Circuit Court for St. Mary's County
Case No. C-18-CR-22-000051

UNREPORTED*

IN THE APPELLATE COURT

OF MARYLAND

No. 1845

September Term, 2023

WAYNE CARROLL KEY, JR.

v.

STATE OF MARYLAND

Leahy,
Zic,
Raker, Irma S.
(Senior Judge, Specially Assigned),

Opinion by Raker, J.

Filed: August 21, 2025

*This is an unreported opinion. This opinion may not be cited as precedent within the rule of stare decisis. It may be cited for its persuasive value only if the citation conforms to Rule 1-104(a)(2)(B).

In the Circuit Court for St. Mary's County, a jury convicted appellant, Wayne Carroll Key, Jr., of two counts of first-degree murder, two counts of second-degree murder, and two counts of first-degree assault.

Appellant presents the following questions for review:

> "1. Did the trial court commit reversible error in admitting historical location estimates for appellant's cell phone?
>
> 2. Did the trial court commit reversible error in allowing the State to impeach defense expert Joseph Sierra with extrinsic and irrelevant evidence of his character for untruthfulness?"

We shall hold the court did not err in admitting the historical location estimates for appellant's cell phone. As to the second question, we hold the trial court did not err in admitting extrinsic evidence to impeach Mr. Sierra's character for untruthfulness.

I.

The Grand Jury for St. Mary's County indicted appellant for two counts of first-degree murder, two counts of second-degree murder, two counts of first-degree assault, one count of neglect of a minor, and one count of confining an unattended child. The trial court granted appellant's motion for judgment of acquittal as to neglecting a minor and confining an unattended child. The jury convicted appellant of the remaining counts.

At sentencing, the court merged the convictions for second-degree murder and first-degree assault with the two convictions for first-degree murder. The court sentenced appellant to a term of incarceration of life in prison for the first-degree murder conviction of Martina Patterson, with credit for one year time served. The court imposed a consecutive

sentence of life in prison without the possibility of parole for the first-degree murder of Lyneasha Greenwell

On November 24, 2021, the bodies of Martina Patterson, aged 35, and her daughter Lyneasha Greenwell, aged 6, were discovered in a wooded area behind their home in St. Mary's County. The autopsies indicated that they died from multiple injuries from strangulation. Appellant, the father of Ms. Patterson's youngest daughter, M.[1], lived in a tent within walking distance of Ms. Patterson's home where she lived with her two daughters, Lyneasha and M. The State's theory was that appellant murdered Ms. Patterson and Lyneasha in their home on Saturday, November 20, 2021, left, and returned on November 22nd to move the bodies, in a trash can, to the woods. Appellant retrieved M. and then returned to the home again on Wednesday, November 24th, to clean the evidence and remove the trash can from the woods.

The State relied on security camera footage, cellular data from appellant's carrier, and testimony from two neighbors who testified that they saw appellant in or near the home of the victims at relevant times. The State posited that the victims died at home on November 20th, when security camera footage from a neighboring home captured audio of a woman yelling, a child sounding distressed, and a man's voice. Additional video footage from a home across the street showed Ms. Patterson and her children outside on November 20th but never showed them appearing outside their home on November 21st or any day after.

[1] Pursuant to Maryland Rule 8-125, this opinion refers to the victim's minor child as "M." and the minor neighbor witness as "A.L."

Prior to trial, appellant filed a motion to preclude the State's expert witness, Stacey Hancock, a crime analysis for the St. Mary County Sheriff's Office, from testifying about "historical mapping" and the estimated location of appellant's cellphone at times relevant to the crimes at issue, and particularly the T-Mobile Timing Advance Records ("TAR"). He relies on *Daubert* and *Rochkind v. Stevenson*, 471 Md. 1 (2020), and Md. Rule 5-702, Testimony by Experts. The State offered Stacey Hancock as an expert witness in historical cell site mapping and GeoTime software. Ms. Hancock testified that she took the Call Detail Records ("CDR") and TAR[2] data provided by T-Mobile and entered it into the

[2] In *USA v. Ardis,* No. 22-cr-00462-SI-1, 2024 WL 3012800, n. 2 (N.D.CA June 14, 2024), United States District Court for the Northern District of California, in fn. 2, described Timing Advance Records as follows:

> "According to Sonnendecker, [Mark Sonnendecker, Special Agent with the Bureau of Alcohol, Tobacco, Firearms, and Explosives, tasked with managing a national cellular analytics program] 'Timing advance records are another type of cellular record that captures a different type of transactional data. These records capture communications between the cellular network and the cellular device. Such data as the date and time, duration, and cell site/sector information are captured in timing advance records. During a timing advance event, the network sends a signal to the handset and then estimates the distance the cellular device is away from the antenna to which the cellular device is communicating based on the time it takes for a signal to travel from the antenna to the cellular device and then back to the antenna. . . . T-Mobile provides a distance in miles the network estimated the cellular device to be from a given antenna during a timing advance event in their timing advance file. Analysis of the cell site/sector information from the call detail records along with the timing advance data can aid investigators in identifying a general area a cellular device was during a timeframe of investigative interest."

Ms. Hancock explained that Timing Advance records are historical location records. She distinguished Call Detail Records ("CDR") from Timing Advance Records ("TAR"), as follows:

> "[MS. HANCOCK]: Call Detail Records are events that occur on a network that are recorded by the carrier. So this would include information about when

GeoTime software using an Excel spreadsheet to generate a timeline map of appellant's approximate phone location during the relevant period. She testified that T-Mobile uses TAR data to "better operate their network." The witness conceded that T-Mobile advises using the data to "please exercise caution when using [the data] for investigative purposes."

The circuit court denied the motion, ruling as follows:

> "I think I would say it's very clear that Ms. Hancock is not the scientist in this case. She is not a science expert. She certainly can be deemed an expert in the field of operating or using GeoTime, which I don't think necessarily, at least from the testimony I heard, requires you to be a scientist, or have some specific science background, but she certainly did receive a certification which the Court thinks is relevant and appropriate. The Court is going to deny the motion to exclude Ms. Hancock as an expert as it relates to GeoTime.
>
> If the Defense wants to have a motions hearing on the T-Mobile data and whether or not it is trustworthy, then I think we can have that motion on some future date and I'd be happy to allow both sides to present whatever they want to present. But at this point, I don't have any testimony or anything in front of me for the Court to consider whether or not it meets the definition in 5-803. *What I did have, and I should put this on the record, is that the business records were certified by T-Mobile.*"
>
> (emphasis added).

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your device communicates with your wireless network. So date, time, location that that occurs, or the cell site that was used, what phone number was called, and the direction of that call.
[PROSECUTOR]: And what are Timing Advance Records?
[MS. HANCOCK]: Timing Advance Records are historical location records. So you don't have to actively use the phone for this to occur. At any given time, your carrier is trying to make sure you're getting the best service possible. So your device is communicating with multiple towers. The carrier will record this information as an approximate distance from the cell site at that time."

Through Ms. Hancock, the maps uploading T-Mobile's data into GeoTime software were admitted into evidence, subject to any pre-trial motions. Appellant filed a motion to exclude the "TrueCall" or TAR evidence under Rule 5-803, Hearsay Exceptions. Those maps reflect call detail records data from Ms. Patterson's phone and call data records and TAR data from appellant's phone. The TAR data appears as arced lines reflecting the estimated distance of appellant's phone from a cell tower, within a certain direction of that tower, at a particular time.

The court held a hearing on the first day of trial, outside the presence of the jury. Tijuana Williams, Custodian of Records for T-Mobile, testified that the records provided were accurate and were made in the ordinary course of business. She clarified that the Timing Advance Records are kept "in the normal course of business," but that she was not "certifying that the [TAR] accurately reflects where a device's location is." She explained that the TAR data was used by the engineers as "a tool to monitor the network," and not to accurately locate a device. The court ruled the TAR evidence was admissible under the business records exception, explaining as follows:

> "Here in this court case, the data is being used for a separate purpose different than how T-Mobile wants to use it, but it doesn't necessarily make the data unreliable. In looking at the case cited by the Defense, I don't think T-Mobile will use this information for any purpose if it wasn't reliable.
>
> Whether or not the way the State is using it and the way the State's expert is going to testify is, I think, a completely separate issue that will go to the weight of the credibility that the jury gives to it is different than whether or not the information, the data, is reliable enough to be considered under the business record exception."

At trial, defense counsel stipulated that Ms. Hancock was an expert in GeoTime software but objected to her admission as an expert in historical cell site mapping. The court received Ms. Hancock as an expert in both GeoTime software and historical cell site mapping. She testified that she responded to Ms. Patterson's home and appellant's tent to collect evidence for forensic testing. Ms. Hancock testified about the information contained in the CDR records as opposed to the TAR records.

> "[PROSECUTOR]: The documentation from the providers, let's first start with the Call Detail Records, what type of information is in the Call Detail Records?
>
> MS. HANCOCK: So date, time, the cell site that was used, the duration of the event, the direction, whether it was incoming or outgoing, the phone call, the phone number that was called, or that was called from.
>
> [PROSECUTOR]: Okay. And who records that information?
>
> MS. HANCOCK: The carrier.
>
> * * *
>
> [PROSECUTOR]: In the Call Detail Records, is there anything regarding distance or location of the device that those records are attributed to?
>
> MS. HANCOCK: Not from Call Detail Records.
>
> [PROSECUTOR]: In the Timing Advance Records.
>
> MS. HANCOCK: Yes.
>
> [PROSECUTOR]: What information is provided in the Timing Advance Records?
>
> MS. HANCOCK: So date, time. There's actually two different locations that are provided by Timing Advance. There will be a latitude and longitude, which corresponds with an estimated triangulation location. And then they will also provide the tower and cell site that is used along with an estimated distance from that cell site for that device."

To create the maps of the approximate location of appellant's phone, Ms. Hancock used the tower files provided by T-Mobile, which identify each cell tower by a number and provides the number of sectors on each cell site. In this case, there were three different sectors on each cell site that indicated the direction of the connection from the device or cell phone to the cell tower. Ms. Hancock explained that she entered the tower file data, TAR data, and CDR data into the GeoTime software to produce a map that created arc sectors indicating the approximate location of appellant's phone at the time of the murders.

The court admitted into evidence the maps that reflect CDR data from Ms. Patterson's phone, and both CDR and TAR data from appellant's phone. Ms. Hancock testified that the maps indicate the approximate location of Ms. Patterson's device and appellant's device at various times over the course of the weekend in question. She explained that the shaded arcs created provide a general direction of where the cell device connected with a tower, but that the device is not necessarily within that shaded area. Ms. Hancock testified as follows about the shaded area related to the location of Ms. Patterson's phone:

> "MS. HANCOCK: It's just showing that [the cellular device] is on that side as opposed to the opposite side.
>
> [PROSECUTOR]: Does it mean that the device is within the shaded area. Correct?
>
> MS. HANCOCK: No.
>
> [PROSECUTOR]: Okay. The device can be anywhere, which includes [Ms. Patterson's] residence.

MS. HANCOCK: Correct."

On cross-examination, defense counsel asked how T-Mobile calculated its phone location estimates. Ms. Hancock testified that the TAR values are calculated by a "proprietary algorithm by T-Mobile" and was unable to provide additional information about how the values were calculated. Ms. Hancock explained that T-Mobile was "measuring a distance to the—for the Timing Advance data it's measuring the distance of—the approximate distance of the device from the cell site." Defense counsel inquired further:

> "[DEFENSE COUNSEL]: Well, that's the end result is the approximate distance. What are they measuring?
>
> MS. HANCOCK: I don't know exactly what T-Mobile measures to come up with that information.
>
> [DEFENSE COUNSEL]: Now, to your knowledge, has anyone tested the accuracy? And I mean on a large scale, not from one testing, you know with a confirmation bias of what they think is going to show up, but has there been any large scale research on this?
>
> MS. HANCOCK: Not that I'm aware of.
>
> [DEFENSE COUNSEL]: Are you familiar with peer review journals?
>
> MS. HANCOCK: I am.
>
> [DEFENSE COUNSEL]: Have there been any peer reviewed articles on this topic?
>
> MS. HANCOCK: Not that I'm aware of."

The State's additional witnesses testified about the timeline of the weekend's events. A.L., Lyneasha's 12-year-old friend, testified that she went with Ms. Patterson, Lyneasha, and M. to run errands on November 20th, then returned to Ms. Patterson's home. She did

not recall seeing appellant on that day but agreed that during her police interview she stated that appellant came to Ms. Patterson's home on either Saturday or Friday. A.L. identified appellant as the person in surveillance footage seen entering Ms. Patterson's home at 4:37 p.m. on Saturday the November 20th.

Lanelle Ward, Ms. Patterson's sister-in-law, testified that she and her husband had custody of Ms. Patterson's three older children. On November 21st, the two families intended to take family photos together, but when she arrived at Ms. Patterson's home, no one answered the door. She did not hear from Ms. Patterson or Lyneasha again, despite attempts to contact them. She testified that she went to the police station on Wednesday, November 23rd to file a missing person's report. While at the police station, appellant called her through Facebook Messenger and asked her to pick-up M. from his sister's house. An officer recorded the call on his body worn camera. When Ms. Wald was able to pick up M., she noted the baby was wet, had a cold, and her diaper was soiled. After appellant was arrested for the murders, the police showed Ms. Wald the surveillance video footage which captured audio from November 21st. She testified that she was 90% certain the male voice belonged to appellant and 50% certain that the child's voice belonged to Lyneasha.

Jeffrey Lyles, a friend of appellant's, testified that appellant came to his apartment on Saturday, November 20th around 7 or 8 p.m. Appellant stayed Saturday and Sunday nights at his place and left on Monday around 3 a.m. to get his work clothes. Mr. Lyles testified that appellant stopped by with M. on Tuesday evening for about 20 minutes while he was looking for M.'s mother.

Ms. Patterson's neighbor, Darman Farrar, testified that he lived next to Ms. Patterson in November 2021. Around 6:30 a.m. on Monday, November 22nd, Mr. Farrar testified that he looked out his window and saw a man whom he recognized as Ms. Patterson's "ex-boyfriend Jay." He went into the woods with a garbage can and then came back out. He testified that the man he saw was around 5'8" and 170 pounds with no distinguishing facial features. On cross-examination, defense counsel noted that when Mr. Farrar was questioned by police on November 24th, he described the man as about 155 to 160 pounds and not having a beard.

The defense called one witness, Joseph Sierra, an expert in historical cell site analysis. Formerly employed as Custodian of Records for T-Mobile, Mr. Sierra explained that TAR data is collected through a third-party owned and operated device installed on T-Mobile's cell towers. He testified that TAR data is collected to analyze dropped call ratios. In 2019, he authored a document, "Interpreting Timing Advance," explaining that TAR records enable T-Mobile to provide the TAR data to the FBI's Cellular Analyst Survey Team as business records. He testified that the records were "accurate as being a business record. It hasn't been manipulated by human interference, et cetera. Computers captured the data."

During cross-examination, Mr. Sierra testified that he created maps using different software from the same data used by Ms. Hancock. The maps were similar to those created by the State's expert. The State attempted to impeach Mr. Sierra about his employment history with T-Mobile as follows:

"[PROSECUTOR]: [I]t sounds like you were the go-to to train the new people. Correct?

MR. SIERRA: Correct.

[PROSECUTOR]: And one of your go-tos in training new staff and everything was including the financial reimbursements on the Policy and Process with T-Mobile. Correct?

[DEFENSE COUNSEL]: Objection, Your Honor. Beyond the scope.

[THE COURT]: Overruled.

[PROSECUTOR]: Correct?

MR. SIERRA: Yes.

[PROSECUTOR]: And, in fact, you were fired from T-Mobile for stealing $18,826.72 and you're on a payment plan to pay back that money. Correct?

MR. SIERRA: No. That's incorrect.

[PROSECUTOR]: Okay.

[DEFENSE COUNSEL]: May we approach, Your Honor.

[THE COURT]: Come on up.

Counsel approached the bench and the following conversation ensued:

[DEFENSE COUNSEL]: We would ask (inaudible) this was not provided to us.

[PROSECUTOR]: It's impeachment, Your Honor. We don't get to slow down this train right now. It's impeachment.

[THE COURT]: That's why they (indiscernible).

[DEFENSE COUNSEL]: We're objecting.

[THE COURT]: Okay.

The State continued questioning Mr. Sierra about his termination and moved Mr. Sierra's termination letter into evidence, over defense counsel's objection.

As indicated above, the jury found appellant guilty of two counts of first-degree murder, two counts of second-degree murder, and two counts of first-degree assault. Appellant was sentenced and noted this timely appeal.

II.

Before this court, appellant argues that the circuit court erred in denying appellant's motion to preclude portions of Ms. Hancock's testimony and the GeoTime Report based upon Timing Advance Records, evidence which was highly prejudicial evidence that was never evaluated under the *Daubert* standards for expert testimony, as explained in *Rochkind* and as required by Rule 5-702. Appellant asserts the court erroneously admitted the TAR evidence under Rule 5-803(b)(6), the business records exception. The court concluded, erroneously, according to appellant, that because the TAR data were certified business records, they were reliable and Ms. Hancock, who was deemed an expert in GeoTime mapping software could rely on them to create a map purporting to show the approximate location of appellant's cellphone during the relevant time period Even if this court accepts Ms. Hancock as an expert, appellant argues, because she could not explain the principles and methodologies behind the location estimate data, the resulting maps were merely conclusory and inadmissible into evidence.

Appellant argues that the trial erred in permitting the State to impeach his expert witness, Mr. Sierra, with undisclosed (pre-trial) and extrinsic evidence of his character trait

for untruthfulness, in violation of Rule 5-608(b) and Rule 5-401. Appellant maintains that the court erred because (1) the cross-examination was irrelevant, and went on too long, (2) the court erred in permitting the impeachment without first holding a hearing to determine whether a "reasonable factual basis" existed for the inquiry, and (3) the court erred in admitting extrinsic evidence, *i.e.*, the termination letter. According to appellant, admitting the termination evidence based on bias was wrong because T-Mobile was not a party, had no interest in the case, and was thus inadmissible under Rule 5-616, the rule addressing bias. Recognizing that the evidence used to impeach Mr. Sierra was "classic evidence of untruthfulness," the court nevertheless erred because the court never held the required factual basis hearing, and extrinsic evidence is inadmissible. Finally, because of the length of the State's questioning on this subject, Mr. Sierra's termination records were irrelevant. This error, according to appellant, was not harmless error.

As a threshold matter, the State argues lack of preservation of any argument appellant presents here. First, defense counsel below never asked the trial court to determine whether there was a factual basis for the allegation, and therefore, the trial court cannot be faulted for not *sua sponte* holding a hearing. Although defense counsel objected to the admission of the termination letter on relevancy grounds, he did not object to the questions preceding questions about the letter except to say that one question was too long. On the merits, the State argues that the timing advance records were only data upon which she relied upon in creating the maps, not the opinion offered by Ms. Hancock at trial, and because they were only data upon which she relied when creating the maps, the State was not required to prove its accuracy to be admissible. The State asserts that even though the

underlying data for the maps does not need to be admissible to be relied upon by the expert, the T-Mobile records here were admitted under Rule 5-803(b)(6) as a business record. As such, the State asserts, the court may accept those records as both reliable and trustworthy because "[the rationale underlying the business records exception is that . . . the business relies on the accuracy of its records to conduct its daily operations[.]" *Dep't of Pub. Safety & Corr. Servs. v. Cole*, 342 Md. 12, 30 (1996). The State argues that any weakness in the data Ms. Hancock relied on in creating the maps goes to the weight of Ms. Hancock's testimony and not admissibility.

Addressing appellant's impeachment argument, the State argues the issue is not preserved for our review. The State asserts that appellant never raised the concept of character evidence at trial and that the only objection to relevance at trial was related to the State's request to enter the termination letter into evidence, not an objection to improper character evidence or a request for the court to determine whether there was a basis for the evidence under Rule 5-608. The State argues that appellant failed to preserve his relevancy argument about the State's questioning of Mr. Sierra's termination. The State asserts the termination letter was offered only after Mr. Sierra was allowed to explain its contents. Although the State concedes that appellant objected to admitting the letter based on relevance, and preserving his argument about the extrinsic evidence, the letter, he did not object except to complain that one question was too long. The State asserts the only reviewable relevancy question is whether the termination was relevant to the proceedings.

III.

We consider first whether the court erred in admitting Ms. Hancock as an expert in historical cell site mapping despite the State's argumenta that the only portion of Rule 5-702 at issue here is whether a sufficient factual basis exists to support the expert testimony. We do not agree with that summation of appellant's argument. We interpret appellant's position to be that the trial court erred in admitting Ms. Hancock as an expert in historical cell site mapping, relying on the business record exception to admit both the CDR and TAR data, and that the use of TAR data was unreliable to approximate appellant's location at the time of the crimes.

We consider the circuit court's decisions on the admissibility of expert testimony on an abuse of discretion standard. *Rochkind*, 471 Md. at 10. Rule 5-702 addresses admission of expert testimony as follows:

> "Expert 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. In making that determination, the court shall determine
>
> (1) whether the witness is qualified as an expert by knowledge, skill, experience, training, or education,
>
> (2) the appropriateness of the expert testimony on the particular subject, and
>
> (3) whether a sufficient factual basis exists to support the expert testimony."

To qualify a witness as an expert, "[t]he trial court is free to consider any aspect of a witness's background in determining whether the witness is sufficiently familiar with the subject to render an expert opinion, including the witness's formal education, professional training, personal observations, and actual experience." *Stevenson v. State*, 222 Md. App. 118, 136 (2015) (cleaned-up).

At trial, appellant stipulated that Ms. Hancock was an expert in operating or using GeoTime software but objected to the trial court's admission of her as an expert in historical cell mapping. We hold the court did not abuse its discretion or err in admitting Ms. Hancock as an expert in historical cell mapping.

Evidence regarding cellular phone technology generally must be presented by an expert witness. *See, e.g., State v. Payne*, 440 Md. 680, 701-02 (2014) (trial court erred in admitting police officer's non-expert testimony regarding location of co-defendants based on cell phone and cell tower records); *Hall v. State*, 225 Md. App. 72, 94-95 (2015) (holding that a State Trooper with multiple hours of experience and training interpreting cell phone data records including plotting and mapping cellular detail records as part of his regular duties was properly admitted as an expert in historical cell site mapping); *Stevenson*, 222 Md. App. at 135-36 (holding that the trial court did not abuse its discretion when qualifying a detective as an expert in cell site mapping who had extensive first-hand experience and training in analyzing cell phone call detail data"). These determinations, although prior to the Maryland Supreme Court adoption of the *Daubert* standard for admitting an expert testimony in *Rochkind*, comport with this adoption.

In *United States v. Medley*, 312 F. Supp. 3d 493 (D. Md. 2018), the United States District Court for the District of Maryland admitted an FBI agent as an expert in analyzing historical cell site location evidence, based on over 600 hours of training in cellular phones investigations and his employment with the FBI since June of 2009 where he conducted cell site mapping and analyzing records as well as trained law enforcement officers and attorneys on cellular technology and record analysis. *Id.* at 503, n.2. The Court explained

in *Medley* that "testimony about how location may be determined from historical cell site billing records (whether from employees of the cellular services company or law enforcement) is best regarded as expert testimony, not lay testimony, because it necessarily involves scientific, technical, or specialized knowledge." *Id.* at 501.

The trial court admitted Ms. Hancock as an expert in historical cell site mapping. She testified that she serves as a Crime Analyst for the Criminal Investigation Division of the St. Mary's County Sheriff's Office, she completed both GeoTime Level One and the Level Two trainings, and she completed the User Certification Course in December of 2021. She testified she "attended multiple webinars in training regarding how to put together a report, how to testify in court in example cases where Call Detail Record Analysis was used." On *voir dire*, defense counsel attempted to highlight Ms. Hancock's lack of understanding as to what TAR records are and how they are calculated, thus disqualifying her as an expert in historical cell site mapping due to not understanding the data she manipulated when creating the maps. The court at first agreed with the defense stating as follows:

> "So far [Ms. Hancock] hasn't given any indication that she knows how this data is used so [the Prosecutor] is going to need to ask her some more. . . . You clearly got that it's collected from the data, but on the *voir dire* from the Defense, they asked her specifically about how this information is collected—"

The State inquired further. Ms. Hancock explained that Timing Advance Records contain the date and time of the calls, a latitude and longitude that corresponds with estimating the triangulation of the device that made the call, and the location of the tower and cell site for estimating the distance from the cell site to the device. She stated that she

did not attempt to triangulate the location of appellant's phone in this case. She testified that she used the "date and time. But then for location, I have to get the tower files, which also come through the carrier." She stated that she inputs the data from the TAR and CDR records provided by T-Mobile into GeoTime, which then plots the data as an arc sector indicating an approximate location of the device that communicated with the cell sites at the various times.

The court concluded that this additional testimony was sufficient to admit Ms. Hancock as an expert in historical mapping. We find no abuse of discretion here. Despite this being Ms. Hancock's first admission as an expert in Historical Mapping, she had additional training, a certification, and she articulated her use of the data to create the maps. She did not suggest the resulting maps showed appellant's actual location and made it clear that the maps *approximated only* the location of appellant's cell phone during the time in question. *See Medley*, 312 F.Supp.3d at 501-02 (citing *United States v. Hill*, 818 F.3d 289, 298 (7th Cir. 2016)) (holding that as long as the expert acknowledges the limitations of the data's ability to pinpoint the location of the cell phone, the methods are considered "accurate enough" for determining approximate locations).

We next consider whether there was a sufficient factual basis for Ms. Hancock's testimony and opinion in the form of the location maps. We review the trial court's decision to admit expert testimony for an abuse of discretion. *Abruquah v. State*, 483 Md. 637, 652, (2023) (citing *Rochkind*, 471 Md. at 10). "[A] circuit court abuses its discretion by, for example, admitting expert evidence where there is an analytical gap between the type of evidence the methodology can reliably support and the evidence offered." *Id*. Nevertheless,

as the Supreme Court of Maryland has stated, "it is still the rare case in which a Maryland trial court's exercise of discretion to admit or deny expert testimony will be overturned." *State v. Matthews*, 479 Md. 278, 306 (2022).

The third prong of Rule 5-702, whether a sufficient factual basis for the expert's opinion exists, requires "two sub-elements: (1) an adequate supply of data; and (2) a reliable methodology." *Rochkind*, 471 Md. at 22. Reliability depends on a number of factors[3], none of which is dispositive or exclusive. *Id.* at 35-36. This flexible inquiry guides

[3] In *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 589 (1993), the United States Supreme Court held that a judge must determine that expert scientific testimony is both relevant and reliable to be admissible. Although the Court clarified that the *Frye* "general acceptance" test for admissibility is no longer a precondition for admitting scientific evidence, a trial judge must still determine whether the evidence is pertinent and based on scientifically relevant principles to be admissible. *Id.* at 597.

The Maryland Supreme Court, in *Rochkind,* adopted the following factors from *Daubert* in assessing reliability of an expert's testimony:

> "(1) whether a theory or technique can be (and has been) tested;
> (2) whether a theory or technique has been subjected to peer review and publication;
> (3) whether a particular scientific technique has a known or potential rate of error;
> (4) the existence and maintenance of standards and controls;
> (5) whether a theory or technique is generally accepted;
> (6) whether experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying;
> (7) whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion;
> (8) whether the expert has adequately accounted for obvious alternative explanations;
> (9) whether the expert is being as careful as he or she would be in his or her regular professional work outside his or her paid litigation consulting; and
> (10) whether the field of expertise claimed by the expert is known to reach reliable results for the type of opinion the expert would give."

the trial court in its gatekeeping function and requires the trial court to "consider the relationship between the methodology applied and conclusion reached." *Id.* at 36.

In *U.S. v. Jones*, 918 F.Supp.2d 1 (Dist. D.C. 2013), the court held that the data used by the Government's expert in creating maps of the approximate location of Jones's cell phone provided a sufficient factual basis to create the maps. The court held as follows:

> "[T]he government's response [to defendant's complaint] clearly explains how Agent Eicher determined the direction of the pie-shaped wedges. The records obtained pursuant to the court orders specify the cell tower and sector the cell phone connected to at the beginning and end of each call. Additionally, the cellular service providers release lists of their cell towers to law enforcement, including 'the location of their cell towers, with GPS coordinates for each tower, and the specifications for each of the sectors of the towers.'"

Id. at 4-5. The Agent then combined these sets of data to create the location maps. The court found that Agent Eicher's opinions were based on sufficient facts and data and were based on reliable methodology. *Id.* at 5. The court added that if the Agent's testimony relies on assumptions about the signal strength from a given cell tower or site, "any challenges to those assumptions go to the weight of his testimony, not reliability." *Id.*

Appellant focuses heavily on the reliability of TAR data and Ms. Hancock's ability as an expert to interpret that data. Appellant argues that because Ms. Hancock could not explain the methodologies behind the TAR data obtained from T-Mobile and that T-Mobile states that it does not certify the accuracy of this data, her conclusions amounted to "pure *ipse dixit* that appellant's phone was present where the State said it was." We disagree. A

Rochkind, 471 Md. at 35-36. The factors are not exclusive.

number of courts, including Maryland, accept the use of call records and cell tower locations provided by service providers as a reliable methodology to determine the approximate location of a cell phone at a specific time. *Stevenson*, 222 Md. at 133-34 (finding the use of cell phone records for investigative purposes is generally accepted in Maryland cases and federal courts); and *Tomanek v. State*, 261 Md. App. 694, 716 (2024) (finding it reasonable that a magistrate approved a warrant application by assuming a perpetrator had a cell phone and that third-party "location data and identifying information about that person" was helpful to the investigation). *See also e.g., United States v. Baker*, 58 F.4th 1109, 1125 (9th Cir. 2023) (holding that expert testimony about cell site location information admissible when the jury is adequately informed of its limitations); *United States v. Hill,* 818 F.3d 289, 298 (7th Cir. 2016) (recognizing that "historical cell-site analysis can show with sufficient reliability that a phone was in a general area," although expert disclaimer that accused's "cell phone's use of a cell site did not mean [he] was right at that tower or at any particular spot near that tower" may be necessary to "save" such testimony); *United States v. Lewisbey*, 843 F.3d 653, 659 (7th Cir. 2016) ("Using call records and cell towers to determine the general location of a phone at specific times is a well-accepted, reliable methodology."); *Jones*, 918 F.Supp.2d at 5 ("[T]he use of cell phone location records to determine the general location of a cell phone has been widely accepted by numerous federal courts."); *State v. Warner*, 842 S.E.2d 361, 364-67 (S.C. 2020) (finding testimony regarding cell phone location analysis and related expert testimony reliable and admissible).

At trial, Ms. Hancock explained her training and the techniques used to create the location maps from the records provided by T-Mobile. Significantly, Ms. Hancock did not suggest that the maps indicated the exact or precise location of appellant's cell phone. Similar to the agent in *Jones*, Ms. Hancock combined the information from the tower files, CDR, and TAR records to create arcs of the probable location of appellant's cell phone at the time of the crimes. Once Ms. Hancock was accepted as an expert and the maps were admitted, defense counsel could cross-examine her about the credibility of the data on which she relied. Defense counsel did so. We hold the court did not abuse its discretion or err in admitting the maps.

Appellant asserts that admitting the TAR records under the business record exception was error and that satisfying the business record exception to the hearsay rule does not make those records *per se* reliable by an expert in forming an opinion. Appellant argues that the TAR data is a second layer of hearsay made up of "conclusions or opinions . . . calculated by unknown individuals, with unknown training and experience, employing an unknown methodology, in reliance on unknown data, which T-Mobile relies on for an unknown purpose that is not determining the location of individual accountholder's devices," and was inadmissible.

Rule 5-801(c) defines hearsay as "a statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted." Hearsay is admissible if it meets an exception. Rule 5-803(b)(6), the business record exception, states as follows:

> "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."

The Supreme Court of Maryland explained the purpose of the business record exception as follows:

> "The purpose of the business record exception is premised on the theory that because the records are reliable enough for the running of a business, in part because of the business duty imposed on the reporter and the recorder, that they are reliable enough to be admissible at trial. We have long since recognized that one of the purposes of the business records exception was to bring the rule of evidence nearer to the standards in responsible action outside of the courts."

Jackson v. State, 460 Md. 107, 124-25 (2018) (citations omitted).

The court admitted the TAR data as a business record after finding that the data was collected in the manner described in the Rule.[4] Ms. Williams, T-Mobile's Custodian of Records, testified at the Rule 5-803(b)(6) hearing about T-Mobile's records as follows:

> "[DEFENSE COUNSEL]: You're certifying that these are T-Mobile's records. Correct?
>
> MS. WILLIAMS: Yes.

[4] Further, during Mr. Sierra's testimony at trial, he stated that the TAR or TDOA data collected by T-Mobile was certified "as business records" because the data "hasn't been manipulated from human interference, et cetera."

[DEFENSE COUNSEL]: But you're not certifying that this accurately reflects where a device's location is.

MS. WILLIAMS: Correct.

[DEFENSE COUNSEL]: You can testify as to tower location.

MS. WILLIAMS: Correct.

[DEFENSE COUNSEL]: But tower location is not the same thing as where a cellular device is.

MS. WILLIAMS: Correct.

[DEFENSE COUNSEL]: Now when you say the Timing Advance is used by the engineers to maintain the network, do you have any further information on that?

MS. WILLIAMS: No.

* * *

[DEFENSE COUNSEL]: Can you certify the distance of a cellular device from a tower?

MS. WILLIAMS: Yes.

[DEFENSE COUNSEL]: Based on this information?

MS. WILLIAMS: Based on the latitude and longitude.

[DEFENSE COUNSEL]: Well, you can certify where a T-Mobile—these are T-Mobile's records, but can you certify the location of a cellular device?

MS. WILLIAMS: No."

This testimony suggests that the data used by Ms. Hancock contained the components necessary to create a map that approximates the location of appellant's cell phone. Ms. Williams stated that the latitude and longitude coordinates provided in the data could be

used to approximate the location of a cellular device, but she could not speak to the accuracy of this location.

Here, the court was well within its discretion to consider the data accurate as a business record and to consider the incentive of a business to keep accurate timing advance records that may be relied upon in developing expert testimony and it did so as follows:

> "T-Mobile is using these records for their specific purpose, and based on the testimony of Ms. Williams, it's clear that the data is being collected by T-Mobile for a very specific purpose, which is to monitor and maintain their network. Therefore, implying that it is reliable data for that purpose.
>
> Here in this court case, the data is being used for a separate purpose different than how T-Mobile wants to use it, but it doesn't necessarily make the data unreliable. . . .
>
> Whether or not the way the State is using it and the way the State's expert is going to testify is, I think, a completely separate issue that will go to the weight of the credibility that the jury gives to it is different than whether or not the information, the data, is reliable enough to be considered under the business record exception."

We agree with the trial court's assessment. While appellant argues the court concluded that because the TAR data is admissible as a business record, it is *per se* reliable evidence under *Rochkind*, appellant misinterprets the court's rationale. The court concluded that T-Mobile needs to keep accurate timing advance records, which approximate the distance of a cellular device to a cellular tower, to make improvements to the strength of its cellular network and to maintain accurate billing records. Having accurate distances and locations of where cellular devices are connecting to the network and switching cell sites are essential to this business purpose. As such, the court reasonably

concluded the TAR data is likely reliable enough for an expert to utilize in generating historical cell site location maps.

Our conclusion is supported by the finding of general reliability and admissibility of TAR by other courts that have considered the reliability of TAR. Federal courts have allowed the use of TAR data in expert testimony and have held it to be reliable for cell site location mapping and analysis. *See e.g., United States v. Daskal*, 21-CR-110 (NGG), 2023 WL 9424080, at *16 (E.D.N.Y. Jul. 12, 2023) ("Data provided by cellular service providers and maintained by those providers in the ordinary course of their business is sufficiently accurate to underly expert testimony.") (internal citation omitted); *United States v. Ray*, 2022 WL 101911, at *7 (S.D.N.Y. Jan. 11, 2022) (finding that cellular service providers maintain cellular location information "in the ordinary course of their businesses for billing purposes" and "have a financial interest in their accuracy" implying "there is no reason to question their reliability").

The discussion of TAR reliability in *United States v. Clanton*, No. 23-CR-328 (KAM), 2024 WL 1072050 (E.D.N.Y. March 12, 2024) is instructive. There the court discussed the accuracy of TAR data used for historical cell site mapping and whether it could be relied upon for expert testimony. *Id.* at *27-29. The court noted that although TAR is a relatively new technology, with no federal cases addressing the technology, the "FBI and other law enforcement agencies across the country use TAR to track the general location of a phone." *Id.* at *29 (internal quotation removed). Significantly, the court noted that cellular service providers maintain TAR for business reasons, including troubleshooting, network optimizing and financial gain, factors indicative of the accuracy

of TAR and "indicative of widespread acceptance in the relevant technological community." *Id.*

We agree with appellant that admitting the data under the business record exception does not make the documents *per se* reliable for mapping the location of appellant's cell phone. However, this does not preclude an expert from using the data to create historical maps of the approximate location of appellant's cell phone. *See Matthews*, 479 Md. at 312 ("[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof" should be used to attack "shaky but admissible evidence").

IV.

Turning to appellant's evidentiary argument about the impeachment of Mr. Sierra, we hold that appellant's arguments that the trial court failed to have a required hearing to determine the factual basis for the inquiry is not preserved for our review. Defense counsel complained to the court that he had not received the letter in discovery, alleging a discovery violation. The short answer is that this type of impeachment evidence need not be disclosed pre-trial in discovery. Rule 4-263(e)(1) (disclosure of impeachment evidence not required until after witness testifies at trial). Addressing his relevancy argument, while appellant concedes that truth and veracity questions are relevant; he failed below to clarify which details were excessive or irrelevant. As to the admissibility of extrinsic evidence, defense counsel never argued that as the basis for exclusion below. Hence, concerns about Mr. Sierra's cross-examination as improper character evidence were not preserved for our review.

Ordinarily, this Court will not decide any issue unless it plainly appears by the record to have been raised in or decided by the trial court. Rule 8-131(a). *Accord Ray v. State*, 435 Md. 1, 20 (2013) (Rule 8-131(a) requires that the issue "plainly appear" in the record to be raised in, or decided by, the circuit court.). Rule 4-323 provides that "an objection to the admission of evidence shall be made at the time the evidence is offered or as soon thereafter as the grounds for objection become apparent. Otherwise, the objection is waived." Our review is limited to preserved issues as "a matter of basic fairness to the trial court and to opposing counsel, as well as being fundamental to the proper administration of justice." *In re Kaleb K.*, 390 Md. 502, 513 (2006).

Here, appellant argues for the first time on appeal that the impeachment evidence submitted during cross examination of Mr. Joseph Sierra was an impermissible attack on his character for untruthfulness and not evidence of bias. During Mr. Sierra's cross-examination, defense counsel objected four times, none of which expressed this concern. The first objection concerned the scope of the State's question to Mr. Sierra about how he trained new staff at T-Mobile.

> "[PROSECUTOR]: And so it sounds like you were the go-to to train the new people. Correct?
>
> MR. SIERRA: Correct.
>
> [PROSECUTOR]: And one of your go-tos in training new staff and everything was including the financial reimbursements on the Policy and Process with T-Mobile. Correct?
>
> [DEFENSE COUNSEL]: Objection, Your Honor. Beyond the scope.
>
> [THE COURT]: Overruled."

Immediately following this objection, defense counsel objected a second time because the State had not disclosed the letter from T-Mobile detailing Mr. Sierra's termination.

> "[PROSECUTOR]: And, in fact, you were fired from T-Mobile for stealing $18,826.72 and you're on a payment plan to pay back that money. Correct?
>
> MR. SIERRA: No. That's incorrect.
>
> [PROSECUTOR]: Okay.
>
> [DEFENSE COUNSEL]: May we approach, Your honor.
>
> [COURT]: Come on up.
>
> [DEFENSE COUNSEL]: *We would ask (inaudible) this was not provided to us*.
>
> [PROSECUTOR]: It's impeachment, Your Honor. We don't get to slow down this train right now. It's impeachment.
>
> [COURT]: That's why they (indiscernible).
>
> [DEFENSE COUNSEL]: We're objecting.
>
> [COURT]: Okay."

Mr. Sierra's Termination Record was marked for identification. Questioning of Mr. Sierra about his termination from T-Mobile continued until defense counsel objected a third time as to the length of the prosecutor's question.

> "[PROSECUTOR]: …But, essentially, before [T-Mobile] had modified policy from once they caught what you were doing, if you traveled to a specific place, like Las Vegas, and T-Mobile may get reimbursed for the flight and stuff like that. But sometimes, incidentals, if you will, the day-to-day, such as your incidentals from last night to today, the day-to-day. What this is, is that Las Vegas—
>
> [DEFENSE COUNSEL]: Objection.
>
> [PROSECUTOR]: -- without your request—

> [DEFENSE COUNSEL]: Is that a question?
>
> [PROSECUTOR]: Yes. It goes to the facts.
>
> [DEFENSE COUNSEL]: We're at Page 4 of this question, then. Could we get to the question.
>
> [PROSECUTOR]: I am. I'm laying the facts, the foundation. The scheme, if you will.
>
> [COURT]: Overruled. Go ahead."

While appellant states the above objection was a general one, we disagree. The above objection appears to be to the meandering nature of the question and not to the type of evidence being offered to impeach Mr. Sierra. Rule 5-608(b) states as follows:

> "The court may permit any witness to be examined regarding the witness's own prior conduct that did not result in a conviction but that the court finds probative of a character trait of untruthfulness. Upon objection, however, the court may permit the inquiry only if the questioner, outside the hearing of the jury, establishes a reasonable factual basis for asserting that the conduct of the witness occurred. The conduct may not be proved by extrinsic evidence."

The court did not conduct a hearing to establish a factual basis for asserting the conduct because defense counsel did not raise an objection that would necessitate this hearing. Even if this was the intent of the above objection, as appellant's brief suggests, the court did not recognize it as such and defense counsel did not attempt to explain the purpose of the objection.

Appellant's argument regarding the relevancy of Mr. Sierra's Termination Record is preserved for our review and we shall address the merits of that argument. Credibility of a witness is always relevant. *Devincentz v. State*, 460 Md. 518, 551 (2018); *Smith v. State*, 273 Md. 152, 157 (1974) ("[T]he witness's credibility is always relevant."). Relevant

evidence is that which has "any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence." Rule 5-401. Extrinsic evidence is not admissible to impeach a witness about "facts that are collateral, irrelevant or immaterial to the issues of the case." *Smith*, 273 Md. at 158; *see also* Rule 5-616(b)(2) ("Other extrinsic evidence contradicting a witness's testimony ordinarily may be admitted only on non-collateral matters."). "In the court's discretion, however, extrinsic evidence may be admitted on collateral matters." Rule 5-616(b)(2).

As to cross-examination and impeachment of Mr. Sierra, we hold that the trial court did not abuse its discretion and properly admitted his termination letter. The cross-examination was probative of Mr. Sierra's character trait for truth and veracity, and therefore relevant. While appellant does not specify which part of the examination was excessive, the State notes that Mr. Sierra offered many details, not elicited by the State, in his answer to the State's questions. Finally, the termination letter was admissible, within the trial court's discretion, once appellant contested the reason for his termination. As to error, any error was harmless.

After Mr. Sierra contested the nature of his termination from T-Mobile, the State offered his Termination Record into evidence and defense counsel objected on relevancy grounds. That Mr. Sierra had been terminated for the bad act of theft as a T-Mobile employee was relevant to his character trait for truth and veracity. That goes to truthfulness. And although we need not address the bias issue, because he had been terminated from T-Mobile, and the T-Mobile records were an important issue in the case, possible bias of a

witness against T-Mobile was relevant. When Mr. Sierra denied the circumstances surrounding his termination, the State could impeach him further with the evidence of the termination letter. Although appellant argues that the questioning of Mr. Sierra went on far too long and included more detail than necessary for the purpose of the case *sub judice*, we agree with the State that much of these details were revealed in Mr. Sierra's lengthy responses and not elicited by the State's questions.[5] We find no abuse of discretion or error in admitting the Termination Record.

JUDGMENTS OF THE CIRCUIT COURT FOR ST. MARY'S COUNTY AFFIRMED. COSTS TO BE PAID BY APPELLANT.

[5] During cross-examination, Mr. Sierra repeatedly offered more information than was required of the prosecutor's questions and frequently contested the information contained in the Termination Record.