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Consultants in Safety Philosophy and Technology

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VEHICLE SAFETY

Is a Left Turn Right?

 by John Goebelbecker, P.E.¹, Michael A. Dilich² and Dror Kopernik³

ABSTRACT

A heavy truck is about to turn left onto a high speed, multi-lane highway. An approaching car in the distance appears far enough away for the truck driver to pull out and start his turn. Seconds later, a collision occurs. What went wrong?

DISCUSSION

Compared to automobiles, heavy trucks require substantial time to enter a highway due to the truck's length and slow acceleration. The left turn maneuver from a driveway depicted in Figure 1 is especially difficult because the truck driver must coordinate the timing of a rather long and slow crossing with the approach of traffic from both directions. Frequently, cooperation from approaching traffic is required to permit the truck to complete this maneuver safely. When an accident occurs, a number of possible factors related to the vehicles, the drivers, and/or the highway must be investigated before the cause(s) of the accident can be determined or fault can be established.

The following list of possible contributing factors was developed as an aid to the investigation of such accidents.



Figure 1 - AIRMAP⁴ of left turn across multi-lane highway.

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⁴ AIRMAP (Accident Investigation and Reconstruction Mapping with Aerial Photography) is a proprietary mapping system developed by Triodyne.

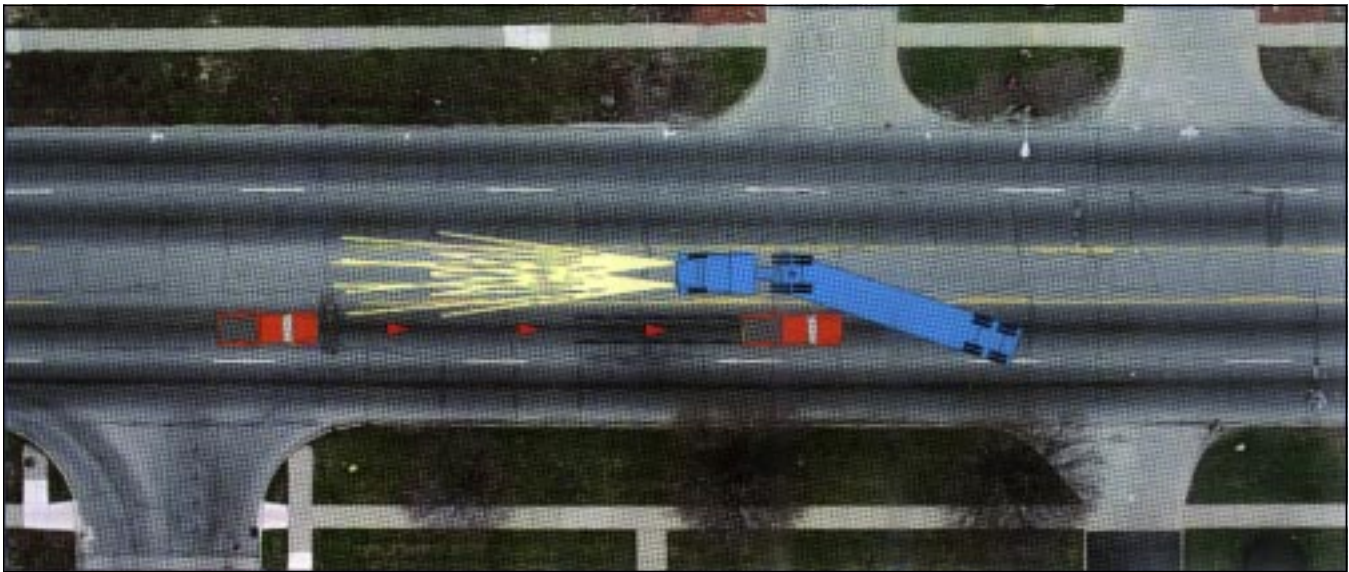


Figure 2 - AIRMAP of headlight glare impairment situation.

POSSIBLE CONTRIBUTING FACTORS

Driver Factors to Consider

- Truck driver did not look for approaching traffic before pulling into highway.
- Truck driver saw approaching traffic but pulled into highway anyway when approaching traffic was too close.
- Approaching driver was inattentive, looking elsewhere, preoccupied with personal problem, etc.
- Approaching driver travelled at excessive speed for conditions (weather, road surface, others) affecting truck driver's estimate of approaching vehicle arrival.
- Truck driver was impatient and did not wait a reasonable time for traffic to clear before proceeding into road.
- Traffic from right forced truck to slow down or stop before completing turn.
- Truck's headlights in median or opposite lane impaired approaching driver's ability to detect trailer ahead. (See Figure 2)
- Truck driver failed to compensate for line-of-sight visibility obstruction such as foliage, building, or sign.
- Approaching driver failed to compensate for line-of-sight visibility obstruction such as hill crest or sharp curve.
- Driver was impaired by fatigue, drowsiness, alcohol, drugs, poor eyesight, etc.
- Driver was reckless, angry, emotional, or otherwise upset.
- Driver failed to turn lights on.
- Driver did not compensate for sun glare.
- Sunglasses worn at dusk or at night.
- Driver did not compensate for poor windshield wiper performance.

Vehicle Factors to Consider

- Truck's side marker lamp(s) not functional.
- Approaching vehicle's headlights not functional.
- Trailer not equipped with required lights and/or reflectors.
- Vehicle lights and/or reflectors dirty.
- Approaching vehicle's headlights misaligned, reducing visibility distance.
- Tractor's headlights misaligned causing approaching driver glare problem.
- Approaching vehicle brake failure or poor brake performance.
- Poor windshield wiper performance during inclement weather.
- Mechanical failure causing truck to stop before completing turn (engine stalled, spring brakes applied, drive train failed, etc.)

Highway and Environment Factors to Consider

- High accident rate history at location.
- Limited sight distance due to curve in road or hill crest.
- Speed limit or advisory speed too high.
- Lack of, improper, or confusing traffic control, signage, etc.
- Slippery road due to snow, ice or rain.
- Approaching driver's vision impaired by glare from headlights of opposing traffic.
- Reduced visibility due to precipitation, fog, sun glare, or low-light condition (night, dawn, or dusk).
- Truck inconspicuous because of background.