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IN GENERAL PUBLIC USE: AN UNNECESSARY TEST IN FOURTH AMENDMENT SEARCHES USING ADVANCED SENSING TECHNOLOGY

*Mike Petridis**

I. INTRODUCTION

*Kyllo v. United States*¹ created a rule with an unnecessary test that can allow law enforcement to search a home, a person's castle, without a warrant. The *Kyllo* rule states: "[O]btaining 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 . . . the technology in question is not in general public use."² This rule was intended to be forward-looking and anticipate future technology.³ However, the "general public use" test is a loophole that can be used by future law enforcement officers to conduct warrantless searches of homes in violation of Fourth Amendment principles.

Danny Kyllo's ("Kyllo") home was scanned by an Agema Thermovision 210, a thermal imager after law enforcement officials suspected him of growing marijuana.⁴ The scan of the home determined that certain areas of the house were at a higher temperature than surrounding homes.⁵ The temperature difference indicated a

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¹ 533 U.S. 27 (2001).

² *Id.* at 34 (citation omitted).

³ *Id.* at 36. "[T]he rule we adopt must take account of more sophisticated systems that are already in use or in development." *Id.*

⁴ *Id.* at 29.

⁵ *Id.* at 30.

strong possibility Kyllo was running halide lights,⁶ which are used in the growing of marijuana.⁷ Based on the thermal imaging, informants, and utility bills, the law enforcement officials were able to obtain a search warrant for Kyllo's home.⁸ Agents found more than 100 marijuana plants.⁹ Prosecutors indicted Kyllo with one count of manufacturing marijuana.¹⁰ Kyllo moved to suppress the evidence,¹¹ but suppression was unsuccessful, and Kyllo "entered a conditional guilty plea."¹² As a result, "[t]he Court of Appeals for the Ninth Circuit remanded the case for an evidentiary hearing regarding the intrusiveness of thermal imaging."¹³ On remand, the District Court of Oregon found that the Agema 210 "is a non-intrusive device that emits no rays or beams and shows a crude visual image of the heat being radiated from the outside of the house."¹⁴ The Ninth Circuit Court of Appeals then held that Kyllo had no subjective expectation of privacy in regard to the heat leaving his home, and there was "no objectively reasonable expectation of privacy because the imager did not expose any intimate details."¹⁵ However, the Supreme Court held that the Agema 210 scan was a search under the Fourth Amendment because a device that is not in "general public use" explored details of a home that could only be found through physical intrusion.¹⁶

This Note will examine how the "general public use" test creates a loophole that allows for unwarranted searches that violate the purpose of the Fourth Amendment. Section II will examine the

⁶ Metal halide lights are commonly used for indoor growing because they produce a broad spectrum of light which is useful for growing plants. Kevin Espiritu, *Metal Halide Grow Lights Explained and Reviewed*, EPIC GARDENING, <https://www.epicgardening.com/metal-halide-grow-lights/> (last updated May 20, 2019). Halide lights work by creating an electrical arc to ionize mercury and halide. This chemical process requires a lot of power to run and 75% of the light produced is heat. *Metal Halide Lamps*, EDISON TECH CTR., <https://edisontechcenter.org/metalhalide.html> (last visited May 6, 2020); see also Bill Bernhardt, *Metal Halide Bulbs: Workhorses of the Industry*, CANNABIS CULTIVATION TODAY (July 27, 2016), <https://cannabisindustryinstitute.com/news/metal-halide-bulbs-workhorses-of-the-industry/>.

⁷ *Kyllo*, 533 U.S. at 30.

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.* at 31.

¹⁶ *Id.* at 40.

original reasons behind the Fourth Amendment. These reasons will then be applied to crafting a principle of Fourth Amendment jurisprudence. Section III will provide the history and evolution of the property-based analysis of the Fourth Amendment. Section IV will provide an overview of current “see through the wall” technology available to law enforcement. In addition, this Note will compare thermal imaging as it was when the Court decided *Kyllo* and the current state of thermal imaging. Section V will examine Supreme Court cases that involved advanced technology relative to the time the Court decided the case. These cases might provide guidelines on how a court should handle advanced sensing technology. Section VI will explore how lower courts have dealt with the “general public use” test. Except for a brief mention in a footnote, the Supreme Court did not provide any definition or formula to determine when the technology is in general public use.¹⁷ The lower courts have struggled to use this test and instead avoid it entirely and rule on cases using other elements of the case. Section VI will discuss and then provide a workable definition of the “general public use” test. Section VIII will explain why the property analysis is the proper framework to analyze advanced sensing technology. Section IX will conclude by proposing that to preserve the spirit of the Fourth Amendment, the Supreme Court should eliminate the “general public use” test and only use the property test.

II. WHAT IS THE PRINCIPLE OF THE FOURTH AMENDMENT?

To understand the principle of the Fourth Amendment, it is important to discuss the events that influenced the Framers and the initial applications of the Fourth Amendment. The Fourth Amendment provides:

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.¹⁸

¹⁷ *Id.* at 39 n.6.

¹⁸ U.S. CONST. amend. IV.

Searching for the original meaning in an amendment provides inherent difficulties because the Framers “had no opportunity to confront them [modern practices] or to consider the fundamentally different social conditions of today.”¹⁹ However, courts can reasonably ascertain the intent of the Framers through their words, the historical context, and the final draft of the Amendment.²⁰ John Adams advised that “[i]n unforeseen cases, that is, when the state of things is found such as the author of the disposition has not foreseen, and could not have thought of, we should rather follow his intention than his words, and interpret the act as he himself would have interpreted it.”²¹

The Framers created the Fourth Amendment to protect against general warrants²² and writs of assistance.²³ The “English customs officers enforced promiscuous searches vigorously and often in the American colonies.”²⁴ Those searches heavily influenced “the Fourth Amendment’s framers when they rejected general warrants in 1789.”²⁵ Search and seizure of colonial ships were extensive because “[t]he same statute that codified writs of assistance in 1662 enabled British customs officers to search everything afloat at all times and without warrant.”²⁶ In June 1768, the British seized John Hancock’s ship *Liberty*.²⁷ The British seized the ship on “two separate counts of smuggling,”²⁸ but Bostonians protested that the *Liberty* was seized

¹⁹ James J. Tomkovicz, *Beyond Secrecy for Secrecy’s Sake: Toward an Expanded Vision of the Fourth Amendment Privacy Province*, 36 HASTINGS L.J. 645, 671 (1985) (citing Anthony G. Amsterdam, *Perspectives on the Fourth Amendment*, 58 MINN. L. REV. 349, 396 (1974)).

²⁰ See *infra* notes 43-63 and accompanying text.

²¹ Thomas K. Clancy, *The Framers’ Intent: John Adams, His Era, and the Fourth Amendment*, 86 IND. L.J. 979, 1060 (2011) (citation omitted) [hereinafter *Framers’ Intent*].

²² “The general warrant, issued by a magistrate, provided government officials with an unlimited ability to search the home of anyone listed in the warrant, regardless of the nature of the violation alleged.” Quin M. Sorenson, Comment, *Losing a Plain View of Katz: The Loss of a Reasonable Expectation of Privacy Under the Readily Available Standard*, 107 DICK. L. REV. 179, 181 n.14 (2002).

²³ “The writ of assistance is most easily described as a form of a general warrant. Under a writ of assistance, issued by a magistrate, customs officials could engage in arbitrary and effectively limitless searches of any home in which they suspected that prohibited goods may be located.” *Id.* at 181 n.15.

²⁴ WILLIAM J. CUDDIHY, *THE FOURTH AMENDMENT: ORIGINS AND ORIGINAL MEANING*, 602-1791, at 258 (2009).

²⁵ *Id.*

²⁶ *Id.* at 419 (citing 13 and 14 Charles II, c.11, sec. 4 (1662), *S.L.*, vol. 8, pg. 80).

²⁷ *Framers’ Intent*, *supra* note 21, at 1019.

²⁸ CUDDIHY, *supra* note 24, at 589 n.54 (citation omitted).

with insufficient probable cause.²⁹ The evidence that supported the seizure was circumstantial,³⁰ and the colonists felt the seizure was politically motivated.³¹ The uproar led to British troops being sent to Boston.³² The result was the Boston Massacre in March 1770.³³ During the American Revolution a few years later, the American rebels used general warrants to aid in the revolution against Britain.³⁴

A Massachusetts law in 1777, which was used to identify Loyalists, allowed “the council to declare any person dangerous to the state, and authorized warrants by which sheriffs could ‘break open any dwelling house or other building’ in which they suspected that such a person was concealed.”³⁵ In New York, “the Albany Committee of Correspondence allowed a colonel to ‘search . . . such places and Houses as he shall think proper’ for deserters from his detachment.³⁶ The largest search performed during the revolution targeted the Philadelphia Quakers.³⁷ The Continental Congress asked the Supreme Executive Council of Pennsylvania to “search the house of every Philadelphian of dubious loyalty and disarm him.”³⁸ The Continental Congress then passed a second resolve sent to every state government and advised them to seize every Quaker and their papers.³⁹ After the war, the general warrant “remained the orthodox mode of search and seizure in five states: New York, Maryland, both Carolinas, and Georgia.”⁴⁰ A general warrant was based on information provided under oath; however, the general warrant provided its bearer “‘to enter into and search . . . all cellars, shops, warehouses, and suspected places,’ using force if necessary.”⁴¹

²⁹ *Id.* at 589 (“[T]he Liberty, had been seized without ‘any probable cause of seizure that we know of.’” (citation omitted)).

³⁰ *Id.* at 590.

³¹ *Framers’ Intent*, *supra* note 21, at 1019-20; CUDDIHY, *supra* note 24, at 590.

³² *Framers’ Intent*, *supra* note 21, at 1019 (citing *Admiralty-Revenue Jurisdiction*, *Editorial Note*, in 2 *LEGAL PAPERS OF JOHN ADAMS* 106, at 98, 103 (L. Kinvin Wroth & Hiller B. Zobel eds., 1965)).

³³ *Id.* (citing *LEGAL PAPERS OF JOHN ADAMS*, *supra* note 32, at 98, 103).

³⁴ *See* CUDDIHY, *supra* note 24, at 613-23.

³⁵ *Id.* at 614 (citation omitted).

³⁶ *Id.* at 617 (citation omitted).

³⁷ *Id.* at 618.

³⁸ *Id.*

³⁹ *Id.* (“[A] pacifist manifesto evinced the disloyalty of many prominent Quakers.”).

⁴⁰ *Id.* at 623-24.

⁴¹ *Id.* at 624 (citations omitted).

In the years following the adoption of the Fourth Amendment, its interpretation and application was similar yet different from our modern analysis.⁴² In addition to providing protection against general warrants and writs of assistance, the Fourth Amendment protected people from unreasonable government intrusions by ensuring certain criteria were met before a search was conducted.⁴³ First, probable cause was required.⁴⁴ The protection afforded by probable cause is that the allegations are true⁴⁵ and reduces arbitrary intrusions.⁴⁶ At the time of the Fourth Amendment, probable cause was not as robust as the current analysis.⁴⁷ In the modern context, probable cause in 1789 can be understood as information alleged to be at least possible or plausible.⁴⁸

Second, certain searches were deemed unreasonable.⁴⁹ Unreasonable searches included multiple-specific warrants, house searches without warrants, nocturnal searches, and “no-knock” searches.⁵⁰ Third, certain objects were highly valued.⁵¹ The Fourth Amendment lists “four protected objects: persons, houses, papers, and effects.”⁵² The home has enjoyed special protection from very early times⁵³ and can be viewed as a place where individuals can enjoy the privileges afforded to them by a free society.⁵⁴ The protection of these objects ensures a person’s right to “the free enjoyment of personal security, of personal liberty, and of private property.”⁵⁵

⁴² See *infra* notes 43-55 and accompanying text.

⁴³ See *Framers’ Intent*, *supra* note 21, at 1056.

⁴⁴ *Id.*

⁴⁵ See CUDDIHY, *supra* note 24, at 754 (explaining that probable cause is supported by an oath or affirmation).

⁴⁶ See *Framers’ Intent*, *supra* note 21, at 1006-10, 1057. “Underlying all of those arguments and principles was a quest for objective criteria to measure the legitimacy of a search or seizure.” *Id.* at 1006.

⁴⁷ See CUDDIHY, *supra* note 24, at 755 (“The current understanding of probable cause, however, is broader than that of 1789.”).

⁴⁸ *Id.* at 757 (“‘Probable’ had diverse meanings in 1789: ‘likely,’ ‘possible,’ even ‘credible.’”).

⁴⁹ *Id.* at 770.

⁵⁰ *Id.*

⁵¹ *Framers’ Intent*, *supra* note 21, at 1058.

⁵² *Id.*

⁵³ Tomkovicz, *supra* note 19, at 673. “The poorest man may, in his cottage, bid defiance to all the forces of the Crown. It may be frail . . . but the King of England may not enter; all his force dares not cross the threshold of the ruined tenement.” *Id.* at 673 n.120 (quoting 1 T. COOLEY, CONSTITUTIONAL LIMITATIONS 610 n.2 (8th ed. 1927)).

⁵⁴ See *id.* at 674.

⁵⁵ *Framers’ Intent*, *supra* note 21, at 1059 (citation omitted).

The structure and wording of the Fourth Amendment illustrate the principles of search and seizure the Framers were advocating.⁵⁶ The Reasonableness Clause “recognized as already existing a right to freedom from arbitrary governmental invasion of privacy.”⁵⁷ The second clause defines and interprets the first clause and provides that searches using the specified methods are not unreasonable.⁵⁸ Further explanation of the Reasonableness Clause provides that searches must be carried out with judicial approval or they will be considered per se unreasonable, “subject only to a few specifically established and well-delineated exceptions.”⁵⁹

In considering the Framers’ intent, one can use John Adams’s advice.⁶⁰ When there is a situation that the author of an act did not account for, then one should follow the author’s intention and interpret it as he “would have interpreted it.”⁶¹ Applying this advice to the search and seizure practice before the Fourth Amendment was adopted, the Framers intended for the Amendment to protect people against unreasonable government intrusion.⁶² The Fourth Amendment protects against physical intrusions of a person’s home and seizures of their person, papers, and effects.⁶³ However, a person is not protected when a loophole provides for warrantless searches. The “general public use” test is a loophole and contradicts the principles of the Fourth Amendment. The “general public use” test permits a home to be searched without a warrant issued under probable cause supported by an oath or affirmation.

III. THE EVOLUTION OF THE FOURTH AMENDMENT PROPERTY-BASED ANALYSIS

Property-based Fourth Amendment jurisprudence, in its first iteration, was based on a literal reading of the Fourth Amendment.⁶⁴

⁵⁶ See *supra* notes 43-55 and accompanying text; see *infra* notes 57-59 and accompanying text.

⁵⁷ *Framers’ Intent*, *supra* note 21, at 983 (citation omitted).

⁵⁸ *Id.*

⁵⁹ *Id.* at 984 (quoting *Arizona v. Gant*, 129 S. Ct. 1710, 1716 (2009)).

⁶⁰ *Id.* at 1060.

⁶¹ *Id.*

⁶² See *id.* at 988.

⁶³ Tomkovicz, *supra* note 19, at 673; see also U.S. CONST. amend. IV.

⁶⁴ THOMAS K. CLANCY, *THE FOURTH AMENDMENT: ITS HISTORY AND INTERPRETATION* 361 (2d ed. 2014).

The Court described the physical trespass property-based analysis of the Fourth Amendment in *Olmstead v. United States*.⁶⁵ *Olmstead* involved a criminal organization created “to import, possess, and sell liquor unlawfully.”⁶⁶ The criminal organization was discovered using wiretaps.⁶⁷ The Court reasoned that “[t]here was no searching. . . . The evidence was secured by the use of the sense of hearing and that only. There was no entry of the houses or offices of the defendants.”⁶⁸ The Court concluded that the Fourth Amendment is only implicated when something tangible is seized or the trespass is a physical intrusion.⁶⁹ After *Olmstead*, cases were decided by “whether the government had physically entered a protected area.”⁷⁰

In *Katz v. United States*,⁷¹ the Supreme Court seemingly abandoned the *Olmstead* view of the Fourth Amendment.⁷² An electronic listening device placed on the outside of a telephone booth was a search under the Fourth Amendment requiring a search warrant.⁷³ The Government argued that there was no reason to invoke the Fourth Amendment because there was “no physical penetration of the telephone booth.”⁷⁴ The Court reasoned “that the Fourth Amendment protects people – and not simply ‘areas.’”⁷⁵ The Fourth Amendment principle derived from *Katz* is that a search has not occurred “unless ‘the individual manifested a subjective expectation of privacy in the object of the challenged search,’ and ‘society [is] willing to recognize that expectation as reasonable.’”⁷⁶ *Katz* asserted “that privacy, not property, was a centralizing principle upon which the Fourth Amendment rights were premised.”⁷⁷

⁶⁵ 277 U.S. 438 (1928), *overruled by* *Katz v. United States*, 389 U.S. 347 (1967).

⁶⁶ *Id.* at 455-56.

⁶⁷ *Id.* at 456-57.

⁶⁸ *Id.* at 464.

⁶⁹ *Id.* at 466. The Court explained that the Fourth Amendment is only violated when there is “an official search and seizure of his person . . . papers or tangible material effects, or an actual physical invasion of his house ‘or curtilage’ for the purpose of making a seizure.” *Id.*

⁷⁰ See CLANCY, *supra* note 64, at 87 (citing *Berger v. New York*, 388 U.S. 41, 64 (1967); *Silverman v. United States*, 365 U.S. 505, 512 (1961)).

⁷¹ 389 U.S. 347 (1967).

⁷² The reach of the Fourth Amendment “cannot turn upon a physical intrusion.” See *id.* at 353.

⁷³ See *id.* at 352-59.

⁷⁴ *Id.* at 352.

⁷⁵ *Id.* at 353.

⁷⁶ *Kyllo v. United States*, 533 U.S. 27, 33 (2001) (alteration in original) (quoting *California v. Ciraolo*, 476 U.S. 207, 211 (1986)).

⁷⁷ See CLANCY, *supra* note 64, at 88.

After *Katz*, the property-based analysis did not vanish entirely.⁷⁸ The property-based analysis was most prominent in the application of seizure cases such as *Soldal v. Cook County*.⁷⁹ *Soldal* involved an illegal seizure of a mobile home, but the Court of Appeals for the Seventh Circuit held that the removal of the trailer was not a seizure under the Fourth Amendment.⁸⁰ The Seventh Circuit held that “absent interference with privacy or liberty, a ‘pure deprivation of property’ is not cognizable under the Fourth Amendment.”⁸¹ The Supreme Court did not agree with the Seventh Circuit Court of Appeals’ narrow view of the Fourth Amendment.⁸² The Court stated that “our cases unmistakably hold that the Amendment protects property as well as privacy.”⁸³ The cases decided following *Katz* did not eliminate protection of property;⁸⁴ the message to derive from those cases is that “property rights are not the sole measure of Fourth Amendment violations.”⁸⁵ *Soldal* dealt with the Fourth Amendment concerning a seizure.⁸⁶ Nevertheless, the Court’s opinion in *Soldal* created the foundation for a re-emergence of property-analysis searches.⁸⁷

Kyllo is a stepping-stone on the re-emergence of the property analysis. In *Kyllo*, the Court uses property-based language when it references constitutionally protected areas, explains privacy violations by using physical intrusion as a reference point, and describes what the Framers protected when the Fourth Amendment was created.⁸⁸ Nonetheless, *Kyllo* did not ignore “the essential lesson of *Katz*,” which

⁷⁸ *See id.* at 106-07.

⁷⁹ 506 U.S. 56 (1992).

⁸⁰ *See id.* at 57-60.

⁸¹ *Id.* at 60 (citation omitted).

⁸² *See id.* at 62 (“[C]onclusion followed from a narrow reading of the Amendment, which the court construed to safeguard only privacy and liberty interests . . . leaving unprotected possessory interests where neither privacy nor liberty were at stake.”).

⁸³ *Id.*

⁸⁴ *Id.* at 64 (“There was no suggestion that this shift in emphasis had snuffed out the previously recognized protection for property under the Fourth Amendment.”).

⁸⁵ *Id.*

⁸⁶ *See id.* at 60-70.

⁸⁷ *See id.* at 62-65; *see also* *United States v. Jones*, 565 U.S. 400, 407 (2012) (“[T]he Court unanimously rejected the argument that although a ‘seizure’ had occurred ‘in a “technical” sense’ . . . no Fourth Amendment violation occurred because law enforcement had not ‘invade[d] the [individuals’] privacy.’”) (alteration in original) (citation omitted)).

⁸⁸ *Kyllo v. United States*, 533 U.S. 27, 34-35, 38, 40 (2001). “This assures preservation of that degree of privacy against government that existed when the Fourth Amendment was adopted.” *Id.* at 34.

is that the Fourth Amendment protected “tangible and intangible interests and that the mode of invasion into those interests is not limited to physical intrusions.”⁸⁹

In *United States v. Jones*,⁹⁰ the Court explained the co-existence of the reasonable expectation of privacy test and the property-based analysis. *Jones* involved the long-term surveillance of a car using GPS.⁹¹ The GPS was physically attached to the car.⁹² The Court held that the attachment of the GPS device to the car was a search.⁹³ The Government argued that there was no reasonable expectation of privacy in the exterior of the Jeep.⁹⁴ The Court ignored the argument entirely “because Jones’s Fourth Amendment rights do not rise or fall with the *Katz* formulation.”⁹⁵ There is a minimum level of protection against the government that “*Katz* did not repudiate.”⁹⁶ The Court further explained that “the *Katz* reasonable-expectation-of-privacy test has been *added to*, not *substituted for*, the common-law trespassory test.”⁹⁷

The property-based analysis provides a bright-line rule; the government cannot intrude on a home and curtilage without a warrant.⁹⁸ Dog sniffs illustrate the effect of the bright-line rule because the Court has treated dog sniffs differently at other locations.⁹⁹ In *Florida v. Jardines*,¹⁰⁰ the Court held that a narcotics dog sniff penetrating the curtilage¹⁰¹ of the home is a search under the Fourth Amendment.¹⁰² The Court affirmed that the Fourth Amendment

⁸⁹ CLANCY, *supra* note 64, at 109; *see also Kylo*, 533 U.S. at 35-36 (“We rejected such a mechanical interpretation of the Fourth Amendment in *Katz* Reversing that approach would leave the homeowner at the mercy of advancing technology.”).

⁹⁰ 565 U.S. 400 (2012).

⁹¹ *Id.* at 402.

⁹² *Id.*

⁹³ *Id.* at 404.

⁹⁴ *Id.* at 406.

⁹⁵ *Id.*

⁹⁶ *See id.* at 406-07.

⁹⁷ *Id.* at 409.

⁹⁸ *See Florida v. Jardines*, 569 U.S. 1, 5-8 (2013).

⁹⁹ *See United States v. Place*, 462 U.S. 696, 707 (1983) (holding a canine sniff of luggage in an airport is not a search); *Illinois v. Caballes*, 543 U.S. 405, 409 (2005) (holding a canine sniff during a traffic stop is not a search).

¹⁰⁰ 569 U.S. 1 (2013).

¹⁰¹ *Id.* at 6-7. “We therefore regard the area ‘immediately surrounding and associated with the home’—what our cases call the curtilage—as ‘part of the home itself for Fourth Amendment purposes.’” *Id.* at 6 (citing *Oliver v. United States*, 466 U.S. 170, 180 (1984)).

¹⁰² *Id.* at 11.

property-based analysis is the minimum level of protection provided to people in their homes.¹⁰³ *Jardines* is an example of how the property based analysis can protect the home. Under the *Katz* formula, Justice Alito, writing for the dissent, would have allowed the dog sniff because “[a] reasonable person understands that odors emanating from a house may be detected from locations that are open to the public.”¹⁰⁴ However, since the porch is part of the curtilage of the home, “[t]he scope of a license—express or implied—is limited not only to a particular area but also to a specific purpose.”¹⁰⁵

Current property-based analysis recognizes that a trespass to property can be physical or intangible.¹⁰⁶ The Court has explained that property-based analysis is one of several frameworks for analyzing Fourth Amendment searches.¹⁰⁷ Additionally, the Court has affirmed that certain areas are constitutionally protected areas that are not modified by an expectation of privacy.¹⁰⁸ Therefore, the current property-based analysis is grounded in the original principles of the Fourth Amendment and upgraded by the understanding of unseen intrusions.¹⁰⁹

IV. CURRENT ADVANCED SENSING TECHNOLOGY

Imagine a situation similar to *Kyllo* in the year 2025. A law enforcement officer suspects there is a marijuana growing operation in a home. The officer stands on the sidewalk outside of the home, retrieves his or her cellphone, and performs an infrared scan of the home. Law enforcement uses the information obtained from the

¹⁰³ *See id.*

¹⁰⁴ *Id.* at 17 (Alito, J., dissenting).

¹⁰⁵ *Id.* at 9. “Here, the background social norms that invite a visitor to the front door do not invite him there to conduct a search.” *Id.*

¹⁰⁶ *Carpenter v. United States*, 138 S. Ct. 2206, 2214 (2018) (“[W]e rejected in *Kyllo* a ‘mechanical interpretation’ of the Fourth Amendment.”) (quoting *Kyllo v. United States*, 533 U.S. 27, 35 (2001)).

¹⁰⁷ *See id.* at 2214 n.1 (“Property rights are often informative . . . and we have repeatedly emphasized privacy interests do not rise and fall with property rights.”) (citations omitted)). The Court stated that “no single rubric definitively resolves which expectations of privacy are entitled to protection.” *Id.* at 2213-14. “[M]ore recent Fourth Amendment cases have clarified that the test . . . derived from the second Justice Harlan’s concurrence in *Katz* . . . supplements, rather than displaces, ‘the traditional property-based understanding.’” *Byrd v. United States*, 138 S. Ct. 1518, 1526 (2018) (quoting *Jardines*, 569 U.S. at 11)

¹⁰⁸ *See Collins v. Virginia*, 138 S. Ct. 1663, 1670 (2018) (holding that the officer was not permitted to enter the curtilage of the home to search a vehicle).

¹⁰⁹ *See CLANCY, supra* note 64, at 106-115, 388-390.

cellphone scan, and other information such as utility bills, to obtain a search warrant. Law enforcement officers search the house. Is the infrared scan performed by the officer an unreasonable search under the Fourth Amendment? Under *Kyllo*, if an average person can also perform an infrared scan with a cellphone, then the search was not unreasonable.¹¹⁰ While this scenario appears speculative, it is not. Infrared camera attachments for cellphones are already a reality.¹¹¹ Beyond the infrared scanning, law enforcement is also using see-through wall technology.¹¹² The see-through the wall technology is also steadily progressing into the realm of “general public use.”¹¹³ Anyone who wants to perform repairs or construction, whether professionally or amateur, can use this technology to find wall studs, pipes, and wires behind walls.¹¹⁴ The technology is also being employed in various settings to track people through walls for security or health monitoring.¹¹⁵ If a person can buy a device and use it for a construction project at home, is that device now considered in “general public use?” When does a device transition into general public use? Is it a matter of scope, depending on how far past the wall the device can detect objects? Arguably, this technology is in public use. Applying the *Kyllo* test, a law enforcement official can scan the inside of a home without requiring a search warrant. Examining these devices in more detail will provide an understanding of their capacity to violate the Fourth Amendment.

The National Institute of Justice has classified several hand-held devices as through-the-wall sensors (“TTWS”).¹¹⁶ These devices include Range-R series,¹¹⁷ Xaver series,¹¹⁸ ReTWis 5,¹¹⁹ and the

¹¹⁰ See *Kyllo v. U.S.* 533 U.S. 27, 24 (2001).

¹¹¹ See *infra* notes 146, 148 and accompanying text.

¹¹² See *infra* notes 116-34 and accompanying text.

¹¹³ See *infra* notes 135-43 and accompanying text.

¹¹⁴ *How Do Stud Finders Work? Complete Tutorial + Tips and Tricks*, ELECTRICSTUDFINDER.COM, <http://electricstudfinder.com/how-do-stud-finders-work/> (last visited Mar. 25, 2020) [hereinafter ELECTRICSTUDFINDER].

¹¹⁵ VAYYAR, <https://vayyar.com/> (last visited Feb. 2, 2020).

¹¹⁶ MANTECH ADVANCED SYS. INT’L. INC., U.S. DEP’T OF JUSTICE, THROUGH-THE-WALL-SENSORS FOR LAW ENFORCEMENT MARKET SURVEY 1 (2012), <https://www.justnet.org/pdf/00-WallSensorReport-508.pdf> [hereinafter MARKET SURVEY].

¹¹⁷ The Range-R series includes several models: Range-R, Range-R Link, Range-R 2D, Range-R 2D Link. *Military and First Responders*, CYTERRA, L3HARRIS, <https://www.2l3t.com/cytterra/> (last visited May 8, 2020).

¹¹⁸ The Xaver series includes several models: Xaver 100, 400, 800. *Xaver Products*, CAMERO, <https://www.camero-tech.com/xaver-products/> (last visited Sept. 15, 2019).

¹¹⁹ *About ReTWis 5*, RETIA, <https://retwis.eu/> (last visited Mar. 8, 2020).

Eagle5-NCL.¹²⁰ TTWS devices use radar¹²¹ transmitted at low power and across several frequencies.¹²² The radar penetrates walls and reflects when it comes into contact with an object or different materials.¹²³ As the radar reflects off the objects or materials, the frequency shifts, and the measurement “distinguishes between stationary and moving objects.”¹²⁴ When radar passes through objects, it becomes attenuated.¹²⁵ Attenuation is the loss of signal strength.¹²⁶ Attenuation is reduced by using a wide range of frequencies to “probe” the area.¹²⁷ To provide as much information about the area being “probed,” and to minimize attenuation problems, TTWS devices will use either a Pulse Wave System or an Ultra-Wide Band Pulse System (UWB).¹²⁸ The difference between these two systems is the amount of information they relay back to the device.¹²⁹ One specific limitation of the technology is that it cannot see through solid metal surfaces,¹³⁰ but it can operate through concrete and wood.¹³¹

The devices can display information gathered in 1 degree (“d”), 2d, or 3d.¹³² Other differences between the devices include various technical specifications such as the degrees of the field of view, the maximum distance of the scan, weight, and battery life.¹³³

¹²⁰ *TiaLinx Unveils New Breathing Detection Sensor to Identify Multiple Individuals Through Thick Concrete Walls*, AZO SENSORS (July 13, 2016), <https://www.azosensors.com/news.aspx?newsID=11326>.

¹²¹ Types of radar used include: Continuous Wave System, Pulse Wave System, and Ultra-Wide Band Pulse System. MARKET SURVEY, *supra* note 116, at 9-14.

¹²² Becky Lewis, *Through-the-Wall Sensor Technology Can Add Another Tool to the Kit*, TECHBEAT 1 (2013), <https://www.justnet.org/pdf/Through-the-Wall.pdf>.

¹²³ *Id.*

¹²⁴ *Id.*

¹²⁵ MARKET SURVEY, *supra* note 116, at 4.

¹²⁶ *Id.* at 4.

¹²⁷ *Id.* at 5.

¹²⁸ *See id.* at 5-6.

¹²⁹ *See id.* at 4-6, 11-14.

¹³⁰ Lewis, *supra* note 122, at 1.

¹³¹ MARKET SURVEY, *supra* note 116, at 4.

¹³² 1d, 2d, and 3d are shorthand for the dimensions provided by the display. The difference between 1d and 2d is that 1d provides the range and status (moving/breathing) of the target and 2d will provide a graphic display of the area scanned, such as the general shape of the room, and multiple persons in the room. *See* MANTech ADVANCED SYS. INT’L. INC., U.S. DEP’T OF JUSTICE, *THROUGH-THE-WALL-SENSORS FOR LAW ENFORCEMENT: BEST PRACTICES 10* (2014), <https://www.justnet.org/pdf/ThroughWallSensorBestPractices-508.pdf>.

¹³³ MARKET SURVEY, *supra* note 116, at 11-16.

Additionally, the devices also differ in price. For example, a Range-R will cost \$6,000, but a Xaver-400 will cost \$47,500.¹³⁴

Commercial applications of see-through the wall radar come in various forms. One type of these devices is called a stud finder.¹³⁵ Stud finders use UWB radar to locate studs, pipes, and electronic wires in a wall.¹³⁶ An example of this device is the Bosch D-Tect 150. As of this writing, it is selling on Amazon for \$699.36.¹³⁷ The Bosch D-Tect 150 has several detection modes, and it can detect objects between one to six inches, depending on the material.¹³⁸ See-through the wall radar is also being sold as a home monitoring system. One company currently selling this system is Vayyar.¹³⁹ The Vayyar chip uses radar bands in the three gigahertz to 81 gigahertz range along with 72 receivers and transmitters to track people through walls and is capable of detecting their “location, movement, height, posture, and vital signs.”¹⁴⁰ The Vayyar HOME can be combined with various appliances, lighting, and heating for home automation.¹⁴¹ Three other uses for the system include eldercare, detecting if someone has fallen in the home, or monitoring the health of people in a home.¹⁴² Finally, Vayyar HOME helps in home security by detecting when everyone has fallen asleep and will then detect if an intruder has entered, at which time an alarm is activated.¹⁴³

In *Kyllo*, the Agema-210 was an infrared thermal imager.¹⁴⁴ Heat detecting devices have been around for several decades.¹⁴⁵ Infrared thermal imaging devices have continued to advance from the

¹³⁴ *Id.* at 15.

¹³⁵ ELECTRICSTUDFINDER, *supra* note 114.

¹³⁶ *Id.*

¹³⁷ *Bosch D-Tect 150*, AMAZON, <https://www.amazon.com/Bosch-D-Tect-Floor-Scanner-Technology/dp/B005EM93R0> (last visited Feb. 2, 2020).

¹³⁸ *D-Tect 150 Product Description*, BOSCH, <https://www.boschtools.com/us/en/boschtools-ocs/stud-finders-d-tect-150-29179-p/> (last visited Jan. 18, 2020).

¹³⁹ VAYYAR, <https://vayyar.com/> (last visited Jan. 18, 2020).

¹⁴⁰ *Technology*, VAYYAR, <https://vayyar.com/technology> (last visited Jan. 18, 2020).

¹⁴¹ *Smart Home*, VAYYAR, <https://vayyar.com/smart-home> (last visited Jan. 18, 2020).

¹⁴² *Home Health*, VAYYAR, <https://vayyar.com/home> (last visited Jan. 18, 2020).

¹⁴³ *Home Security and Fire*, VAYYAR, <https://vayyar.com/home-security-and-fire> (last visited Jan. 18, 2020).

¹⁴⁴ *Kyllo v. United States*, 533 U.S. 27, 29-30 (2001).

¹⁴⁵ The first thermographic camera was created by Kálmán Tihanyi in 1929. Nic Fleming, *The Man who Makes you See the Invisible*, BBC (June 14, 2017), <https://www.bbc.com/future/article/20170614-thermal-imaging-reveals-the-hidden-heat-lost-from-your-home>.

time of the *Kyllo* decision; many different models are available to the average person.¹⁴⁶ These products are cheaper than the Agema-210¹⁴⁷ and provide more detail and accuracy than the Agema-210.¹⁴⁸ If the average person has access to thirty models of infrared cameras and even the ability to attach an infrared camera to their smartphone, it is arguably in “general public use.” Under the current *Kyllo* rule, a police officer using one of these devices to scan a home without a warrant would not be violating the Fourth Amendment. The *Kyllo* rule loophole is already a possibility.

V. SUPREME COURT ANALYSIS OF ADVANCED TECHNOLOGY

While it is impossible to predict the exact path technological progress will take, the trend is usually for smaller and more portable.¹⁴⁹ The evolution of the infrared camera displays this trend; the infrared camera evolved from large bulky devices to attachments that people

¹⁴⁶ At the time of this writing, 30 products are available and some products have different models. See *Handheld Thermal Cameras*, FLIR, <https://www.flir.com/browse/industrial/handheld-thermal-cameras/?page=2> (last visited Mar. 8, 2020). Thermal cameras can also attach to a smartphone. *FLIR ONE Pro*, FLIR, <https://www.flir.com/products/flir-one-pro/?model=435-0006-02> (last visited Mar. 8, 2020). The PerfectPrime is an infrared camera available on Amazon that comes in different models and ranges in price from \$129.99 to \$299.99 at the time of this writing. *PerfectPrime IR0002 Thermal Camera*, AMAZON, https://www.amazon.com/Perfect-Prime-IR0001-Infrared-Resolution-Temperature/dp/B075F61GFH?ref_=fsclp_pl_dp_5 (last visited Apr. 20, 2020).

¹⁴⁷ Considering the time when the Agema-210 was used, it probably cost at least \$10,000. See Adam W. Brill, Case Note, *Kyllo v. United States: Is the Court’s Bright-Line Rule on Thermal Imaging Written in Disappearing Ink?*, 56 ARK. L. REV. 431, 433 n.13 (2003) (reporting that thermal imagers range from \$15,000 to \$35,000); see also Ed Kochanek, *Thermal Imaging from the Beginning of the Thermographer’s Camera to the Present*, IRINFO.ORG, <https://irinfo.org/12-1-2013-kochanek/> (last visited Sept. 15, 2019) (explaining that a thermal camera sold for \$25,000 in 1997).

¹⁴⁸ Contrast the Agema-210 technical specification with a \$10,000+ modern model or the smartphone camera. AGEMA INFRARED SYSTEMS, THERMOVISION 210 SERIES OPERATING MANUAL Section 6 at 1-9 (2002), [https://support.flir.com/DocDownload/Assets/dl/1557627\\$a.pdf](https://support.flir.com/DocDownload/Assets/dl/1557627$a.pdf); AGEMA INFRARED SYSTEMS, THERMOVISION 400 & 200 (1990), [https://support.flir.com/DocDownload/Assets/dl/1557569\\$a.pdf](https://support.flir.com/DocDownload/Assets/dl/1557569$a.pdf); FLIR, TECHNICAL DATA FLIR T5XX SERIES (2019), <https://support.flir.com/DocDownload/Assets/dl/t810463-en-us.pdf>; FLIR, *FLIR One Pro*, https://support.flir.com/DocDownload/Assets/dl/17-1746-oem-flir_one_pro_datasheet_final_v1_web.pdf (last visited Oct. 21, 2019).

¹⁴⁹ See *From Bricks to Brains: The Evolution of the Cell Phone*, COMPUTER SCIENCE DEGREE HUB, <https://www.computersciencedegreehub.com/cell-phone/> (last visited Mar. 8, 2020); Frank Olito, *Computers Actually Date Back to the 1930s. Here’s How They’ve Changed*, INSIDER (Sept. 13, 2019, 12:13 PM) <https://www.insider.com/how-computers-evolved-history-2019-9>.

can place on a phone.¹⁵⁰ A corollary to this progress is that devices created for the military might become available for the general public; an example of this progress is the internet¹⁵¹ and GPS devices.¹⁵² With this trend in mind, judging the validity of a search on whether the public is using an item is a precarious position.

In assessing the proper lens to view advanced sensing technology searches, an analysis of how the Supreme Court has dealt with other types of technology and its rationale in these cases might provide insight.

Justice Harlan's "oft-quoted concurrence"¹⁵³ established the *Katz* subjective expectation of privacy test.¹⁵⁴ Considering the influence of the concurrence, one should examine Justice Harlan's reasoning. Interestingly, Justice Harlan anchored his opinion in relation to a place.¹⁵⁵ The Fourth Amendment protects people, but the amount of protection afforded is related to a place.¹⁵⁶ "Thus a man's home is, for most purposes, a place where he expects privacy . . ."¹⁵⁷ However, "objects, activities, or statements that he exposes to the 'plain view' of outsiders are not 'protected' because no intention to keep them to himself has been exhibited."¹⁵⁸ Justice Harlan concluded that basing Fourth Amendment violations on physical trespass was no longer viable because law enforcement can use electronic means to defeat a person's reasonable expectation of privacy.¹⁵⁹ The concurrence and majority opinion responded to the electronic listening device by extending "protection to intangible interests."¹⁶⁰

In *United States v. Karo*,¹⁶¹ a beeper was used to trace a can of ether. DEA agents learned that James Karo, Richard Horton, and William Harley ordered 50 cans of ether to extract cocaine from

¹⁵⁰ See *supra* notes 146-48 and accompanying text.

¹⁵¹ Evan Andrews, *Who Invented the Internet?*, HISTORY, <https://www.history.com/news/who-invented-the-internet> (last updated Oct. 28, 2019).

¹⁵² *Global Positioning System History*, NASA, https://www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html (last updated Aug. 7, 2017).

¹⁵³ *Kyllo v. United States*, 533 U.S. 27, 33 (2001).

¹⁵⁴ See CLANCY, *supra* note 64, at 92.

¹⁵⁵ *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J., concurring).

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* at 362.

¹⁶⁰ See CLANCY, *supra* note 64, at 89.

¹⁶¹ 468 U.S. 705 (1984).

imported clothing.¹⁶² Agents replaced one of the cans of the ether with their can that contained the beeper.¹⁶³ Eventually, on February 6, 1981, the can of ether was transported to a home in Taos, New Mexico.¹⁶⁴ The “agents determined, using the beeper monitor[,] that the beeper can was still inside the house.”¹⁶⁵ On February 7, the beeper reported the ether can was still in the house.¹⁶⁶ Based partly on this information, the agents acquired a warrant on February 8, 1981.¹⁶⁷ The Court held that the warrantless use of the beeper was a search that violated the Fourth Amendment.¹⁶⁸ The home is where an “individual normally expects privacy.”¹⁶⁹ The Court reasoned that where the Government uses “an electronic device to obtain information that it could not have obtained by observation from outside the curtilage of the house,” it is an unreasonable search within the meaning of the Fourth Amendment.¹⁷⁰ Unfortunately for the defendants, after striking the beeper information, the warrant affidavit contained enough information to support probable cause for a search warrant.¹⁷¹

While not strictly human-made like other technologies are, narcotics sniffing dogs can also be described as a sense-enhancing technology.¹⁷² Justice Scalia, writing for the majority, decided *Jardines* on property grounds.¹⁷³ The government argued that law enforcement investigation of a home by a forensic narcotics dog “by definition could not implicate any legitimate privacy interest.”¹⁷⁴ However, as Justice Scalia explained, the home and curtilage are a constitutionally protected area that is unaffected by expectations of

¹⁶² *Id.* at 708.

¹⁶³ *Id.*

¹⁶⁴ *Id.* at 709.

¹⁶⁵ *Id.* at 709-10.

¹⁶⁶ *Id.* at 710.

¹⁶⁷ *Id.*

¹⁶⁸ *Id.* at 714-15.

¹⁶⁹ *Id.* at 714.

¹⁷⁰ *Id.* at 715.

¹⁷¹ *Id.* at 721.

¹⁷² *Florida v. Jardines*, 569 U.S. 1, 14-15 (2013) (Kagan, J., concurring). *But cf.* *United States v. Place*, 462 U.S. 696 (1983) (holding a canine sniff of luggage in an airport is not a search); *Illinois v. Caballes*, 543 U.S. 405 (2005) (holding a canine sniff during a traffic stop is not a search).

¹⁷³ *See Jardines*, 569 U.S. at 3-12. “The *Katz* reasonable-expectations of privacy test ‘has been added to, not substituted for,’ the traditional property-based understanding of the Fourth Amendment.” *Id.* at 11 (citing *United States v. Jones*, 565 U.S. 400, 409 (2012)).

¹⁷⁴ *Id.* at 10.

privacy.¹⁷⁵ If law enforcement intrudes upon a constitutionally protected area without authorization, then a violation of the Fourth Amendment has occurred.¹⁷⁶ Justice Kagan, in a concurring opinion, reasoned that the case could have been decided using *Kyllo*.¹⁷⁷ A narcotics sniffing dog is similar to a sense enhancing tool that is not in “general public use” because the narcotics dog can explore details of the home that have an expectation of privacy.¹⁷⁸ Justice Kagan’s application of *Kyllo* is sound because the general public does not use narcotics dogs. However, deciding *Jardines* through the *Kyllo* test would have further weakened the constitutionally protected areas through the use of the “general public use” test. In using the property analysis, the Court affirmed the minimum level of protection provided by the curtilage.¹⁷⁹

VI. HOW THE LOWER COURTS HAVE DEALT WITH THE GENERAL PUBLIC USE TEST

In *Kyllo*, the Supreme Court did not provide a definition or outline to determine when an item is in “general public use.”¹⁸⁰ Because the Supreme Court did not provide direction for the lower courts, the resulting jurisprudence has not been consistent.¹⁸¹ Courts have avoided determining whether an item is in “general public use,” unless the item, such as a camera, is easily considered to be in “general public use.”¹⁸²

A state appeals court avoided examination of an item’s “general public use” in *McClelland v. State*.¹⁸³ Daryl J. McClelland was arrested by police officers who were investigating individuals who

¹⁷⁵ *Id.* at 5-11.

¹⁷⁶ *Id.* at 10-12.

¹⁷⁷ *Id.* at 14 (Kagan, J., concurring).

¹⁷⁸ *Id.* at 14-15 (Kagan J., concurring).

¹⁷⁹ *See id.* at 5.

¹⁸⁰ *Kyllo v. United States*, 533 U.S. 27, 39 n.6 (2001) (“Given that we can quite confidently say that thermal imaging is not ‘routine,’ we decline in this case to reexamine that factor.”).

¹⁸¹ *See* *McClelland v. State*, 255 So. 3d 929 (Fla. Dist. Ct. App. 2018); *United States v. Hachey*, No. 16-0128, 2017 U.S. Dist. LEXIS 34192 (D. Pa. 2017); *United States v. Vela*, 486 F. Supp 2d 587 (D. Tex. 2005); *United States v. Deleston*, No. 15-cr-113, 2015 U.S. Dist. LEXIS 107341 (D.N.Y. 2015); *Idaho v. Howard*, No. CR-2011-2029, 2012 Ida. Dist. LEXIS 31 (2012).

¹⁸² *See* cases cited *supra* note 181.

¹⁸³ 255 So. 3d 929 (Fla. Dist. Ct. App. 2018).

downloaded child pornography.¹⁸⁴ The police officers traced McClelland's Wi-Fi signal using a Yagi antenna.¹⁸⁵ At trial, McClelland moved to suppress the child pornography found on his computer because "the Yagi antenna constituted an enhanced technology which breached the expectation of privacy that McClelland had within his motorhome."¹⁸⁶ The trial court concluded that McClelland did not have a reasonable expectation of privacy because he was broadcasting signals outside his motorhome and that the use of the Yagi antenna was lawful because it was in "general public use."¹⁸⁷ The Florida District Court of Appeal reviewing the case declined to examine the issue of "general public use" because it was sufficient that McClelland lacked an expectation of privacy.¹⁸⁸ Further, the District Court of Appeal reasoned that unlike *Kyllo*, who confined his activities to his home, McClelland "extend[ed] 'an invisible, virtual arm,'"¹⁸⁹ which put him "beyond the safe harbor provided by *Kyllo*."¹⁹⁰ As *McClelland* illustrates, the property-based analysis of *Kyllo* extends an impenetrable wall to the home because the Supreme Court expanded it to "any information regarding the interior of the home."¹⁹¹

Courts have decided that night vision goggles, flashlights, and cameras are in "general public use."¹⁹² Courts have not provided in-depth analyses as to why these products are in the "general public use."¹⁹³ Flashlights or cameras do not require an in-depth analysis because of their availability as consumer products for decades.¹⁹⁴ As

¹⁸⁴ *Id.* at 930-31.

¹⁸⁵ *Id.*

¹⁸⁶ *Id.* at 931.

¹⁸⁷ *Id.* at 932.

¹⁸⁸ *Id.* at 932 n.2 ("It is unnecessary for us to make any determination regarding whether this was an accurate conclusion due to our agreement with the trial court that McClelland lacked an expectation of privacy that society would be willing to recognize as reasonable.")

¹⁸⁹ *Id.* at 933 (citation omitted).

¹⁹⁰ *Id.* at 934 (citation omitted).

¹⁹¹ *Kyllo v. United States*, 533 U.S. 27, 34 (2001).

¹⁹² See *United States v. Vela*, 486 F. Supp. 2d 587 (W. D. Tex. 2005); *United States v. Deleston*, No. 15-cr-113, 2015 U.S. Dist. LEXIS 107341 (D.N.Y. 2015); *Idaho v. Howard*, No. CR-2011-2029, 2012 Ida. Dist. LEXIS 31 (2012).

¹⁹³ See cases cited *supra* note 192.

¹⁹⁴ The first camera was introduced in 1888. *Original Kodak Camera Serial No. 540*, NAT'L MUSEUM OF AM. HIST., https://americanhistory.si.edu/collections/search/object/nmah_760118 (last visited Jan. 18, 2020). The flashlight was patented in 1899. Mary Bellis, *The Invention of the Flashlight*, THOUGHTCO. (last updated Feb. 26, 2019), <https://www.thoughtco.com/invention-of-the-flashlight-1991794>.

for the night vision goggles, the court in *United States v. Vela*¹⁹⁵ reasoned that “they are available to the public via internet. More economical night vision goggles are available at sporting goods stores. Therefore, night vision goggles . . . are available for general public use.”¹⁹⁶

*United States v. Stanley*¹⁹⁷ involved MoocherHunter, which is a software that police use to locate computers that are piggy-backing onto other Wi-Fi routers.¹⁹⁸ The Court of Appeals for the Third Circuit held the use of the software was not a Fourth Amendment search.¹⁹⁹ The court summarized its reasoning in two points. First, if a person is intentionally sharing his or her activities outside of the confines of the home, then the privacy protections afforded by the home are lost.²⁰⁰ Second, a person who uses a third-party Wi-Fi router without consent in an attempt to disguise a signal’s origin has no legitimate expectation of privacy.²⁰¹ In this case, the government did not argue that the MoocherHunter can be defined as an item in “general public use.”²⁰² However, since it is a “software tool that can be downloaded for free . . . and used by anyone with a laptop computer and directional antennae,”²⁰³ it is arguably in “general public use.” *Stanley* is an example of another case decided on grounds other than the “general public use” test.

VII. A DEFINITION OF GENERAL PUBLIC USE

Another source that can be examined to define “general public use” is the definitions section of the Federal Acquisition Regulations System.²⁰⁴ Under section 2.101, there are eight types of items that are considered commercial items.²⁰⁵ Relevant portions include:

¹⁹⁵ 486 F. Supp. 2d 587 (W.D. Tex. 2005).

¹⁹⁶ *Id.* at 590.

¹⁹⁷ 753 F.3d 114, 115-17 (3d Cir. 2014).

¹⁹⁸ The MoocherHunter is a software tool that uses “a laptop computer and a directional antenna.” *Id.* at 116. “[T]he “user enters the MAC address of the wireless card he wishes to locate[,] and the program measures the signal strength of the radio waves emitted from this card.” *Id.*

¹⁹⁹ *See id.* at 120-122.

²⁰⁰ *Id.* at 119-20.

²⁰¹ *Id.* at 120-21. “Stanley, was in effect, a virtual trespasser.” *Id.* at 120.

²⁰² *Id.* at 119.

²⁰³ *Id.* at 116.

²⁰⁴ 48 C.F.R. § 2.101 (LEXIS through the Sept. 9, 2019 issue of the Federal Register).

²⁰⁵ *Id.*

(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and

(i) Has been sold, leased, or licensed to the general public; or

(ii) Has been offered for sale, lease, or license to the general public;

Commercially available off-the-shelf (COTS) item - -

(1) means any item of supply (including construction material) that is - -

(i) A commercial item (as defined in paragraph (1) of the definition in this section);

(ii) Sold in substantial quantities in the commercial marketplace;²⁰⁶

When considering these factors and the lower court decisions,²⁰⁷ an item is in “general public use” when two conditions are met. First, is the item accessible to an average person? An item is accessible if the item can be bought at a store or on the internet. An item is not accessible if it is only available to the government. Second, what is the level of difficulty in acquiring the item? While an item may be accessible to the public, the item’s price can increase the difficulty in obtaining the item. An item that costs \$10,000 is much more challenging to acquire than an item that costs \$100, even if the item is available to the general public. If these factors are applied, a camera, a flashlight, and night vision goggles available in sporting goods stores and the internet would be found in “general public use.” Additionally, applying these factors would also place current thermal imaging and some see-through the wall devices in the “general public use” category.

VIII. COURTS SHOULD ANALYZE ADVANCED SENSING TECHNOLOGY UNDER A PROPERTY ANALYSIS

Courts should analyze advanced sensing technology under a property rubric. Property analysis provides a bright-line for courts to use. The property-based cases illustrate this. In *Kyllo*, the Court

²⁰⁶ *Id.*

²⁰⁷ *See* cases cited *supra* note 181.

declined to determine if there was a difference between thermal information coming off the wall or through the wall.²⁰⁸ This type of analysis is too mechanical, “the approach would leave the homeowner at the mercy of advancing technology.”²⁰⁹ In *Collins* and *Jardines*, once the curtilage was invaded, further analysis was unnecessary.²¹⁰ There is a license to walk up to a door and knock as custom dictates,²¹¹ but “[t]here is no customary invitation”²¹² to engage in a forensic dog search of the area around the door.²¹³ In *Collins*, a motorcycle under a tarp was protected from a police search because it fell under the umbrella of the curtilage.²¹⁴ The Court did not see a reason to apply the vehicle exception.²¹⁵ The Court explained the protection of the curtilage by analogy to another scenario:

Imagine a motorcycle parked inside the living room of a house, visible through a window to a passerby on the street. Imagine further that an officer has probable cause to believe that the motorcycle was involved in a traffic infraction. Can the officer, acting without a warrant, enter the house to search the motorcycle and confirm whether it is the right one? Surely not.²¹⁶

The Court in *Jones* did not determine “thorny” questions of which length of time or quality of surveillance intruded on *Jardines*’ reasonable expectation of privacy.²¹⁷ Instead, the physical intrusion of the device on the car was enough to decide the violation of the Fourth Amendment.²¹⁸ Justice Scalia, writing for the majority in *Jardines*, provided a succinct reason to use the property analysis. Justice Scalia

²⁰⁸ *Kyllo v. United States*, 533 U.S. 27, 35-39 (2001).

²⁰⁹ *Id.* at 35.

²¹⁰ “[W]e need not decide whether the officers’ investigation of *Jardines*’ home violated his expectation of privacy under *Katz*.” *Florida v. Jardines*, 569 U.S. 1, 11 (2013). “The automobile exception does not permit an officer without a warrant to enter a . . . curtilage in order to search a vehicle therein.” *Collins v. Virginia*, 138 S. Ct. 1663, 1675 (2018).

²¹¹ *Jardines*, 569 U.S. at 7-8.

²¹² *Id.* at 9.

²¹³ *Id.*

²¹⁴ *Collins*, 138 S. Ct. at 1670-1672, 1675.

²¹⁵ *Id.* at 1671-74.

²¹⁶ *Id.* at 1671.

²¹⁷ *United States v. Jones*, 565 U.S. 400, 412-13 (2012).

²¹⁸ *Id.* at 412-13 (“We may have to grapple with these ‘vexing problems’ in some future case where a classic trespassory search is not involved . . . but there is no reason for rushing forward to resolve them here.”).

said that “[o]ne virtue of the Fourth Amendment’s property-rights baseline is that it keeps easy cases easy.”²¹⁹

After nineteen years, the Supreme Court has yet to provide a workable framework to determine when an item is in “general public use.” The Court’s reluctance to define “general public use” provides further support to no longer using the “general public use” test. Further, it is likely that even if the Court created a workable framework for “general public use,” it would nonetheless still leave a loophole to circumvent the Fourth Amendment. As Section IV shows, it is hard to imagine a scenario where these advanced sensing technologies will not be in “general public use” within a decade. Arguably, thermal imagers are already in that category.²²⁰ If the Court decided cases using the property analysis, where appropriate, then courts will not have to waste time determining if an item is in “general public use” or to try to find an alternative means of deciding the case. Since the property analysis is a bright-line rule, courts will not be ambivalent as to how they should proceed. While it is still early in the development cycle of some advanced technologies, there is no reason to provide police with the means to evade the protection provided by the Fourth Amendment. As John Adams said, “when the state of things is found such as the author of the disposition has not foreseen, and could not have thought of . . . interpret the act as he himself would have interpreted it.”²²¹ It is reasonable to conclude from the Framers’ position on unreasonable searches of their time that they would also find technology that can see into a person’s home is not a reasonable search under the Fourth Amendment.

The “general public use” standard also contradicts the *Kyllo* decision itself. While *Kyllo* benefitted the property analysis by adopting the concept of intangible protection from *Katz*, the “general public use test” defeats that extra protection. It is a logical fallacy to create a constitutionally protected area, yet at the same time provide a means by which law enforcement can intrude upon that area at some undefined future time.

Similar to the *Jardines* property-based ruling, a police officer should not be allowed to invade a home’s curtilage to use a hand-held or portable advanced sensing device to examine the interior of the home. Additionally, as the property-analysis also protects against

²¹⁹ Florida v. Jardines, 569 U.S 1, 11 (2013).

²²⁰ See *supra* notes 145-48 and accompanying text.

²²¹ *Framers’ Intent*, *supra* note 21, at 1060 (citation omitted).

intangible intrusions of a constitutionally protected area, then a search of a home beyond the curtilage with advanced sensing technology should also not be allowed.

The rule would not be complete without the exigent circumstances exception. The use of advanced searching technology without a warrant should be allowed in those specific circumstances.²²² Further, the courts should account for the naked eye observation of a law enforcement official as an exception.²²³ A reasonable application of the naked eye observation exception is illustrated by a hypothetical scenario. A police officer views contraband or illegal activity through a window from a public area. The police officer can then, within a reasonable time frame from the observation, use the advanced sensing technology to provide further information. Of course, even under the naked eye observation, the officer should be held to the exigency standard. The situation must call for a “warrantless search [that] is objectively reasonable under the Fourth Amendment.”²²⁴ Therefore, if the situation observed meets the exigency standard for warrantless entry, then it follows that an advanced sensing search would also be valid.

IX. CONCLUSION

This Note is not intended to diminish or dismiss the usefulness of advanced sensing technology to law enforcement officials. These devices contribute to public safety and crime prevention. However, it is equally as essential to respect the rights accorded to every person under the Law and the Constitution.

The Supreme Court intended the *Kyllo* rule as a bright-line test for the use of advanced sensing technology. However, the addition of the “general public use” test defeats that purpose. Technology that can see into a home is arguably accessible to the general public. Additionally, courts struggle to apply the “general public use” test. Therefore, to preserve the spirit of the Fourth Amendment and provide a clear guide to the lower courts, searches involving advanced sensing

²²² Some situations include “hot pursuit,” imminent destruction of evidence, and the preservation of life. See *Brigham City v. Stuart*, 547 U.S. 398, 403-04 (2006).

²²³ See *California v. Ciraolo*, 476 U.S. 207, 213 (1986) (“The Fourth Amendment protection of the home has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares.”).

²²⁴ *Brigham City*, 547 U.S. at 403.

technology should be analyzed under a property analysis. Advanced sensing technology that invades the curtilage of the home or penetrates the walls to see into the interior of the home is presumptively unreasonable and requires a warrant. The new rule is a combination of *Kyllo*, and the framework advanced in *Katz*. The home and the curtilage are constitutionally protected areas that law enforcement cannot intrude upon using any method, both physical and intangible. Therefore, the property analysis would provide coverage well into the future as science creates new methods to see the unseen.