to times when activity occurs in the yard, or the camera may identify times when it detects motion or swivels the lens to follow a moving object. *See Pole Cameras*, *supra* note 51 (offering video analytics that include the ability to send alerts or alarms to police to inform them of movement).

[184] *See* Ardoin, *supra* note 57.

[185] *See id.*

V. LESSONS AND IMPLICATIONS

By analyzing the legal implications of a novel surveillance practice, this Article sheds light on both pole camera surveillance and Fourth Amendment law in general. This is especially necessary because Fourth Amendment law is in a transitional phase, as courts struggle to apply the overlapping and at times conflicting concepts of *Katz* and *Carpenter*.[186] This Article aims to clarify the law by applying it in a real-world context.

This exercise reveals, among other things, that the *Katz* test is fairly unhelpful for resolving novel Fourth Amendment questions.[187] Over the years, the Supreme Court has interpreted *Katz*'s ambiguous standard in so many ways that virtually any outcome is plausible under *Katz* and its progeny.[188] There is no single model or theory of *Katz*—rather there are multiple, conflicting models, which courts can pick and choose from at will.[189] *Katz* works best in a case-by-case fashion, as the Supreme Court gradually addresses whether various surveillance practices are searches or non-searches, and lower courts apply its precedents accordingly.[190] But *Katz*'s usefulness as a forward-looking test, at least for difficult questions, is negligible.

The *Carpenter* test is generally clearer and offers more concrete guidance to courts facing new Fourth Amendment questions. This is likely the reason lower courts have applied it to a wide variety of Fourth Amendment issues ranging well beyond location tracking.[191] It can also add some rigor to the evaluation of new surveillance practices, focusing courts' analysis on discernable facts in well-defined categories. At the least, judges addressing high volumes of revealing data not voluntarily disclosed to others will find it difficult to withhold Fourth Amendment protection under *Carpenter*.[192] The *Carpenter* test is a real standard, with teeth.

This is not to say that *Carpenter*'s factors will always be easy to apply. For example, the voluntariness prong of *Carpenter* can be difficult to apply cleanly, at least in the context of pole camera surveillance. Many activities that people

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[186] Tokson, Carpenter *Test*, *supra* note 15, at 1–2.

[187] *See* Ohm, *supra* note 153, at 1325–26 (discussing *Katz*'s unsuitability for the internet age); Solove, *supra* note 127, at 1522–24 (discussing the difficulty of applying *Katz*).

[188] *See* Kerr, *Four Models*, *supra* note 36, at 525–26.

[189] *Id.*; Tokson, Carpenter *Test*, *supra* note 15, at 1–3.

[190] Ronald J. Allen & Ross M. Rosenberg, *The Fourth Amendment and the Limits of Theory: Local Versus General Theoretical Knowledge*, 72 ST. JOHN'S L. REV. 1149, 1198–200 (1998).

[191] Tokson, Carpenter *Test*, *supra* note 15, at 10.

[192] *See, e.g.*, United States v. Diggs, 385 F. Supp. 3d 648, 661 (N.D. Ill. 2019); State v. Eads, 154 N.E.3d 538, 548–49 (Ohio Ct. App. 2020). Likewise, judges addressing small quantities of unrevealing information voluntarily disclosed to others will find it difficult to extend Fourth Amendment protection. *See, e.g.*, United States v. Tolbert, 326 F. Supp. 3d 1211, 1225 (D.N.M. 2018); People v. Alexander, No. 2-18-0193, 2021 WL 912701, at *5 (Ill. App. Ct. Mar. 10, 2021).

undertake could be considered voluntary or involuntary, depending on how abstractly one views them. The individual act of putting on nice clothes and walking to one's car is voluntary; the broader practice of leaving one's house to go interact with other people is not. Moreover, a crude application of the voluntariness prong threatens to penalize people without the means or legal authority to build a fence surrounding their entire yard.[193] Even a more sophisticated approach to voluntariness, which takes finances and homeownership into account, may create harmful incentives for homeowners.[194] It may, for instance, penalize them for failing to build costly and unwanted fences.[195] These harmful incentives will often arise when courts unduly emphasize the voluntariness of information disclosure.[196]

Finally, while pole cameras raise novel Fourth Amendment questions, they also implicate classic Fourth Amendment principles involving the power of the government and the sanctity of the home. The combination of sophisticated cameras and constant monitoring can reveal a great deal about a home and its curtilage.[197] As cases like *Jardines* remind us, pervasive surveillance of the curtilage ultimately becomes pervasive surveillance of the home.[198] Observing everything and everyone that enters and exits a house allows one to "see," at least in part, inside of the house.

Such continuous observation would permit the government to scrutinize and exert control over its citizens. If knowledge is power, the ability to videotape one's citizens whenever they enter, leave, or are near a dwelling is an awesome power indeed. It reveals the details of their lives and associations, creating a constant, visual record of their home-related activities. It also exerts power over their property, dispelling their privacy and eliminating the dominion they once had over their curtilage. As this Article demonstrates, the Fourth Amendment imposes constitutional limits on this remarkable power.

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193 *See* Commonwealth v. Mora, 150 N.E.3d 297, 306 (Mass. 2020) ("[R]equiring defendants to erect physical barriers around their residences before invoking the protections of the Fourth Amendment and art. 14 would make those protections too dependent on the defendants' resources.").

194 *See supra* note 174 and accompanying text.

195 *See id.*

196 *See* Tokson, *supra* note 174, at 433–37.

197 *See supra* Part IV.C.

198 *See* Florida v. Jardines, 569 U.S. 1, 6 (2013) (noting that the Fourth Amendment right against home surveillance "would be of little practical value" if the State's agents could search extensively for evidence in the curtilage); Kyllo v. United States, 533 U.S. 27, 35–36 (2001) (holding that a thermal imager that captured only heat emanating from the outside of the home nonetheless violated a defendant's Fourth Amendment rights in the home); United States v. Garcia-Gonzalez, No. 14-10296-LTS, 2015 U.S. Dist. LEXIS 116312, at *16 ("Although the officers never entered the home, and never set foot on private property, the pole camera was akin to stationing a police officer at the front door by whom every person and object must pass.").