Accident Reconstruction in Truck Collision Investigations and Trial
Partnering With Reconstruction Experts to Maximize Case Value

THURSDAY, JUNE 25, 2015
1pm Eastern    |    12pm Central   |   11am Mountain    |    10am Pacific

Today’s faculty features:


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The audio portion of the conference may be accessed via the telephone or by using your computer’s speakers. Please refer to the instructions emailed to registrants for additional information. If you have any questions, please contact Customer Service at 1-800-926-7926 ext. 10.
I. TRAFFIC CRASH RECONSTRUCTION

a. WHAT IS IT:
   i. The use of scientific methods to determine what occurred in a traffic crash
   ii. The techniques involved apply to all crash situations including those involving pedestrians, bicycles, ATVs, snowmobiles, cars, trucks, semi-trailers, motorcycles, etc.

b. WHY USE THEM:
   i. Police agencies don’t reconstruct crashes for civil issues and it can be difficult to gain access to the AR from the policy agency.
   ii. Reconstructionists can assist with issues surrounding interaction with road, driver and vehicle performance and environmental issues.
   iii. Determine if other experts might be necessary to account for Defendant’s behavior or Plaintiff’s behavior: Human Factors, Conspicuity, etc.
   iv. Technology is changing rapidly and competent AR will know and be able to apply current technology to your situation
   v. Balance against opposing AR
   vi. Assist in trial preparation

c. WHEN TO USE
   i. Decision to use AR must be made quickly because evidence spoils and has a tendency to disappear or change – Especially true in trucking cases

      1. EXHIBIT 1 – PRESERVE EVIDENCE LETTER
ii. Little to no police investigation

iii. Defendant hires AR in “simple” case

iv. Something just isn’t right about parties’ recollection of collision

d. HOW

i. Phase 1 – Preliminary Phase
   1. Gather the information and listen to the AR for additional information he needs (See below SOURCES OF INFORMATION TO INVESTIGATOR)
   2. Get advice on additional experts necessary
   3. Viable case to keep or refer out?

ii. Phase 2 – Discovery
   1. Discovery responses through Request for Production of Documents
   2. Depositions of parties, witnesses, police officers, opposing AR, etc
   3. Again, get advice from AR on what additional information would assist in his analysis
   4. Some ARs will give you outlines for deposing the opposing AR
   5. Some ARs will give you orders and motions where the opposing AR has been struck as a witness
   6. Decide whether a report is best in the case or not

iii. Phase 3 – Trial
   1. Make things simple, boil it down to basics and common sense Presentation of AR materials
   2. Determine together the best trial exhibits including photographs, maps, scaled drawing, etc
   3. Prepare for opposing AR cross

II. EVENTS OF A COLLISION

a. Create a timeline of pre-impact events
   i. 1st – first possible perception
   ii. 2nd – point of actual perception
iii. 3rd – “event horizon” final point where no evasive action would prevent the collision
iv. 4th – Point of Impact. If actual point of impact is not possible to determine, then area of impact.
v. 5th – Point of Maximum Engagement – the vehicles are fully engaged before beginning to separate
vi. 6th – Final resting position

III. SOURCES OF INFORMATION TO AN INVESTIGATOR
   a. Police report
   b. Police photographs
   c. Police Dashcams
   d. Police accident reconstruction
   e. Sight inspection
   f. Traffic cams videos
   g. Business surveillance video
   h. Vehicle inspections
   i. Electronic data downloads
   j. Service records of vehicles involved
   k. Witnesses to collision or residents near the scene
   l. Occupants of vehicles – depositions
   m. Emergency room / EMS records
   n. Trucking expert reports
   o. Discovery obtained from trucking company/driver

IV. ACCIDENT RECONSTRUCTION IN TRUCKING CASES
   a. Qualify your AR before hiring him/her in your tractor-trailer case because commercial vehicle accidents have distinctive issues and dynamics because of their size and weight.
      i. Make sure they have the hardware/software to analyze the ECM/EDR data.
      ii. Will your case require full scale vehicle testing and can they do it
      iii. Can they do adequate animations
   b. Driving a truck is foreign to most everyone
i. Sitting 12 feet above the road surface is completely foreign to most people. Show perspective through animations or exemplar vehicles and photographs

ii. The dynamics of tractor-trailer articulation movement is foreign to most people and animations help people understand.

iii. When our client is the bullet vehicle, how does Conspicuity mold our case (if we have one at all)

iv. A truck’s air brakes don’t work like the brakes in my Hybrid Milan.

c. Important considerations in trucking cases
   i. Spoliation of evidence
      1. Tractor-trailer taken to business location instead of held by law enforcement
      2. Data downloads conducted by Defendant rather than law enforcement
      3. Unsecured ECM/EDR unit corruption
      4. GPS information
      5. Trucking documentation (logs, receipts, etc)
   
   ii. 2nd to the evidence
      1. Act quickly. Defendant’s team has usually finished their analysis before you were even retained.

V. EVALUATING THE POLICE REPORT
   a. Were the vehicles secured and available to others
   b. Documentation of any witnesses, statements, contact information
   c. Photographs of scene and debris
   d. Was anything moved prior to photographs
   e. Scale drawing
   f. What drag factors were used
   g. Any recall checks of vehicles
   h. Data recorders secured and downloaded by police
   i. Medical responders indentified
   j. Road evidence documented thoroughly (measurements, marks, debris, etc)
   k. Visibility issues addressed
I. Calibration of any measurement tools
m. Obtain error rates used by AR and why
n. Exact measurements versus average between 2 points

VI. PERCEPTION - REACTION TIMES (PRT)
a. The time that elapses between when the danger is perceived and when the actor initiates an action in response
   i. Important that the AR utilizes a range of times that are considered normal or average reaction times because there is no way to measure the exact perception or reaction time of any individual driver
   ii. Trying to use simulations to determine perception reaction times will likely differ from reality because when a driver is under the stress of the event his reactions can be slower or faster
   iii. Environmental factors will affect perception reaction time (weather, visibility, traffic, etc)
   iv. Personal factors will affect perception reaction time (fatigue, alcohol, drugs, etc)
   v. Expecting a dangerous situation may shorten perception reaction time
   vi. Which PRT to use 1.5 v 2.5 or something else is dependant upon your situation. Consider using a range of possible PRTs to develop your theory.
b. Critical factor in reconstruction of any case even admitted liability cases or “clear liability” cases.
c. Analyze your client’s PRT as well as the Defendant’s

VII. DEPOSITIONS
a. A good AR will assist you in preparing for the deposition of Defendant’s AR. Following a careful review of the Defendant’s report, your AR should be able to give you an outline or outline areas for impeachment of
b. EXHIBIT 2 – Deposition Outline for use against Def’s AR
June 4, 2014

FIRST CLASS MAIL & CERTIFIED/RRR

RE:  Our Client:  
     Our File No.:  215900
     Incident Date:  April 14, 2014

Gentlemen:

As you may be aware, my firm represents [redacted] for personal injuries resulting from a collision which occurred on or about April 14, 2014 in Byron Township, Michigan. This letter is to formally demand the preservation of certain evidence related to this collision. If you fail to properly secure and preserve these important pieces of evidence it will give rise to the legal presumption that the evidence would have been harmful to your side of the case. We specifically request that the following evidence be maintained and preserved, and not be destroyed, modified, altered, repaired, or changed in any manner, and further that you immediately put any third party vendor that has or controls this information, material, or documentation, on notice to maintain and preserve without change:

1. The tractor and trailer involved in this collision.

2. Bills of lading for any shipments transported by the driver and co-driver, for the day of the collision and the thirty (30) day period preceding the collision.

3. Any oversized permits or other applicable permits or licenses covering the vehicle or load on the day of the collision.

4. The driver’s complete driver qualification file, as required by 49 C.F.R. 391.51, including but not limited to:
5.  
   a) Application for employment  
   b) CDL license  
   c) Driver's certification of prior traffic violations  
   d) Driver's certification of prior collisions  
   e) Driver's employment history  
   f) Pre-employment MVR  
   g) Annual MVR  
   h) Annual review of driver history  
   i) Certification of road test  
   j) Medical examiner's certificate  
   k) HAZMAT or other training documents  

In addition please also preserve:  
   l) All drug and alcohol testing records of the driver  
   m) All inquiries and responses regarding the driver's employment history  

6. The driver's post-collision alcohol and drug testing results.  

7. The accident register maintained by the motor carrier as required by federal law for the one (1) year period preceding this collision. (FMCSR 390.15)  

8. All OmniTRAC, Qualcomm, MVPC, QTRACS, OmniExpress, TruckMail, TrailerTRACS, SensorTRACS, JTRACS, and other similar systems data for the six (6) months prior to the collision and the day of the collision, for this driver, truck, and trailer.  

9. Cargo pickup or delivery orders prepared by motor carriers, brokers, shippers, receivers, driver, or other persons, or organizations for thirty (30) days prior to the date of the collision as well as the day of the collision.  

10. Accounting records, cargo transportation bills and subsequent payments or other records indicating billings for transportation or subsequent payment for the transportation of cargo, with both the front and back of cancelled checks for cargo transported by the driver and/or truck involved in the collision for thirty (30) days prior to the date of the collision as well as the day of the collision.  

11. The entire personnel file of the driver involved in this collision.  

12. All letters, reports, and written material from a government entity involving safety, and safety ratings for the company and driver to include, but not be limited to, Department of Transportation audits by the state or federal government, the Federal Motor Carrier Safety Administration, or material generated on your company or driver pursuant to SAFERSYS or CSA 2010. The request is limited to
one (1) year prior to the wreck and any subsequent document, report, letter, or other material (to include electronically transmitted information) that includes the date of the wreck or the driver.

13. The front and back of the driver’s daily logs and his co-driver’s logs (if any) for the day of the collision, and the six month period preceding the collision, together with all material required by 49 C.F.R. 395.8 and 395.15 for the driver(s) involved in the above matter together with the results of any computer program used to check logs as well as all results of any audit of the logs by your company or a third party. This specifically includes any electric on board computers (AOBRD’s, EOBR’s, etc...) and the audit trail for those entries. We require you to put any vendor which stores or audits this information on notice of the need to preserve this data.

** Please preserve the original, actual daily logs submitted for this time period. Do not destroy the actual logs following scanning into your computer system as might be your regular business practice **

14. All existing driver vehicle inspection reports required under 49 C.F.R. 396.11 for the vehicle involved in the above collision, to include all existing daily inspection reports for the tractor and trailer involved in this collision.

15. All existing maintenance, inspection and repair records or work orders on the tractor and trailer involved in the above collision.

16. All annual inspection reports for the tractor and trailer involved in the above collision, covering the date of the collision.

17. Photographs, video, computer generated media, or other recordings of the interior and exterior of vehicles involved in this collision, the collision scene, the occurrence, or relating to any equipment or things originally located at or near the site of the occurrence.

18. Any lease contracts or agreements covering the driver or the tractor or trailer involved in this collision.

19. Any interchange agreements regarding the tractor or trailer involved in this collision.

20. Any computer data from the tractor or trailer to include but not be limited to: any data and printout from on-board recording devices, including but not limited to the ECM (electronic control module), any on-board computer, tachograph, trip monitor, trip recorder, trip master, Hours of Service (HOS) or other recording or tracking device for the day of the collision and the six (6) month period preceding the collision for the equipment involved in the collision.
21. Any post-collision maintenance, inspection, or repair records or invoices in regard to the tractor and trailer involved in the above collision.

22. Any weight tickets, fuel receipts, hotel bills, tolls, or other records of expenses, to include expense sheets and settlement sheets regardless of type (to specifically include Comdata or similar vendor reports), for the truck driver pertaining to trips taken for the day of the collision and thirty (30) days prior to the collision.

23. Any trip reports, dispatch records, trip envelopes regarding the driver or the tractor or trailer involved in this collision for the day of the collision and the thirty (30) day period preceding this collision.

24. Any e-mails, electronic messages, letters, memos, or other documents concerning this collision.

25. Any drivers’ manuals, guidelines, rules or regulations given to drivers such as the one involved in this collision.

26. Any reports, memos, notes, logs or other documents evidencing complaints about the driver in the above collision at any time.

27. Any DOT or PSC reports, memos, notes or correspondence concerning the driver or the tractor or trailer involved in this collision.

28. Any and all communications via CB radio, mobile or satellite communication systems, email, cellular phone, pager or other in cab communication device to include the bills for the devices for seven (7) days before, the day of, and seven (7) days after the collision.

29. Any and all computer, electronic, or e-mail messages created in the first forty eight hours immediately after the incident, by and between the defendant and any agents or third parties relating to the facts, circumstances, or actual investigation of the incident as well as any computer messages which relate to this particular incident, whether generated or received by you or your agents. WE REQUIRE THAT YOU PUT ANY VENDOR WHICH HOSTS OR STORES THIS DATA FOR YOU ON NOTICE OF THE NEED TO PRESERVE THIS DATA.

30. If not previously listed, all documents required by Federal Motor Carrier Safety Regulation 395.8, specifically those items identified in the Department of Transportation’s interpretation of the regulation in its Answer to Question 10, a copy of which is attached.

31. Any other items associated in any way with the wreck, documents, database, or other piece of evidence concerning or reflecting upon the driver, the collision, the truck, or the trailer.
32. All correspondence and documents regarding any safety issue for the driver to include but not be limited to the initiation, investigation and final conclusion of any:

   (1) warning letters,
   (2) targeted roadside inspections
   (3) any document that stated the driver was unfit.

33. All correspondence and documents regarding any safety issue for the company to include but not be limited to the initiation, investigation and final conclusion of any:

   (1) any off-site investigation,
   (2) any on-site investigation,
   (3) any cooperative safety plan,
   (4) any notice of violation,
   (5) any notice of claim/settlement agreement,
   (6) any document that stated the company was unfit, and
   (7) any document that the company was to be subjected to targeted roadside inspections.

34. Any document that found the driver or the company deficient in any BASIC (Behavior Analysis and Safety Improvement Categories) category.

35. The BASIC measurements for the trucking company and driver for the three years prior to the collision.

36. Any correspondence regarding the company or the driver objecting to, or asking for a correction of, any BASIC measurement or FMCSA intervention.

37. The Pre-Employment Screening Program (PSP) report on the driver for each month for the three years prior to the collision.

38. Any documents showing inquiry by the trucking company for any PSP reports of the driver for the three years prior to the collision.

39. Copy of the carrier profile maintained by MCMIS (Motor Carrier Management Information System) for the three years prior to the collision.

40. All logs of activity (both in paper and electronic formats) on computer systems and networks that have or may have been used to process or store electronic data containing information about or related to safety and safety policies, the collision, the driver(s), the truck, the trailer, witnesses to the collision, the plaintiff(s), the load, the facts of the collision, preventability determinations, GPS data, Hours of Service (HOS) data, dispatcher data for this driver(s), this truck, and this trailer.
41. Courts have made it clear that all information available on electronic storage media is discoverable, whether readily readable ("active") or "deleted" but recoverable. See, e.g., Santiago v. Miles, 121 F.R.D. 636, 640 (W.D.N.Y. 1988; a request for "raw information in computer banks" was proper and obtainable under the discovery rules); Gates Rubber Co. v. Bando Chemical Indus., Ltd., 167 F.R.D. 90, 112 (D. Colo. 1996; mirror-image copy of everything on a hard drive "the method which would yield the most complete and accurate results," chastising a party's expert for failing to do so); and Northwest Airlines, Inc. v. Teamsters Local 2000, 163 L.R.R.M. (BNA) 2460, (USDC Minn. 1999); court ordered image-copying by Northwest's expert of home computer hard drives of employees suspected of orchestrating an illegal "sick-out" on the Internet).

Accordingly, electronic data and storage media that may be subject to our discovery requests and that your client(s) are obligated to maintain and not alter or destroy, include but are not limited to the following:

Introduction: description of files and file types sought

a. All digital or analog electronic files, including "deleted" files and file fragments, stored in machine-readable format on magnetic, optical or other storage media, including the hard drives or floppy disks used by your computers and their backup media (e.g., other hard drives, backup tapes, floppy disks, DVD's, Jaz cartridges, CD-ROMs, etc.) or otherwise, whether such files have been reduced to paper printouts or not. More specifically, you are to preserve all of your e-mails, both sent and received, whether internally or externally; all word-processed files, including drafts and revisions; all spreadsheets, including drafts and revisions; all databases; all CAD (computer-aided design) files, including drafts and revisions; all presentation data or slide shows produced by presentation software (such as Microsoft PowerPoint); all graphs, charts and other data produced by project management software (such as Microsoft Project); all data generated by calendaring, task management and personal information management (PIM) software (such as Microsoft Outlook or Lotus Notes); all data created with the use of personal data assistants (PDAs), such as Palm Pilot, HP Jornada, Cassiopeia or other Windows CE-based or Pocket PC devices; all data created with the use of document management software; all data created with the use of paper and electronic mail logging and routing software; all Internet and Web-browser-generated history files, caches and "cookies" files generated at the workstation of each employee and/or agent in your employ and on any and all backup storage media; and any and all other files generated by users through the use of computers and/or telecommunications, including but not limited to voice mail. Further, you are to preserve any log or logs of network use by employees or otherwise, whether kept in paper or electronic form, and to preserve all copies of your backup tapes and the software necessary to reconstruct the data on those tapes, so that there can
be made a complete, bit-by-bit “mirror” evidentiary image copy of the storage media of each and every personal computer (and/or workstation) and network server in your control and custody, as well as image copies of all hard drives retained by you and no longer in service, but in use at any time from April 14, 2014 to the present.

You are also not to pack, compress, purge or otherwise dispose of files and parts of files unless a true and correct copy of such files is made.

You are also to preserve and not destroy all passwords, decryption procedures (including, if necessary, the software to decrypt the files); network access codes, ID names, manuals, tutorials, written instructions, decompression or reconstruction software, and any and all other information and things necessary to access, view and (if necessary) reconstruct the electronic data we will request through discovery.

b. Business Records: All documents and information about documents containing backup and/or archive policy and/or procedure, document retention policy, names of backup and/or archive software, names and addresses of any offsite storage provider.

c. Online Data Storage on Mainframes and Minicomputers: With regard to online storage and/or direct access storage devices attached to your mainframe computers and/or minicomputers: they are not to modify or delete any electronic data files, “deleted” files and file fragments existing at the time of this letter’s delivery, which meet the definitions set forth in this letter, unless a true and correct copy of each such electronic data file has been made and steps have been taken to assure that such a copy will be preserved and accessible for purposes of this litigation.

d. Offline Data Storage, Backups and Archives, Floppy Diskettes, Tapes and Other Removable Electronic Media: With regard to all electronic media used for offline storage, including magnetic tapes and cartridges and other media that, at the time of this letter’s delivery, contained any electronic data meeting the criteria listed above: You are to stop any activity that may result in the loss of such electronic data, including rotation, destruction, overwriting and/or erasure of such media in whole or in part. This request is intended to cover all removable electronic media used for data storage in connection with their computer systems, including magnetic tapes and cartridges, magneto-optical disks, floppy diskettes and all other media, whether used with personal computers, minicomputers or mainframes or other computers, and whether computer systems.

42. All e-mails, and information about e-mails (including message contents, header information and logs of e-mail system usage) sent or received by the driver and
co-driver involved in the collision for period of time involving the collision and
the seven (7) days before and after the collision.

43. All other e-mail and information about e-mail (including message contents, header
information and logs of e-mail system usage) containing information about or
related to company safety and safety policies, the collision, the driver(s), the truck,
the trailer, witnesses to the collision, the plaintiff(s), the load, the facts of the
collision, preventability determinations, GPS data, dispatcher data for this
driver(s), this truck, and this trailer.

44. All databases (including all records and fields and structural information in such
databases), containing any reference to and/or information about or related to
company safety and safety policies, the collision, the driver(s), the truck, the
trailer, witnesses to the collision, the plaintiff(s), the load, the facts of the
collision, preventability determinations, GPS data, dispatcher data for this
driver(s), this truck, and this trailer.

45. All electronic documents and the storage media on which they reside which
contain relevant, discoverable information beyond that which may be found in
printed documents. Therefore, even where a paper copy exists, we will seek all
documents in their electronic form along with information about those documents
contained on the media. We also will seek paper printouts of only those
documents that contain unique information after they were printed out (such as
paper documents containing handwriting, signatures, marginalia, drawings,
annotations, highlighting and redactions) along with any paper documents for
which no corresponding electronic files exist. Our discovery requests will ask for
certain data on the hard disks, floppy disks and backup media used in your
computers, some of which data are not readily available to an ordinary computer
user, such as “deleted” files and “file fragments.” As you may know, although a
user may “erase” or “delete” a file, all that is really erased is a reference to that
file in a table on the hard disk; unless overwritten with new data, a “deleted” file
can be as intact on the disk as any “active” file you would see in a directory
listing.

46. All word processing files, including prior drafts, “deleted” files and file fragments,
containing information about or related to safety and safety policies, the collision,
the driver(s), the truck, the trailer, witnesses to the collision, the plaintiff(s), the
load, the facts of the collision, preventability determinations, GPS data, dispatcher
data for this driver(s), this truck, and this trailer.

47. With regard to electronic data created by application programs which process
financial, accounting and billing information, all electronic data files, including
prior drafts, “deleted” files and file fragments, containing information about or
related to safety and safety policies, the collision, the driver(s), the truck, the
trailer, witnesses to the collision, the plaintiff(s), the load, the facts of the
collision, preventability determinations, GPS data, dispatcher data for this
driver(s), this truck, and this trailer.

48. All files, including prior drafts, "deleted" files and file fragments, containing
information from electronic calendars and scheduling programs regarding or
related to safety and safety policies, the collision, the driver(s), the truck, the
trailer, witnesses to the collision, the plaintiff(s), the load, the facts of the
collision, preventability determinations, GPS data, dispatcher data for this
driver(s), this truck, and this trailer.

49. All electronic data files, including prior drafts, "deleted" files and file fragments
about or related to safety and safety policies, the collision, the driver(s), the truck,
the trailer, witnesses to the collision, the plaintiff(s), the load, the facts of the
collision, preventability determinations, GPS data, dispatcher data for this
driver(s), this truck, and this trailer.

50. Replacement of Data Storage Devices: You or your agents are not to dispose of
any electronic data storage devices and/or media that may be replaced due to
failure and/or upgrade and/or other reasons that may contain electronic data
meeting the criteria listed above.

51. Fixed Drives on Stand-Alone Personal Computers and Network
Workstations: With regard to electronic data meeting the criteria listed above,
which existed on fixed drives attached to stand-alone microcomputers and/or
network workstations at the time of this letter’s delivery: You are not to alter or
erase such electronic data, and not to perform other procedures (such as data
compression and disk defragmentation or optimization routines) that may impact
such data, unless a true and correct copy has been made of such active files and of
completely restored versions of such deleted electronic files and file fragments,
copies have been made of all directory listings (including hidden files) for all
directories and subdirectories containing such files, and arrangements have been
made to preserve copies during the pendency of this litigation.

52. Programs and Utilities: You are to preserve copies of all application programs
and utilities, which may be used to process electronic data covered by this letter.

53. Log of System Modifications: You are to maintain an activity log to document
modifications made to any electronic data processing system that may affect the
system’s capability to process any electronic data meeting the criteria listed above,
regardless of whether such modifications were made by employees, contractors,
vendors and/or any other third parties.

54. Personal Computers Used by Your Employees and/or Their Secretaries and
Assistants: The following steps should immediately be taken in regard to all
personal computers used by your employees and/or their secretaries and assistants:
a. As to fixed drives attached to such computers: (i) a true and correct copy is to be made of all electronic data on such fixed drives relating to this matter, including all active files and completely restored versions of all deleted electronic files and file fragments; (ii) full directory listings (including hidden files) for all directories and subdirectories (including hidden directories) on such fixed drives should be written; and (iii) such copies and listings are to be preserved until this matter reaches its final resolution.

b. All floppy diskettes, magnetic tapes and cartridges, and other media used in connection with such computers prior to the date of delivery of this letter containing any electronic data relating to this matter are to be collected and put into storage for the duration of this lawsuit.

55. **Evidence Created Subsequent to This Letter:** With regard to electronic data created subsequent to the date of delivery of this letter, relevant evidence is not be destroyed and you are to take whatever steps are appropriate to avoid destruction of evidence.

In order to assure that your obligation to preserve documents and things is met, please immediately forward a copy of this letter to all persons and entities with custodial responsibility for the items referred to in this letter, to specifically include third parties and vendors.

In the meantime, if you have any questions, please do not hesitate to call.

Sincerely,

Jeffrey A. Bussell

JAB/jjb
Depo Questions

1. **Background** (in addition to the normal questions that you would ask him)
   
a. Northwestern University Training
   
i. Has he ever attended NU for accident reconstruction training?
      
      (1) If so, why?
      
      (2) Is NU considered to be an authority in the area of accident reconstruction?
      
      (3) Does he ever rely on the NU textbooks?
   
   ii. Has any of his staff attended NU for accident reconstruction training?
      
      (1) Why?
   
b. Is he a PE in the state of Michigan?
      
i. If not, why not?
   
c. Is he ACTAR accredited? (See www.actar.org)
      
i. If not, why not?
   
d. Is he licensed to drive a motorcycle?
   
e. Has he ever driven a motorcycle?
      
i. If so, when and what kind?
   
f. Does he have any motorcycle accident investigation or reconstruction training?
      
i. If so, from where and when?
      
ii. Has he ever done any motorcycle testing?
      
      (1) If so, what kind of testing and where?
2. Scene investigation

a. When did he visit the scene?
   i. What did he do there?
   ii. Did he map it or take measurements?
   iii. Was the motorcycle pre-impact tire mark still there?
   iv. Was any physical evidence from this accident still there?
      (1) If so, what was still there?
   v. What were the weather conditions at the scene at the time of his visit?
   vi. Did he measure the coefficient of friction at his scene visit?
      (1) If not, why not?
      (2) If he did not measure it, what value does he use in his reconstruction?
         (a) Where does he get this from?

b. Scene diagram

i. Did he prepare any diagram of the accident site?
   (1) Does it have the rest position of the truck and trailer on it?
      (a) If so, how did he determine this?
      (b) Was the truck driven to it's rest position or did it come to an uncontrolled stop? (Was driven)
      (c) Did the pickup truck driver steer the pickup truck to the right after impact? (Yes - see depo)
      (d) Can he show the path that the pickup truck took post-impact?
         (i) What is the evidence that he uses to show the pickup path?
(2) Does he have the rest position of the motorcycle and the riders on the scene diagram?

(a) If so, how did he determine this?

c. Point of Impact

i. How did he determine that the point of impact is 3 feet west of the yellow line?

3. Truck Inspection

a. When was he hired on this case?

b. When did he inspect the truck in this case?

c. Did he ever ask to download the SDM in the truck?

i. If so, when?

ii. Did he tell his client that info could be lost if it was downloaded in a timely manner?

d. Did he ever download the SDM in the truck?

i. If so, when?

ii. If not, why did someone else download it?

iii. Would he expect this collision to have triggered a non-deployment (or near-deployment) event that was recorded by the subject truck SDM?

(1) If not, why not?

(2) Did he calculate a delta V for the pickup truck as a result of this collision?

(a) If so, what is it and how did he calculate it?

e. Did he inspect the trailer?

i. If so, when?
(1) If so, what info did he get from the trailer and how did he use it in his analysis?

(2) Is the trailer wider than the pickup truck?

ii. Did he see any evidence that the motorcycle struck the trailer?

(1) If so, what did he see?

4. M/C Inspection

a. Did he inspect the motorcycle in this case?

i. If so, when?

(1) If so, what did he glean from the inspection?

ii. If not, why not?

iii. What portion(s) of the motorcycle contacted the ground after impact with the truck?

(1) Did both sides of the motorcycle contact the ground?

(a) If so, how does he explain this/

(b) If so, how does this affect the coefficient of friction for the motorcycle post-impact?

5. Speed calculations

a. Did he perform any sort of impact speed calculations in this case?

i. If so, did he try to determine impact speeds thru the use of momentum?

(1) If yes, did the riders stay attached to motorcycle after impact?

(a) If the riders did not stay attached, how does this affect his analysis?
(2) If yes, what did he use for the following variables:

(a) The approach angle for the motorcycle

(b) The departure angle for the motorcycle
   (i) The departure angle for the motorcycle driver
   (ii) The departure angle for the motorcycle passenger

(c) The weight of the motorcycle
   (i) Did this include the riders?

(d) The departure (or after impact) speed for the motorcycle
   (i) The departure (or after impact) speed for the motorcycle driver
      1) What post impact drag factor did he use for the driver?
         a) Where did this value come from?
         b) Did he consider using a range?
            i) If not, why not?
   (ii) The departure (or after impact) speed for the motorcycle passenger
      1) What post impact drag factor did he use for the driver?
         a) Where did this value come from?
         b) Did he consider using a range?
            i) If not, why not?

(e) The approach angle for the pickup truck

(f) The departure angle for the pickup truck
How did he determine the truck departure angle?

Didn't the pickup truck driver testify that he steered his vehicle to the right after impact?

1) Wouldn't this mean that the pickup truck did not come to a controlled rest position?
2) Doesn't this change the departure angle?
3) Did the pickup truck driver testify that he didn't steer the pickup truck to the right after impact?
4) How did he determine the truck departure angle?

Where did he get the weight of the trailer from?

What was the post-impact drag factor for the pickup truck?

The departure speed for the pickup truck:

The weight of the pickup truck:

The weight of the trailer:

How did he determine the trailer weight?

Did this include the weight of the trailer and the equipment on the trailer?

Did this include the weight of the occupants?

Where did he get this weight from?

The weight of the pickup truck:

Doesn't this change the departure angle?

1) Wouldn't this mean that the pickup truck did not come to a controlled rest position?
(a) If so, what ranges did he use.

(4) Have him explain/show how he got each of the values that he used for each variable

ii. What is the weight ratio for this collision? (Weight of pickup truck, trailer and cargo compared to motorcycle)

(1) Does this weight ratio make the motorcycle impact speed calculations more sensitive to small changes in the other inputs?

iii. Under what conditions is the use of momentum the least sensitive?

iv. Is the pickup truck and trailer considered an articulated vehicle?

(1) Is the use of momentum an accepted methodology for determining impact speeds in this type of collision with an articulated vehicle?

(a) If so, what reference can he point to?

(b) If not, why not?

v. Did he try to calculate impact speed using energy in this case?

(1) If so, how did he calculate the damage energy to the pickup truck?

(a) What did he use for the stiffness of the pickup truck?

(i) Where did this value come from?

(b) What did he use for the crush width of the pickup truck?

(i) Where did this value come from?

(c) What did he use for the crush depth of the pickup truck?

(i) Where did this value come from?

(2) If so, how did he calculate the damage energy to the
motorcycle?

(a) What did he use as the stiffness of the motorcycle?
   (i) Where did this value come from?

(b) What did he use for the crush depth of the motorcycle?
   (i) Where did this value come from?

b. If he did not perform any impact speed calculations, did he assume a speed for the pickup truck at any point in time?
   i. If so, what speed(s) did he assume and at what point(s) in time?
      (1) What is the basis for these assumptions?

c. If he did not perform any impact speed calculations, did he assume a speed for the motorcycle at any point in time?
   i. If so, what speed(s) did he assume and at what point(s) in time?
      (1) What is the basis for these assumptions?

6. M/C Speed calculations

   a. Is there a pre-impact skid mark from the motorcycle?
      i. How long is it?
         (1) How did he determine the length?
         (2) If from photogrammetry, get the photos that he used and the electronic photogrammetry files

      ii. What tire made this mark?
         (1) Why? (Get basis for this)
         (2) Is it from one or two tires? (Get basis)

      iii. Is the mark at an angle relative to the edge line of the roadway?
(1) If so, what is the relative angle?

(2) How did he determine this angle?

(3) If so, does this angled mark indicate that the motorcycle driver was trying to avoid the pickup truck?

b. Did he perform any speed calculations for the motorcycle based upon the skid mark?

i. If not, why not?

ii. If so, what did he use for the following:

   (1) What percentage of weight was on the rear axle?

   (2) What percentage of weight was on the front axle?

   (3) What amount of braking was occurring at the front tire?

   (4) What amount of braking was occurring at the rear tire?

   (5) What value for the coefficient of friction did he use for the roadway?

      (a) Where does this come from?

   (6) Did he use any ranges for any of the above variables?

      (a) If not, why not?

      (b) If so, what ranges did he use and how did it affect his results?

iii. Did he perform any speed calculations assuming that the tire skid mark is from the rear tire of the motorcycle and that there was no other braking?

   (1) If not, why not? Wouldn’t this be the minimum speed of the motorcycle?

   (2) If so, what were the results?

c. Did he calculate the stopping distance for the Motorcycle?
i. If so, from what initial speed?
   (1) Why did he pick this speed?
   (2) If so, did he use or consider any other initial speeds?
      (a) If so, what were they and why did he pick them?

ii. If so, what did he use for the following:
   (1) What percentage of weight was on the rear axle?
   (2) What percentage of weight was on the front axle?
   (3) What amount of braking was occurring at the front tire?
   (4) What amount of braking was occurring at the rear tire?
   (5) What value for the coefficient of friction did he use for the roadway?
      (a) Where does this come from?
   (6) Did he use any ranges for any of the above variables?
      (a) If not, why not?
      (b) If so, what ranges did he use and how did it affect his results?

7. Damage Analysis
   a. Did he perform any qualitative damage analysis on the pickup truck?
      i. Was he able to determine what caused each dent and scrape on the truck?
         (1) If so, have him describe it.
      ii. Have him describe the methodology used by him in his damage analysis.
         (1) Was this methodology any different than what Mr. Green
used?

(2) Is this an accepted methodology?

b. Did he perform any qualitative damage analysis on the motorcycle?
   i. Was the motorcycle upright or on its side at the time of impact with the truck?
      (1) What is the basis for this?

c. Did he perform any quantitative damage analysis on the pickup truck?
   i. If so, how, and how did he use it in his analysis?
   ii. Did he create any scale damage diagrams of the truck?
      (1) If so, how did he create these?

d. Did he perform any quantitative damage analysis on the motorcycle?
   i. If so, how, and how did he use it in his analysis?
   ii. Did he create any scale damage diagrams of the truck?
      (1) If so, how did he create these?

8. Photogrammetry

a. Did he perform any photogrammetry in this case?
   i. If so, what program did he use?
      (1) What version of the program?
   ii. If so, was it for the scene, the truck or both?
      (1) If he did the truck, what were the results? (Get electronic copies of any files that he has)
         (a) What photos did he use of the damaged truck?
         (b) Did he map an exemplar truck?
(i) If so, get year, make, model and VIN

(2) How did he use the results in his analysis?

iii. If for the scene, what photos did he use?

(1) What information did he get from the scene photogrammetry? Get electronic copies of any files that he has)

(2) How did he use the results in his analysis?

iv. If for the scene, what photos did he use?

(1) What information did he get from the scene photogrammetry? Get electronic copies of any files that he has)

(2) How did he use the results in his analysis?

9. Impact configuration

a. Have him describe entire accident sequence, including what the pickup truck driver did prior to initiating the left turn.

b. What is the orientation of the two vehicle relative to one another at the time of first contact? (Have him show this in a drawing, etc.)

i. How did he arrive at this orientation? (Have list all evidence, damage, photos, etc. that he used)

ii. It appears that he has an included angle of 35 to 45 degrees between the two vehicles at impact. At an impact angle of 35 degrees, the deformation to the pickup truck should be more "forward", than it is "in". Have him show you what evidence there is that the damage is more forward than in. Note; The photos show the opposite - that the damage is more "in" than "forward."

c. Have him describe how the vehicles interacted from first contact to rest.

d. Have him describe how the vehicles interacted with the motorcycle riders
from first contact to rest.

e. What are the speeds at impact for each vehicle?
   i. If they cannot be calculated, why can’t they be?

f. Where was the pickup truck on the roadway when it initiated it’s left turn?
   i. What physical evidence is there that allows him to place the pickup truck where he does?
   ii. Has he used or looked at the minimum turning radius for the pickup truck?

g. How much time did it take the pickup truck to move from this initial position to the point of impact?
   i. What radius did the truck turn at?
      (1) Was the radius information important at all for his analysis?
         (a) If so, why?
         (b) If not, why not?

h. What was the reaction time for the motorcycle driver?
   i. Was this an appropriate length of time?
      (1) If not, why not?
      (2) If not, what should it have been?

i. How much time did it take for the motorcycle to skid prior to impact?

j. Was he able to match up any of the motorcycle riders injuries to any specific contact points with the truck?
   i. If so, how?
   ii. If so, how did that factor into his analysis?

k. Have him explain his time-distance analysis.

10. Sensitivity Analysis
a. What is a sensitivity analysis?

b. Did he perform one in this case?
   i. If not, why not?
   ii. If so, what were the results?

c. Have him list all of the variables used in calculating the impact speeds of the two vehicles

d. Then have him list the range of each value used - for example, he talks about a range of angles in his report.

e. Did he then calculate the impact speeds using this range of values?
   i. If so, what were the results?
   ii. If so, why did he not mention this in his report?

11. Animations/Simulation

   a. Did he create an animation for this case?
      i. If so, what program did he use?
      ii. If so, get key frame data

   b. Did he perform a simulation in this case?
      i. If so, what program did he use?
      ii. If so, get all inputs, output reports and electronic copies of the files

   c. What is the difference between an animation and a simulation?

12. Get electronic copies of any scene drawings, vehicle drawings, CAD files, mapping data, photogrammetry data, animations or simulations that he has for this case.

13. Values he used
a. From what I can determine (working backwards thru his calculations), Wiechel used the following values for some of the variables:

i. Motorcycle pre-impact braking drag factor = 0.82 g's

ii. Motorcycle post-impact drag factor (on it's side) = 0.4 g's

iii. GMC post-impact drag factor = 0.18 g's