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SJC-10355

COMMONWEALTH vs. EVERETT H. CONNOLLY.

Barnstable. May 5, 2009. - September 17, 2009.

Present: Marshall, C.J., Ireland, Spina, Cowin, Cordy, Botsford,
& Gants, JJ.

Probable Cause. Search and Seizure, Affidavit, Probable cause, Warrant, Automobile, Expectation of privacy. Constitutional Law, Search and seizure, Probable cause, Probable cause, Privacy, Confrontation of witnesses, Harmless error. Practice, Criminal, Affidavit, Warrant, Probable cause hearing, Disclosure of identity of informer, Confrontation of witnesses, Harmless error. Evidence, Informer, Certificate of drug analysis. Error, Harmless. Controlled Substances. Global Positioning System Device.

Indictments found and returned in the Superior Court Department on December 21, 2004.

A pretrial motion to suppress evidence was heard by Robert J. Kane, J.; the cases were tried before Gary A. Nickerson, J., and a motion for a new trial was heard by him.

The Supreme Judicial Court on its own initiative transferred the case from the Appeals Court.

Ian Stone for the defendant.

Julia K. Holler, Assistant District Attorney, for the Commonwealth.

The following submitted briefs for amici curiae:

Martha Coakley, Attorney General, James J. Arquin & Pamela L. Hunt, Assistant Attorneys General, & David F. Capeless, District Attorney for the Berkshire District & others.

Sharon N. Chaitin-Pollak, Committee for Public Counsel Services, & Beth L. Eisenberg, Committee for Public Counsel Services, for the Committee for Public Counsel Services.

John Verdi, of the District of Columbia, & Marc Rotenberg,

for Electronic Privacy Information Center.

COWIN, J. A Superior Court jury convicted the defendant of trafficking in cocaine in violation of G. L. c. 94C, § 32E (b) (3), and distribution of cocaine in violation of G. L. c. 94C, § 32A (c). Much of the evidence at trial was obtained as the result of a warrant that was issued to search the defendant's minivan.¹ The affidavit attached to the application for the warrant contained information obtained from informants, from police investigation, and from a global positioning system (GPS) device. The GPS device had been installed in the defendant's minivan pursuant to a warrant previously issued.²

On appeal,³ the defendant claims that the judge erred in denying his motion to suppress evidence found in his minivan because the affidavit supporting the application for a warrant to search that vehicle did not contain evidence that would support a finding of probable cause. He argues further that he should receive a new trial because a warrant is required for the use of a GPS device, and, while a warrant in fact issued in this case,

¹ Other warrants were also issued at the same time. The defendant's claims essentially relate to the search of the minivan; the other warrants are not relevant to this appeal.

² We acknowledge the amicus briefs of the Attorney General and the district attorneys for the Berkshire, Bristol, Eastern, Hampden, Middle, Norfolk, Northern, Northwestern, Plymouth, and Suffolk districts; the Committee for Public Counsel Services; and the Electronic Privacy Information Center.

³ The defendant appealed to the Appeals Court and filed a motion for a new trial in the Superior Court. The defendant appealed separately from the order denying his motion for a new trial, and the Appeals Court consolidated the appeals. We transferred the case from the Appeals Court on our own motion.

the police obtained data from the GPS device after the warrant had expired, thereafter using that data to obtain the other search warrant as well as to locate his minivan in order to stop and search it. In addition to his arguments with respect to the search warrant, the defendant maintains that two defects in the trial proceedings (the failure to disclose the identity of a confidential informant and a witness's comment on the defendant's invocation of his right to remain silent) require a new trial. He asserts that his counsel's allegedly inadequate responses to these trial errors also require a new trial. Finally, the defendant claims that his right to confrontation was denied by the introduction at trial of the certificate of analysis of a chemist whom he had no opportunity to cross-examine. See Melendez-Diaz v. Massachusetts, 129 S. Ct. 2527 (2009).⁴

We conclude that there was probable cause to issue the search warrant for the minivan; the use of a GPS tracking device requires a warrant for purposes of art. 14 of the Massachusetts Declaration of Rights; the installation and use of the GPS tracking device in this case was a seizure; and the GPS tracking warrant had not expired. We determine further that any deficiencies at trial were adequately cured by the judge's instructions; thus, there was no ineffective assistance of counsel. We conclude that any denial of the right to confrontation was harmless beyond a reasonable doubt. Accordingly, we affirm the convictions and the denial of the

⁴ In fact, three certificates of analysis were introduced. See Part 2.d, infra.

motion for a new trial.

1. Background. a. Facts and procedural history. We summarize the facts that the jury could have found from the evidence at trial, supplemented by undisputed facts in the record, and reserve some details for later discussion. State and local police investigated the defendant, a suspected drug dealer, for more than a year. The investigation included surveillance of the defendant, controlled drug purchases by multiple confidential informants, and observation by police officers of the defendant engaged in numerous apparent narcotics transactions using his minivan. Toward the end of the surveillance period, on August 24 and 25, 2004, Officer Jennifer Margeson, a reserve officer with the Orleans police department, working as an undercover officer with the Cape and Islands drug task force, made additional controlled purchases of "crack" cocaine from the defendant. Based on the lengthy investigation, a State police trooper submitted a search warrant application to place a GPS monitoring device on the defendant's minivan for fifteen days. The warrant was issued on August 30, 2004, and on September 7, 2004, an "addendum" was filed with the court stating that the GPS device had been installed in the defendant's minivan on August 31, 2004, monitoring was ongoing, and a "full" return would be made by the end of the fifteen-day period.⁵ Such a return was made on September 14, 2004, within the fifteen-day period.

On September 8, 2004, police also obtained an arrest warrant

⁵ Police installed the GPS device late at night, while the minivan was parked behind the defendant's apartment building. Such installation was authorized by the warrant.

for the defendant and a search warrant to search his minivan and its occupants. Information obtained from the GPS device was included in the affidavit for the search warrant. On September 9, 2004, with the use of data obtained from the GPS device, a State trooper observed the defendant driving the minivan on Route 6 on Cape Cod, arrested him, and drove his minivan to the Harwich police station, where it was searched by a drug detection canine. A large ball of crack cocaine, wrapped in electrical tape and later determined to weigh 124.31 grams, was found wedged under the dashboard. The glove compartment of the minivan contained a number of documents in the defendant's name. Police also found a substantial amount of cash in the defendant's apartment.

b. GPS tracking devices. According to the affidavit in support of the application for the GPS warrant, a GPS tracking system allows police to monitor and record the location of a vehicle without the owner's knowledge. A GPS device is capable of operating twenty-four hours per day with no human intervention. The tracking system consists of three components: a receiver on the target vehicle which calculates the vehicle's location through the use of satellites; a cellular telephone or other technology which transmits the vehicle's position; and a computer monitoring device which receives and stores location information and uses mapping software to display the vehicle's location. Since the location data is stored in computer files, it may be kept indefinitely, and new information based on the data obtained regarding a vehicle's past locations may be

generated at any time.⁶

GPS devices are powered by one of two methods. A GPS device containing its own internal batteries may be attached easily to the exterior of a vehicle, but the batteries in this type of device require replacement. Alternatively, as with the device at issue here, a GPS device may be installed in the engine compartment of a vehicle and attached to the vehicle's power source (battery). Although this type of device may take more than an hour to install and test, it runs on the vehicle's power, and thus can operate indefinitely without battery replacement. See United States v. Garcia, 474 F.3d 994, 995-996, cert. denied, 128 S. Ct. 291 (7th Cir. 2007); United States v. Berry, 300 F. Supp. 2d 366, 367-368 (D. Md. 2004); People v. Weaver, 12 N.Y.3d 433, 436 (2009).

2. Discussion. a. Motion to suppress. (i) Probable cause to search the minivan. The defendant maintains that the affidavit did not provide evidence sufficient to establish probable cause for issuance of the search warrant because there was an inadequate showing that drugs would be found in his minivan. He contends alternatively that, to the extent that there was a showing of probable cause at all, it was probable cause only to believe that there would be drugs in the vehicle when the defendant was returning from a trip to his New York

⁶ For instance, even if the vehicle's route was not observed by police officers, and even if the vehicle traveled different routes to reach the same destination, the database may be queried to determine if the vehicle always paused en route at a particular convenience store parking lot known to be a location of frequent drug transactions at a particular time every evening.

supplier, and the affidavit did not demonstrate that he had just returned from New York. The defendant argues further that only two confidential informants were known to be credible and reliable; the facts in the supporting affidavit were stale, because the warrant issued on September 8, 2004, while the last controlled purchases by confidential informants were made in late June, 2004, and there was no indication of any criminal activity after Margeson's (the undercover officer's) second controlled purchase on August 25, 2004; and the failure to refer in the warrant application to a specific confidential informant whose existence was not disclosed until mid-trial rendered the statements in the affidavit unreliable. We consider each of these arguments.

Review of the sufficiency of the showing to justify issuance of a search warrant "begins and ends with the four corners of the affidavit." Commonwealth v. O'Day, 440 Mass. 296, 297 (2004), quoting Commonwealth v. Villella, 39 Mass. App. Ct. 426, 428 (1995). In order to establish probable cause to issue a search warrant, the affidavit must "contain enough information for the issuing magistrate to determine that the items sought are related to the criminal activity under investigation, and that they may reasonably be expected to be located in the place to be searched." Id. at 300, quoting Commonwealth v. Cefalo, 381 Mass. 319, 328 (1980). In determining whether an affidavit justifies a finding of probable cause, the affidavit is considered as a whole and in a commonsense and realistic fashion; inferences drawn from the affidavit need only be reasonable, not required.

Commonwealth v. Kaupp, 453 Mass. 102, 110-111 (2009).

Where the affidavit relies on information from confidential informants, it must provide "some of the underlying circumstances from which the informant concluded that the contraband was where he claimed it was (the basis of knowledge test)" and "some of the underlying circumstances from which the affiant concluded that the informant was 'credible' or his information 'reliable' (the veracity test)."⁷ Commonwealth v. Byfield, 413 Mass. 426, 429 (1992), quoting Commonwealth v. Upton, 394 Mass. 363, 374-375 (1985). If the information from the informant does not satisfy both requirements, "other allegations in the affidavit that corroborate the information could support a finding of probable cause." Id. Facts asserted in the affidavit must be closely related in time to the issuance of the warrant in order to justify a finding of probable cause; whether facts are stale or timely is determined by the circumstances of each case. Commonwealth v. Cruz, 430 Mass. 838, 843 (2000), quoting Sgro v. United States, 287 U.S. 206, 210-211 (1932).

We conclude that the affidavit here contained ample evidence to support a finding of probable cause that drugs would be found in the defendant's minivan. The affidavit set forth information describing a lengthy investigation involving at least eight confidential informants who told police they had purchased

⁷ Under art. 14 of the Massachusetts Declaration of Rights, we continue to apply the two-prong Aquilar-Spinelli test described here, see Commonwealth v. O'Day, 440 Mass. 296, 301 (2004), citing Spinelli v. United States, 393 U.S. 410 (1969), and Aquilar v. Texas, 378 U.S. 108 (1964), despite its abandonment by the Federal courts. See Commonwealth v. Upton, 394 Mass. 363, 374 (1985).

cocaine from the defendant; furnished details about the defendant's drug sales in the Cape Cod area; and described controlled drug purchases from the defendant in his minivan during the investigation. See Commonwealth v. O'Day, supra at 298-303. Informants stated that the defendant hid cocaine under the dashboard of his minivan, in the center console, under a floor mat, and in a wheel well; one of them stated that the defendant usually hid enough cocaine on his person or in his minivan sufficient to supply customers for one "day or night." See Commonwealth v. Matias, 440 Mass. 787, 794 (2004). Police confirmed the informants' information by surveillance and by contact with rental car companies, hotels, the registry of motor vehicles, and authorities in New York, where the defendant had been arrested, and Jamaica, where the defendant was born and where he had been a police officer.⁸

Furthermore, the affidavit contained detailed information about Margeson's controlled purchases of crack cocaine from the defendant in his minivan on August 24 and 25, 2004. See Commonwealth v. Cruz, supra at 842 n.2 (controlled purchase alone may establish probable cause to issue search warrant for search of location where sale was made). During one of these purchases, Margeson saw the defendant reach under the dashboard to retrieve

⁸ The affidavit sets forth the results of an earlier search, conducted in February of 2004, in the middle of the year-long investigation. During that search, pursuant to a warrant issued to search the defendant and his home, police recovered \$10,860 from a hidden panel in a wall. One of the bills in the wall, and two bills found in the defendant's wallet, were marked bills from previous controlled purchases. This information by itself would be stale, see infra at - , but it is probative in combination with the other statements in the affidavit.

something before handing her a second bag of cocaine. See Commonwealth v. Staines, 441 Mass. 521, 525-526 (2004) (probable cause to believe drugs would be in defendant's car at time anticipatory warrant was executed where six controlled purchases had taken place in car and, on one occasion when undercover officer requested additional cocaine during purchase, defendant had officer leave car, drove up street, and then returned immediately with more cocaine). Thus, the affidavit contained evidence establishing probable cause that drugs would be found in the minivan.

The defendant maintains that, even if the affidavit demonstrated probable cause, it only supported probable cause to believe that drugs would be found in the minivan on a day that the defendant had returned from New York; the police had no reason to believe he had just returned from New York when they executed the search warrant; and, therefore, there was no reason to believe that there would be drugs in the minivan on the day the search warrant was executed. The affidavit, however, provided sufficient evidence to support a finding of probable cause that drugs would be in the minivan after the defendant's return from his trip to New York on September 6, 2004.

The police had specific, detailed information from informants that the defendant went to New York periodically to purchase cocaine and that he ordinarily remained there a day or two before returning to Cape Cod. On the evening of September 6, 2004, police observed the defendant driving the minivan on a highway near the Massachusetts-Rhode Island border heading in the

direction of New York. The GPS device then provided data showing the minivan traveled to an address in New York that night, arriving at approximately 10 P.M. Thus, when police applied for the warrant to search the minivan on September 8, 2004, they had probable cause to believe that the defendant had recently returned from a buying trip to New York and would have drugs in his minivan.

The defendant's assertion that the affidavit did not support a finding of probable cause because it established the credibility and reliability of only two of the confidential informants is unavailing. The defendant's failure to indicate which two informants are reliable, as opposed to those he considers unreliable, renders it impossible to address this claim effectively. Regardless, the affidavit clearly set forth information establishing that all of the informants met both prongs of the Aguilar-Spinelli test. See Commonwealth v. O'Day, supra at 301, citing Spinelli v. United States, 393 U.S. 410 (1969), and Aguilar v. Texas, 378 U.S. 108 (1964).

The detailed information the confidential informants provided was based on personal knowledge; most stated explicitly that the defendant was known to them and that they had obtained information during conversations with the defendant. See Commonwealth v. Allen, 406 Mass. 575, 578 (1990) (firsthand knowledge through observation satisfies basis of knowledge prong of Aguilar-Spinelli test). In addition, the circumstances indicated that the informants were reliable. Some of them had provided information that led to the convictions of other

suspects or the seizure of a large quantity of cocaine and money obtained from narcotics sales, see Commonwealth v. Lapine, 410 Mass. 38, 41-42 (1991), and some stated that they were currently or had previously been employed as "runners" by the defendant. See Commonwealth v. Parapar, 404 Mass. 319, 322 (1989), quoting United States v. Harris, 403 U.S. 573, 585 (1971); Commonwealth v. Vynorius, 369 Mass. 17, 21 (1975), quoting United States v. Harris, *supra* ("admissions of crime . . . carry their own indicia of credibility -- sufficient at least to support a finding of probable cause"). Police corroborated the informants' statements through surveillance, see Commonwealth v. Germain, 396 Mass. 413, 418 (1985), and Commonwealth v. Upton, 394 Mass. 363, 375-376 (1985), and controlled purchases. See Commonwealth v. Cruz, 430 Mass. 838, 842 n.2 (2000). In addition, in a number of instances, specific, detailed information from one informant was confirmed by similar statements from one or more additional informants. See Commonwealth v. Va Meng Joe, 425 Mass. 99, 103-105 (1997).

Contrary to the defendant's argument, the information contained in the affidavit was not stale. The defendant treats the affidavit as if the allegedly stale sales were the only evidence in the affidavit.⁹ But the affidavit established a continuous sequence of drug transactions by the defendant over a year-long period, ending at a time that was probative at the time of the search. See Commonwealth v. Vynorius, *supra* at 25,

⁹ The defendant emphasizes that the last purchase by a confidential informant was made in late June, 2004.

quoting Bastida v. Henderson, 487 F.2d 860, 864 (5th Cir. 1973) ("if an affidavit recites activity indicating protracted or continuous conduct, time is of less significance"). Indeed, the last two controlled purchases were made by Margeson at the end of August, 2004, less than two weeks before the warrant was sought. These two purchases alone were sufficient to establish probable cause to issue the warrant. See Commonwealth v. Cruz, supra at 843 (where six controlled purchases were made over four-week period, passage of two weeks between last purchase and issuance of warrant did not cause information to become stale). In addition, police surveillance also suggested ongoing drug activity after the last controlled purchase.

Finally, the defendant claims that the failure to mention in the warrant application an informant whose existence was not disclosed until mid-trial rendered the entire warrant application unreliable. The defendant is correct that the affidavit did not mention that, prior to Margeson's two controlled purchases described in the affidavit, she was present at an earlier controlled purchase between a confidential informant and the defendant. The absence of such information, however, did not cause the affidavit to be unreliable. The affidavit established probable cause without reference to that initial controlled purchase. The police need not provide every detail of an investigation as long as probable cause supports the issuance of the warrant and the information omitted does not negate the existence of probable cause. See Commonwealth v. O'Day, 440 Mass. 296, 301-304 (2004); Commonwealth v. Watson, 430 Mass. 725,

734-735 (2000). See also Commonwealth v. Luce, 34 Mass. App. Ct. 105, 110-111 (1993) (motion to suppress properly denied where information withheld but affidavit had not omitted significant exculpatory information).

(ii) Use of the GPS device. The defendant argues that surreptitious GPS monitoring without a warrant constitutes an unreasonable search and seizure that violates the Fourth Amendment to the United States Constitution and art. 14 of the Massachusetts Declaration of Rights. While acknowledging that a warrant for use of the GPS device was issued in this case, the defendant maintains that the police continued to obtain information from that warrant after the warrant had expired. He claims that the police then improperly used that information both to obtain a warrant to search his minivan and to locate his minivan and execute the search warrant.¹⁰ During the search of his minivan, the incriminating cocaine was found.

In its brief, the Commonwealth never actually takes a position on the question whether a warrant is required for the installation of a GPS device. We read the Commonwealth's brief

¹⁰ Although the defendant did not explicitly argue the GPS issue at the brief hearing on the motion to suppress evidence obtained during execution of the search warrant, he claimed at that hearing that the entire affidavit supporting the search warrant, including paragraphs describing the GPS monitoring and the information gleaned from that monitoring, failed to establish probable cause to issue the warrant. He specifically cited the paragraphs concerning the GPS device in a separate memorandum submitted at the judge's request. Detailed arguments concerning use of the GPS device were contained in his motion for a new trial in the Superior Court and in additional memoranda on the GPS issue submitted at the request of the motion judge; the judge also issued a lengthy decision on the merits. Thus, we consider the issue preserved.

as suggesting that a warrant is not necessary, although such is not clearly stated. In any event, if use of a GPS device is either a search or a seizure, a valid warrant is required for its use. See Commonwealth v. Balicki, 436 Mass. 1, 8 (2002). We conclude that the installation and use of the GPS device in the circumstances of this case was a seizure requiring a warrant, and that the warrant obtained had not expired when the minivan was seized.

(1) Electronic tracking under the Fourth Amendment. A search implicating the Fourth Amendment occurs "when an expectation of privacy that society is prepared to consider reasonable is infringed" and a seizure of property for purposes of the Fourth Amendment occurs when "there is some meaningful interference with an individual's possessory interests in that property." United States v. Karo, 468 U.S. 705, 712 (1984) (Karo), quoting United States v. Jacobsen, 466 U.S. 109, 113 (1984). Under the Fourth Amendment, there is no reasonable expectation of privacy in the publicly visible exterior of a vehicle. See New York v. Class, 475 U.S. 106, 112-114 (1986) (noting that interior of vehicle, in contrast, is subject to Fourth Amendment protection). Additionally, for Fourth Amendment purposes, no privacy interest exists in the movement of a vehicle traveling on a public roadway. See United States v. Knotts, 460 U.S. 276, 281-283 (1983) (Knotts).

Although the United States Supreme Court has decided that

use of a beeper¹¹ placed inside a vehicle to track that vehicle while it is traveling on a public road is not a search for Fourth Amendment purposes, see Knotts, supra, the Court has not yet determined whether installation of a GPS device on a vehicle constitutes a search under the Fourth Amendment. See People v. Weaver, 12 N.Y.3d 433, 445 (2009). In its decisions on beeper tracking, the Court has relied on the level of sophistication of the particular electronic device, and the physical location from which the device transmitted its signal, to determine whether use of the device interferes with a reasonable expectation of privacy and therefore constitutes a search. Where the beeper at issue emitted a local signal that officers were required to track while driving within close range of the vehicle, the Court reasoned that it merely augmented officers' physical abilities and did not provide more information than officers could have obtained by visual surveillance. Knotts, supra at 282. The Court indicated that other types of more sophisticated electronic surveillance might require a different result, id. at 283-284, and

¹¹ In contrast to GPS devices, beepers or radio transmitters emit a local signal that is received by a particular local receiver tuned to that signal. The signal must be followed closely by officers conducting surveillance, and is not transmitted to a computer system. The strength of the signal, and therefore the range within which officers may follow the signal while themselves avoiding detection, varies. Beepers or radio transmitters operate from batteries that must be replaced. However, through the use of magnets, the devices are easily and quickly attached to the exterior of a vehicle, such as the bumper or undercarriage; they are also readily concealed inside other objects which may be placed in the vehicle. See United States v. Knotts, 460 U.S. 277-278 (1983) (Knotts); United States v. Berry, 300 F. Supp. 2d 366, 367-368 (D. Md. 2004); State v. Campbell, 306 Or. 157, 160 (1988).

subsequently stated, in dicta, that satellite technology which replaces rather than enhances officers' physical abilities could constitute a search under the Fourth Amendment. Dow Chem. Co. v. United States, 476 U.S. 227, 238-239 (1986). In addition, the use of data obtained from beeper tracking constitutes a Fourth Amendment search if the defendant has a protected privacy interest in the location, such as the interior of a private building, from which the beeper is signaling. See Karo, supra at 714-717.

Although they have concluded that a GPS device permits far more sophisticated surveillance than a beeper, see, e.g., United States v. Berry, 300 F. Supp. 2d 366, 368 (D. Md. 2004), and that GPS devices replace rather than enhance officers' physical abilities, see, e.g., United States v. Garcia, 474 F.3d 994, 998 (7th Cir. 2007), the few Federal courts to have considered the question of GPS monitoring have generally extended the reasoning in Knotts and Karo to the use of GPS devices. See United States v. McIver, 186 F.3d 1119, 1126-1127 (9th Cir. 1999), cert. denied, 528 U.S. 1117 (2000) (installation of GPS device on undercarriage of vehicle in driveway not search where driveway not within curtilage); United States v. Williams, F. Supp. 2d (W.D. Ky. 2009) (no search where GPS device was installed on exterior of vehicle and vehicle was tracked only on public roads, but outcome might have been "entirely different" if device had been installed or monitored while vehicle was located on private property); United States v. Jones, 451 F. Supp. 2d 71, 88 (D.D.C. 2006) (tracking GPS device on public roadway not search, but GPS

data received while vehicle parked in garage is obtained as result of search); United States v. Moran, 349 F. Supp. 2d 425, 467 (N.D.N.Y. 2005) (tracking GPS device on highway not search where officers could have conducted surveillance by following vehicle on public road). Similarly, a few State courts have concluded that use of a GPS device on a public way is not a search under the Fourth Amendment. See, e.g., Stone v. State, 178 Md. App. 428, 446-450 (2008); State v. Sveum, 769 N.W.2d 53, 59 (Wis. Ct. App. 2009). At least one Federal court declined to decide whether the use of a GPS device constitutes a search or a seizure under the Fourth Amendment, but upheld the use where there was a court order permitting installation of the device and probable cause had been shown. See United States v. Berry, supra at 368.

Courts have not generally considered explicitly the question whether use of an electronic tracking device constitutes a seizure under the Fourth Amendment. See United States v. Garcia, supra at 996 (not deciding question of seizure with battery powered device because device did not "affect the car's driving qualities, draw power from the car's engine or battery," or occupy space that "might otherwise have been occupied by passengers or packages"). In Knotts, some members of the United States Supreme Court observed that consideration of the seizure issue would have been desirable, but that the defendant did not raise the issue.¹² See Knotts, supra at 285-287 (Brennan, J.,

¹² In both Knotts and Karo, rather than being attached to the vehicle itself, as a GPS device is, the beeper was installed in a container that was sold to the defendant, who placed the

concurring in the judgment). The dissent in Karo made a similar observation. See Karo, supra at 729-734 & n.1 (Stevens, J., concurring in part and dissenting in part) (stating that tracking of beeper constituted seizure of truck).

(2) Other State Constitutions. A few State courts have concluded that, whatever the extent of Fourth Amendment protection, installation of a sophisticated electronic tracking device on a vehicle constitutes a search requiring a warrant under their State Constitutions. See People v. Weaver, 12 N.Y.3d 433, 445 (2009); State v. Campbell, 306 Or. 157, 172-173 (1988). See also State v. Jackson, 150 Wash. 2d 251, 264 (2003) (raising issue under State Constitution only). These courts have rejected the Fourth Amendment emphasis on the location of the vehicle when the device transmits its signal and have focused instead on the privacy interest in being free from electronic surveillance, see Olmstead v. United States, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting), and the extent to which secret electronic surveillance by government interferes with that interest. See, e.g., State v. Campbell, supra at 169-172; State v. Jackson, supra at 263-264. Courts have noted also that, despite the increasing use of sophisticated technological devices, there has not been a corresponding societal expectation that government authorities will use such devices to track private citizens, and have emphasized that, if no warrant is required, any individual could be tracked indefinitely without suspicion of any crime.

container in the vehicle. See Knotts, supra at 278-279; Karo, supra at 708-709.

See People v. Weaver, supra at 442-443; State v. Jackson, supra at 263-264.

While no State court has explicitly addressed the question whether use of a GPS tracking device constitutes a seizure, the Washington court concluded, without further distinguishing the two subjects, that installation and use of a GPS device was both a search and a seizure. See State v. Jackson, supra at 263-264. Relying on State v. Campbell, supra at 164, 167, 169-170, that court observed that Washington's constitutional protection against "warrantless searches and seizures," like Oregon's, "focuses on the right to privacy, which is not defined by technological advances." Id. at 263. See State v. Campbell, supra at 164, 167-172.

(3) GPS device under art. 14. We resolve the defendant's claims based only on the protection afforded by art. 14 of the Massachusetts Declaration of Rights, which, in the area of motor vehicles, provides protection at least equal to, and at times greater than, that provided by the Fourth Amendment. See Commonwealth v. Gonsalves, 429 Mass. 658, 662-663 (1999). We have not previously considered whether art. 14 provides greater protection than the Fourth Amendment in the area of GPS tracking devices.

We conclude that a warrant was required here because the initial installation of the particular device clearly constituted a seizure under art. 14. The installation required not only entry by the police into the minivan for an hour, but also operation of the vehicle's electrical system, in order to attach

the device to the vehicle's power source and to verify that it was operating properly. Moreover, operation of the device required power from the defendant's vehicle, an ongoing physical intrusion. See Karo, supra at 729 (Stevens, J., dissenting) (insertion of beeper in vehicle is physical invasion and seizure because it infringes on owner's exclusionary right).

In addition, and apart from the installation of the GPS device, the police use of the defendant's minivan to conduct GPS monitoring for their own purposes constituted a seizure.¹³ When an electronic surveillance device is installed in a motor vehicle, be it a beeper, radio transmitter, or GPS device, the government's control and use of the defendant's vehicle to track its movements interferes with the defendant's interest in the vehicle notwithstanding that he maintains possession of it. The owner of property has a right to exclude it from "all the world," see Karo, supra at 729 (Stevens, J., dissenting), and the police use "infringes that exclusionary right." Id. The interference occurs regardless whether the device draws power from the vehicle and regardless whether the data is transmitted to a monitoring computer. It is a seizure not by virtue of the technology employed, but because the police use private property (the vehicle) to obtain information for their own purposes.

As stated, in gathering and using the GPS data by means of the minivan, the police used the defendant's minivan for government purposes, and did so without the defendant's knowledge

¹³ Because of the result we reach here, we need not consider whether use of a GPS device also constitutes a search.

or authorization. Tracking of the GPS data by the police constituted use and control of the defendant's minivan by them, and interfered with the defendant's right to exclude others from his vehicle.¹⁴ See United States v. Moore, 562 F.2d 106, 112 (1st Cir. 1977), cert. denied sub nom. Bobisink v. United States, 435 U.S. 926 (1978) (use of beeper legally implanted by stealth or attached by technical trespass "transforms the vehicle, unknown to its owner, into a messenger in the service of those watching it"). Although the defendant was not deprived of the ability to drive the minivan, by using the GPS device on the vehicle to track its movements the police asserted control over it, converting the minivan to their own use notwithstanding the defendant's continued possession. The continual monitoring of the GPS data also substantially infringed on another meaningful possessory interest in the minivan: the defendant's use and enjoyment of his vehicle. See Karo, supra at 729 (Stevens, J., dissenting) ("the character of the property is profoundly different when infected with an electronic bug than when it is entirely germ free"). Accordingly, we conclude that the monitoring and use of data from GPS devices requires a warrant

¹⁴ In another context, an electronic use of a publicly accessible location has been held to constitute an interference with a possessory interest notwithstanding that there was no physical intrusion and the owner retained possession and use of the property. See Register.com, Inc. v. Verio, Inc., 356 F.3d 393, 404 (2d Cir. 2004) (use of computer search program to obtain data from plaintiff's publicly available Internet site interfered with plaintiff's possessory interest in computer system).

under art. 14.¹⁵

(4) Warrant to install the GPS device. Despite the fact that G. L. c. 276, § 1, which provides authority to issue search warrants, contains no specific provision authorizing installation of GPS devices or monitoring of data from such devices,¹⁶ the defendant asserts that the tracking warrant here was issued pursuant to that statute and, therefore, that the seven-day period in which to execute a warrant under G. L. c. 276, § 3A, applies.¹⁷ Thus, the defendant argues that the search of his minivan was invalid because data from the GPS device was used to obtain the search warrant, and subsequently to locate his vehicle, but the warrant to install and monitor the GPS device

¹⁵ The defendant claims that under the Fourth Amendment to the United States Constitution a warrant was required for the GPS device. We have concluded under our Constitution that a warrant was necessary and therefore need not address the Federal issue.

¹⁶ The categories the statute explicitly authorizes to be seized are "[1] property or articles stolen, embezzled or obtained by false pretenses, or otherwise obtained in the commission of a crime . . . [2] property or articles which are intended for use, or which are or have been used, as a means or instrumentality of committing a crime . . . [3] property or articles the possession or control of which is unlawful, or which are possessed or controlled for an unlawful purpose . . . [4] the dead body of a human being . . . [5] the body of a living person for whom a current arrest warrant is outstanding." G. L. c. 276, § 1.

¹⁷ General Laws c. 276, § 3A, requires that "[e]very officer to whom a warrant to search is issued shall return the same to the court by which it was issued as soon as it has been served and in any event not later than seven days from the date of issuance thereof, with a return of his doings thereon" See Commonwealth v. Cromer, 365 Mass. 519, 524-526 (1974) (execution of search warrant under G. L. c. 276, § 1, delayed more than seven days per se invalid).

had expired at the time the information was obtained from it.¹⁸

Because the use of a GPS device in this case was not for tangible property, the provisions of G. L. c. 276, which pertain to search warrants for tangible property, were inapplicable. Accordingly, the procedural provisions of G. L. c. 276, such as the seven-day return period under § 3A, did not apply. Data from GPS devices also does not fall within the language of the wiretap statute, G. L. c. 272, § 99 I 2, which authorizes interception of "oral or wire communications." We conclude that GPS tracking warrants are issued under the common-law authority of the courts.¹⁹ See Commonwealth v. Penta, 423 Mass. 546, 552-553 (1996) (where statute authorizing warrant is not directly applicable, "warrant [may] issue if based on common law authority and consistent with art. 14"; therefore, court upheld warrant for hidden transmitter and recorder worn by informant to capture conversations).

We hold that warrants for GPS monitoring of a vehicle may be issued under the courts' common-law authority, in circumstances similar to those here, where proper procedures are followed. The Commonwealth must establish, before a magistrate, probable cause

¹⁸ Under G. L. c. 276, § 3A, the seven-day period for execution of a search warrant issued pursuant to G. L. c. 276, § 1, expired here on September 7, 2004, and the minivan was located using the GPS device on September 9, 2004.

¹⁹ General Laws c. 276, § 1, also contains a "common law" clause following the descriptions of specific types of tangible property. That clause provides: "[n]othing in this section shall be construed to abrogate, impair or limit powers of search and seizure granted under other provisions of the General Laws or under the common law."

to believe that a particularly described offense has been, is being, or is about to be committed, and that GPS monitoring of the vehicle will produce evidence of such offense or will aid in the apprehension of a person who the applicant has probable cause to believe has committed, is committing, or is about to commit such offense. The monitoring period must be no longer than fifteen days from the date of the warrant's issuance. See Matter of Lavigne, 418 Mass. 831, 835-836 (1994). In concluding that a fifteen-day period is appropriate, we are guided by the Legislature's determination that a maximum period of fifteen days for electronic surveillance of wire communications is reasonable, G. L. c. 272, § 99 I 2. The return should indicate the date that the GPS device was installed.

The GPS tracking warrant here was validly issued and complied with constitutional requirements. The warrant application requested monitoring of two explicitly identified vehicles; the affidavit furnished specific details concerning the make, model, registration number, and vehicle identification number of each vehicle to be monitored.²⁰ Information in the supporting affidavit established probable cause to believe that the defendant used these vehicles extensively in the course of conducting his drug business and that GPS monitoring would be likely to produce additional evidence of drug transactions between the defendant, his business associates, and his

²⁰ The application and supporting affidavit sought approval for monitoring of the defendant's minivan and an identified rental car from a car rental agency. The defendant makes no argument concerning the GPS device attached to the rental car.

customers. See Commonwealth v. Penta, supra at 552-553. The warrant application sought monitoring for a period of fifteen days after installation of the GPS device, and this period was approved. See Commonwealth v. Staines, 441 Mass. 521, 525 (2004) (where type of warrant not explicitly provided for in statute, "our inquiry is whether the warrant meets the requirements of the Fourth Amendment to the United States Constitution and art. 14 of the Massachusetts Declaration of Rights").

Once the warrant was issued, the GPS device was installed promptly and the affiant kept the court informed of the progress of the monitoring. The warrant was issued on August 30, 2004, and the GPS device was installed on August 31. On September 7, 2004, within seven days of installation, the affiant filed with the court an "addendum" to the warrant application stating that the GPS had been installed, the authorized monitoring had begun, and a "full" return to the court would be made at the conclusion of the fifteen-day period. On September 14, 2004, within the fifteen-day period, the affiant filed a "return of officer serving search warrant" form with the court. These procedures met all the requirements for a warrant under art. 14. See Commonwealth v. Blood, 400 Mass. 61, 68 & n.9, 75 n.15 (1987). The police complied with the explicitly limited and reasonable period authorized by the magistrate. See Commonwealth v. Penta, supra at 554-555. See also Commonwealth v. Blood, supra. Thus, the tracking warrant had not expired when the minivan was

seized.²¹ We now consider the two claimed trial errors.

b. Nondisclosure of informant. During trial, Margeson, the undercover officer, testified that she had been introduced to the defendant by a confidential informant prior to the two controlled purchases that she made from the defendant. This testimony was struck. The defendant argues that the prosecutor's failure to disclose the existence and identity of this confidential informant violated his right to confrontation under the Sixth Amendment to the United States Constitution and art. 12 of the Massachusetts Declaration of Rights, and that the judge erred in denying his motions for a mistrial on this ground.²² The defendant contends that nondisclosure of the informant prejudiced his ability to pursue his defense of mistaken identity because he was unable to cross-examine the confidential informant, and also was unable to cross-examine Margeson concerning the certainty of her identification.²³

²¹ The defendant argues also that his counsel was ineffective for failing to address adequately at the suppression hearing the issue whether the tracking warrant had expired. See note 10, supra. Since we conclude that the tracking warrant had not expired, it is of no consequence whether the issue of expiration of the tracking warrant was adequately preserved. For the same reason, counsel could not have been ineffective for failing to raise an objection that would not have succeeded. See Commonwealth v. Bol Choern, 446 Mass. 510, 520 (2006).

²² The defendant's argument concerning failure to disclose and identify this informant is in addition to, and separate from, his contention that this informant should have been identified in the affidavit for the search warrant. See part 2.a.i, supra.

²³ Although the prosecutor had been aware that a confidential informant had initially introduced Margeson to the defendant during an uncharged controlled purchase, the prosecutor was not aware of a third police report describing this purchase which had not been disclosed to either side; the defendant does

The judge ordered the prosecutor either to disclose the informant's identity or not to question Margeson regarding the earlier purchase. The prosecutor selected the latter option. The judge allowed the defendant to conduct an extensive voir dire of Margeson in respect to the extent of her interaction with the defendant at the earlier purchase, and the certainty of her identification of the defendant. The defendant chose not to cross-examine Margeson further about the strength of her identification.

Disclosure of an informant is required where the disclosure "is relevant and helpful" to the defense. Commonwealth v. Lugo, 406 Mass. 565, 570 (1990), quoting Roviaro v. United States, 353 U.S. 53, 60-61 (1957). A determination whether disclosure must be made involves consideration of all the circumstances, including "the crime charged, the possible defenses, the possible significance of the [informant's] testimony, and other relevant factors." Id. at 570-571, quoting Roviaro v. United States, supra at 62. Disclosure is generally required when the "informer is an active participant in the alleged crime or the only nongovernment witness." Id. at 572.

In the circumstances here, the judge acted within his sound discretion in treating the issue as he did. The informant was not a percipient witness to the charged crimes. Furthermore, disclosure of the informant would not have been helpful to the defense. To the contrary, evidence that the informant had been

not claim otherwise, and the judge found that there was no deliberate failure to disclose the report.

involved in arranging another transaction with the defendant, at which Margeson was present, would have tended to undermine the defendant's contention that Margeson saw him only briefly and was mistaken as to his identity. Moreover, evidence that the defendant had been involved in a third controlled purchase of cocaine with Margeson would have strengthened both Margeson's identification and the Commonwealth's case that the defendant was involved in drug distribution.

c. Right to remain silent. At trial, a police detective testified that after the defendant's arrest and after receiving Miranda warnings, the defendant stated that he "did not have anything to say at that time." The defendant argues that this was an improper reference to his invocation of his right to remain silent. The Commonwealth properly concedes that the witness's statement was inappropriate under Doyle v. Ohio, 426 U.S. 610, 611, 617-618 (1976). That decision prohibits reference to a defendant's invocation of his privilege under the Fifth Amendment to the United States Constitution after the defendant has been given Miranda warnings. Id. Before the defendant could voice an objection to the improper testimony, the judge, sua sponte, held a lobby conference and offered the defendant several options for curing the Doyle violation. The defendant elected a jury instruction on his right to remain silent. The judge immediately and forcefully instructed the jury that they could not consider the defendant's exercise of his right to remain silent. Defense counsel indicated that he was content with this instruction. In his final charge to the jury, the judge again

instructed on the defendant's right to remain silent.

Introducing evidence of a suspect's invocation of his right to remain silent is a serious error that may result in reversal of a conviction. See Commonwealth v. DePace, 433 Mass. 379, 383-386 (2001), S.C., 442 Mass. 739 (2004), cert. denied, 544 U.S. 980 (2005). We inquire whether the evidence created a substantial risk of a miscarriage of justice, see Commonwealth v. Brown, 451 Mass. 200, 208-209 (2008), by considering five factors: "(1) the relationship between the evidence and the premise of the defense; (2) who introduced the issue at trial; (3) the weight or the quantum of evidence of guilt; (4) the frequency of the reference; and (5) the availability or effect of curative instructions" (footnotes omitted). Commonwealth v. Mahdi, 388 Mass. 679, 696-697 (1983).

Here, the defendant waived all objections and accepted the judge's curative instructions. Given the brief and interrupted statement by the detective, the overwhelming evidence against the defendant, and the judge's forceful and immediate curative instruction, the single statement that the defendant had nothing to say did not result in a substantial risk of a miscarriage of justice. See Commonwealth v. Brown, supra. Had the error been preserved, the result would have been no different.²⁴

²⁴ Therefore, the defendant's claim that his counsel was ineffective because he waived any objection is unavailing. An objection would not have accomplished anything for the defense. See Commonwealth v. Satterfield, 373 Mass. 109, 115 (1977). For the same reason, counsel was not ineffective for failing to impeach another witness's credibility. See Commonwealth v. Bart B., 424 Mass. 911, 916 (1997), citing Commonwealth v. Roberts, 423 Mass. 17, 21 (1996).

d. Introduction of the drug certificates. We have allowed the defendant's request to file a supplemental brief in the wake of the decision in Melendez-Diaz v. Massachusetts, 129 S. Ct. 2527 (2009) (Melendez-Diaz). The defendant claims that, pursuant to Melendez-Diaz, he had a right under the confrontation clause of the Sixth Amendment to the United States Constitution to examine the chemical analyst whose affidavits (certificates of analysis)²⁵ were introduced to establish that the substance he sold to Margeson was three grams of cocaine and that the cocaine found in the search of his minivan was 124.31 grams of cocaine.²⁶ The United States Supreme Court ruled in Melendez-Diaz that analysts' affidavits are "testimonial statements" and that "[a]bsent a showing that the analysts were unavailable to testify at trial and that [a defendant] had a prior opportunity to cross examine them," a defendant has a right to confront the analysts at trial. Id. at 2532 (emphasis in original). Here, there was no showing that the analysts were unavailable, and the defendant had not previously cross-examined them. Under Melendez-Diaz, admission of the certificates of analysis was error.

The defendant did not raise the confrontation issue at trial. Trial in this case was in August, 2006. On May 19, 2005, this court in Commonwealth v. Verde, 444 Mass. 279, 280, 283-284

²⁵ As indicated, see note 4, supra, the defendant, in his supplemental brief, refers only to one certificate of analysis. In fact, three certificates of analysis were introduced. Because the same issues arise with respect to each of them, we discuss them all.

²⁶ The Commonwealth filed an opposition to the defendant's motion.

(2005), held that drug certificates of analysis did not implicate the confrontation clause and were not affected by the decision in Crawford v. Washington, 541 U.S. 36 (2004). The Supreme Court did not grant certiorari in Melendez-Diaz until March 17, 2008, long after the defendant's trial. Although it is not free of doubt, the "clairvoyance" exception may apply in these circumstances. See Commonwealth v. Randolph, 438 Mass. 290, 295 (2002), quoting Commonwealth v. Rembiszewski, 391 Mass. 123, 126 (1984) ("'clairvoyance' exception . . . applies to errors of a constitutional dimension 'when the constitutional theory on which the defendant has relied was not sufficiently developed at the time of trial or direct appeal to afford the defendant a genuine opportunity to raise the claim at those junctures of the case'"). Arguably, the defendant could not reasonably have been expected to assert at trial a constitutional proposition that we had so recently rejected; it would therefore follow that he could raise the issue now and have us apply the standard for constitutional error, i.e., whether the error was harmless beyond a reasonable doubt.

However, we need not resolve the question of the appropriate standard because, even assuming that the standard more favorable to the defendant applies, we conclude that the error was harmless beyond a reasonable doubt. We consider first the sales the defendant made to the undercover agent and then the substance that was found in his minivan. An undercover trooper testified that she bought from the defendant, in two controlled purchases shortly before his arrest, a substance that the defendant called

crack cocaine. Detective Lieutenant John Allen, an officer with twenty-five years of experience in narcotics investigations, testified that he field tested the substances at the time of each purchase and each tested positive for cocaine. He was, of course, available for cross-examination. Moreover, the quantity sold was not essential for distribution purposes. See Commonwealth v. Terrelonge, 42 Mass. App. Ct. 941, 941-942 (1997).

With respect to the cocaine found in the search of the defendant's minivan, Sergeant John Milos, a police officer with approximately seventeen years of experience in narcotics investigations who had investigated "high hundreds" of cocaine distribution cases, was one of the officers who found the cocaine in that vehicle. He testified that he field tested chunks of the white substance recovered from the vehicle immediately after it was seized, before the substance was sent to the State police laboratory, and that the substance tested positive for cocaine. He identified the ball of cocaine at trial as the one that was recovered from the minivan. Trooper James Bazzinotti, who had thirteen years of experience conducting drug searches with a narcotics detection canine, also testified that the substance appeared to him to be cocaine. Both of these witnesses were available for cross-examination.

The weight of the 124.31 grams found in the minivan was significant because the defendant was convicted of trafficking in cocaine between one hundred and 200 grams. Sergeant Milos testified that one-eighth of an ounce of cocaine was the

equivalent of 3.5 grams and that one-quarter ounce was double that, or seven grams. From that evidence, the jury could extrapolate that one ounce was twenty-eight grams and that one hundred grams was therefore less than four ounces. See Commonwealth v. Thomas, 439 Mass. 362, 365 (2003) (jury expected to apply their common sense and experience). Trooper Bazzinotti testified that, when he found the cocaine in the minivan, it was wrapped in electrical tape. He examined it and it looked "like a baked potato"; it was "bigger than a baseball." The trooper described the cocaine after the electrical tape was unwound as a "large ball, hard," and "a very solid piece of . . . block cocaine."

The unwrapped cocaine was introduced in evidence and taken to the jury room where the jurors could see the amount for themselves, although after the chemical analysis the cocaine was "more flaked, more crushed up . . . the original package was more solid."²⁷ The jury could determine that a large, hard ball weighed more than four ounces. We permit lay witnesses to testify to opinions such as size, weight and distance, all of which require judgment. See Commonwealth v. Moore, 323 Mass. 70, 76-77 (1948), citing Commonwealth v. Sturtivant, 117 Mass. 122, 123 (1875) ("Every person is competent to express an opinion on a question of . . . weight of objects . . ."). Jurors can make the same judgments based on adequate evidence. Because evidence

²⁷ Whether the cocaine was one hundred per cent pure or mixed with another ingredient is not material to the over-all weight in grams. The total amount of the mixture controls. See Commonwealth v. Verde, 444 Mass. 279, 284-285 n.5 (2005); Commonwealth v. Beverly, 389 Mass. 866, 868-869 (1983).

other than the certificates of analysis established that the substances were cocaine, and that the weight of the cocaine in the minivan was over one hundred grams, the error in admitting the certificates was harmless beyond a reasonable doubt.

Order denying motion for a
new trial affirmed.

GANTS, J. (concurring, with whom Cordy and Botsford, JJ., join). I agree with the court that, in this case, the installation of the global positioning system (GPS) device by the police inside the defendant's minivan, where it was attached to and powered by the minivan's battery, constituted a traditional seizure of the minivan that required a warrant based on a finding of probable cause. I also agree that, even if there had been no entry into the interior of the minivan and the GPS device had simply been affixed to the exterior of the minivan, a warrant based on probable cause would still have been required, but not for the reasons given by the court. I differ with the court's conclusion that the use of the minivan to conduct GPS monitoring constitutes a seizure of property regardless whether the GPS device was installed inside the vehicle. When there is no physical intrusion into the vehicle to install the GPS device but simply the attachment of a battery-powered device to the exterior of the vehicle, the police have not seized the vehicle, but instead have invaded the reasonable expectation of privacy of any person authorized to drive that vehicle. In our constitutional jurisprudence, this invasion is better characterized as a search.

The distinction is not merely academic. The court's decision declares that a warrant supported by probable cause is required when a GPS device is attached to the exterior of a motor vehicle because the police intend to "use private property (the vehicle) to obtain information for their own purposes" without the owner's consent, and thereby have "asserted control over it." Ante at - . The court's decision suggests that the

constitutional concern we have with GPS monitoring is that attaching the device to the outside of the motor vehicle interferes with the owner's property interests. In fact, the appropriate constitutional concern is not the protection of property but rather the protection of the reasonable expectation of privacy. More specifically, the appropriate constitutional concern is that, without judicial oversight based on a finding of probable cause, the police potentially could engage in GPS monitoring of any individual and, through this device, learn what otherwise could be learned only through physical surveillance conducted seven days per week, twenty-four hours per day.

The New York Court of Appeals recently described the potential intrusion on privacy that may be accomplished through a GPS device attached to one's automobile:

"Disclosed in the data retrieved from the [GPS] transmitting unit, nearly instantaneously with the press of a button on the highly portable receiving unit, will be trips the indisputably private nature of which takes little imagination to conjure: trips to the psychiatrist, the plastic surgeon, the abortion clinic, the AIDS treatment center, the strip club, the criminal defense attorney, the by-the-hour motel, the union meeting, the mosque, synagogue or church, the gay bar and on and on. What the technology yields and records with breathtaking quality and quantity, is a highly detailed profile, not simply of where we go, but by easy inference, of our associations -- political, religious, amicable and amorous, to name only a few -- and of the pattern of our professional and avocational pursuits."

People v. Weaver, 12 N.Y.3d 433, 441-442 (2009).

In Katz v. United States, 389 U.S. 347, 351 (1967), the United States Supreme Court first articulated that "the Fourth Amendment [to the United States Constitution] protects people, not places," and that a search protected by the Fourth Amendment

occurs when the government invades an individual's reasonable expectation of privacy. See id. at 360-361 (Harlan, J., concurring) (invasion of "a constitutionally protected reasonable expectation of privacy" "may constitute a violation of the Fourth Amendment"). In our jurisprudence under art. 14 of the Massachusetts Declaration of Rights, we have similarly maintained that a "search" is committed when the government invades an individual's reasonable expectation of privacy. See, e.g., Commonwealth v. One 1985 Ford Thunderbird Auto., 416 Mass. 603, 607 (1993); Commonwealth v. Montanez, 410 Mass. 290, 301 (1991); Commonwealth v. Blood, 400 Mass. 61, 68 (1987). In Katz, the Federal Bureau of Investigation (FBI) affixed an electronic listening and recording device to the outside of a public telephone booth and used it to intercept telephone calls placed by the petitioner. Katz v. United States, supra at 348. The Court concluded that a warrant was required, not because the FBI had seized the telephone booth by using it to obtain information for its own purposes or by asserting dominion and control over it, but because the FBI invaded the petitioner's reasonable expectation of privacy. Indeed, the Court repudiated the holding in Olmstead v. United States, 277 U.S. 438 (1928), that surveillance without any trespass or seizure of a physical object fell outside the ambit of the Federal Constitution. Katz v. United States, supra at 352-353. Rather, the Court concluded, "The Government's activities in electronically listening to and recording the petitioner's words violated the privacy upon which he justifiably relied while using the telephone booth and thus

constituted a 'search and seizure' within the meaning of the Fourth Amendment." Id. at 353.

In the context of GPS monitoring, the expectation of privacy on which an individual justifiably relies is that his comings and goings will not be continuously and contemporaneously monitored except through physical surveillance, which requires a far greater investment of police resources and generates far less information than GPS monitoring. The precise contours of this reasonable expectation of privacy with respect to GPS monitoring will need to be carefully and predictably delineated, but such careful and predictable delineation will be more difficult to accomplish if the court's analysis focuses on the purported seizure of property committed by attaching a GPS device to the exterior of a motor vehicle.

The attachment of a GPS device to a motor vehicle by law enforcement officers is only one way to gather data in real time regarding the whereabouts of an individual. For example, virtually all of us now carry cellular telephones, many of which are equipped with GPS technology, permitting a cellular carrier to learn our precise whereabouts at any given moment. Even without GPS technology, any cellular telephone, when it is turned on, can be traced to the tower with which it is communicating, giving an approximate location.¹ Presumably, with the assistance

¹ Evidence concerning the location of a defendant's cellular telephone at some point in the past (e.g., at the time that a crime was committed), derived from cellular companies' records, is now commonly offered in evidence in criminal cases. See Cellphones Enter Court as Sources of Evidence, *New York Times*, July 6, 2009, at A15.

of the cellular company, law enforcement could conduct real-time monitoring of any individual carrying a cellular telephone, without needing to attach anything to any property or person. To take another example, GPS devices for vehicles are widely available, some marketed for security purposes, such as enabling the vehicle to be located if it is stolen, and others marketed as navigation aids. With the assistance of the companies monitoring these devices, law enforcement could conduct real-time monitoring without attaching anything to the vehicles, simply by relying on the devices that the vehicle owners themselves paid to install. Undoubtedly, new technologies will emerge that offer comparable opportunities of real-time monitoring to law enforcement.

The court's decision suggests that our constitutional analysis of contemporaneous GPS monitoring may depend on whether the monitoring can be accomplished without a law enforcement officer attaching a GPS device to anyone's property, even when the invasion of the reasonable expectation of privacy would be the same. Our constitutional analysis should focus on the privacy interest at risk from contemporaneous GPS monitoring, not simply the property interest. Only then will we be able to establish a constitutional jurisprudence that can adapt to changes in the technology of real-time monitoring, and that can better balance the legitimate needs of law enforcement with the legitimate privacy concerns of our citizens.²

² Such a jurisprudence would need to recognize that the assistance of a third party, namely, the cellular company or other service provider, may be needed for the police to conduct certain types of contemporaneous GPS monitoring, or its equivalent. In these instances, we would need to consider

whether a warrant was needed before the police could request a third party's assistance to monitor its customers in real time, and whether a court, in the absence of statutory authorization, may order a third party to provide such technical assistance, perhaps analogous to court orders authorizing a wiretap and directing the telephone company to assist law enforcement in the execution of the wiretap warrant. See New England Tel. & Tel. Co. v. District Att'y for the Norfolk Dist., 374 Mass. 569 (1978).