

A NOTE CONCERNING THE PROGRAM MATERIALS

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Collision Reconstruction

- ▶ What is it?
 - An in-depth investigation of a collision scene, similar to a murder or other crime scene investigation
 - Investigation conducted by trained accident reconstructionists
 - Looking for evidence from the roadway, vehicles, environment, DNA, touch DNA

Collision Reconstruction, cont.

- Forensic mapping, diagramming and three dimensional rendering (animation)
- Event data recorder (black box), Progressive Snapshot data
- Jigsaw puzzle without all the pieces

Current Technology

- ▶ Event Data Recorder (Black Box)
 - Data available depends on manufacturer
 - Earliest vehicles are 2000 Ford and GMC products
 - Private companies offer downloads of older vehicles but data is limited to Delta V which is only useful in certain types of crashes
 - NHTSA requirements are forcing vehicle manufacturers to provide codes for translation of hexadecimal data to useable information



Current Technology

- ▶ Event Data Recorder
 - Issues for Attorneys
 - Who owns the data?
 - Manufacturer, Insurance company, lien holder, vehicle owner
 - How to acquire the data?
 - Was the data obtained with consent, from a vehicle abandoned at collision scene or search warrant
 - Typical search and seizure requirements
 - Veracity of data – Bosch (Formerly Vetronix)

Current Technology

- ▶ Power train control modules (CMV)
- ▶ Transmission control modules
- ▶ Progressive Snapshot
 - Disclaimer on website indicating you should inform law enforcement you are using this
- ▶ Aftermarket programmers
 - Mainly in "cul-de-sac cowboy" diesel trucks
 - Gaining popularity in gasoline engines

Current Technology Issues

- ▶ Bulb investigation
 - LED bulbs do not deform or break like the incandescent filaments, loss of important data
- ▶ HID bulbs
 - Cut off and washout
- ▶ Night vision camera displays
 - Conspicuity issues
- ▶ Crash avoidance systems and computer applied braking
 - Possible perception and reaction time concerns
- ▶ Blind spot assist

Current Technology Issues

- ▶ Investigation and Training
 - Common pitfall of retired police investigators providing reconstruction services
 - Technology is progressing at an astounding rate and vehicle manufacturers are racing one another to have the most advanced and gadget filled vehicles
 - Investigators must continue training as technology will pass them by
 - SAE, IPTM, NHTSA, Northwestern and others provide training in current investigative methods

Scene Evidence

- ▶ Debris patterns
- ▶ Fluid patterns
- ▶ Roadway design
- ▶ Signage
- ▶ Construction
 - KY 177 Fatal in work zone. Work zone signs placed ½ mile in advance of blind, downhill curve
 - Vehicle crested hill to see stopped traffic, emergency brake application and steering input

Scene Evidence

- ▶ Evidence Eradication Team
- ▶ Fire Department objectives vs. investigator objectives vs. tow truck drivers
- ▶ Battery cables cut, any effect on EDR?
- ▶ Vehicle debris kicked by first responders
- ▶ Dump truck fatality debris kicked off road
- ▶ Recordings
 - Stores, home owner security cameras, cruiser cam, lapel cameras

Data Analysis

- ▶ Application of Newtonian physics
- ▶ Basic geometry, trigonometry and algebra
- ▶ Court accepted derived formulae
- ▶ Mathematical formulae are tested, peer reviewed and verified
- ▶ Increased participation by academia
- ▶ Crash testing with scientific instrumentation to verify formulas
- ▶ Meta-Data analysis
 - Experts disagree on its current use and application
 - Sampling data sets from others in differing conditions and using statistical analysis. Not true to real world

Forensic Mapping

- ▶ Use of survey instruments to measure distances between objects
 - Allows for true to scale diagramming
 - True to scale diagramming permits the civil expert to take measurements and reconstruct a scene without having been there (nothing beats present sense perception though!)
 - Software packages permit the download of Total Station data
 - Raw data and point data recorded and should be verified when receiving a Total Station drawing



Forensic Mapping and Courts

- ▶ Gosser v. Com., 31 S.W.3d 897 (Ky. 2000)
- ▶ Demonstrative evidence vs. Real evidence
 - Do we need to decide and label it as one or other
 - it is not necessary to classify the photographs as "demonstrative" or "real" in order to determine their admissibility under the KRE.^[6] Likewise, while classifying a particular type or piece of CGVE as either "demonstrative" or "real" might be helpful as a starting point, the question of admissibility 31 S.W.3d 903 is ultimately determined under the KRE.^[6]

Forensic Mapping and Courts

- ▶ This is a pretty well settled area of law
 - The introduction of a map or diagram made prior to trial is in "no wise different from one drawn by a witness in the presence of the jury." Cook v. Commonwealth, 24 S.W.2d 269, 271 (Ky. 1930).
 - Best practice is to have the on scene investigator prepare the diagrams and video rendering
 - In civil cases it is not likely to have the investigator at the scene so reliance must be on photographs, witness interviews and investigator reports. Also raw data from Total Station

Expert Qualifications

- ▶ Traditional Daubert Rules for reliability and relevance
- ▶ Daubert v. Merrell Dow Pharmaceuticals, Inc., 43 F.3d 1311 (9th Circuit 1995)
 - Under Daubert, the trial court functions as a "gatekeeper" charged with keeping out unreliable, pseudoscientific evidence:[T]he trial judge must determine at the outset ... whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.

Expert Qualifications

- ▶ Expert reports and testimony must also
 - Goodyear Tire and Rubber Co. v. Thompson, 11 S.W.3d 575 (Ky. 2000)
 - "...testimony based on "scientific" knowledge, but also to testimony based on "technical" and "other specialized" knowledge. [See KRE 702]. We also conclude that a trial court may consider one or more of the more specific factors that Daubert [and Mitchell mention[] when doing so will help determine that testimony's reliability. But ... the test of reliability is "flexible," and Daubert 's [and Mitchell 's] list of specific factors neither necessarily nor exclusively applies to all experts or in every case. Rather, the law grants [the trial] court the same broad latitude when it decides how to determine reliability as it enjoys in respect to its ultimate reliability determination. See General Electric Co. v. Joiner, 522 U.S. 136, 143 (1997) ([a trial court's reliability determination is reviewed for abuse of discretion]).

Expert Qualification

- ▶ Courts readily admit reconstruction reports and evidence from forensic mapping without issue as it is based on Newtonian Physics, algebra and other well founded mathematical principles
- ▶ Emerging technology is often what results in Frye and Daubert hearings
- ▶ Deviation from training and standard protocol is ripe for a Daubert hearing

Expert Pitfalls

- ▶ Not all experts are ethical
- ▶ Some experts who fail to continue education and training are thus behind the current technology
- ▶ Application of accepted formulae has evolved
 - Rules that were steadfast in 1999 when I attended the basic reconstruction training are now reversed and incorrect

Expert Pitfalls

- ▶ Some experts will change factors in the collision that are not in dispute to muddy the water
 - Juries can and do see through the smoke and mirrors
 - Damages expert credibility
 - Commonwealth v. Trester KENTON CIRCUIT COURT / CASE NUMBER: 04-CR-00614
 - First Assistant Commonwealth Attorney Jim Redwine cross

Expert Pitfalls

- ▶ Credible experts will tell you the truth, even when damaging
- ▶ Some experts will conduct extraneous investigations, tests and reports to increase billable hours
- ▶ Having the facts without bias permits proper adjudication and strengthens your position
- ▶ Smoke and mirrors leads to battle of the experts (difficult to overcome uniform)

Experts

- ▶ Vet out credentials
- ▶ Research reputable collision reconstruction training institutes
- ▶ Not all training is equal but most provide certificates for successfully completed classes
- ▶ Be wary of attendance certificates, they are like credit for CLEs!

Questions?

- ▶ Veritas, Honor, Justitia, Sapientia, Scientia
- ▶ Truth, Honor, Justice, Wisdom, Knowledge
