

DEVELOPMENTS IN ACCIDENT RECONSTRUCTION EVIDENCE

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Accident reconstruction is a term that often engenders skepticism and a degree of uncertainty in Virginia litigation. Within the living memory of many current practicing attorneys, the Supreme Court of Virginia noted that “accident reconstruction expert testimony is rarely admissible in Virginia.”¹ Expert testimony purporting to explain the mechanics of a motor vehicle accident was generally believed to be inadmissible. Today, among many Virginia litigators and in many courtrooms, the belief persists that the admission of evidence derived from accident reconstruction is improper. This belief, however, is no longer accurate in Virginia, and with a properly laid foundation, accident reconstruction evidence can be both admissible and highly effective in the courts of the Commonwealth. This article traces the evolution of the law governing accident reconstruction evidence in Virginia, highlights its applicability in modern litigation, and considers how it may continue to evolve as new motor vehicle technology develops.

I. HISTORY OF ACCIDENT RECONSTRUCTION EVIDENCE

Over the past several decades, Virginia jurisprudence has reflected a trend toward greater acceptance of scientific evidence to assist the finder of fact in determining the details of a motor vehicle accident. In the middle of the last century, courts commented on the inherent unreliability of certain physical evidence in proving how motor vehicle accidents occurred.² As the Supreme Court of Virginia noted, “[i]t is a matter of common knowledge that if an automobile, traveling at fifty-five miles per hour, or less, gets out of control it may behave in a manner which seemingly defies all laws of physics.”³

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¹ *Brown v. Corbin*, 244 Va. 528, 531, 423 S.E.2d 176, 178–79 (1992).

² *See Richter v. Seawell*, 183 Va. 379, 382, 32 S.E.2d 62, 63 (1944); *see also Weddle v. Draper*, 204 Va. 319, 323, 130 S.E.2d 462, 466 (1963) (observing that the “cars collided with great force and when this happens the course of travel they take afterwards very often defies all laws of physics”).

³ *Richter*, 183 Va. at 382, 32 S.E.2d at 63.

The last published Virginia opinion endorsing the ability of motor vehicles to seemingly defy the laws of physics was written in 1963.⁴ Regardless of whether the subtle change in language reflected any material change in receptiveness to accident reconstruction evidence, significant barriers to its admissibility remained. One of the most significant hurdles was the prohibition against allowing an expert witness to render an opinion on the ultimate issue in civil or criminal cases.⁵

Since an accident reconstruction expert seeks to determine forensically the manner in which an accident occurred, the testimony of such an expert in a motor vehicle case will frequently address the ultimate issue of liability. Virginia's preclusion of expert opinions on the ultimate issue in a case greatly limited the utility of accident reconstruction evidence. In *Venable v. Stockner*, for example, the plaintiff and defendant each alleged that the other's vehicle crossed the center line, resulting in the accident at issue. Stockner offered an expert witness who personally examined accident scene skid marks on the pavement, photographs of the skid marks, and photographs of the vehicles. The expert then stated that, using the information he gained from those sources, he was able to determine the angle of the vehicles' impact, and that the Venable vehicle had crossed the center line.⁶ Although Venable did not challenge the foundation of these opinions, the Supreme Court of Virginia ruled that this testimony was inadmissible because, by opining which vehicle crossed the center line, it directly addressed the ultimate issue of liability.⁷

However, in 1993, the General Assembly enacted Virginia Code section 8.01-401.3(B), which in effect reversed the rule followed in *Venable*. That code section provides that "[n]o expert or lay witness while testifying in a civil proceeding shall be prohibited from expressing an otherwise admissible opinion or conclusion as to any matter of fact solely because that fact is the ultimate issue or critical to the resolution of the case."⁸ Notably, however, an expert opinion on the ultimate issue remains prohibited in criminal cases.⁹

Although the promulgation of section 8.01-401.3(B) removed a significant barrier to the admission of accident reconstruction testimony, other important limiting principles remain.¹⁰ The first limitation is that expert testimony cannot invade the province of the jury, which is to say that it "may not concern a matter within the range of common knowledge of the factfinder."¹¹ The second limita-

⁴ See *Fletcher v. Horn*, 197 Va. 317, 322, 89 S.E.2d 89, 93 (1955) ("[I]t is a matter of common knowledge that a motor vehicle, out of control as a result of a collision, may seemingly defy all laws of physics.").

⁵ E.g., *Venable v. Stockner*, 200 Va. 900, 905, 108 S.E.2d 380, 383 (1959).

⁶ *Id.* at 904, 108 S.E.2d at 383.

⁷ *Id.* at 905, 108 S.E.2d at 383.

⁸ VA. CODE § 8.01-401.3(B).

⁹ E.g., *Velazquez v. Commonwealth*, 263 Va. 95, 104, 557 S.E.2d 213, 219 (2002).

¹⁰ See, e.g., *Rhodes v. Lance, Inc.*, 55 Va. Cir. 253, 256 (Suffolk 2001) (Kelsey, J.).

¹¹ E.g., *Rhodes*, 55 Va. Cir. at 256 (quoting *Virginia Power v. Dungee*, 258 Va. 235, 258, 520 S.E.2d 164, 177 (1999)).

tion affecting accident reconstruction testimony is the requirement of an adequate factual foundation for the expert's opinions.

The prohibition against expert testimony invading the province of the jury is found in Virginia Code section 8.01-401(A), which sets forth the foundational requirement that expert testimony in a civil proceeding must be based upon "scientific, technical, or other specialized knowledge [that] will assist the trier of fact to understand the evidence or to determine a fact in issue" ¹²

Virginia courts have traditionally been reluctant to admit the testimony of an expert witness who opines how an accident happened based upon conclusions drawn from the physical evidence at the scene. The rationale behind this reluctance is that a layperson is equally capable of analyzing the physical evidence and concluding how an accident occurred. ¹³ As the Supreme Court of Virginia held, "[a] witness may describe the marks that he has observed near the place of an accident. The inference to be drawn from the testimony regarding such tire marks, skid marks, or scratches is solely the province of the jury." ¹⁴

The general rule has been that an expert witness may describe the physical evidence at an accident scene but may not synthesize that evidence to explain how the accident occurred. For example, in *Grasty v. Tanner*, an expert witness opined on the speed of a vehicle during an accident based on his observations of the resulting vehicle damage and the accident scene. The Supreme Court of Virginia held that this testimony was inadmissible and should have been excluded "on the ground that the jury could draw a conclusion from the facts as well as the [expert] witness." ¹⁵ The court went on to explain that "reasonable men were capable of drawing their own conclusions as to the speed of the Grasty car, based on its condition after the impact, and [therefore] the expert's testimony invaded the province of the jury on a vital issue in the case." ¹⁶ Even after the promulgation of Virginia Code section 8.01-401.3(B) permitting expert opinions on "a vital issue" in the case, accident reconstruction remained relatively disfavored. The belief was that it failed to assist the trier of fact because it was not based on specialized knowledge. ¹⁷

¹² VA. CODE § 8.01-401(A).

¹³ See *Grasty v. Tanner*, 206 Va. 723, 726, 146 S.E.2d 252, 254 (1966) (excluding expert testimony on the speed of a vehicle, based on the expert's examination of vehicle damage, photographs, and a scene inspection); see also *Richardson v. Lovvorn*, 199 Va. 688, 101 S.E.2d 511 (1958); see also *Yeldell v. Commonwealth*, No. 0699-05-2, 2006 Va. App. LEXIS 359, at *11-14 (Va. Ct. App. Aug. 8, 2006) (excluding expert testimony regarding the vehicles' point of impact and the direction the vehicles moved and rotated after the collision, based on physical evidence at the scene); see also *Scooler v. Commonwealth*, 14 Va. App. 418, 419-21 (1992) (excluding expert testimony regarding where vehicle struck a tree and its movement following the impact, based on physical evidence at the scene).

¹⁴ E.g., *Venable v. Stockner*, 200 Va. 900, 905, 108 S.E.2d 380, 383 (1959) (quoting *Richardson v. Lovvorn*, 199 Va. 688, 693, 101 S.E.2d at 514 (1958)).

¹⁵ *Grasty*, 206 Va. at 726, 146 S.E.2d at 254-55. Note that the court in *Grasty* also found that the opinion of the expert lacked sufficient factual foundation.

¹⁶ *Id.* at 727, 146 S.E.2d at 254-55.

¹⁷ VA. CODE § 8.01-401.3(B).

Gradually, however, Virginia courts began to accept that expert testimony concerning physical evidence of an accident can assist the trier of fact by virtue of the expert's specialized knowledge. In his 2001 opinion, *Rhodes v. Lance, Inc.*, then-Judge (now Justice) Arthur Kelsey acknowledged that “the difference between common and uncommon knowledge can sometimes be illusive.”¹⁸ The case involved an accident reconstruction expert who sought to testify to the positions and trajectories of the accident vehicles, the sequence and timing of the traffic light, as well as the color of the defendant's light. The expert based this testimony on simple mathematical calculations, drawn from the known sequencing of the traffic light, the physical layout of the intersection in question, and a scene inspection with a witness who passed through the intersection shortly before the accident.¹⁹

The plaintiff objected to the introduction of this testimony on the grounds that the expert's “synthesis of the factual testimony about vehicle positions, speed, relative positions—and their interplay with the signal sequencing engineered at this particular intersection—can be duplicated by the jurors by using mathematical equations.”²⁰ Specifically, plaintiff's counsel argued that the vehicles' velocities were available to the jurors in the table set forth in Virginia Code section 46.2-880. The jury could then use witness testimony to “plot track-lines for each vehicle and then plug each one into the known sequencing characteristics” of the traffic signals at the intersection.²¹ While the court excluded the expert's testimony regarding the color of the light, it found the remaining opinions admissible.²²

In explaining this ruling, Justice Kelsey analyzed the issue of expert testimony invading the province of the jury:

This [mathematical calculation], the plaintiff argues, can take place without the assistance of [the accident reconstruction expert]. Perhaps so. But the issue is not whether reasonably intelligent jurors could somehow figure it out on their own. It is whether their aptitude for doing so makes it likely that testimony from a more experienced witness would not “assist” in their effort to “understand the evidence” or to “determine a fact” in dispute.²³

The analysis set forth by Justice Kelsey in his 2001 circuit court opinion in *Rhodes* underscores the purpose of expert testimony set forth in Virginia Code section 8.01-401.3(A)²⁴ and reflects a more balanced analysis than many earlier

¹⁸ *Rhodes v. Lance, Inc.*, 55 Va. Cir. 253, 257 (Suffolk 2001) (Kelsey, J.).

¹⁹ *Id.* at 254–55.

²⁰ *Id.* at 257.

²¹ *Id.* at 257–58.

²² *Id.* at 259.

²³ *Id.* at 258.

²⁴ VA. CODE § 8.01-401.3(A) (1993).

decisions, which tended to exclude accident reconstruction testimony by assuming that a jury and an expert were equally capable of evaluating the evidence. In more recent years, accident reconstruction evidence has been more readily permitted where it will assist the trier of fact in understanding physical evidence, provided that the expert opinion is supported by a sufficient foundation.²⁵

Perhaps the main limitation on the introduction of accident reconstruction testimony is that it must be predicated on sufficient factual foundation. As stated by the circuit court in *Rhodes*, Virginia courts have traditionally “adopt[ed] a gate-closed attitude when reconstruction experts lay out cascading general-to-specific assertions without verifying each step in the syllogism with specific facts.”²⁶ It is well established that no expert testimony should be admitted unless “the expert has considered all the variables bearing on the inferences to be drawn from the facts observed.”²⁷ Expert testimony cannot be based on factual assumptions.²⁸

Today, new technology can eliminate many variables from accident analysis and thus moot many traditional challenges to establishing sufficient factual foundation. So, in addition to the gradual development in the substantive law, developments in the preservation of accident reconstruction evidence itself have affected the utility of accident reconstruction evidence in present day Virginia civil litigation.

II. PRACTICAL APPLICATIONS

The advent of new technology has put a wealth of admissible information at the disposal of litigants. With a qualified accident reconstruction expert, the proper foundation, and an understanding of the relevant law, counsel may be able to convert this information into powerful evidence at trial.

A. VEHICULAR BLACK BOXES: TYPES OF DATA AVAILABLE IN PASSENGER VEHICLES AND HOW TO GET THEM

Most trial lawyers are aware that passenger vehicles contain event data recorders (EDR). Like their commercial counterparts, passenger vehicle EDRs contain a wealth of information. Manufacturers began installing the precursor to what would become the EDR in passenger vehicles in the mid-1990s, and in 2000 the first commercially available tool to retrieve the stored data was devel-

²⁵ See, e.g., *Rich v. Commonwealth*, 292 Va. 791, 797, 793 S.E.2d 798, 801 (2016) (permitting accident reconstruction expert to opine on the position of plaintiff’s wheel chair and defendant’s vehicle at the moment of impact and the angle of impact, based on his scene inspection as part of the fatal crash team).

²⁶ *Rhodes*, 55 Va. Cir. at 256.

²⁷ E.g., *Tarmac Mid-Atlantic v. Smiley Block Co.*, 250 Va. 161, 166, 458 S.E.2d 462, 466 (1995).

²⁸ E.g., *Tittsworth v. Robinson*, 252 Va. 151, 154, 475 S.E.2d 261, 263 (2000); see, e.g., *Keesee v. Donigan*, 259 Va. 157, 162–63, 524 S.E.2d 645, 648 (2000) (reversing trial court ruling admitting expert accident reconstructionist testimony that was based on “average” driver reaction time, without establishing the reaction time of the specific driver in question).

oped: Vetronix Corporation's Crash Data Retrieval System.²⁹ Over the following years, additional manufacturers installed EDRs in their vehicles, and Vetronix updated its software to enable the retrieval of the data stored in those devices.³⁰ In 2006, the National Highway Traffic Safety Administration (NHTSA) first promulgated standards for the types of data an EDR must record.³¹ For all EDR-equipped passenger vehicles manufactured after September 2, 2012, the EDR must capture, inter alia, the following data: longitudinal delta-V, speed, percentage of engine throttle employed or percentage accelerator pedal depressed, service brake status, number of events, and the time between multiple events.³² Although not required, by 2014, ninety-six percent of new cars sold in the United States contained an EDR installed by the manufacturer.³³

While it is replete with information, the EDR captures only a fraction of the data generated by the vehicle. Newer model passenger vehicles contain an average of seventy computers and generate approximately twenty-five gigabytes of data per hour; much of that data is then stored in the vehicle's infotainment system.³⁴ To access that information, Berla Corporation developed iVe—a hardware and software kit—that allows the user to download the data stored on infotainment systems. In 2013, the Department of Homeland Security partnered with Berla to further develop the iVe toolkit.³⁵ As of 2017, the iVe supported more than 6730 models of vehicles from more than twenty-four manufacturers.³⁶

Vehicle infotainment systems amass data from three primary sources: the user, the vehicle, and any paired phone.³⁷ User-generated data are primarily limited to interaction with the vehicle's integrated touch screen display and manual controls. Vehicle-generated data are collected from numerous vehicle systems and include headlight usage, passenger door openings and closures, gear changes, speed, odometer readings, and data from any integrated navigation system.³⁸ Data from integrated navigation systems frequently include time-stamps

²⁹ A. Chidester, *et al.*, "Real World Experience with Event Data Recorders," National Highway Traffic Safety Administration, 2001.

³⁰ W. Bortles, *et al.*, "A Compendium of Passenger Vehicle Event Data Recorder Literature and Analysis of Valuation Studies," SAE Technical Paper 2016-01-1497, 2016, doi: 10.427/2016-01-1497 [hereinafter Bortles, "Compendium"].

³¹ 49 C.F.R. § 563, *et seq.*

³² *Id.*

³³ U.S. Senate, 113th Congress, report 113-255 (2015).

³⁴ U.S. Department of Homeland Security, Science and Technology Directorate, "Project iVe – Vehicle Navigation/Infotainment System Forensics for Law Enforcement," April 6, 2017.

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.*

³⁸ W. Bortles, *et al.*, "An Introduction to the Forensic Acquisition of Passenger Vehicle Infotainment and Telematics Systems Data," SAE Technical Paper 2017-01-1437, 2017, doi: 10.4271/2017-01-1437 [hereinafter Bortles, "Introduction"].

and location data.³⁹ The data captured from paired phones vary based on the make, model, and trim of the vehicle as well as the paired phone itself. The captured data may include Bluetooth connection events, Wi-Fi connection events, contacts lists, call logs, short message service (SMS or “text”) messages, media files, emails, and social media feeds.⁴⁰

Data captured by EDRs and infotainment systems are the property of the owner of the vehicle.⁴¹ Significantly, the data remain the property of the owner even when the vehicle has been sold to a “nonbeneficial” purchaser such as an insurer or a salvage yard.⁴² Subject to the consent of the vehicle’s owner, in most circumstances, data recorded by the EDR or infotainment system are easily obtainable by a qualified accident reconstruction expert with the proper tools. The data for EDR systems and some infotainment systems can be downloaded via the vehicle’s on-board diagnostics (OBD) port.⁴³ In cases of damage to the OBD port or where the OBD port is inaccessible, EDR data may be obtained from the airbag control module, while infotainment system data may be obtained by accessing the infotainment module in the dashboard.⁴⁴

B. MODERN CHALLENGES TO ACCIDENT RECONSTRUCTION TESTIMONY

As discussed in Section I, above, under the Code of Virginia, and the provisions of Rules 2:702, 2:703, and 2:704 of the Virginia Rules of Evidence, a properly qualified expert witness may offer opinions—including an opinion on the ultimate issue—if those opinions are based upon the expert’s scientific, technical, or other specialized knowledge.⁴⁵ With the enactment of Virginia Code section 8.01-401.3, opponents of accident reconstruction testimony can no longer object that the expert’s testimony goes to the ultimate issue. However, challenges remain, and there are steps that can assist a litigant in securing the admission of accident reconstruction testimony.

1. Accident Reconstruction is Based on Specialized Knowledge

Litigants seeking to prevent admission of accident reconstruction commonly argue that all expert opinions must be based on scientific, technical, *and* specialized knowledge (*i.e.*, they read section 8.01-401.3 conjunctively as opposed to disjunctively). The Supreme Court of Virginia, however, has held that an expert’s specialized knowledge need not be scientific or technical, provided that it is beyond the jury’s common knowledge and will aid the jury in reaching a ver-

³⁹ A. Cornetto III, *et al.*, “Vehicle System Forensics: Introducing Your New Star Witness,” *USLAW MAGAZINE*, Fall/Winter 2015.

⁴⁰ *Id.*

⁴¹ VA. CODE ANN. § 46.2-1088.6

⁴² *Id.*

⁴³ Bortles, “Introduction,” *supra* note 38.

⁴⁴ *Id.*

⁴⁵ VA. CODE ANN. § 8.01-401.3

dict.⁴⁶ Thus, an opinion's failure to rely on scientific or technical knowledge does not bar its admissibility, provided that the opinion is based on the expert's specialized knowledge that will assist the trier of fact.

Objections to the introduction of accident reconstruction into evidence derive from the similar argument that expert testimony is inadmissible if the jury is capable of evaluating the same evidence upon which the expert relied. One can rely on the court's holding in *Rhodes v. Lance, Inc.*, to argue that the strength of this argument has eroded significantly; provided that the expert's testimony assists the jury in evaluating the evidence, the testimony should not be excluded solely on the basis that the jury could have eventually digested the data on its own.

2. Avoiding Speculation: Laying the Proper Factual Foundation and Considering All Variables

It is well established that expert testimony is admissible only if it is based on an adequate factual foundation: "We have repeatedly held that expert testimony must be based upon an adequate foundation. Expert testimony is inadmissible if such testimony is speculative or founded upon assumptions that have no basis in fact."⁴⁷ BLACK'S defines *reconstruction* as "the act or process of rebuilding, re-creating, or reorganizing something."⁴⁸ As such, accident reconstruction is, by definition, a fact-intensive endeavor.

Accident reconstructionists can be used in two ways: to testify to general principles and answer hypotheticals or to relate those general principles to the facts of the case at bar.⁴⁹ In the Supreme Court's well-known 1999 decision in *Holmes v. Doe*, the trial court permitted the expert to testify to the conditions that cause hydroplaning and the scientific principles of hydroplaning; however, because the expert lacked knowledge of the specific road conditions at the time and location of the accident, the expert was not permitted to opine that the plaintiff's vehicle in fact hydroplaned.⁵⁰ The Supreme Court upheld the trial court's ruling.⁵¹ In *Keesee*, the accident reconstruction expert testified to average driver perception times, but lacked facts to support the proposition that the perception time of the defendant in that case fell within the average.⁵²

Reading *Holmes* and *Keesee* together, it is apparent that an expert can testify to hypotheticals and general principles with fewer case-specific facts than are required when testifying to details of a specific case. Whether an accident reconstructionist will be able to make the leap and connect the general to the specific

⁴⁶ *Neblett v. Hunter*, 207 Va. 335, 339–40, 150 S.E.2d 115, 118 (1966).

⁴⁷ *Virginia Fin. Assocs. v. ITT Hartford Grp.*, 266 Va. 177, 183, 585 S.E.2d 789, 792 (2003).

⁴⁸ BLACK'S LAW DICTIONARY (9th ed. 2009).

⁴⁹ See, e.g., *Holmes v. Doe*, 257 Va. 573, 515 S.E.2d 117 (1999); *Breeden v. Roberts*, 258 Va. 411, 518 S.E.2d 834 (1999); *Keesee v. Donigan*, 259 Va. 157, 524 S.E.2d 645 (2000).

⁵⁰ *Holmes*, 257 Va. 573, 576, 515 S.E.2d 117, 119 (1999).

⁵¹ *Id.* at 578, 515 S.E.2d at 120.

⁵² *Keesee*, 259 Va. at 162, 524 S.E.2d at 648.

will depend on the available facts. The more facts an accident reconstructionist has considered, the greater the likelihood that the witness will be allowed to offer opinions involving the specific facts of the case. With the right investigation and workup, this can be accomplished.

Ideally, the expert should inspect the scene of the accident and the vehicles and obtain photographs and measurements of all available physical evidence. If this is not feasible, the accident reconstructionist should be provided with all available evidence, such as photographs, videos, witness statements, and any physical evidence that remains. The accident reconstructionist should also—after obtaining the owner's permission—download all data available from the involved vehicles. Because the accident reconstructionist is being called upon to rebuild and recreate the accident, eliminating as many variables as possible to permit correlation of the data and physical evidence is critical.

If the driver's condition is at issue, additional experts will be necessary. As in *Keesee*, when an accident reconstruction expert is asked to give opinions that relate general principles to a specific individual, admissibility will hinge upon additional evidence that the individual in question belongs to the statistical cohort and is not an outlier. The Supreme Court has been clear that when it comes to testimony about a party's physical condition, such testimony may be given only by a properly qualified medical expert opining within his or her field of medicine.⁵³

Accident reconstruction evidence is a frequent target of motions in limine, and lack of sufficient factual foundation is a common basis for these challenges. Accordingly, it is essential to thoroughly set forth in the expert's designation all facts upon which the expert relied. One should also attach and incorporate all documents, videos, photographs, statements, and industry publications upon which the expert relied.

Similarly, the accident reconstructionist's deposition is critical. The foundation of the expert's opinion will almost certainly be probed at deposition. By identifying a list of factors that the expert did not consider, even if those factors are tangential or irrelevant to the basis of the opinion, skilled counsel may create the false impression that a well-founded opinion lacks sufficient support. Preparing the witness for this tactic is important. If the expert's factual review is thorough and the opinions are well founded, the expert should be prepared to explain and support the opinions at deposition. Should the expert concede that relevant variables were not considered, the expert opinions are likely to be excluded.

3. Avoiding Hearsay and Corroborating the Data

Other common challenges to accident reconstruction testimony are that the data upon which the expert relies are hearsay or that they cannot be corroborated. Both arguments can be successfully rebutted.

⁵³ John v. Im, 263 Va. 315, 321, 559 S.E.2d 694, 697 (2002).

Virginia Code section 8.01-401.1 permits an expert witness to “give testimony and render an opinion or draw inferences from facts, circumstances or data made known to or perceived by such witness at or before the hearing or trial during which he is called upon to testify.” It further provides that “the facts, circumstances or data relied upon by such witness in forming an opinion or drawing inferences, if of a type normally relied upon by others in the particular field of expertise in forming opinions and drawing inferences, need not be admissible in evidence.”⁵⁴ Thus, an accident reconstruction expert who has reviewed and relied upon EDR and infotainment data may testify to and offer opinions generated from that data regardless of the underlying data’s admissibility.

Moreover, EDR and infotainment data are not hearsay. *Hearsay* is defined 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.”⁵⁵ To be hearsay, a statement must be made by a “declarant.” The court of appeals addressed the connection between hearsay and the declarant in the context of cell phone records stating: “there is no ‘person’ or declarant, however, where the evidence is based on computer generated information and not simply the repetition of prior recorded human input or observation.”⁵⁶ The court expressed its reasoning as follows:

Likewise, in the present case, there was no out-of-court asserter upon whom the veracity of the telephone records relied. [The custodian of records] testified that T-Mobile’s telephone records were automatically self-generating and that they were created contemporaneously with the placement or receipt of a telephone call. Thus, it is evident that the records were not created for the purpose of litigation. Although [there was a custodian of records], he played no role in recording or altering what was displayed on the computer results. Rather, [the custodian of records] indicated that no human was involved in the formation of the records. Accordingly, the admissibility of the telephone records was not governed by hearsay principles⁵⁷

To the extent the trial court disagrees and finds that there is a declarant, certainly data that are contemporaneously recorded may qualify as *res gestae* and fall within the hearsay exception.

Opponents of accident reconstruction evidence will also argue that the accuracy of the underlying data cannot be corroborated. Over the years, EDRs have been the subject of many studies to establish the accuracy of the recorded data. The method by which the EDR records vehicle data has repeatedly been con-

⁵⁴ VA. CODE ANN. § 8.01-401.1.

⁵⁵ FED. R. EVID. 2:801(c).

⁵⁶ *Godoy v. Commonwealth*, 62 Va. App. 113, 120, 742 S.E.2d 407, 411 (2013).

⁵⁷ *Id.*, at 121.

firmed to be accurate.⁵⁸ The output is therefore accurate when verified with physical evidence. The one metric that is subject to variability is a vehicle's actual speed versus its indicated speed. The sensors record axle rotations. A vehicle's actual speed, however, can be subject to anomalies caused by longitudinal wheel slip such as "peeling out" upon acceleration or skidding while braking. The addition of aftermarket wheels or tires that differ in size from the vehicle's original equipment can also affect indicated speed.⁵⁹ However, when verified with physical evidence, these anomalies can be explained and do not compromise the integrity or accuracy of the data.

Speed and location data from infotainment systems have also been subject to testing and their accuracy confirmed. Studies have shown that GPS location data from infotainment systems can be accurate to within 50 feet, but most commonly within 3.5 to 7.5 feet of the vehicle's actual location.⁶⁰ Studies have also confirmed the accuracy of EDR-reported phone events, light events, gear shift events, and door events. The primary limitation with infotainment systems is not that they record errant data, but that not all data are recorded.⁶¹ Thus, while infotainment data can be used to prove that the event recorded in the data reported actually occurred, until the data storage capabilities increase, infotainment data should not be used to prove a negative.

C. THE SPOILIATION SWORD AND SHIELD

With the passage of Virginia Code section 8.01-378.2:1, there is now a duty for potential litigants to "preserve evidence that may be relevant to reasonably foreseeable litigation." The amount of data stored in an EDR is generally limited either to the last two events or to a certain number of engine ignitions. The amount of data storage for infotainment systems varies widely based upon the manufacturer. When the limit of storage is reached, data are overwritten.⁶² Thus, if litigation is reasonably foreseeable, care should be taken to download all electronically stored data from a vehicle before it is sold or returned to service. Moreover, once litigation commences, defense counsel should use the new spoliation statute as a sword and request all electronically stored data from the plaintiff. If the plaintiff has failed to preserve EDR and infotainment data that may be relevant to the case, he may have lost his case before it has begun.

III. ON THE HORIZON

Computing power continues to rapidly improve. These technological advancements are seen in the automotive industry, which now produces vehicles with

⁵⁸ See Bortles, "Compendium," *supra* note 30.

⁵⁹ *Id.*

⁶⁰ See Bortles, "Introduction," *supra* note 38.

⁶¹ *Id.*

⁶² W. Vandiver, *et al.*, "Analysis of Berla iVe Acquisitions of Vehicle Speed Data from Ford Sync Systems," *SAE Int. J. Trans. Safety* 6(3): 2018, doi: 10.4271/2018-01-1442.

improved safety features and improved communication and entertainment systems. Collision avoidance systems are one example of these enhanced, modern safety features. Some current systems emit a vibration in the driver's seat when the vehicle begins to drift into another lane, sound a tone when there is a vehicle in a blind spot, and even apply the brakes when a vehicle ahead suddenly stops. Such systems employ dozens of radar sensors and cameras to collect data about the vehicle and its surroundings.

As vehicle sophistication increases, the quantity of data available to counsel and accident reconstruction experts will also increase. At present, a significant limitation in using electronic data from motor vehicles is the capacity of the vehicles to store this data. As data storage becomes less expensive and more compact, however, more information will become available for use in litigation. In the future, it will likely become increasingly possible to establish the speed, direction, and position of vehicles before and during an accident.

IV. CONCLUSION

Many Virginia defense attorneys can attest to the veracity of Professor Kent Sinclair's warning: "Although such testimony has on occasion been admitted, Virginia courts have in general been hostile toward accident reconstruction testimony."⁶³ Yet, with the proper foundation accident reconstruction evidence can be admissible and highly effective. New technology now provides more detailed crash data, which will reduce the foundational challenges (*e.g.*, EDR data documenting a vehicle's speed versus an expert determining the speed based on a review of evidence at the scene) while providing a variety of detailed information. Practitioners should be aware that accident reconstruction evidence may be an arrow in their quiver. In the not so distant future, accident reconstruction evidence may become more commonplace and more readily accepted.

⁶³ SINCLAIR, *THE LAW OF EVIDENCE IN VIRGINIA* § 13-13[d] (8th ed. 2018).