Road collision investigation

How it can assist Scottish solicitors and Advocates

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The questions this session will answer



What does an investigator actually do?

Which evidence can answer the disputed questions?

How can the findings assist a case?

When and how should a solicitor instruct?

What is collision investigation?

A structured examination of the evidence to explain how a collision occurred.

Investigation

Locates, preserves and evaluates relevant material.

Reconstruction

Tests the sequence of events against measurements and physical principles.

Newtons Laws of Motion

Philosophiae Naturalis Principia Mathematica 1687

First Law An object at rest stays at rest, and an object in motion stays in motion at a constant speed and in a straight line, unless an external net force acts on it

Second Law The acceleration of an object is directly proportional to the net force acting on it and inversely proportional to its mass

Third Law Whenever one object exerts a force on another object, the second object exerts an equal and opposite on the first

Types of calculations

Speed from locked wheel tyre marks

Maximum theoretical speed for a bend

Speed from projectiles

Speed from pedestrian throw and slide

Speed from momentum exchanges

Pedestrian walking speed calculations

The evidence comes from several places

Locus

Road geometry, surface, marks, debris and sight lines.

Vehicles

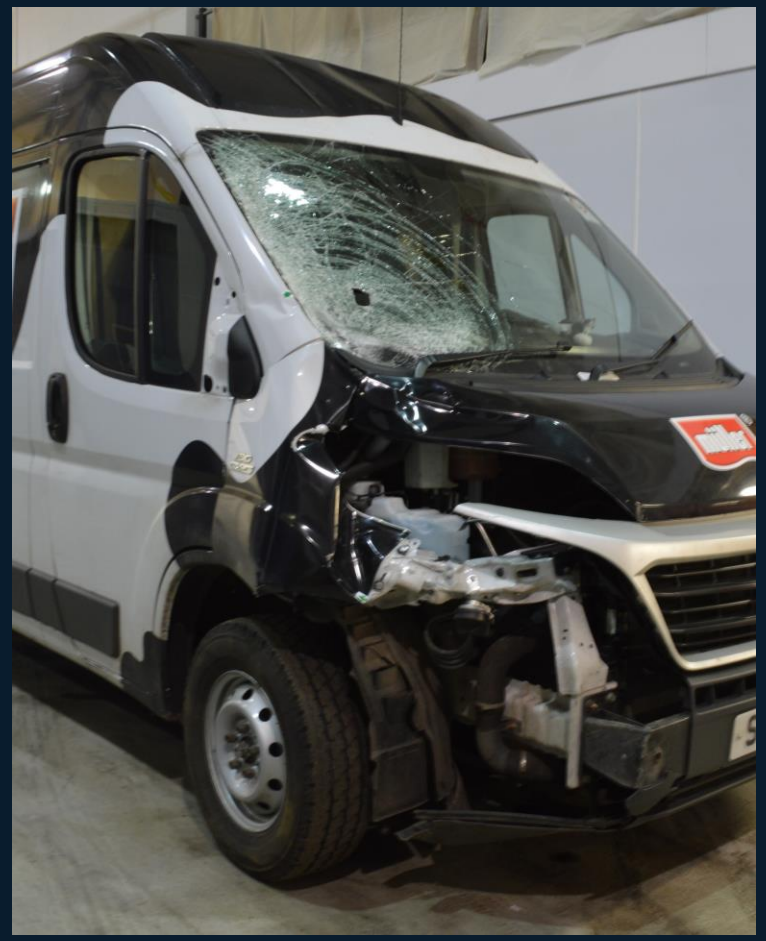
Damage, tyres, brakes and relevant electronic systems.

Recordings

CCTV, dashcam, photographs and telematics.

Accounts

Witness statements and other records.



Factors involved in collisions

- Behaviour of drivers
- Behaviour of other people
- Behaviour of vehicles
- Road layout and conditions
- Weather conditions

Physical Evidence

Tyre marks

Gouges and other marks on the road

Debris

Damage to vehicles

Visibility and response need their own analysis



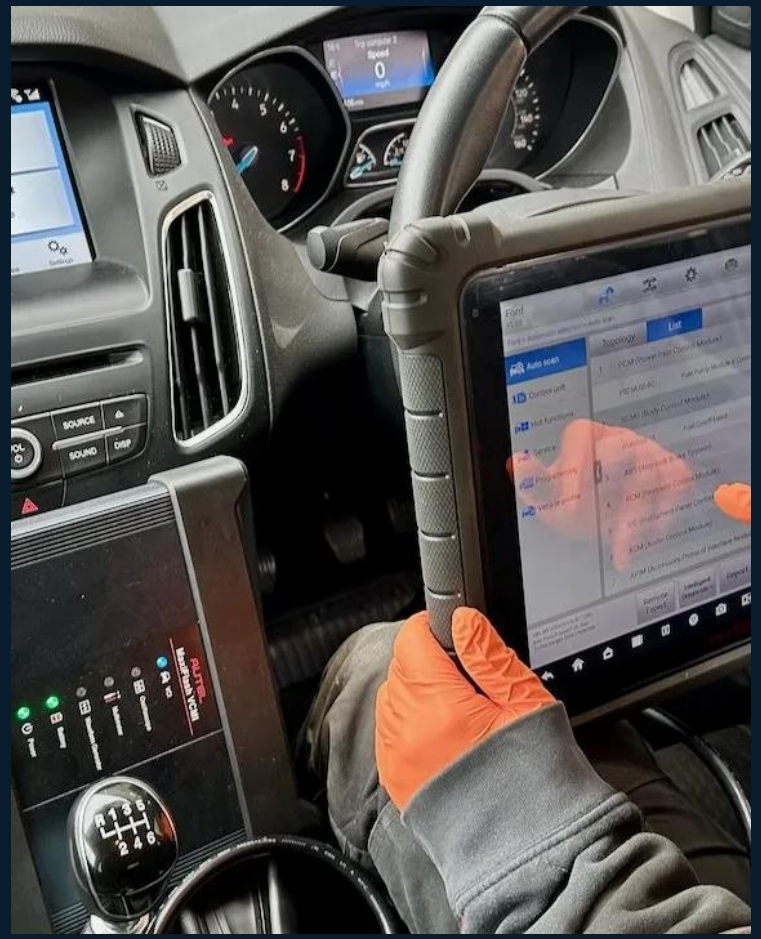
What could the road user see?

When could a hazard become apparent?

What response was physically available?

What did the driver do in response to the hazard

Digital evidence



Video

Original files, reliable timing and measured reference points can support analysis.

Vehicle data

CDR event data, ECU data and telematics.

Vehicle data



ECU

Reads damaged sensors

Fault codes can include:

- Time
- Date
- Mileage

Can help validate collision circumstances or vehicle condition



EDR

Event Data Recorder

Five seconds pre-crash data

- Speed
- Braking
- Throttle position
- Steering input

Esp. Toyota, Volvo, new Audi, VW, BMW

Digital Data - EDR

- Uses Bosch CDR to download event data from the airbag system
- High quality, dedicated collision data
- Gives 5 seconds of pre-crash data: speed, acceleration, braking, steering
- Doesn't always need airbags to be deployed (so can read historic data)
- Shows exactly what the driver was doing before the incident
- Download of the data is not always possible from every vehicle.
- From March 2022, access to EDR data became mandatory on all new vehicle models in the EU.
- From March 2024, all newly registered vehicles must have EDR.
- Latest supported vehicles list: https://cdr.boschdiagnostics.com/cdr/software-downloads



System Status at Event (Record 1, Most Recent)

Event Counter at Event	5
Event Type	Side
Multi-Event, Number of Events	1. Event
Time from Initial Event to Current Event (msec)	0.0
Time from Previous Event to Current Event (msec)	0.0
Vehicle Clock, Date and Time at Event (YYYY-MM-DD, HH:MM:SS)	2023-05-29, 23:16:11
Vehicle Mileage (km)	25,960
Operating Time (min)	31,036

Pre-Crash Data -1 Sec (Record 1, Most Recent)

Safety Belt Status, Driver	Fastened
Safety Belt Status, Front Passenger	Fastened
Frontal Airbag Disable Indicator Status, Passenger	Off
Airbag Warning Lamp, Status	Off
Frontal Airbag Suppression Switch Status, Front Passenger	not suppressed

Pre-Crash Data -5 to 0 sec (Record 1, Most Recent)

Time (sec)	Engine RPM (Combustion Engine) (RPM)	ABS Activity	Stability Control	Steering Input (deg)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	960	Non-Engaged	On	4	11 [18]	0	On
-4.5	960	Non-Engaged	On	6	9 [14]	0	On
-4.0	960	Non-Engaged	On	4	6 [9]	0	On
-3.5	896	Non-Engaged	On	4	4 [7]	0	On
-3.0	896	Non-Engaged	On	4	2 [3]	0	On
-2.5	896	Non-Engaged	On	12	1 [1]	0	On
-2.0	960	Non-Engaged	On	10	0 [0]	0	On
-1.5	960	Non-Engaged	On	10	0 [0]	0	On
-1.0	896	Non-Engaged	On	10	0 [0]	0	On
-0.5	896	Non-Engaged	On	12	0 [0]	0	On
0.0	896	Non-Engaged	On	0	0 [0]	0	On

Case discussion: Pedestrian Knockdown

Locus:	Hayfield Road. Kirkcaldy
Scenario Provided:	Vehicle travelling eastwards has struck a pedestrian who has been crossing the road from the offside. The pedestrian sustained fatal injuries.
Information Supplied:	Disclosed Statements Police Crash Investigation Report CCTV Footage
My Instruction:	Consideration of visibility issues Consideration of whether, given the circumstances the driver should have seen the pedestrian crossing the road and more so, should have been able to stop avoiding a collision with him

Locus Inspection




SK52 OUS

Investigation

Locus inspection at relevant time of day

Measurements

Drive through

Reattendance after FOI report

CCTV Analysis


NBDVR312GW 19:34:59 07/10/2020 31MPH N56.125423 W3.170087

Result

The Audi was travelling at 20 MPH when seen in the CCTV footage

The pedestrian and driver would have the potential to see each other for approximately 19 seconds prior to the contact

There was a lack of contrast between the pedestrian and the bushes to their rear

By the time the pedestrian was clearly visible to the driver, a collision was inevitable

How the work assists solicitors

Civil claims

Assess factual informaftion for liability and causation.
Test competing accounts and contributory factors.
Identify issues before negotiation or proof.

Criminal cases

Scrutinise the evidence available.
Test alternative explanations and avoidability.
Assist in assessing culpability and whether standard of driving was criminal.

The expert explains technical findings. The court determines legal responsibility.

Expert evidence in Scotland

The principal duty is to the court.

Will the evidence assist?

Does the witness have the relevant expertise?

Is the witness impartial?

Does a reliable body of knowledge support the evidence?

Kennedy v Cordia [2016] UKSC 6, para 44. COPFS Expert witness guide.

A useful letter of instruction

“What can the evidence establish about the opportunity to avoid contact?”

Scope and materials

Identify the disputed facts and questions.
Provide relevant and adverse material.
Ask for limits and alternative explanations.

Practical arrangements

Check expertise, conflicts and availability.
Agree access, authority, fees and stages.
Set deadlines and intended use.

Questions to ask of an expert report

01 Can I trace each important conclusion to evidence?

02 Which assumptions materially affect the opinions given?

03 Has the expert tested credible alternatives?

04 Are methods, limits and expertise clear?

05 What additional evidence could change the opinion?

Three points to take into the next case

A focused technical question makes the investigation more useful.

Preserve vulnerable evidence early.

Match the expert and method to the issue.

Expect an independent opinion with clear limits.

Questions and discussion

Where would an investigator add value in your next case?

What evidence would you preserve first?

What technical question would you ask?

Any Questions

