



National Transportation Safety Board

Washington, D.C. 20594

Highway Accident Brief

Accident No.: HWY-04-FH-039
Accident Type: Median crossover, collision, and fire
Location: U.S. Highway 75, Sherman, Texas
Date and Time: September 20, 2004; 4:29 p.m. central daylight time

Vehicle One: 1999 Freightliner truck tractor/1997 Trailmobile dry van semitrailer
Operator: KV Express, Inc.
Occupant: 1
Injuries: Minor

Vehicle Two: 2000 Ford Expedition sport utility vehicle
Operator: Driver
Occupants: 5
Fatalities: 5

Vehicle Three: 1990 Ford F150 pickup truck
Operator: Driver
Occupants: 7
Fatalities/Injuries: 5 fatalities
2 serious injuries

Accident Description

On September 20, 2004, about 4:29 p.m. central daylight time, a 1999 Freightliner truck tractor, in combination with a 1997 Trailmobile dry van semitrailer, traveling northbound on U.S. Highway 75 (US 75), in the city of Sherman, Grayson County, Texas, crossed the median and collided with a 2000 Ford Expedition sport utility vehicle (SUV) and a 1990 Ford F150 pickup truck traveling southbound on the same road. A postaccident fire ensued. The Freightliner was driven by a 45-year-old man en route from Dallas, Texas, to Kansas City, Missouri. The weather was cloudy, and the roadway was dry.

Tire marks from the accident scene, consistent with scuff marks,¹ indicate that as the Freightliner tractor-semitrailer approached the Farm-to-Market 1417 overpass bridge at a speed of 65–70 mph, it veered leftward from the right lane, crossed the left lane, and entered the

¹ Scuff marks are created when lateral forces cause a rotating tire to deform and roll onto the sidewall.

earthen median at an angle of approximately 20°. The tractor-semitrailer continued across the median and entered the southbound lanes, where it collided with the SUV and the pickup truck. The Freightliner and the SUV came to rest partially in the grass, just west of the southbound travel lanes; the ensuing fire engulfed both vehicles. The pickup truck came to rest in the southbound travel lanes.

The driver and all four passengers in the SUV and the driver and four passengers in the pickup truck were killed. Two passengers in the pickup truck sustained serious injuries. The Freightliner driver received minor injuries.

Roadway

At the accident scene, US 75 is a controlled-access divided road running north–south. The depressed earthen median that separates the two northbound and two southbound travel lanes varies in width from 34–43 feet. The posted speed limit is 70 mph. In the immediate vicinity of the accident, the northbound lanes included an entrance ramp from a frontage road running parallel to the highway. As shown in the accident scene figure, the tire marks produced by the Freightliner began approximately 159 feet prior to the entrance ramp.

Mechanical Inspection of Tractor-Semitrailer

A National Transportation Safety Board (NTSB) postaccident inspection of the Freightliner tractor-semitrailer revealed no obvious defects other than accident damage and brake drum wear on axle 3. A detailed mechanical inspection, focusing on the tractor’s steering system and the semitrailer’s electrical lighting system, revealed no mechanical defects in the steering gear, kingpins, bearings, associated steering linkages, or lamp filaments.

Driver and Witness Statements

After the accident, the Freightliner driver told investigating law enforcement personnel that he had been driving in the right lane and was cut off by another vehicle. He said he was forced to steer left to avoid a collision; he then lost control, entered the median, and continued into the opposing lanes.

The Sherman Police Department interviewed 14 eyewitnesses, most of whom stated that the Freightliner was traveling 65–70 mph, and that the driver appeared to be changing from the right lane to the left lane before swerving leftward into the median. None of the witnesses recalled a vehicle suddenly entering the Freightliner’s lane of travel, though one witness stated that a vehicle in front of the Freightliner changed from the right lane to the left lane. Another witness stated that he was on the frontage road, preparing to enter the roadway, when the accident occurred. None of the witnesses reported seeing the semitrailer’s brake lights illuminate during the accident sequence.

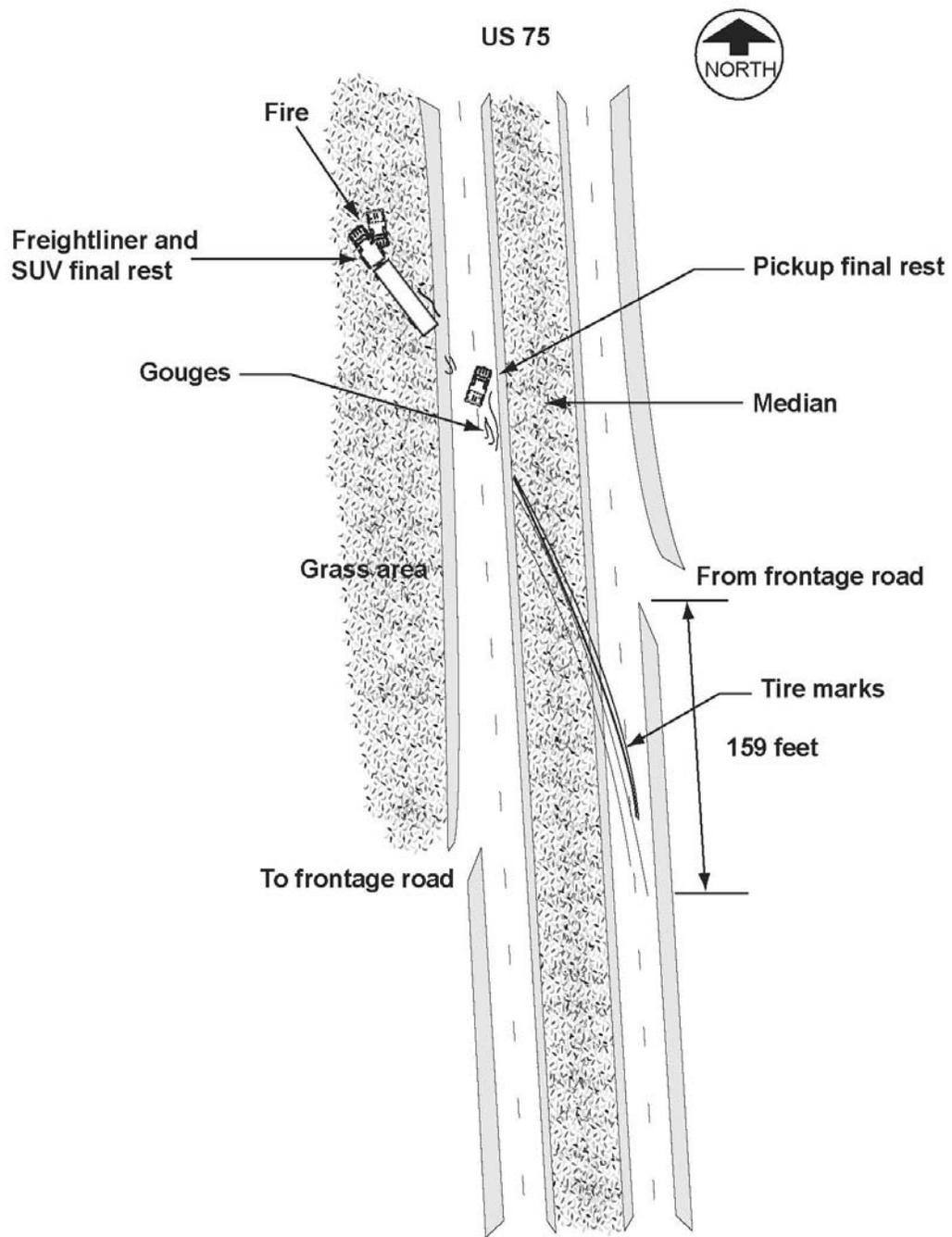


Figure. Accident scene diagram, adapted from Sherman Police Department sketch.

Accident Trip

KV Express, Inc., dispatched the Freightliner driver from Chicago, Illinois, on September 17, 2004, about 10:30 p.m., to transport a cargo of mail to Dallas, Texas. Because of the distance from Chicago to Dallas and the required rest time, the trip would be expected to take approximately 25 hours. When dispatched, the driver had more than sufficient time to safely drive to Dallas and comply with all driving time and rest requirements. For unknown reasons, the driver chose to remain in the Chicago area until the afternoon of September 19. The cargo was delivered in Dallas on September 20, about 63 hours after being dispatched. The driver departed the Dallas area about 2:40 p.m. on September 20 to deliver an empty trailer to Kansas City, Missouri.

Records obtained from the Freightliner driver's cellular telephone provider produced additional information about his activities in the days preceding the accident. On September 19, the driver began making and receiving calls about 6:00 a.m. He made his last call of the day using a cellular tower in Lenexa, Kansas, about 9:00 p.m. The driver made or received a total of 35 calls on September 19; the timing, duration, and location of these calls suggest that he would have had only 2 hours to rest, sometime between 6:00 and 10:00 a.m.² The driver's first call on September 20 was made about 4:03 a.m., using a cellular tower in Dallas, Texas. Further examination of his cell phone records revealed that he made or received 97 calls between 4:03 a.m. and 4:24 p.m. on September 20 (about 5 minutes before the accident). The only break of any significant length in the driver's cell phone use on that day was from 6:05–9:05 a.m., suggesting that—at best—he may have been able to take a nap or otherwise rest for about 3 hours. Taken as a whole, the driver's cell phone records suggest that he would have been awake for most of the 34.5 hours prior to the accident. Title 49 *Code of Federal Regulations* 395.3 states that the driver of a property-carrying motor vehicle shall not drive more than 11 cumulative hours following 10 consecutive hours off duty or for any period after the end of the 14th hour after coming on duty (following 10 consecutive hours off duty).

It is well established that sleep loss results in deficits in a number of driving-related performance measures, including reaction time,^{3,4} vigilance,⁵ sustained attention,⁶ and lane tracking ability.⁷

² Although this period is 4 hours, only 2 hours at most would have been available for rest based on the distance traveled during this time.

³ N. Kleitman, ed., "Deprivation of Sleep," *Sleep and Wakefulness* (Chicago: University of Chicago Press, 1963), pp. 215–229.

⁴ H. Babkoff, T. Caspy, and M. Mikulincer, "Subjective Sleepiness Ratings: The Effects of Sleep Deprivation, Circadian Rhythmicity, and Cognitive Performance," *Sleep*, vol. 14 (1991), pp. 534–539.

⁵ M. Glenville, R. Broughton, A. Wing, and R. Wilkinson, "Effects of Sleep Deprivation on Short-Duration Performance Measures Compared to the Wilkinson Auditory Vigilance Task," *Sleep*, vol. 1 (1978), pp. 169–176.

⁶ D. Dinges, "Performance Effects of Fatigue," *Fatigue Symposium Proceedings, November 1–2, 1995, National Transportation Safety Board and NASA Ames Research Center*, NTSB/RP-95/02 (Washington, DC: National Transportation Safety Board, 1995), pp. 41–46.

⁷ N. Lamond and D. Dawson, "Quantifying the Performance Impairment Associated With Fatigue," *Journal of Sleep Research*, vol. 8 (1999), pp. 255–262.

Specific to this accident, research has shown that a driver can have an oversteer reaction following a startle response from an episode of inattention or incipient sleep.⁸ A 20° angle of departure relative to the roadway suggests a large, abrupt steering input in response to an imminent or just-recognized hazard. As stated above, none of the witnesses saw a hazard enter the Freightliner's path prior to the driver's abrupt steering input; in fact, the only potential hazard was a vehicle in front of the tractor-semitrailer, suggesting that the driver noticed or became aware of the vehicle only just prior to initiating his steering maneuver.

Immediately before the accident, the Freightliner driver was traveling in the right lane. The tire marks created as the tractor-semitrailer abruptly moved to the left were consistent with those caused by an evasive steering maneuver. The accident scene diagram (see figure) shows that the tire marks began about 159 feet prior to where an entrance ramp joined the main northbound travel lanes of US 75. Based on the Freightliner's overall length of approximately 50 feet, the front of the tractor would have been only 109 feet from the ramp at the inception of the tire marks. Witnesses reported the Freightliner to be traveling 65–70 mph, which would have placed it less than 1.15 seconds from the ramp. At least two witness statements place other vehicles in the vicinity of the entrance ramp. One vehicle was changing from the right lane to the left lane in front of the tractor-semitrailer, and the other vehicle was preparing to enter the highway at the entrance ramp. Although none of the statements suggested that these vehicles were a hazard, the Freightliner's tire marks show that the driver made an evasive steering maneuver in response to possibly perceiving the vehicles as being hazardous.

Freightliner Driver

The accident investigation revealed the Freightliner driver to be a Polish citizen in the United States legally as a resident alien. Although the driver's primary language was Polish, he was conversant in English and made several comments to English-speaking witnesses postaccident. At the time of the crash, the driver held a valid Florida class "A"⁹ commercial driver's license (CDL) with no restrictions and a hazmat endorsement. The CDL was issued in April 1998 and expired in April 2005.

Less than 5 weeks prior to the accident, the Freightliner driver was issued a medical certificate following an examination. At that time, the driver did not indicate any medical conditions or the use of any medications. Two antipsychotic medications (described in the following section)—neither available in the United States—were found in the driver's possession at the time of the accident, and he indicated to medical personnel after the accident that he had been diagnosed with and given medication for depression while visiting Poland in January 2004. Treated depression is not specifically disqualifying for commercial drivers, but it would have been nearly impossible for a U.S. examiner to adequately evaluate the effects of the two drugs that had apparently been prescribed for the driver.

⁸ P. Hancock and W. Verwey, "Fatigue, Workload, and Adaptive Driver Systems," *Accident Analysis and Prevention*, vol. 29, no. 4 (1974), pp. 495–506.

⁹ In Florida, a class "A" license allows the operation of any tractor-trailer with a gross vehicle weight rating of 26,001 pounds or more.

Medications

At the time of the accident, the Freightliner driver was found to have perazine,¹⁰ sulpiride,¹¹ and dipyron¹² in his possession. Because the driver declined to grant an interview to NTSB investigators, no specific information on his use of these prescription drugs could be obtained. NTSB staff visited 13 pharmacies¹³ in the vicinity of the driver's home. No record of prescriptions was found during this search.

The driver was arrested following the crash and was taken to the Grayson County jail, where medical personnel examined him. According to records from the jail, the driver stated that—during a visit to Poland—he had been prescribed medication for depression in January 2004 but had stopped taking it in May 2004 because it made him sleepy. The driver could not name the medication, but he stated that it was in his briefcase. The driver declined through counsel to be interviewed; no specific information was obtained on over-the-counter drugs that the driver may have been taking. The driver did indicate to staff at the jail that he was taking Tylenol (acetaminophen) and glucosamine.

At the request of the Sherman police, staff at the Wilson N. Jones Medical Center took blood and urine samples from the driver to test for drugs and alcohol. The blood sample was collected at 5:34 p.m., and the urine sample was collected at 6:40 p.m.—both within 2.5 hours of the accident. Laboratory tests on the driver's urine were negative for phencyclidine, benzodiazepines, cocaine, tetrahydrocannabinol, opiates, barbiturates, and amphetamines. A test of the driver's blood was negative for alcohol.¹⁴

On September 24, 2004, at the request of NTSB investigators, the remaining blood and urine samples from the driver were hand-delivered to the Civil Aerospace Medical Institute (CAMI) by an officer of the Sherman Police Department. Tests of the driver's urine were negative for ethanol, amphetamine, opiates, marijuana, cocaine, phencyclidine, benzodiazepines, barbiturates, antidepressants, antihistamines, meprobamate, methaqualone, and nicotine.

¹⁰ Perazine is a phenothiazine with general properties similar to those of chlorpromazine and is used for the treatment of psychotic conditions.

¹¹ A dopamine D2-receptor antagonist, sulpiride is used therapeutically as an antidepressant, as an antipsychotic, and as a digestive aid.

¹² Dipyron (also known as metamizole) is a nonsteroidal anti-inflammatory agent with analgesic and antipyretic properties.

¹³ The total number of pharmacies checked was 17, including those networked with facilities visited by NTSB investigators.

¹⁴ Data in support of human performance, highway, and motor carrier factors are included in the docket for this investigation. See <<http://www.nts.gov/Dockets/Highway/HWY04FH039/default.htm>>.

When testing specifically for the drugs found in the driver’s possession, CAMI found perazine in the driver’s urine but not in his blood—indicating that he was likely no longer under the effect of the drug at the time of the accident.¹⁵ A screening test found dipyrone in the driver’s blood, but the specimen was insufficient for confirmation.

The Royal Dutch Society for the Advancement of Pharmacy has compiled a list of drugs that can affect driving based on pharmacodynamic profile or therapeutic class, and a nonmandatory yellow warning label with black lettering is used to indicate that a specific drug can affect driving performance. Perazine is recommended to carry such a label. Dipyrone is a nonnarcotic painkiller similar in action to acetaminophen. No psychomotor impairment would typically be expected from its use. The driver had noted to medical personnel at the jail that he suffered from arthritis, and it is likely that he was prescribed the medication for this purpose.

The driver clearly had at least one condition, and had been prescribed at least two medications, that should have called into question his ability to safely operate a commercial vehicle. He had not, however, revealed his condition or medications to the examiner performing his last CDL medical examination, so they could not be evaluated in that context. It is unclear what effect, if any, his psychiatric condition(s) or medications had on the accident.

Cellular Telephone Use

Evidence recovered from the crash indicated that the driver possessed two cell phones. Records were obtained from both service providers. One provider showed no activity in the 72 hours prior to the crash; records from the second provider (Verizon) showed substantial activity in the same time frame, as summarized in the following table.

Table. Summary of cell phone usage by Freightliner driver, September 18–20, 2004.

Date (2004)	First Call	Last Call	Calls Made	Calls Received
Sept 18	10:06 a.m.	8:54 p.m.	16	14
Sept 19	5:52 a.m.	9:00 p.m.	29	6
Sept 20	4:03 a.m.	4:24 p.m. ^a	74	23
^a The 4:24 p.m. call on September 20 was the last call prior to the accident at 4:29 p.m.				

¹⁵ Perazine is an antipsychotic medication for the treatment of schizophrenia; it is available by prescription in only four European countries. As with other drugs in the same class, it presents a risk of causing abnormalities of movement, which would usually be apparent with the first dose. Serious side effects reported (rarely) with perazine include delirium and sedation.

The last call to or from the driver's cell phone prior to the crash was an outgoing call placed at 4:24 p.m., which lasted 60 seconds. The first 911 call regarding the accident was received at 4:29 p.m.¹⁶ NTSB investigators determined that the time at the 911 call center in Sherman, Texas, was 3 seconds behind official U.S. time.¹⁷ Investigators also attempted to determine the relationship between Verizon call time and U.S. time but were told that Verizon call time is not coordinated with any time standard. When a Verizon network phone was checked a few weeks after the accident, the time was 4 seconds behind official U.S. time.

In the 24 hours preceding the accident, the driver made 97 calls and received 26 calls. The average duration of each outgoing and incoming call was 2.5 minutes and 1 minute, respectively. According to the driver's cell phone records, in the last half hour of calls logged preceding the crash, the driver spent 14 minutes—or 48 percent of his time—on the phone (excluding time spent dialing or retrieving the phone). Cell phone use is considered to impair driver control of a motor vehicle and to increase the risk of driver involvement in an accident.¹⁸

According to the Sherman Police Department report, which appears in the docket, one witness interviewed by the police stated that the Freightliner driver was using a cell phone prior to the accident, and another witness stated that the driver was using a cell phone at the time of the accident. The review of the driver's cell phone log makes it unlikely that he was conversing just prior to the accident sequence. However, given the frequency of his phone use and the sudden left steering input, the NTSB is unable to rule out the possibility that the driver may have taken his eyes off the road to dial or retrieve his phone just prior to his sudden left steer input.

Motor Carrier

The accident motor carrier was identified as KV Express, Inc., which was registered with the Federal Motor Carrier Safety Administration (FMCSA) on February 4, 2004, as an interstate "for hire" carrier and was assigned U.S. Department of Transportation (USDOT) identification number 1210971. KV Express was registered as a carrier of general freight with four power units (truck tractors) and four interstate drivers. KV Express estimated that its vehicles travel 270,000 miles per year.

On May 27, 2004, the FMCSA conducted a new entrant safety audit of KV Express. Because KV Express is not a hazardous materials carrier, five factors were considered in this examination. KV Express failed the driver factor by not correctly answering three questions deemed to be critical to managing safe drivers; however, the carrier passed the other four factors

¹⁶ According to the Sherman police, the times of 911 calls are recorded automatically when the calls are received.

¹⁷ See <<http://www.time.gov>>, created by the National Institute of Standards and Technology and the U.S. Naval Observatory. The official U.S. time is maintained to within 0.1 second of Coordinated Universal Time. When the time at the Sherman 911 center was 13:11:30, U.S. time was 13:11:33.

¹⁸ Virginia Tech Transportation Institute research indicates that for operators of heavy vehicles/trucks, the risk of a crash or near-crash event—when compared with nondistracted driving—is 5.9 times higher when the driver is dialing a cell phone and 6.7 times higher when the driver is using or reaching for an electronic device. See <http://www.vtti.vt.edu/PDF/7-22-09-VTTI-Press_Release_Cell_phones_and_Driver_Distractio.pdf>, accessed December 18, 2009.

and was determined to “pass” overall, indicating that it had adequate safety management controls in place.

Two days following the accident, on September 22, 2004, the FMCSA initiated a compliance review of KV Express. The compliance review revealed discrepancies in the driver, operational, and vehicle areas; and the carrier was issued a “conditional” safety rating. The FMCSA also initiated an enforcement action against KV Express for using a driver before receiving preemployment drug test results, using a driver not medically reexamined for 24 months, and failing to properly enter duty status during meal stops. The enforcement action resulted in a fine of \$2,610.

KV Express was previously known as KV Trucking, Inc. The owner and his wife shared the responsibilities and duties of running the company. The husband was the president, handled most business matters, and drove only occasionally. KV Trucking was registered with the FMCSA and had been assigned USDOT identification number 879903 on December 6, 2001. KV Trucking operated four power units with six interstate drivers. The company ceased operation in February 2004 but was still listed as an active carrier by the FMCSA at the time of the accident.

Because the FMCSA had not been notified by the owners that KV Trucking was inactive, the company was considered an active carrier in the FMCSA database. The NTSB database inquiry response at the time of the accident was based on the prior 24 months. During this time, KV Trucking vehicles had been subjected to 15 vehicle inspections, of which 4 inspections resulted in a vehicle out-of-service (OOS) violation—for an OOS rate of 26.7 percent, compared to the national OOS average of 22.92 percent. KV Trucking drivers had been subjected to roadside driver inspections 22 times, during which 4 drivers were placed out of service—for a driver OOS rate of 18.2 percent, compared to the national OOS average of 6.78 percent.

The rationale for KV Trucking becoming KV Express is unclear. According to the husband and wife owners, the husband wanted to return to driving duties. The NTSB did not discover any unpaid fines or FMCSA orders to cease operating against KV Trucking. However, the company’s driver OOS average was nearly three times greater than the national average. There is no apparent justification for the KV Express application as a new entrant carrier. The FMCSA has recently developed new procedures to identify existing carriers who attempt to reincarnate themselves through the new entrant program.

Ejections From Pickup Truck

Of the six passengers in the Ford pickup truck, four were either partially or fully ejected. One of these passengers had been sitting in the front seat and was partially ejected out the front right door as it was torn open during the accident sequence. All three passengers who had been sitting in the enclosed bed of the pickup were ejected—two of whom came to rest in the roadway and were killed. The third passenger was found on the roof of the upright pickup truck at final rest.

There are no restraints in open or enclosed cargo areas. In 1981, the NTSB conducted a safety study on fatalities and injuries associated with riding in cargo areas of pickups.¹⁹ The study focused on an accident involving a compact pickup truck carrying 11 passengers—3 riding in the cab and 8 riding in the open cargo area of the truck. The driver failed to negotiate a curve, and the truck ran off the road and overturned. Seven people in the cargo area were killed. The study also examined 1975–1979 data from the National Highway Traffic Safety Administration’s Fatality Analysis Reporting System involving accidents with occupants riding in the cargo areas of pickups. As a result of the study, the Board made a recommendation to the states to review existing laws and revise as necessary to prohibit passengers from riding in the open cargo area of a vehicle, except during work-related activities. (The status of Safety Recommendation H-81-68 is “Closed—Acceptable Action.”) As of February 2010, 30 states and the District of Columbia have enacted laws that restrict riding in the cargo areas of pickup trucks.²⁰

Probable Cause

The National Transportation Safety Board determines that the probable cause of the September 20, 2004, median crossover accident near Sherman, Texas, was the Freightliner driver’s startle response consisting of a sudden and sharp over control maneuver to the left in an unnecessary reaction to vehicles that were traveling a safe distance ahead of the truck, caused either by the driver’s significant lack of sleep, which resulted in a brief period of sleep or attention loss while driving, or by the driver’s attempted or imminent use of a wireless device, which distracted him from his driving duties. Contributing to the severity of the accident was the use of a pickup truck cargo area bed to transport passengers despite its lack of any occupant restraint system.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

DEBORAH A.P. HERSMAN
Chairman

ROBERT L. SUMWALT
Member

CHRISTOPHER A. HART
Vice Chairman

Adopted: April 8, 2010

¹⁹ *Fatalities and Injuries Associated With Riding in Cargo Areas of Pickup Trucks*, Highway Special Study NTSB/HSS-81/02 (Washington, DC: National Transportation Safety Board, 1981).

²⁰ See <<http://www.iihs.org/laws/cargoareas.aspx>>, accessed February 25, 2010.