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Event data recorders and municipal liability

How municipalities can strengthen their defence in litigation

‹ In municipal litigation, claims frequently hinge on subjective accounts. Traditional reconstruction methods, such as skid marks and vehicle damage, remain important but can be subject to interpretation. Event data recorders provide quantifiable, objective measurements that either support or challenge these interpretations. *Photo: Adobe Stock*

By Essam Dabbour

When a serious traffic collision results in litigation against a municipality, the central question often becomes whether the roadway, its design, or its maintenance contributed to the incident. Plaintiffs may allege inadequate signage, improper geometry, poor maintenance, or failure to meet applicable standards. In such cases, municipalities must rely on objective, defensible evidence to establish what truly occurred.

Event data recorders (EDRs) are proving to be one of the most powerful tools available in this context. EDRs – commonly referred to as vehicle "black boxes" – capture critical pre-impact data such as vehicle speed, braking, throttle application, steering input, and seatbelt usage.

Most light-duty vehicles manufactured after 2011 are equipped with these systems, which are typically integrated into the airbag control module. Although the recording window is relatively short, often limited to approximately five seconds before impact, the data captured during this interval is highly detailed and time-stamped, offering a precise snapshot of driver behaviour immediately before a collision.

From Allegations to Measurable Evidence

In municipal litigation, claims frequently hinge on subjective accounts. A driver involved in a traffic collision may make allegations that they were driving prudently and that the collision was caused by faulty road design, insufficient signage, or substandard road maintenance. Without objective evidence, it could be difficult for the defendant municipality to conclusively refute such claims.

EDR data introduces a critical evidentiary shift. For example, the legal counsel representing an Ontario municipality and its insurer retained me to review a single-vehicle collision in which the driver sustained injuries after the vehicle left the roadway while negotiating a horizontal curve on a municipal road. To protect the privacy of the involved parties and maintain confidentiality obligations associated with the litigation, certain details of this example have been modified while preserving the technical substance of the analysis and conclusions.

The plaintiff alleged that the collision was caused by deficiencies in the roadway design, lighting, and signage. However, an engineering review determined that the curve geometry, roadway lighting, and traffic signage were all consistent with the applicable engineering standards and guidelines. More importantly, EDR data retrieved from the involved vehicle demonstrated that the driver had been travelling at approximately 138 kilometres per hour while the posted speed limit was 60 kilometres per hour and the curve advisory speed was 40 kilometres per hour.

The EDR data further showed that the driver attempted a sharp steering maneuver while travelling at approximately 117 kilometres per hour, which engaged the vehicle's electronic stability control system in an attempt to compensate for the excessive speed and steering input. Despite the intervention of the stability control system, the excessive speed and steering input generated forces that exceeded the vehicle's ability to maintain stability, causing the vehicle to leave the roadway and enter the ditch. After the report detailing these findings was served on the plaintiff's legal counsel and insurer, the municipality was removed from the legal action.

To reduce time, uncertainty, and litigation costs, most personal-injury claims against municipalities are resolved before reaching the trial stage. This is particularly common in cases involving EDR evidence, as the data often provides objective and highly persuasive insight into the sequence of events leading to a collision.

When EDR data clearly demonstrates factors such as excessive speed, delayed braking, abrupt steering inputs, or other driver-related actions inconsistent with prudent vehicle operation, the parties involved are often able to assess liability more efficiently and realistically. As a result, many cases are resolved through settlement discussions or discontinued altogether before trial, thereby reducing legal costs and the time required to further litigate the matter.

Supporting Engineering-Based Defences

While EDR data can play a significant role in clarifying liability and facilitating early resolution of claims, its value extends beyond litigation strategy.

In municipal liability cases, EDR data can also serve as a critical technical input within a broader forensic and engineering analysis. Courts generally expect expert opinions that consider multiple factors, including roadway geometry, traffic control devices, environmental conditions, vehicle dynamics, and human factors. In this context, EDR data provides precise, time-stamped measurements that can be integrated into engineering reconstruction models and technical assessments.

For instance, vehicle speed derived from EDR data can be compared against roadway design parameters to assess whether a roadway was being operated within its intended design envelope. Braking and steering inputs can provide insight into the driver's perception-response time, evasive maneuvers, and decision-making process immediately before the collision. Furthermore, EDR data may include information regarding the vehicle's change in velocity during impact, commonly referred to as "delta-v," which can support biomechanical assessments related to injury causation and occupant kinematics.

By integrating EDR data with roadway design analysis, observations from site inspections, review of maintenance records, and sound reconstruction modelling, municipalities can develop more technically robust and scientifically defensible opinions regarding the causes and contributing factors of a collision. In many cases, this integrated approach assists in distinguishing between allegations of infrastructure deficiency and collisions primarily attributable to driver behaviour or vehicle operation.

While EDR data can be a highly valuable piece of evidence, it is not without limitations. The recording duration is short, and data capture depends on

Interpretation of EDR data requires specialized expertise. For example, vehicle speed is often derived from wheel rotation sensors rather than GPS, which can introduce discrepancies if tire sizes differ from manufacturer specifications. Without proper analysis, such nuances may be misunderstood or misapplied in litigation ... Equally important is the preservation of data integrity. Maintaining a proper chain of custody is essential to ensure admissibility in court.

specific triggering conditions. In some cases, particularly where airbags do not deploy during the collision, data may be overwritten if retrieval is delayed. Additionally, variations exist among vehicle manufacturers in terms of the parameters recorded and their accuracy.

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Equally important is the preservation of data integrity. Maintaining a proper chain of custody is essential to ensure admissibility in court. Any gaps in documentation or handling can undermine the evidentiary value of the data, regardless of its technical merits.

Strategic Benefit for Municipalities

For municipalities, the strategic value of EDR data lies in its ability to reduce uncertainty. Traditional reconstruction methods, such as skid marks, vehicle damage, and final rest positions, remain important but can be subject to interpretation. EDR data provides quantifiable, objective measurements that either support or challenge these interpretations.

In litigation, this can translate into stronger expert opinions, more persuasive testimony and, in some cases, early resolution of claims. When EDR data clearly demonstrates that driver behaviour was inconsistent with safe operation, it can significantly weaken allegations of municipal negligence.

To fully leverage the benefits of EDR data, municipalities and their legal teams should adopt proactive practices:

- ***Early identification and preservation*** – Ensure that vehicles involved in serious collisions are identified quickly and that EDR data is preserved before it is lost or overwritten.
- ***Engagement of qualified experts*** – Retain professionals with expertise in EDR data retrieval and interpretation, as well as in roadway engineering, traffic safety, and collision reconstruction.
- ***Integration with engineering analysis*** – Use EDR data as part of a comprehensive assessment that includes roadway design, maintenance records, and applicable standards.
- ***Documentation and chain of custody*** – Maintain rigorous documentation protocols to support admissibility in legal proceedings.

EDRs have emerged as a critical tool in modern collision analysis, and they may provide valuable evidence in litigation related to municipal liability. They provide an objective, data-driven perspective that can clarify the sequence of events leading to a collision and help distinguish between infrastructure-related issues and driver-related factors.

When combined with sound engineering analysis and proper legal strategy, EDRs can transform uncertainty into clarity, ensuring that decisions are based not on assumptions but on measurable evidence. As the use of EDR data becomes more widespread, its integration into municipal risk management and litigation practices is increasingly becoming an essential component of modern municipal risk management and litigation defence.

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