

*Martaz Johnson v. State of Maryland*, No. 6, September Term 2017. Opinion by McDonald, J.

**Evidence – GPS data – Expert Witnesses.** The State introduced data derived from a GPS device carried by the defendant as part of his employment and kept by his employer in the ordinary course of business. That data indicated an itinerary consistent with the testimony of the victim of the offense. The data, which would be understandable to a lay juror based on common experience, was admissible in evidence without the need for foundation testimony by an expert concerning the operation of, and science underlying, the GPS device.

Circuit Court for Baltimore City  
Case Nos. 114094009 thru 114094013  
Argument: September 12, 2017

IN THE COURT OF APPEALS  
OF MARYLAND

No. 6

September Term, 2017

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MARTAZ JOHNSON

V.

STATE OF MARYLAND

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Barbera, C. J.,  
Greene  
Adkins  
McDonald  
Watts  
Hotten  
Getty,

JJ.

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Opinion by McDonald, J.  
Adkins and Watts, JJ., dissent.

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Filed: February 21, 2018

A factfinder at a trial applies common sense drawn from shared human experience to the evidence to reach a fair determination of the facts. Some evidence, however, is beyond the common experience of most people. Expert testimony may be necessary for the factfinder to decide the significance of such evidence.

Expert testimony is often required to explain scientific or technical matters. But expert testimony is not required simply because one can explain a matter scientifically. For example, a jury can be expected to readily understand the significance of testimony that a clock or a thermometer displayed certain numbers without need for an expert to explain the scientific phenomenon that underlies the thermometer or the engineering that powers the clock. But the jury will need an expert to understand the significance of an opinion that two biological samples “match” based upon a statistical analysis involving DNA evidence.

While common sense does not change, common human experience does. A technical marvel of an earlier time may become the everyday tool of the contemporary person. This case presents the question whether location information from a GPS device is more like numbers read from a clock or thermometer or more like a conclusion reached from the analysis of DNA evidence.

Petitioner Martaz Johnson,<sup>1</sup> an officer with the Maryland Transit Administration

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<sup>1</sup> The indictments, and several other papers filed in the Circuit Court, spelled Petitioner’s first name as “Martez.” On the first day of the trial, the Circuit Court granted the State’s motion to amend the indictments to correct the spelling of Mr. Johnson’s first name to “Martaz.”

(“MTA”) police, was charged with assaulting and raping a young woman shortly after she had been involved in a traffic accident with an MTA bus. According to the young woman, Mr. Johnson had responded to the scene of that accident in his official capacity and drove her home, where the offense occurred. Among the equipment that Mr. Johnson carried that evening as part of his job was a mobile GPS device, which allowed the MTA to keep track of the locations of its officers.

At the trial in the Circuit Court for Baltimore City, the State introduced GPS data from Mr. Johnson’s device that matched the itinerary given by the woman in her testimony at trial. That evidence was introduced by a custodian of records of the MTA police.

While Mr. Johnson’s defense counsel did not appear to dispute that Mr. Johnson had been present at the locations indicated in the GPS data, he objected to the Circuit Court’s decision to admit that evidence on several bases. In this appeal, Mr. Johnson argues that the State should have presented expert foundation testimony concerning GPS devices as a prerequisite to the admission of such evidence.

The Court of Special Appeals, relying on one of its prior decisions,<sup>2</sup> held that a lay juror could understand the significance of GPS data without expert help and that it was not necessary for the State to present expert testimony on GPS devices and data. We agree with the Court of Special Appeals.

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<sup>2</sup> *Gross v. State*, 229 Md. App. 24 (2016), *cert. denied*, 451 Md. 259 (2017).

# I

## Background

To provide the context in which the legal issues before us arise, we summarize the key testimony at trial and the procedural path of this case.

### *The Accident and its Immediate Aftermath*

The victim of the alleged offenses was a 28-year-old woman whom we shall refer to as Ms. K.<sup>3</sup> After going out with a female friend on the evening of March 12, 2014, for dinner, drinks, and dancing, Ms. K. was driving home in the early morning hours when her car was struck by an MTA bus at the intersection of Central Avenue and Monument Street in Baltimore City.

MTA police officers responded to the scene of the accident.<sup>4</sup> Mr. Johnson was one of those officers. Ms. K. testified that Mr. Johnson told her she should not be driving any more that evening; she agreed to refrain from doing so because she had been drinking. According to Ms. K., Mr. Johnson instructed her to sit in the back of his police car and said that he needed to “release” her to someone or else he would have to take her “downtown,” which Ms. K. interpreted to mean jail.

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<sup>3</sup> As the intermediate appellate court chose to do, we substitute an initial for the last name of the alleged victim.

<sup>4</sup> The MTA police have concurrent jurisdiction in any political subdivision in which the MTA provides transit service. Maryland Code, Transportation Article, §7-207.

Ms. K. decided to contact the friend she had been out with, who lived nearby, in the hope that the friend would retrieve her and her car. However, Ms. K. was unsuccessful in multiple attempts to reach her friend by phone. Mr. Johnson then drove Ms. K. to her friend's home and Ms. K. attempted to call the friend from the police car, again without success. According to Ms. K., Mr. Johnson would not allow her to leave the car to knock on the door.

*Officer Johnson Takes Ms. K. Home and Remains There*

Ms. K. testified that, after failing to rouse her friend, she sat crying in the back of the police car. She said that Mr. Johnson, instead of taking her "downtown" as he had originally indicated, then drove her to her own home at 708 North Duncan Street in Baltimore City. According to Ms. K., while they were en route, Mr. Johnson asked her "what are you going to do to make this up."

Ms. K. testified that, as she entered her home, Mr. Johnson followed her in without being invited to do so. According to Ms. K., Mr. Johnson asked her whether anyone else lived there, and she replied that she lived alone. He then used his flashlight to check whether there was anyone else in the house.

According to Ms. K., Mr. Johnson then assaulted and raped her. Afterwards, she testified, she tried to take a picture of Mr. Johnson with her cell phone without success. Mr. Johnson took the phone from her, made her unlock it, and scrolled through her pictures. He then left the house.

Shortly after Mr. Johnson left her home, Ms. K. called 9-1-1 and reported that she had been raped by a police officer. An ambulance transported her to a hospital where she

underwent a rape kit examination. At that time Ms. K. was reluctant to be interviewed by Baltimore City police detectives because she thought that Mr. Johnson was associated with the Baltimore City police. She spoke with an attorney acquaintance later that day who encouraged her to talk to the detectives. When she was subsequently interviewed by the detectives, she told them that Mr. Johnson was the officer who had assaulted her.

Mr. Johnson later submitted to forensic testing, which revealed Ms. K.'s skin cells on the shaft of his penis.<sup>5</sup>

### *The Charges*

Mr. Johnson was charged in the Circuit Court for Baltimore City with first and second-degree rape, third and fourth-degree sex offenses, first-degree assault, two counts of second-degree assault, first, third, and fourth-degree burglary, reckless endangerment, and misconduct in office.

### *The Trial*

At trial, the State presented the testimony of Ms. K., who recounted the events as summarized above and made an in-court identification of Mr. Johnson as her assailant. The State sought to corroborate Ms. K.'s account through other testimony and evidence. In particular, it called the MTA police officer who had initially responded to the accident before Mr. Johnson arrived and who left the scene while Mr. Johnson was talking with Ms. K. That officer testified that an MTA police protocol required an officer who planned to

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<sup>5</sup> Sperm fractions recovered from the rape kit examination did not match Mr. Johnson.

transport a civilian to report that activity to radio dispatch. He testified that the radio log for that evening did not reveal such a call by Mr. Johnson.

The Baltimore City police detectives who investigated the offense also testified about their interview of Ms. K. and the gathering of forensic evidence. The forensic nurse who had examined Mr. Johnson, the police DNA technician who noted skin cells on the swabs taken from Mr. Johnson's genitals, and the DNA analyst who matched the DNA of those skin cells to Ms. K.'s DNA also testified. The attorney acquaintance of Ms. K. testified that he had found a "frantic" message on his phone from Ms. K. the morning of March 13 in which she stated that she had been raped by a police officer and that he had counseled her to talk to the detectives.

The State also introduced evidence from a GPS tracking device<sup>6</sup> known as a "Pocket Cop" that Mr. Johnson had carried that night. MTA police officers carry Pocket Cops primarily for officer safety. A Pocket Cop records GPS data concerning its location and movements. Police supervisors can access the data from a particular officer's device through a program called "Field Force Manager." That program generates a report that shows the location of a Pocket Cop at specific times and the duration of time spent at each location. As a result, the MTA can determine where its officers are, and have been, at any particular moment.

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<sup>6</sup> "GPS" is an acronym commonly used for devices that rely upon global positioning system satellites to obtain accurate geographic location information. *See generally* <[www.gps.gov](http://www.gps.gov)>.

An MTA police supervisor who served as its custodian of records testified that the data derived from the device carried by Mr. Johnson on March 13, 2014, showed that he had spent 14 minutes that night in the vicinity of the address of Ms. K.'s friend and 37 minutes in the vicinity of Ms. K.'s residence. The evidence and arguments concerning the admissibility of that data are described in greater detail in Part II.A of this opinion.

The MTA police supervisor also reiterated that it would be contrary to department policy for an officer to transport a civilian in the officer's police car without calling a supervisor over the radio and obtaining permission. He testified that the radio log for the evening did not show a call by Mr. Johnson to his supervisor for that purpose.

The defense did not call any witnesses and Mr. Johnson exercised his right not to testify.

### *Verdict and Appeal*

The Circuit Court granted a judgment of acquittal on charges of fourth-degree burglary, first-degree assault, third-degree sex offense, and reckless endangerment. The jury acquitted Mr. Johnson of first-degree and third-degree burglary, as well as first-degree rape. It could not reach a verdict on the charges of second-degree rape and fourth-degree sex offense. The jury convicted Mr. Johnson of misconduct in office and two counts of second-degree assault.

Mr. Johnson filed a timely appeal to the Court of Special Appeals, where he raised several legal issues, including the admissibility of the GPS evidence. The Court of Special Appeals affirmed the convictions in an unreported opinion on December 16, 2016.

Mr. Johnson then petitioned this Court for a writ of *certiorari* on the question of whether the GPS data was properly admitted without expert testimony. The State submitted a conditional cross-petition on the question whether Mr. Johnson had preserved that issue in the Circuit Court. We granted both petitions.

## II

### Discussion

#### A. *The GPS Evidence at Trial*

The legal issues in this appeal concern whether expert testimony was necessary in order to admit GPS data from the Pocket Cop device carried by Mr. Johnson on March 13, 2014 and whether the defense adequately preserved an objection to that evidence on that basis. Accordingly, it is useful to recount, in some detail, how that evidence was elicited at trial and how the defense objections to it were framed.

The defense made a motion *in limine* at the beginning of the trial to exclude various items of the State's evidence, but the GPS data from Mr. Johnson's Pocket Cop was not among those items. Indeed, the theory of the defense at trial appeared to be consistent with the GPS data derived from the Pocket Cop device. In his opening statement to the jury, defense counsel conceded that Mr. Johnson drove Ms. K. first to her friend's house and then to her own house. Defense counsel also told the jury that Mr. Johnson had entered

Ms. K.'s house for a period of time, stated that Ms. K. made an "advance at" Mr. Johnson while they were inside the house, and denied that Mr. Johnson raped her during that visit.<sup>7</sup>

When Ms. K. testified as the State's first witness, the defense cross-examination of her was consistent with the approach taken in its opening statement. Defense counsel had Ms. K. repeat much of the same testimony that she gave on direct examination, but suggested that she was attracted to Mr. Johnson. The theory of the defense appeared to be that Mr. Johnson had responded to the accident in his official capacity and that he had taken Ms. K. home in that capacity as well, but that he had not initiated or consummated any assault of Ms. K.

Testimony concerning the Pocket Cop device was first elicited at the trial during the defense cross-examination of the MTA police officer who had initially responded to the accident scene before Mr. Johnson arrived. Defense counsel adduced testimony from that officer concerning the function of the Pocket Cop device. The thrust of the defense cross-examination was that, even though an MTA radio log indicated that Mr. Johnson had failed to call in his location when he was transporting Ms. K. (as required by the MTA police protocol), Mr. Johnson's supervisors would have known where he was because he was carrying a GPS device.

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<sup>7</sup> The prosecutor had given a bare bones opening statement that advised the jury that they would hear about a rape of Ms. K. by Mr. Johnson, but did not go into detail as to what evidence the jury would hear.

The State later introduced some details concerning the data recorded by Mr. Johnson's Pocket Cop that evening. Sergeant William Schauman, an executive officer at MTA police headquarters, testified that Mr. Johnson was assigned to cover the area of the bus accident on the night of March 12-13, 2014. Sergeant Schauman explained the function of the Pocket Cop device and described a report summarizing GPS data from Mr. Johnson's Pocket Cop for the period from midnight to noon on March 13, 2014. The State sought to introduce the GPS report through Sergeant Schauman.

Defense counsel objected to admission of the report. At a bench conference, defense counsel elaborated that his objection was based on the fact that Sergeant Schauman had not personally investigated the matter and that the document was not itself maintained in the ordinary course of business, but had been generated from the computer records for purposes of the case. Defense counsel also argued that the report was incomplete in that it contained an unexplained "gap" of time.<sup>8</sup> He contended that the report should be introduced only by the person who generated it. These objections appeared to go to authentication of the report and an assertion that the State had not established a sufficient foundation for the report itself to come within the business record exception to the hearsay rule.<sup>9</sup> The Circuit Court initially reserved its decision on these objections and allowed the

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<sup>8</sup> During the period prior to the bus accident, the report showed a "stop" at the "Southern District" at 12:53 a.m. followed by an entry for "Login" three hours later.

<sup>9</sup> Under the business record exception to the hearsay rule, a record of regularly conducted business activity is admissible if: (A) it was made at or near the time of the act, event, or condition, or the rendition of the diagnosis; (B) it was made by a person with knowledge or from information transmitted by a person with knowledge; (C) it was made

State to ask additional questions of Sergeant Schauman to lay a foundation for admission of the document.

The State then resumed questioning Sergeant to lay a more complete foundation for admitting the GPS report under the business record exception to the hearsay rule. Sergeant Schauman testified that it was standard operating procedure for MTA officers to carry the device so that their movements could be tracked while they are on duty. The State again sought to admit the GPS report into evidence. The defense objected again and a second bench conference ensued.

The Circuit Court observed that, although the witness had not used the “magic words,” he had essentially testified that it was the ordinary course of business for the MTA to track the locations of its officers by means of the Pocket Cop. Defense counsel then complained that the record appeared to be incomplete and that the witness would not be able to speak to the “authenticity or veracity” of the record.

In the midst of this discussion as to whether the State had laid a sufficient foundation to satisfy the defense objections as to authenticity, hearsay, and the completeness of the GPS report, defense counsel asserted that “this gentleman is now being offered as a quasi-

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and kept in the course of a regularly conducted business activity; and (D) the regular practice of that business was to make and keep the memorandum, report, record, or data compilation. Maryland Rule 5-803(6). It is within a trial judge’s discretion to exclude such a record if “the source of information or the method or circumstances of the preparation of the record indicate that the information in the record lacks trustworthiness.” *Id.* There is “no requirement that the witness have first-hand knowledge of the matter reported or that the witness actually have prepared or observed the preparation of the report.” *Department of Public Safety and Correctional Services v. Cole*, 342 Md. 12, 29 (1996).

expert to lay a foundation for the admission of technical information.” The discussion, however, then returned to whether the GPS data was generated in the ordinary course of business and, after the Circuit Court reiterated its finding that it was, the defense did not further pursue its objection that Sergeant Schauman was being asked to provide the necessary foundation as a “quasi-expert.”

Defense counsel then questioned whether the entire document would come into evidence or just specific references in the GPS report. The Circuit Court agreed that some references in the report were not relevant, and the State volunteered to simply ask Sergeant Schauman about specific entries in the report that were relevant to the trial. The Circuit Court observed that defense counsel could attack any defects in the GPS report through cross-examination.

In response to questions from the prosecutor, Sergeant Schauman then read two entries from the report to the jury. He stated that the first entry indicated that, on March 13, 2014, beginning at 3:55 a.m., Mr. Johnson was at 1224 Ashland Avenue – a location near the home of Ms. K’s friend – for 14 minutes. He testified that the second entry indicated that Mr. Johnson was at 710 North Duncan Street – a building next to Ms. K.’s home – for 37 minutes beginning at 4:10 a.m.

On cross-examination, defense counsel asked Sergeant Schauman various questions about the calibration and accuracy of the GPS function on the Pocket Cop. Sergeant Schauman responded that he was “not the technical person” for the agency. Defense counsel also obtained admissions from Sergeant Schauman that he could not tell from the GPS report whether Mr. Johnson had entered a building at either of the two locations

mentioned in his direct testimony. Defense counsel also questioned Sergeant Schauman about other entries on the GPS report that had not been covered on direct examination. The Circuit Court later confirmed that it had not admitted the entire report.

During the discussion of Sergeant Schauman's testimony, the State suggested that it might call another officer more knowledgeable about the technical aspects of GPS, but apparently elected not to do so. The defense never moved to strike the testimony derived from the GPS report – perhaps unsurprising as that testimony did not contradict the defense theory of the case.<sup>10</sup>

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<sup>10</sup> While defense counsel had told the jury in his opening statement that Mr. Johnson had entered Ms. K.'s house, at later points in the trial, outside the presence of the jury, he appeared to demur as to whether Mr. Johnson had actually entered the house. In any event, the defense consistently appeared to concede that Mr. Johnson had been in the vicinity of the house.

In the middle of the State's case, the jury sent a note to the judge asking for clarification whether the defense position was that Mr. Johnson had never entered the house or that any sexual contact between Mr. Johnson and Ms. K. in the house that night had been consensual. After consulting with counsel, the Circuit Court responded that the defendant had pleaded not guilty and that the State had not yet completed its side of the case.

Later, during one of the bench conferences concerning the defense objection to the GPS report, the Circuit Court asked if it was Mr. Johnson's position that he was not at the location listed in the report at the time indicated in the report. Defense counsel responded that he did not "think that's necessarily relevant to this particular objection."

Finally, toward the end of the State's case, the Circuit Court again raised the question, out of the presence of the jury, whether the defense was taking the position that Mr. Johnson had not entered Ms. K.'s residence. Defense counsel did not answer the question directly, but responded that the GPS data that placed Mr. Johnson near the address for 37 minutes was not specific as to whether he was "inside, outside, down the block, in his car."

In closing arguments, the prosecution never mentioned the GPS data. The defense alluded to it only (1) to reiterate that Mr. Johnson could not have gone “off the grid” from his supervisors while he was on duty because he was being tracked by a GPS device and (2) to point out that the device did not precisely indicate whether Mr. Johnson was inside Ms. K.’s house or what he was doing when it showed him in the vicinity of her house.

**B.     *Preservation***

As an initial matter, the State argues that Mr. Johnson did not adequately preserve for appeal his contention that the State was required to present expert testimony explaining the operation of GPS devices as a prerequisite to the admission of GPS data. “Ordinarily, the appellate court will not decide any ... issue [other than jurisdiction] unless it plainly appears by the record to have been raised in or decided by the trial court ....” Maryland Rule 8-131(a).

It is true, as the State asserts, that the defense objection to Sergeant Schauman’s testimony concerning the GPS report appeared, at least initially, to be that the State had not laid an adequate foundation relating to authentication, hearsay, and completeness of the report – objections quite distinct from whether expert testimony is necessary to lay a foundation for admission.<sup>11</sup> In particular, much of the discussion focused on whether the

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<sup>11</sup> In another example of evidence derived from modern technology, the courts have dealt with issues of authentication and hearsay related to posts on social media without requiring expert testimony on how the internet works. *See, e.g., Sublet v. State*, 442 Md. 632 (2015).

report satisfied the business records exception to the hearsay rule. For example, at the beginning of each bench conference, defense counsel argued that the report was not kept in the ordinary course of business. That is how the Circuit Court characterized the objection and ultimately ruled on it, and defense counsel did not correct the court's understanding of his objection.<sup>12</sup>

On the other hand, during the second bench conference concerning the defense objection to Sergeant Schauman's testimony, defense counsel did raise the question whether the officer was purporting to testify as a "quasi-expert." Defense counsel also later posed various technical questions on cross-examination that Sergeant Schauman was unable to answer. However, the defense did not explicitly argue that the jury required expert testimony to understand the operation of a GPS device and the data it generated.

The question of whether the defense objection at trial can be characterized as Mr. Johnson now argues is a close one. The record is clear that Mr. Johnson took issue with Sergeant Schauman's lack of expertise in GPS technology, but that complaint is surrounded by a panoply of other legal issues relating to the authenticity, the hearsay nature, and the completeness of the GPS report. While defense counsel need not have restated his objection to preserve it for appeal,<sup>13</sup> his cryptic reference to Sergeant Schauman's lack of

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<sup>12</sup> The trial judge stated that "I understand your objection ... it appears to me, and I do so find, this is kept in the ordinary course of business to track the officer. If there's a defect it goes to weight." Defense counsel responded "Yes."

<sup>13</sup> See *Clemons v. State*, 392 Md. 339, 363 (2006).

expertise only barely gave the trial court a clue as to its rationale. Nor did he furnish the Circuit Court with any of the case law on which he now relies.<sup>14</sup> Nevertheless, the question whether GPS data should be admissible only through an expert witness is an important issue that trial courts are likely to confront with increasing frequency. Even if we were inclined to find that Mr. Johnson failed to preserve his objection, this is one of those rare instances, out of the ordinary,<sup>15</sup> in which we would choose to address the issue.<sup>16</sup>

**C. *Whether the GPS Data Was Admissible Without Expert Testimony***

In essence, the Circuit Court admitted a redacted form of the GPS report that the State offered by having Sergeant Schauman orally describe two specific entries.<sup>17</sup> The

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<sup>14</sup> See footnote 27 below.

<sup>15</sup>As indicated earlier, the rule provides that an appellate court will “ordinarily” address only issues that have been preserved in the trial court. *See also Jones v. State*, 379 Md. 704, 713-15 (2004) (in deciding whether to address an unpreserved issue, an appellate court must consider any unfair prejudice to a party and whether consideration of the issue will promote the orderly administration of justice).

<sup>16</sup> An argument advanced by Mr. Johnson regarding lay opinion testimony is a different matter. In his brief, Mr. Johnson argues that Sergeant Schauman provided improper lay opinion testimony when the prosecutor asked him what the two GPS report entries meant. Sergeant Schauman responded that they showed that Mr. Johnson was at each location for the stated duration. There was no contemporaneous objection or motion to strike that testimony. Nor can anything in the bench conference be fairly read as an objection to a lay witness giving an opinion about the contents of a business record – the discussion was focused on the foundation for the admission of the GPS report rather than the interpretation of its contents.

<sup>17</sup> The trial court did not admit the entire GPS report into evidence. Instead, the trial court permitted the witness to present the two entries to the jury by reading them aloud. As instructed by this Court, trial courts commonly require redaction of a document to exclude irrelevant or inadmissible material before it is admitted in evidence. *See, e.g., CSX Transp., Inc. v. Continental Ins. Co.*, 343 Md. 216, 251-52 (1996); *Ellsworth v. Sherne Lingerie, Inc.*, 303 Md. 581, 621 (1985). A document, whether redacted or not, need not

issue before us is whether expert testimony is required before a trial court may admit such GPS data.

### *Standard of Review*

Whether evidence is properly admitted at trial is typically reviewed on an abuse of discretion standard. *Hopkins v. State*, 352 Md. 146, 158 (1998). However, in some circumstances, the admissibility of a particular item of evidence is a legal question on which we accord no special deference to a trial court. *Brooks v. State*, 439 Md. 698, 708-9 (2014).

Under Maryland Rule 5-702, “[e]xpert testimony may be admitted, in the form of an opinion or otherwise, if the court determines that the testimony will assist the trier of fact to understand the evidence or to determine a fact in issue.”<sup>18</sup> Expert testimony is

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be admitted as an exhibit for its contents to be in evidence. *See, e.g., Dean v. E. Shore Tr. Co.*, 159 Md. 213, 220 (1930) (requiring formal admission of documentary evidence that had been orally presented to jury “would be a species of judicial ritualism which cannot be sanctioned”); *Thompson v. Standard Wholesale Phosphate & Acid Works*, 178 Md. 305, 325-26 (1940); *cf. United States v. Romero*, 692 F.2d 699, 705 (10th Cir. 1982) (trial court acted within its discretion in admitting written statement by having it read to jury without admitting document itself).

Thus, as is often the case, admitting the relevant entries from the GPS report in this case through oral testimony was within the trial judge’s discretion to control the presentation of evidence and “avoid[ed] needless consumption of time.” Maryland Rule 5-611(a). Contrary to the suggestion in the Dissenting Opinion (at pp. 1, 15), expert testimony was not required simply because the entire GPS report itself was not admitted into evidence.

<sup>18</sup> If a witness is not testifying as an expert, the witness may not offer an opinion or inference unless it is “(1) rationally based on the perception of the witness and (2) helpful to a clear understanding of the witness's testimony or the determination of a fact in issue.” Maryland Rule 5-701.

required “only when the subject of the inference ... is so particularly related to some science or profession that is beyond the ken of the average layman [; it] is not required on matters of which the jurors would be aware by virtue of common knowledge.” *Bean v. Department of Health and Mental Hygiene*, 406 Md. 419, 432 (2008) (citations and internal quotation marks omitted). If a court admits evidence through a lay witness in circumstances where the foundation for such evidence must satisfy the requirements for expert testimony under Maryland Rule 5-702, the court commits legal error and abuses its discretion. *See Ragland v. State*, 385 Md. 706, 726 (2005).

#### *GPS Data in a Business Record*

As Mr. Johnson necessarily conceded before us, GPS technology is pervasive and generally reliable. Courts have recognized the reliability of GPS technology in other contexts. *See, e.g., United States v. Jones*, 565 U.S. 400, 428-29 (2012) (Alito, J., concurring) (noting that smart phones equipped with GPS devices are accurate enough to determine real time traffic conditions); *In re Application of U.S. for an Order Authorizing Disclosure of Location Info. of a Specified Wireless Tel.*, 849 F. Supp. 2d 526, 533 (D. Md. 2011) (recognizing that GPS technology would permit law enforcement to track suspects “within ten meters or less”). GPS technology is also familiar to the general public, who use it for purposes similar to those for which the MTA uses its Pocket Cop device – tracking one’s location.

Although a user may not understand precisely how a GPS device works, the same is true for other commonly used devices such as clocks, scales, and thermometers. The general public has a common sense understanding of what information the device conveys

– time, weight, temperature – and of the margin of error to which such devices are ordinarily subject: a colleague’s watch may tell time a minute faster or slower than one’s own; the scale at the gym may display a different weight than the scale at home; and a thermometer that estimates child’s temperature may give a slightly different answer in a second reading.

In the same way, the general public relies on GPS devices to locate a destination, to ascertain a route to get there from a current location, and to estimate the duration of travel.<sup>19</sup> The general public is also aware that a GPS device may not be absolutely precise – *e.g.*, a navigation system may tell a driver to turn onto a road just passed, or a ridesharing application may send a car service down the street from the individual who summoned it. Moreover, any of these devices may be broken or provide erroneous information for reasons that only an expert would explain. But that does not mean that lay jurors are incapable of comprehending the information provided by the device and its usual margin of error.

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<sup>19</sup> The Dissenting Opinion suggests that a durational tracking capability in a GPS device is unusual or unique to the Pocket Cop device. Dissenting Opinion at pp. 14 -15. However, map applications (*e.g.*, Google Maps “timeline”), real-time traffic navigation applications that show how long traffic has been gridlocked, ride hailing applications that require drivers to remain at a pick-up location for a specific duration, fitness trackers and applications that combine durational and distance information (*e.g.*, “map my run”), and child monitoring applications that alert parents as to the amount of time their child has spent at the ice cream parlor rather than the library, all gather and report such data on a routine basis.

In our view, the times and locations reflected in GPS data in a business record do not necessarily require expert testimony to be admissible. Courts regularly admit business records through witnesses who are not experts in the technology that produced those records. In many instances, such records indicate, like the GPS report here, a person's (or device's) location at a given time, are produced or processed by computers, and are admitted without expert testimony – *e.g.*, computer generated reports from electronic ankle monitoring devices,<sup>20</sup> electronic records of employee card access,<sup>21</sup> computer reports generated from electronic hotel key cards,<sup>22</sup> and computer reports from electronic toll transponders.<sup>23</sup> Expert testimony about how a clock works is not necessary every time an employee's timesheet is offered into evidence. The same is true for GPS entries.

Courts in other jurisdictions have admitted evidence derived from GPS tracking devices over objections to the lack of technical expertise of the sponsoring witness. For example, courts have admitted tracking reports from GPS devices concealed in currency

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<sup>20</sup> *State v. Kandutsch*, 799 N.W.2d 865, 868 (Wis. 2011).

<sup>21</sup> *Ahmed v. Houk*, 2014 WL 2709765 (S.D. Ohio June 16, 2014); *Moore v. Baptist Mem'l Coll. of Health Scis.*, No. 08-2311 MA/P, 2010 WL 100551, at \*4 (W.D. Tenn. Jan. 7, 2010); *Loyal v. Georgia*, 684 S.E. 2d 124, 126 (Ga.App. 2009).

<sup>22</sup> *State v. Christensen*, 582 N.W.2d 675, 679-81 (S.D. 1998).

<sup>23</sup> *United States v. Angell*, 588 Fed. Appx. 161, 163 (3d Cir. 2014); *United States v. An Soon Kim*, 2011 WL 3045230 at \*2 (S.D.N.Y. July 25, 2011), *aff'd*, 471 Fed. Appx. 82 (2d Cir. 2012).

stolen from banks,<sup>24</sup> data reports from GPS monitoring devices worn by probationers,<sup>25</sup> and data on a GPS device seized from drug smuggling boat.<sup>26</sup> We reject a categorical rule that expert testimony is required whenever location and duration information derived from a GPS device is offered into evidence. Of course, the party opposing admission is free to cross-examine the sponsoring witness concerning any defects in the data, as happened in this case, or to present its own expert to contest the accuracy of a particular device.

*Comparison to Location Evidence from Cell Phone Call Records*

Mr. Johnson argues that this Court's decision in *State v. Payne*, 440 Md. 680 (2014), which concerned the admissibility of cell tower location information derived from cell phone records, required that the State present expert testimony concerning GPS devices in this case.<sup>27</sup> In *Payne*, the defendants were charged with a kidnapping and murder in which the body had been dumped and set on fire at a location in Baltimore County. The State subpoenaed voluminous records related to the defendants' cell phones from the phone service provider. Those records contained extensive data concerning the call history of the defendants' cell phones. A police detective presented a summary of information culled

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<sup>24</sup> E.g., *United States v. Brooks*, 715 F.3d 1069, 1078 (8th Cir. 2013); *United States v. Thompson*, 393 Fed. Appx. 852, 857-58 (3d Cir. 2010).

<sup>25</sup> E.g., *State v. Jackson*, 748 S.E.2d 50, 56 (N.C. Ct. App. 2013); *Commonwealth v. Thissell*, 928 N.E.2d 932, 933 (Mass. 2010).

<sup>26</sup> *United States v. Espinal-Almeida*, 699 F.3d 588, 612-613 (1st Cir. 2012)

<sup>27</sup> Mr. Johnson did not rely on *Payne* – or any other case concerning cell towers – in the Circuit Court.

from those records, which included translating codes on the records into cell tower locations related to calls made on the phones during the relevant time period and plotting those locations on a map. In closing argument, the State argued that the fact that certain calls passed through certain cell towers demonstrated that the defendants were in the vicinity of the location where the body had been found at a critical time.

On appeal, this Court held that the police detective should have been qualified as an expert witness as a prerequisite to testifying how he had determined the “communication path” of the defendants’ calls. 440 Md. at 697-702. In particular, the Court noted that the cell phone records from which the detective created his analysis contained “a string of data unfamiliar to a lay person and ... not decipherable based on personal experience.” *Id.* at 701 (citation and quotation marks omitted).<sup>28</sup>

There are critical distinctions between *Payne* and this case. Unlike this case, the defendants’ locations were not included in the records from which the detective testified. The holding in *Payne* specifically concerned the detective’s testimony about the “process for determining the communication path” of defendants’ cell phones, as well as his conclusion as to which cell towers were the most pertinent to the case. *Payne*, 440 Md. at 684. The cell phone records were “not decipherable” based on common experience

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<sup>28</sup> In *Payne*, the cell phone records included two sets of numbers, a lag ID and a cell ID. 440 Md. at 687 n.9. To determine the defendant’s location, those numbers had to be cross-referenced against a separate document listing the location of different cell towers. The phone service provider had provided instructions on how to conduct this process in a separate document. *Id.* at 686 n.8. The detective applied that process to the information in the cell phone records, testifying that the defendants had been within two miles of the crime scene at one time, and within one-half mile at another time. *Id.* at 687-88.

because they consisted of a “string of data.” 400 Md. at 701. The detective had to rely on “knowledge, skill, experience, training or education” to understand the “technical language of the entries” to hone in on the pertinent entries and eliminate extraneous data. *Id.* (internal quotation and citation omitted). The Court held that the detective was not simply reciting information from the business records, but applying specialized knowledge to translate the voluminous records into something the jury could understand. Testimony relying on such knowledge or training must be introduced through an expert, whether it is an opinion or not. *State v. Blackwell*, 408 Md. 677, 693 (2009) (requiring witness testifying about facts observed to be qualified as an expert if observations required specialized knowledge). Accordingly, an expert was needed to explain the process for attaching significance to data that would not be comprehensible by a lay person.

By contrast, in this case, Sergeant Schauman was literally reading the entries as they appeared in the report. Those entries do not use technical language and are decipherable without specialized knowledge. The entries were street addresses and times written in plain language. They were not beyond the ken of the average juror.

In addition, in *Payne* the detective was attempting to determine the “communication path” of phone calls through various cell towers so that the State (and the jury) might draw inferences about the geographic path physically travelled by the defendants’ themselves. That was beyond the purpose for which the phone service provider used that data and required expert testimony relating the location of a cell tower to the phones that it served. 440 Md. at 719-21 (McDonald, J., concurring). By contrast, the GPS data in this case was

being used for precisely the same purpose for which the MTA used it in the ordinary course of business – to track the location of an MTA officer.

In its opinion in this case, the Court of Special Appeals relied on its own recent decision in *Gross v. State*, 229 Md. App. 24 (2016), *cert. denied*, 451 Md. 259 (2017), which distinguished *Payne* and held that data generated from a GPS tracking device was admissible without need for expert testimony. *Gross* arose out of the prosecution of a ring that stole copper from a plumbing supply company and sold the copper to scrap yards. One of the members of the ring delivered the metal to a scrap yard in a truck that he ordinarily drove for his employer. Unbeknownst to the driver, the employer had outfitted its trucks with GPS devices that tracked the location of its trucks. As part of the State's evidence at trial, the prosecution introduced records from the GPS tracking device on the truck driven by the ring member along with testimony from a supervisor at the company concerning key entries from those records. Those entries showed that the truck had been in the vicinity of the plumbing supply business (even though the company that owned the truck did no business with the plumbing supply business) shortly before the truck had been in the vicinity of a scrap yard. 229 Md. App. at 29-30.

On appeal, the defendant argued that the GPS data should not have been admitted without expert testimony on, among other things, how GPS satellites work, how the system was installed in the truck, how frequently the system transmitted data, and how accurate or inaccurate GPS data can be. The Court of Special Appeals rejected that argument, holding that the witness from the trucking company who introduced the GPS data was not relying on any specialized knowledge. Rather, he simply read the GPS data as it appeared in the

company's records, which, like the GPS report in this case, clearly stated particular dates, times, and locations by ordinary street references. The intermediate appellate court opined that "the average juror could understand the GPS records without expert help" and noted that the defendant was free to cross-examine the witness concerning the particulars of the company's GPS system. 229 Md. App. at 34.

*Comparison to Evidence from DNA Analysis*

Mr. Johnson also attempts to make an analogy to evidence derived from DNA analysis of biological evidence. That technology is seen as generally reliable, the public has a basic understanding of it, and it is quickly becoming pervasive in society. In spite of these facts, courts require expert testimony as a prerequisite to the admission of DNA evidence. Mr. Johnson analogizes the GPS report in this case to a DNA report that states that a defendant's DNA "matches" that found at a crime scene.<sup>29</sup>

Although we use acronyms to describe both types of evidence and both are the product of scientific advances, the comparison is superficial. An average juror may have some familiarity with the science and technology underlying DNA analysis from a high school science class or a television show, but jurors do not use DNA analysis in their daily lives. Even those who have used DNA testing for medical or genealogical purposes do so infrequently. The average lay juror has little experience on which to evaluate the

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<sup>29</sup> Typically, such conclusions are phrased in terms of a statistical probability that approaches absolute certainty. *See, e.g., Phillips v. State*, 451 Md. 180, 186 (2015).

information conveyed by DNA analysis and little sense of the margin of error associated with such analysis.

### **III**

#### **Conclusion**

For the reasons stated above, we hold that data from a business record indicating locations and durations of time determined by a GPS device carried by Mr. Johnson was admissible without need for expert testimony to explain the operation of, and science underlying, GPS devices.

**JUDGMENT OF THE COURT OF SPECIAL  
APPEALS AFFIRMED. COSTS TO BE PAID BY  
PETITIONER.**

Circuit Court for Baltimore City  
Case Nos. 114094009 thru 114094013

Argued: September 12, 2017

IN THE COURT OF APPEALS

OF MARYLAND

No. 6

September Term, 2017

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MARTAZ JOHNSON

v.

STATE OF MARYLAND

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Barbera, C.J.  
Greene  
Adkins  
McDonald  
Watts  
Hotten  
Getty,

JJ.

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Dissenting Opinion by Watts, J., which Adkins,  
J., joins.

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Filed: February 21, 2018

Respectfully, I dissent. I agree with the Majority that, generally, expert testimony is not required for the admission of data that is derived from a Global Positioning System (“GPS”), see Maj. Slip Op. at 2, and that this Court should address the question of whether GPS evidence must be admitted through expert testimony given the importance of the issue, see Maj. Slip Op. at 16. Nonetheless, in my view, under this case’s circumstances, the Circuit Court for Baltimore City (“the circuit court”) abused its discretion in allowing Sergeant William Schauman of the Maryland Transit Administration (“MTA”) Police Force to testify about information from the Pocket Cop report concerning the location of the cell phone of Martaz Johnson, Petitioner. Because the circuit court never admitted the Pocket Cop report, or any portion thereof, into evidence under the business records exception to the hearsay rule or any other exception, and Sergeant Schauman lacked personal knowledge of the information in the report, he could not properly testify as a lay witness about the content of the report. Additionally, because the technology that resulted in the Pocket Cop report exceeds what is generally available to and understood by the public, expert testimony was required under the circumstances of this case to explain the report. Accordingly, I would reverse the judgment of the Court of Special Appeals.

In this case, the circuit court did not admit the Pocket Cop report, or any portion thereof, into evidence, but the circuit court allowed Sergeant Schauman to testify about information in the report and about what he thought the information meant. For example, Sergeant Schauman testified that the report indicated that, on March 13, 2014, starting at 4:10 a.m., Johnson was at 710 North Duncan Street—which is next door to the residence of T.K., the alleged rape victim—for thirty-seven minutes. In permitting this and other

testimony about the Pocket Cop report, the circuit court abused its discretion.

When a trial court accepts a witness as an expert, the witness gains the ability, under certain circumstances, to provide an opinion that is based on facts or data that are not in evidence. The expert witness need not have personal knowledge of the facts or data. Maryland Rule 5-703(a) states:

The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by **or made known to the expert** at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, **the facts or data need not be admissible in evidence.**

(Emphasis added). Maryland Rule 5-705 provides, in pertinent part: “Unless the court requires otherwise, the expert may testify in terms of opinion or inference and give reasons therefor without first testifying to the underlying facts or data.” Thus, under certain circumstances, an expert witness may offer an opinion that is based on facts that are not in evidence, and of which the expert witness lacks personal knowledge.

A lay witness, by contrast, enjoys no such authority. Maryland Rule 5-602 limits lay testimony as follows: “Except as otherwise provided by Rule 5-703, a witness may not testify to a matter unless evidence is introduced sufficient to support a finding that the witness has **personal knowledge of the matter.**” (Emphasis added). And Maryland Rule 5-701 limits a lay witness’s ability to offer opinions or inferences as follows: “If the witness is not testifying as an expert, the witness’s testimony in the form of opinions or inferences is limited to those opinions or inferences which are [] **rationaly based on the perception of the witness[.]**” (Emphasis added).

In this case, Sergeant Schauman exceeded the limitations that Maryland Rules 5-

602 and 5-701 place on a lay witness's testimony. Sergeant Schauman had no personal knowledge of the information in the Pocket Cop report, but offered testimony, including opinions about Johnson's cell phone's locations that were based exclusively on the report—which the circuit court never admitted into evidence. Of course, there is no requirement under the business records exception to the hearsay rule that a witness have firsthand knowledge of a matter reported, or that a witness actually participate in gathering information in a report. But, in this case, the circuit court did not admit the Pocket Cop report, or any part of it, into evidence under the business records exception. Sergeant Schauman was a lay witness testifying about the content of a report, or entries from the report, that had not been deemed admissible by the circuit court.

The record plainly demonstrates that Sergeant Schauman lacked personal knowledge of the information contained in the Pocket Cop report. Sergeant Schauman could not remember whether he had run Field Force Manager to create the report of Johnson's cell phone's movements.<sup>1</sup> Although Sergeant Schauman testified that he had seen the report before, he did not testify that he had ever used or relied on the report for a purpose other than preparing for his testimony in this case. Sergeant Schauman testified that the GPS tracking device on Johnson's cell phone was on during the early morning hours of March 13, 2014. The circuit court asked Sergeant Schauman how he knew this. Sergeant Schauman responded that the report said so, and that officers are supposed to have

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<sup>1</sup>Sergeant Schauman testified that officers of the MTA Police Force are issued cell phones called "PocketCops" that have a program called "Field Force Manager" installed on them. Each cell phone is equipped with a GPS tracking device, and Field Force Manager uses that device to track the cell phone's movement.

the GPS tracking devices on their cell phones on when they are working. The circuit court asked Sergeant Schauman how information “get[s] from the [cell] phone into the report[.]” Sergeant Schauman responded: “That’s technical stuff, I’m not the tech guy, but it goes -- it’s a computer tracked system. Goes up to the satellite and then down to the -- whoever monitor [sic] -- whoever is the owner of the program and then you access the program.”

On multiple occasions during his testimony, Sergeant Schauman repeated the statement that he did not know how Field Force Manager determined the information in the report. Johnson’s counsel asked Sergeant Schauman when, how, and how often the officers’ cell phones’ GPS tracking devices are calibrated. Johnson’s counsel also asked Sergeant Schauman whether a cell phone’s GPS tracking device would be able to accurately pinpoint the address where the cell phone was. In response to each question, Sergeant Schauman testified that he did not know, and that he was “not the technical person for the” MTA Police Force.

There was information in the Pocket Cop report that Sergeant Schauman could not explain. Sergeant Schauman acknowledged that the report did not provide Johnson’s location from 12:53 a.m. to 3:54 a.m. on March 13, 2014. Johnson’s counsel asked Sergeant Schauman why there was a gap in the report’s timeline. Sergeant Schauman responded that he did not know “what was wrong with [Johnson’s cell] phone.” Sergeant Schauman testified that the report did not reflect whether Johnson’s cell phone was turned off, or whether it went into a subway station. The following exchange occurred:

[JOHNSON’S COUNSEL:] And you’re sure it’s a problem with the phone and not something else?

[SERGEANT SCHAUMAN:] **What else would it be? I don't -- I'm not the technical guy.** So --

[JOHNSON'S COUNSEL:] So you don't know?[] You simpl[y] don't know? You can't offer this jury panel any explanation as to why that period of time is not reflected in this [report]?

[SERGEANT SCHAUMAN:] Other than occasionally it goes off and the dispatcher tells you to turn it back on.

(Emphasis added).

After hearing Sergeant Schauman's testimony, the circuit court announced that it would not admit the Pocket Cop report into evidence. Although the circuit court observed that the report was "kept in the ordinary course of their business to track the officer[.]" the circuit court did not admit the report into evidence under the business records exception. Tellingly, the circuit court observed that the report was "**the one [that Sergeant Schauman] knows nothing about[.]**" (Emphasis added).

The circuit court was absolutely right in this regard. Aside from knowing that reports like the one in question are generated from computers using Field Force Manager, Sergeant Schauman knew nothing about the report. He could not remember whether he created the report. He did not know how information came to be in the report. And, as Johnson's counsel had predicted at a bench conference, he could not explain why there was a gap in the report's timeline. These circumstances are problematic because Sergeant Schauman, a lay witness, testified about information and offered opinions that were based on a report that was not in evidence, and about which Sergeant Schauman lacked personal knowledge.

As Johnson's counsel indicated at a bench conference, the proper method of getting

the report admitted into evidence might have been to call a witness who could sponsor the report's admission under the business records exception to the hearsay rule. With such a witness, the prosecutor could have asked questions to establish that the report fell under the "business records" hearsay exception under Maryland Rule 5-803(b)(6), which provides:

The following are not excluded by the hearsay rule, even though the declarant is available as a witness: . . . [a] memorandum, report, record, or data compilation of acts, events, conditions, opinions, or diagnoses if (A) it was made at or near the time of the act, event, or condition, or the rendition of the diagnosis, (B) it was made by a person with knowledge or from information transmitted by a person with knowledge, (C) it was made and kept in the course of a regularly conducted business activity, and (D) the regular practice of that business was to make and keep the memorandum, report, record, or data compilation. A record of this kind may be excluded if the source of information or the method or circumstances of the preparation of the record indicate that the information in the record lacks trustworthiness. In this paragraph, "business" includes business, institution, association, profession, occupation, and calling of every kind, whether or not conducted for profit.

In this case, at trial, the following exchange occurred regarding the admission of the Pocket Cop report:

THE COURT: I'm not going to admit this, yet. However, I think we have to inquire as to -- and if [Sergeant Schauman] testified, then I didn't grasp it, as to how this is composed. In other words, can anybody just put this in or is it automatically -- I don't know how to put it to you. Does each officer's cell phone automatically track and, you know, it automatically goes into the computer? If that's what it is, that's what it is.

[PROSECUTOR]: I can ask him.

THE COURT: Yeah, ask him. I'll reserve ruling on your --

[PROSECUTOR]: Thank you, Your Honor.

THE COURT: I haven't admitted, it yet. I have not admitted.

The prosecutor asked Sergeant Schauman additional questions, then asked the circuit court whether Sergeant Schauman's additional testimony was sufficient. Johnson's counsel renewed his objection to the report. At a bench conference, the following exchange occurred:

THE COURT: Even though he's not using any magic words about, it sounds like it's the ordinary course of their business to track, and the officer tracks it. It's initiated by that officer, it's not like somebody else is turning his phone on.

[JOHNSON'S COUNSEL]: That's not what I understand [Sergeant Schauman's] testimony to be. He just said that they're tracked indefinitely while they're on duty, we know -- there's a matter of certainty from the face of this [report] that there's a gap in time where [Johnson]'s not being tracked. [Sergeant Schauman] can't offer any explanation as to why that is. It's material to this case --

THE COURT: Well, I don't know whether [Sergeant Schauman] was ever asked that if you got --

[JOHNSON'S COUNSEL]: Well, but the point being, it's an incomplete [report], [Sergeant Schauman] can't explain how the [report] is generated, he just told you he doesn't have the technical know-how. He can't be -- he can't be cross-examined o[n] why there's incompleteness, what else would be done with this [report]. He can't speak to the authenticity or v[e]racity of this. He hasn't talked about any of the GPS process, he doesn't talk about calibration.

I mean, he basically is saying, hey, they got these cell phones and it beams up to space and --

THE COURT: Well, I think -- okay.

[JOHNSON'S COUNSEL]: I mean --

THE COURT: Is it your position, or going to be your position, I don't know what your position is, that [Johnson] was not there at all?

[JOHNSON'S COUNSEL]: My position, Your Honor -- and that's, I don't think are necessarily relevant to this particular objection. My position is that [Sergeant Schauman] is now being offered as a quasi[-]expert to lay a foundation for the admission of technical information without --

THE COURT: Well, I'll get to the point. At this point, I'm not going to admit it at this point. I'm not saying I never would admit it. If it's not clear to me, then it's not going to be clear to a jury, and evidence that's not clear should not be admitted. It's that simple.

[PROSECUTOR]: Is the fact that the report was generated by his agency, is that admitted fact?

THE COURT: Yes.

[PROSECUTOR]: All right. And as an admitted fact, then specific -- specific references can report -- kept in the ordinary course of business, then would be, in my view, admissible because they are required to be tracked.

[JOHNSON'S COUNSEL]: And if that is the case, Your Honor, then we have a problem with the document because there's a gap in time that is unexplained --

THE COURT: Fine.

[JOHNSON'S COUNSEL]: -- which could be cross-examined.

THE COURT: Yeah. Okay. I understand your objection. I understand it. It seems to me that -- it appears to me, and I do so find, **this is kept in the ordinary course of their business to track the officer.** If there's a defect, that goes to the weight --

[JOHNSON'S COUNSEL]: Yes.

THE COURT: -- not the admissibility. Your objection is noted and overruled. You can explore whatever you want to explore on cross-examination.

[JOHNSON'S COUNSEL]: **So is the document coming in or the specific references?**

THE COURT: Well, **I don't see the relevancy of the other references.**

[PROSECUTOR]: Okay. I'll ask the specific reference, Your Honor.

THE COURT: Okay.

[JOHNSON'S COUNSEL]: I do. You know, obviously --

THE COURT: You want it all in?

[JOHNSON'S COUNSEL]: No, but the point -- what I want to get in that I can't get in is there would be GPS tracking for this whole time that he's responding to the bus stop. And, obviously, the time that he leaves there is an issue that has been put into the case by the Defense --

THE COURT: You can cross-examine him then. If he looks --

[JOHNSON'S COUNSEL]: But he can't speak to it because it's not on the document.

THE COURT: That's it. Hold it. If he doesn't know it, then that, in simple terms, that makes his weight as a witness diminished.

[JOHNSON'S COUNSEL]: Okay.

[PROSECUTOR]: Thank you, Your Honor.

(Emphasis added). At that point, the bench conference concluded, and Sergeant Schauman's testimony resumed. After Sergeant Schauman's testimony, during a discussion of which exhibits had been admitted and which ones had not, the following exchange occurred with regard to the GPS records:

[PROSECUTOR]: [Y]our ruling was that it's -- that's not an admissible -- that document cannot be admitted.

THE COURT: I never really ruled, but I don't think I'm going to let it in.

[PROSECUTOR]: You're not going to let it in?

THE COURT: [State's Exhibit] 13 was the -- the one he knows nothing about?

[PROSECUTOR]: Yeah, the one he's knows nothing about.

THE COURT: No.

Here, the record indicates that the circuit court did not actually rule on the request to admit the records under the business records exception and did not admit the GPS records.<sup>2</sup>

In contrast to this case, an example of eliciting information from a GPS report that has been admitted into evidence can be found in Gross v. State, 229 Md. App. 24, 142 A.3d 692 (2016), cert. denied, 451 Md. 259, 152 A.3d 758 (2017). In Gross, 229 Md. App. at 28-29, 142 A.3d at 695, as a witness for the State, the supervisor for repairs and truck teams at an elevator company testified that the company's trucks were equipped with GPS tracking devices. The supervisor explained that he monitored the data from the GPS

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<sup>2</sup>This case is very different from the cases cited by the majority opinion in Footnote 18 on page 17. In those cases, the trial courts evidently found the documents admissible, and permitted testimony about the documents. In Dean v. E. Shore Tr. Co., 159 Md. 213, 220, 150 A. 797, 800 (1930), although a trial court did not admit a check into evidence, a witness was shown the check, and identified the signatures on it. Additionally, the appellant—who contended on appeal that the trial court erred in failing to admit the check—acknowledged at trial that he had signed the check and delivered it to the payee. See id. at 220, 150 A. at 800. This Court stated: “When an instrument in writing is produced . . . , and witnesses examined in relation to it **without objection to its admissibility from the other side**, it is not error for the court to regard it as in evidence, although not formally offered and read by the party producing it.” Id. at 221, 150 A. at 800-01 (emphasis added) (cleaned up). In United States v. Romero, 692 F.2d 699, 705 (10th Cir. 1982), a trial court allowed a defendant's counsel to read to the jury a statement in which a person alleged that the defendant did not know that the person had marijuana in grocery bags. On appeal, the defendant “contend[ed] that was not enough[,]” and argued that the trial court should have admitted the statement into evidence. See id. Given that the defendant's counsel read the statement to the jury, it is apparent that the defendant had no objection to the statement's admissibility, and that the trial court overruled any objection by the government to the statement's admissibility. Here, the distinction is that the circuit court did not find the Pocket Cop report, or any part of it, admissible. The Majority is correct that a trial court may permit testimony about a document, without admitting the document into evidence, if the trial court finds the document, or portions of the document about which testimony is given, admissible. That is not what occurred in this case.

tracking devices, and occasionally checked the data against the drivers' logs for accuracy. See id. at 29, 142 A.3d at 695. During the supervisor's testimony, the prosecutor offered into evidence the GPS records from the truck of the defendant's cousin, who was one of the company's drivers. See id. at 28-29, 142 A.3d at 695-96. The prosecutor offered the GPS records, and the trial court admitted them, as business records of the company under Maryland Rule 5-803(b)(6). See id. at 31, 35, 142 A.3d at 697, 699. Significantly, instead of offering any opinions or inferences about the GPS records, the supervisor "simply read the GPS data as it appeared in the GPS records." Id. at 34, 142 A.3d at 699.

The Court of Special Appeals held that the trial court did not err in admitting the GPS records and allowing the supervisor to read from them. See id. at 26, 142 A.3d at 694. More broadly, the Court of Special Appeals held that "expert testimony is not necessary for the admission of records of GPS data, where the witness merely reads the GPS data as it appears in the records." Id. at 36, 142 A.3d at 699. The Court of Special Appeals distinguished State v. Payne, 440 Md. 680, 684, 104 A.3d 142, 144 (2014), in which this Court held that a detective needed to be qualified as an expert before being allowed to testify about how he used phone records to determine the cell towers to which the defendants' cell phones connected. See Gross, 229 Md. App. at 34, 142 A.3d at 699. The Court of Special Appeals explained that, unlike the detective in Payne, the supervisor in Gross "was not relying on special knowledge, skill, or training to interpret the GPS records for the [] truck, nor did he 'engage[] in a process to derive his conclusion . . . that was beyond the ken of an average person.'" Gross, 229 Md. App. at 34, 142 A.3d at 699 (quoting Payne, 440 Md. at 700, 104 A.3d at 154) (ellipsis in original).

I fully agree with the Court of Special Appeals's holding in Gross. I also agree with the Court of Special Appeals's conclusion that Payne is distinguishable where reading from GPS records is at issue, as no expertise may be required to read from GPS records, as opposed to interpreting cell phone records. At a minimum, to elicit testimony about the Pocket Cop report from a lay witness such as the sergeant, the State needed to admit the report into evidence as a business record—which is exactly what the State did in Gross.

Contrary to Gross, here, the State did not follow the proper procedure to have the report admitted under the business records exception. Once it became clear that the report would not be admitted into evidence, the circuit court should not have permitted any questions about information in the report, absent a determination that an expert had reasonably relied on information in the report to form an opinion relevant to the case and that the report was trustworthy, unprivileged, and disclosure of the report was necessary to illuminate the expert's testimony. See Md. R. 5-703(b).

In this case, in addition to the report not having been admitted under the business records exception to the hearsay rule, and it, therefore, not being properly the subject of lay witness testimony, Sergeant Schauman's testimony involved more than reading aloud from the report. Questions were generated about how the report was prepared and the meaning of information in the report; and the report contained information not readily available to or understandable by the general public, *i.e.*, information concerning how long Johnson stayed at specific locations.

The majority opinion posits that the issue in this case is whether the admission of GPS evidence is the same as the admission of evidence derived from looking at a clock, a

scale, or a thermometer, see Maj. Slip Op. at 18, or is more akin to the admission of the evidence derived from DNA testing, with the former not requiring expert testimony and the latter requiring such testimony, see Maj. Slip Op. at 1. But the device at issue here, the Pocket Cop device, has the capacity to produce more information than that seen in some GPS reports. Although the general public may be familiar with turning on a GPS device and getting directions to a certain location, and, admittedly, there would not be the need for expert testimony for a witness to read from a GPS report that a GPS device displayed directions to a physical location, the route to the location, and the time of arrival, the Pocket Cop report provided more information than that. The Pocket Cop report gives information about an individual's prior activities, including information such as locations purportedly previously traveled to, the date and time on which an individual traveled to a certain location, and most significantly, the duration of time an individual spent at a particular location. Indeed, in this case, Sergeant Schauman's testimony that, on March 13, 2014, Johnson was at a location next door to the residence of T.K. for thirty-seven minutes provided critical information that Johnson may have been with T.K. long enough to perform the acts of which he was accused.

This case differs from the circumstances in Gross. The opinion of the Court of Special Appeals in Gross v. State, 229 Md. App. at 29, 142 A.3d at 695, indicates that the GPS records were comprised of "entries[.]" each of which included at least "the date, time[.], and address[.]" The GPS records demonstrated that, "on the days where the truck was used in scrap transactions, it would generally be at or near [a] warehouse at some point shortly before being at or near one of the scrap yards." Id. at 29, 142 A.3d at 696. The

Court of Special Appeals’s opinion does not indicate, one way or another, whether the GPS records indicated how long the driver stayed at each location. In addition, in Gross, there was no indication that Gross attempted to question the proponent of the evidence about how the company’s GPS system worked or its reliability.

In this case, in addition to the Pocket Cop report containing information about the duration of time that Johnson spent at particular locations, questions arose during cross-examination regarding how information from the cell phone got into the report, how often the tracking devices are calibrated, how Field Force Manager determined the information in the report, if the actual address/location could be pinpointed, and gaps in time and the significance of the time gaps in the report concerning Johnson’s location.

The majority opinion states that “the general public relies on GPS devices to locate a destination, to ascertain a route to get there from a current location, and to estimate the duration of travel.” Maj. Slip Op. at 19 (footnote omitted). I agree that this is true. The majority opinion also contends, however, that the general public relies on GPS applications (“apps”) such as “MapMyRun” to report duration of travel, and parents rely on apps to track the time children may spend “at the ice cream parlor rather than the library[.]” See Maj. Slip Op. at 19 n.19. How much a member of the public would know about either MapMyRun or apps that track children is debatable.<sup>3</sup> More importantly, the Majority does

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<sup>3</sup>Although MapMyRun can keep track of how long and how far a person traveled on foot, and can display on a map the route that the person took, it is unclear whether MapMyRun can keep track of how long the person stayed at any particular location along his or her route. See Under Armour, MapMyRun (2018), <https://www.mapmyrun.com/app/> [<https://perma.cc/B4L9-NWFJ>]. Similarly, although certain apps,

not contend that the general public would have any knowledge of the questions asked of Sergeant Schauman regarding how the Pocket Cop report was created, how Field Force Manager Works, or the significance of gaps in times in the report. The information derived from the Pocket Cop device plainly involves more than routine GPS information that a member of the public would be familiar with. In essence, I agree that GPS data in a business record does not generally require expert testimony to be admissible where a witness simply reads from a report containing general GPS information. But, in this case, we are dealing with more than a witness reading routine GPS data from a report, and, in my view, expert testimony was required to explain the meaning of the information in the Pocket Cop report and how the information was obtained.

The stumbling point in the majority opinion is that the Majority concludes that the circuit court correctly permitted limited testimony regarding entries from the Pocket Cop report. This testimony would be permissible, however, only if the circuit court found that the Pocket Cop report, or some portion thereof, met the requirements of the business records exception to the hearsay rule, or some other exception. The circuit court did not so find. Permitting testimony about entries in the Pocket Cop report, when neither the report nor any part of it had been found to be admissible, was a clear abuse of discretion.

In sum, a lay witness may not look at a document that is not in evidence and about which the lay witness has no personal knowledge, then testify about the information in the

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such as Google Maps, can provide directions to a driver's destination, display on a map the route that the app suggests, and estimate the time that it will take the driver to reach his or her destination, it is not apparent that such apps keep track of how long the driver stays at any specific location along the way.

report and the witness's opinions or inferences regarding the information in the document. To do so is in violation of Maryland Rules 5-602 and 5-701, which, respectively, require lay witnesses to have personal knowledge of the subject matter of their testimony, and to refrain from offering opinions or inferences that are not rationally based on their perception. That is exactly what happened here. And, for the reasons explained above, the data in the Pocket Cop report was of a nature that expert testimony was required to explain the information to the jury. In this case, reversal is warranted.

For the above reasons, respectfully, I dissent.

Judge Adkins has authorized me to state that she joins in this opinion.