



## Engineering Sciences Section – 2004

### C18 Road Rage Caused a Multiple Vehicle Crash

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After attending this presentation, attendees will understand an application of engineering analyses to determine a crash sequence leading to the conclusion that the cause was road rage of a driver whose vehicle was the last one to become involved in any of the multiple collisions.

This presentation will impact the forensic community and/or humanity by demonstrating a basis for accident reconstruction in complex collisions. Elementary calculations may give part of the story, but not necessarily a complete solution.

**Background:** On a summer night Ms. BB was driving a rented van truck loaded with household furnishings and towing a low bed trailer loaded with a small sedan. She was westbound on I-80 in central Iowa with her son AM as a passenger when she passed a westbound loaded semi truck driven by Mr. DR. A few minutes later and a few miles down the road, Mr. DR passed Ms. BB such that his semi truck was westbound on I-80, generally in front of Ms. BB, who was now in the westbound lane. Mr. MG was driving his luxury sedan with front seat passenger AC westbound on I-80 following Ms. BB. Mr. KP was driving a second loaded semi truck westbound on I-80 in the right lane, following Mr. MG. Shortly after midnight, the front of Mr. KP's semi truck collided with the rear of Mr. MG's luxury sedan. Mr. MG's luxury sedan rotated  $\frac{1}{2}$  revolution and its rear end collided with the rear of the trailer and the small sedan being towed by Ms. BB. Mr. KP's semi truck continued forward and its front right collided with the left rear of Mr. DR's trailer.

Ms. BB's van truck came to rest facing WSW in the north ditch, a short distance beyond the beginning of a weigh station exit ramp. Her trailer with the loaded small sedan separated from the van truck hitch and came to rest facing WSW in the north ditch with its left side near the van truck right side. Mr. MG's luxury sedan came to rest facing ENE in the north ditch a short distance east from Ms. BB's van truck and trailer. Rear portions of Mr. MG's luxury sedan were damaged by fire after its two collisions. Mr. KP's semi truck came to rest facing W and straddling the dividing line between the two westbound driving lanes with its trailer partly jack-knifed SW. The rear end of Mr. KP's trailer was a short distance SSW from the front of Ms. BB's van truck. Mr. DR's semi truck came to rest on the weigh station exit ramp facing WNW with the rear of his trailer a short distance due south from the front of Ms. BB's van truck.

Another investigator photographed the accident scene and vehicles within a day or two after the crashes. A few days later, with the investigator's photographs in hand, the author inspected the scene and Mr. MG's luxury sedan. Pertinent measurements were made.

Application of engineering and crash analyses and accident reconstruction methods will be described, and the following results will be presented:

- Mr. KP's semi truck speed was over the 65 mph maximum speed limit. He was in the right part of the right westbound lane turned to the left with brakes applied hard.
- Mr. MG's luxury sedan speed was under the 40 mph minimum speed limit. He was in the right westbound lane near the north shoulder pointed to the right and steering to the left. The space between his vehicle and Ms. BB's trailer was much less than a safe operating distance.
- Ms. BB's van truck speed was under the 40 mph minimum speed limit. The van truck was straddling the north fog line between the right driving lane and the north shoulder, and the trailer was in the right driving lane near the fog line. The van truck and trailer were turned to the right toward the north ditch.
- Two different scenarios were explored for Mr. DR's semi truck actions. In both scenarios his speed was much slower than the 40 mph minimum speed limit, impeding a normal traffic flow. In one scenario he is moving very slowly (less than 15 mph) in the right hand lane before turning onto the weigh scale exit ramp. In the other scenario he is moving to the right at a slightly faster speed and is literally running Ms. BB off the road. In either case he is grossly interfering with Ms. BB's travel path. (Her son and passenger AM stated that he thought Ms. BB had passed Mr. DR's semi truck several miles before the collisions began.)

#### Crash Analyses, Accident Reconstruction, Road Rage