

# ROCHON REPORT

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### Motor Vehicle Accident Reconstruction as a Tool for Efficient Claims Management

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Until perfect human, vehicle and environment conditions exist for drivers, motor vehicle collisions will continue to occur. The fact is that decisions made by drivers, mechanical conditions of the vehicles, unfavourable environment conditions and road design and maintenance deficiencies commonly play a role in contributing to a motor vehicle collision. A motor vehicle driver must choose a travel speed and travel direction along a road. The vehicle must respond as it is intended and the road and environment conditions must be capable of providing a reasonable level of positive route guidance.

The travel speed may be too fast for the road and environment conditions may contribute to a loss of vehicle control. Safe vehicle operation is limited by the road-to-tire traction and vehicle mechanical fitness and crashworthiness. Poor vehicle tire conditions or brake malfunctions can also lead to a loss of vehicle control. A curve in the road ahead and a lack of road signs may influence the vehicle and driver. The degree of surface roughness or horizontal and vertical alignment can limit driver perception which can also lead to the loss of vehicle control.

The objective of motor vehicle accident reconstruction is to determine the set of factors that occurred, simultaneously or in sequence, that resulted in the collision events. Achieving this objective will assist in determining fault and assessing the potential for involving other parties for subrogation.



Early in the motor vehicle accident reconstruction one must consider vehicle travel speeds, travel directions, the area of impact with respect to the roadway and the orientation of one vehicle to another for cases involving multi-vehicle collisions. Pre-impact and post-impact road markings should be analyzed through an independent collision scene survey or by reviewing available notes, photographs and diagrams and videotape recordings completed by others, depending upon the timeframe from the collision date to the reconstruction analysis date.

When it is necessary to analyze personal injuries arising from collision events, collision speed and vehicle occupant dynamics must be assessed. Evaluation of involuntary type occupant movements relative to the vehicle flail space and impact forces must be completed and compared to features such as vehicle damage profiles and interior vehicle design. Use or non-use of available seatbelt assemblies, deployment of front or side airbags and the position of vehicle seats and head restraints can influence the extent of personal injury. Therefore, an engineering evaluation of vehicle seatbelts, airbags and vehicle seats should be conducted. If

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children are involved, the need for proper use of child restraint systems must be considered. Failure to properly use an available seatbelt assembly or child restraint system may contribute to personal injuries.

A motor vehicle accident reconstruction can also include an engineering analysis of the opportunity for collision avoidance by involved parties. A driver faced with a potential hazard must first perceive the hazard and react to it by steering, or braking or accelerating a vehicle. A driver's opportunity for collision avoidance could be affected by view obstructions, travel speed, reduced night visibility, poor weather conditions, road design deficiencies, impairment due to alcohol or a distraction occurring inside the vehicle. Further, an unfit motor vehicle could prevent a driver from normal steering or braking to avoid a hazard ahead. A driver unfamiliar with the road ahead may not be provided with reasonable positive route guidance features such as road signs necessary to negotiate along the roadway.

A collision scene survey conducted with a laser guided total station survey instrument maps road construction characteristics and features to produce detailed plan and profile diagrams. The diagrams can be presented to mediators and arbitrators to illustrate collision scenes and crash events. Collision scene and vehicle examination data combined with application of engineering principles will aid in determining the opportunity for collision avoidance. The opportunity for collision avoidance is a prime concern for determination of fault.

Motor vehicle accident reconstruction is most useful as a tool for claims management when it includes a balanced approach to analyzing evidence available from involved vehicles, occupants and the collision scene compared to the accounts of witnesses.

Witness evidence may prove beneficial to understanding and confirming some collision events but may also prove to be unreliable due to a poor witness vantage point or the inability of the witness to accurately judge speed and distance. Also, when faced with a hazardous and possibly life threatening event, involved parties may not be able to reliably recall specific events surrounding the collision. An engineering analysis of a motor vehicle collision should eliminate unreliable opinions and statements made by involved parties or witnesses, through calculations, testing and interpreting the available human, vehicle and environment factors.

Some motor vehicle collisions occur due to a primary cause and others occur due to a set of contributing principal factors. Using the objectives of accident reconstruction and considering human, vehicle and environment factors is a beneficial tool that will aid in the ultimate task of determining degree of fault and help manage a claim in an efficient and timely manner.

