HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

Fatal Grade Crossing Accident
Midland, Texas: 11/15/2012

HWY-13-MH-003
(30 pages)

NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY
WASHINGTON, D.C.

HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

A. ACCIDENT

Location:	At the intersection of South Garfield Street and the Union Pacific Railroad (UPRR), Mile Post 554.65, DOT grade crossing inventory #796-331L, Midland, Midland County, Texas
Vehicle #1:	2006 Peterbilt truck-tractor in combination with a 2005 Transcraft Eagle Drop Deck (Flatbed) Semitrailer
Operator #1:	Smith Industries of Midland, Texas
Vehicle #2:	Union Pacific Freight Train ZLCAI-14, consisting of 4 locomotives and 84 loaded cars
Operator #2:	Union Pacific Railroad (UPRR)
Vehicle #3:	2008 Ford Crown Victoria Police Interceptor
Operator #3:	Midland County Sheriff's Office
Date:	November 15, 2012
Time:	Approximately 4:35 p.m. CST
NTSB #:	**HWY-13-MH-003**

B. HUMAN PERFORMANCE FACTORS GROUP

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C. ACCIDENT SUMMARY

For a summary of the accident, refer to the *Accident Summary* report in the docket for this investigation.

D. DETAILS OF THE HUMAN PERFORMANCE FACTORS INVESTIGATION

The accident discussed in this report involves a collision between a 2006 Peterbilt truck-tractor in combination with 2005 Transcraft Eagle Drop Flatbed Semitrailer with Union Pacific Railroad freight train ZLCAI-14. The 2006 Peterbilt combination vehicle was operating as part of a parade.

The Human Performance factual investigation focused on the behavioral, medical, operational, and environmental factors associated with the driver of the 2006 Peterbilt and the crew of Union Pacific Railroad (UPRR) freight train ZLCAI-14. Each person is discussed in separate sections below.

1. Factors Associated With the 2006 Peterbilt Driver

Information in this section and subsections was obtained from an interview with the driver,[1] his logbook,[2] records from his cell phone service provider,[3] and an interview with another driver in the parade. [4]

1.1. Behavioral Factors

1.1.1. Activities Prior to the Accident

Using the above-mentioned sources of information, investigators generated the following table of the driver's activities preceding the accident.

[1] Interview conducted on February 20, 2013; see Human Performance Factual Report Attachment 1: Narratives/Transcripts of Investigative Interviews.
[2] Available in the docket as an attachment to the Motor Carrier Group Chairman's Factual Report.
[3] Human Performance Factual Report Attachment 2: 2006 Peterbilt Driver's Cellular Telephone Records.
[4] See Human Performance Factual Report Attachment 2.

Table 1. 2006 Peterbilt driver activities prior to the accident[5]

Monday, November 12, 2012		
Time	Event	Source
5:15 a.m.	Driver logs on duty, not driving in Midland, TX	Logbook
5:30 a.m.	Driver logs driving in Midland, TX	Logbook
6:47 a.m.	Driver sends first outgoing data[6] of day	Cell records
10:45 a.m.	Driver logs on duty, not driving in Florence, TX	Logbook
11:00 a.m.	Driver logs sleeper berth in Florence, TX	Logbook
12:00 noon	Driver logs on duty, not driving in Florence, TX	Logbook
1:15 p.m.	Driver logs driving in Florence, TX	Logbook
4:27 p.m.	Driver receives, answers first call of day	Cell records
6:15 p.m.	Driver logs on duty, not driving in Midland, TX	Logbook
6:30 p.m.	Driver logs off duty in Midland, TX	Logbook
6:37 p.m.	Driver receives, answers last call of day	Cell records
unknown	Driver returns home	Interview*
unknown	Driver eats dinner	Interview*
8:11 p.m.	Driver sends last outgoing data of day	Cell records
9:30 p.m.	Driver goes to bed	Interview*
Tuesday, November 13, 2012		
Time	Event	Source
5:15 a.m.	Driver awakes	Interview*
5:40 a.m.	Driver leaves his house	Interview*
5:50 a.m.	Driver arrives at the yard	Interview*
6:40 a.m.	Driver sends first outgoing data of day	Cell records
7:00 a.m.	Driver logs on duty, not driving in Midland, TX	Logbook
9:15 a.m.	Driver logs driving in Midland, TX	Logbook
10:45 a.m.	Driver logs on duty, not driving in Patricia, TX	Logbook
6:00 p.m.	Driver logs driving in Patricia, TX	Logbook
6:50 p.m.	Driver checks his voicemail; first phone activity	Cell records
7:15 p.m.	Driver logs on duty, not driving in Midland, TX	Logbook
7:30 p.m.	Driver logs off duty in Midland, TX	Logbook
unknown	Driver returns home	Interview*
unknown	Driver eats dinner	Interview*
8:08 p.m.	Driver makes last outgoing call of day	Cell records
9:24 p.m.	Driver sends last outgoing data of day	Cell records
9:30 p.m.	Driver goes to bed	Interview*
Wednesday, November 14, 2012		
Time	Event	Source
5:15 a.m.	Driver awakes	Interview*
5:20 a.m.	Driver checks voicemail; first phone activity	Cell records

[5] When interviewed, the driver could not recall his specific activities on these days. Information marked with an asterisk (*) is based on the driver's description of a typical day.

[6] Text/SMS/Pictures are tracked together by the driver's cellular provider; this will be referred to as "data" in the table.

Wednesday, November 14, 2012 (continued)		
Time	Event	Source
5:40 a.m.	Driver leaves his house	Interview*
5:50 a.m.	Driver arrives at the yard	Interview*
6:43 a.m.	Driver sends first outgoing data of day	Cell records
7:00 a.m.	Driver logs on duty, not driving in Midland, TX	Logbook
8:14 a.m.	Driver makes outgoing call; first activity of day	Cell records
8:30 a.m.	Driver logs driving in Midland, TX	Logbook
11:30 a.m.	Driver logs on duty, not driving in Mentone, TX	Logbook
12:00 noon	Driver logs driving in Mentone, TX	Logbook
1:30 p.m.	Driver logs on duty, not driving in Kermit, TX	Logbook
2:15 p.m.	Driver logs driving in Kermit, TX	Logbook
3:30 p.m.	Driver logs on duty, not driving in Midland, TX	Logbook
4:00 p.m.	Driver logs off duty in Midland, TX	Logbook
unknown	Driver returns home	Interview*
unknown	Driver eats dinner	Interview*
6:00 p.m.	Driver watches M.A.S.H. on television	Interview*
6:00 p.m.	Driver makes last outgoing call of day	Cell records
7:00 p.m.	M.A.S.H ends	Interview*
9:30 p.m.	Driver goes to bed	Interview*
10:21 p.m.	Driver sends last outgoing data of day	Cell records
Thursday, November 15, 2012		
Time	Event	Source
5:15 a.m.	Driver awakes	Interview*
5:40 a.m.	Driver leaves his house	Interview*
5:50 a.m.	Driver arrives at the yard	Interview*
7:00 a.m.	Driver logs on duty, not driving in Midland, TX	Logbook
7:08 a.m.	Driver sends first outgoing data of day	Cell records
unknown	Driver helps other drivers with their loads	Interview
unknown	Driver has accident vehicle washed at yard	Interview
11:26 a.m.	Driver makes outgoing call; first activity of day	Cell records
unknown	Driver goes home, puts on uniform. returns	Interview
unknown	Driver polishes chrome on truck, puts on flags/chairs	Interview
2:15 p.m.	Driver logs driving in Midland, TX	Logbook
2:30 p.m.	Driver arrives at Double Tree hotel	Interview (Other)
unknown	Driver assists veterans onto flatbed	Interview
3:51 p.m.	Driver receives incoming data; last activity before accident	Cell records
4:02 p.m.	Parade begins	Video
4:36 p.m.	**Accident Occurs**	

1.2. Medical Factors

As part of the investigation, attempts were made to identify doctors who had treated or were treating the Peterbilt driver at the time of the accident in order to

determine if he had any medical conditions that may have caused or contributed to the accident. No such physicians were identified and when interviewed, the driver stated he did not see any doctors on a regular basis. He also told investigators he was not experiencing any health issues the day of the accident.

1.2.1. Commercial Driver Fitness Determination Exam

Commercial drivers in the United States are required by the Federal Motor Carrier Safety Regulations (FMCSRs) to be medically certified as being physically qualified to drive a commercial vehicle.[7] These examinations result in one of four outcomes with respect to medical qualification:

- The driver is found to meet the standards in 49 CFR §391.41 and is given a 2-year certificate;[8]
- The driver is found to meet the standards, but requires periodic evaluation for one or more conditions and is qualified for 3 months, 6 months, or 1 year;
- The driver is temporarily disqualified due to a condition or medication; or;
- The driver is found to not meet the standards.

The most recent commercial driver fitness determination for the driver of the 2006 Peterbilt prior to the crash was conducted on November 16, 2010 by a physician in Odessa, Texas.[9] In that exam, the driver indicated he had experienced illness/injury in the last five years and digestive problems. He indicated he was taking Omeprazole[10] for his stomach.

In the section for medical examiner comments, the physician performing the exam[11] noted the Omeprazole was for stomach reflux. He also noted the driver had undergone right regional hernia surgery, thyroid cyst removal, a chest tube in 2006,[12] and smoked less than one pack a day. The physician noted he advised the driver to stop smoking.

The driver's blood pressure was recorded as 122/84 and his pulse was regular with a rate of 60. The driver's urine specimen had a specific gravity of 1.010 and was

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[7] 49 Code of Federal Regulations §391.41.

[8] For more information on who must be examined and the examination process, please see 49 CFR §391.43 and 49 CFR §391.45.

[9] Human Performance Factual Report Attachment 3: 2006 Peterbilt Driver's Commercial Driver Fitness Determination Exam.

[10] Omeprazole is a proton-pump inhibitor marketed as Omesec or Prilosec. It is typically prescribed to treat gastroesophageal reflux disease (GERD), a condition in which backward flow of acid from the stomach causes heartburn and possible injury of the esophagus, conditions in which the stomach produces too much acid, or to treat and prevent ulcers. Over-the-counter, it is marketed to treat frequent heartburn (in this instance, frequent means it occurs two or more days a week). Information from: http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0000936/ (accessed November 21, 2012).

[11] The driver had not been seen or treated by this physician prior to this exam.

[12] A chest tube is a hollow, flexible tube inserted into the chest to drain blood, fluid, or air from around the lungs. Information from: http://www.nlm.nih.gov/medlineplus/ency/article/002947.htm (accessed February 26, 2013).

negative for protein, blood, and sugar. His height was recorded as 69 inches and his weight was recorded as 198 pounds, which corresponds to a Body Mass Index of 29.2. [13] The physician performing the exam indicated he observed no abnormalities in any of the driver's general body systems, with the exception of the genito-urinary system, for which the physician noted a left side inguinal hernia.

The Peterbilt driver was qualified for two years while wearing his prescription glasses. Therefore, his medical certification would have expired on November 16, 2012.

1.2.2. General Health

When interviewed by NTSB investigators, the driver described his general health as good, stating that acid reflux was his only medical condition. He further stated he had no allergies. He gave his height at either five feet nine inches or five feet ten inches and his weight as 180 pounds.[14]

1.2.3. Vision

When interviewed by NTSB investigators, the 2006 Peterbilt driver stated he wears glasses because he is nearsighted. He stated he was wearing his glasses at the time of the accident and was not experiencing any problems with his vision that day. In his November 2010 Commercial Driver Fitness Determination, the driver's corrected Snellen distant visual acuity[15] was measured as 20/20 with the right eye, 20/15 with the left eye, and 20/13 with both eyes. The driver's horizontal field of view was recorded as 80° with the right eye and 80° with the left eye. The physician noted the driver could recognize and distinguish between standard red, green, and amber colors.

1.2.4. Hearing

The Peterbilt driver described his hearing as "good" and told NTSB investigators he had never had any problems with his hearing, in general or on the day of the accident. In his most recent Commercial Driver Fitness Determination,[16] he was noted to be able to hear a forced whispered voice at 10 feet with both his left and right ears.

1.2.5. Medications (Prescription, Over-the-Counter, Other)

Investigators conducted a canvas of pharmacies in the area of the Peterbilt driver's home; no records of prescriptions in his name were found. When interviewed, the driver told investigators that Omeprazole, over-the-counter, was the only medication he was

[13] For BMI information, see: http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html.
[14] This would correspond to a BMI of 25.8 or 26.6.
[15] Snellen fractions are a measure of visual acuity (sharpness of sight). In the Snellen fraction, the first number represents the test distance (20 feet) and the second represents the distance at which the average eye could see the letters on a certain line of the chart. A fraction of 20/20 is considered normal vision.
[16] See Human Performance Factual Report Attachment 3.

taking on a regular basis. He stated he took over-the-counter pain medications as needed and did not take herbal supplements of any kind.

1.2.6. Alcohol and Drug Consumption

The Peterbilt driver told NTSB investigators he very seldom drinks alcohol and when he does, he typically consumes no more than three or four beers. The driver stated he did not consume any alcohol on the day of the accident. He also stated he does not take any illicit drugs.

1.2.7. Post-accident Toxicology

1.2.7.1. Law Enforcement

Following the accident, at the request of local law enforcement, a blood sample was taken from the Peterbilt driver. Safety Board investigators requested a split of the sample and were told the sample size was insufficient to allow a split. The results of testing performed by law enforcement have been requested by the Safety Board but have not yet been received.

1.2.7.2. Department of Transportation Required Post-accident Drug and Alcohol Testing

Under Federal regulations,[17] the employers of commercial drivers involved in an accident resulting in the loss of human life are required to test their surviving drivers for alcohol and controlled substances. The Peterbilt driver's employer sent a technician to the hospital to collect samples from the driver. Breath alcohol testing was performed at 8:11 p.m. on November 15, 2012 using a Lifeloc Technologies Phoenix 6.0 machine. The results were reported as a 0.000 blood alcohol level. The technician also collected a urine sample at 8:27 p.m. The sample was tested in accordance with 49 CFR Part 40[18] and was negative for alcohol and the five classes of drugs specified in the regulations. [19]

1.2.8. Psychological Factors

When interviewed, the driver stated he had not experienced any significant life changes or stressors in the days and weeks prior to the accident. He lives alone and was not in a relationship at the time of the accident.

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[17] 49 CFR § 382.303 requires post-accident testing of blood for alcohol and urine for controlled substances.

[18] Laboratories must test for the following five drugs or classes of drugs in a DOT drug test: (1) marijuana metabolites, (2) cocaine metabolites, (3) amphetamines, (4) opiate metabolites, and (5) phencyclidine (PCP). In 2010, the DOT modified its tested drugs and drug cutoff concentrations to harmonize with drug testing requirements set by the U.S. Department of Health and Human Services, which added additional tests for MDMA, MDA, and MDEA to the amphetamine drug group.

[19] Human Performance Factual Report Attachment 4: 2006 Peterbilt Driver's Post-Accident Toxicological Testing Results.

1.2.9. Sleep Habits

When interviewed by NTSB investigators, the driver stated on days he has to work he typically goes to bed by 9:30 or 10:00 p.m. and gets up at 5:15 a.m. in the morning. He also stated on his days off he typically goes to bed by 11:00 p.m. and gets up at 7:00 a.m. He stated he typically feels rested when he awakes and described the quality of his sleep at good or average quality. He told investigators he has no trouble falling asleep or awaking in the morning and does not nap. When asked, he stated he typically does wake one time during the night but has no trouble falling back asleep. He stated he uses an alarm clock on the days he has to get up at a particular time.

Based on his logbook and interview, the driver had approximately 7 hours of time in bed the night prior to the accident and 7.75 hours time in bed each of the two nights prior to that night.

1.3. Operational Factors

1.3.1. Licensing

The driver of the 2006 Peterbilt truck-tractor was a 50-year-old male. At the time of the accident, he held a Texas class "A" commercial driver's license[20] (CDL) with the "N" (tank) endorsement and a prescription glasses ("A") restriction, issued on 02/21/2012 and expiring on 01/26/2017.[21] He held a current medical card (see above).

When interviewed by NTSB investigators, the driver stated be got his first driver's license when he was sixteen; this was a non-commercial driver's license issued in Nevada. He told investigators he first received a commercial driver's license in 1989 or 1990. At that time, he had a tanker endorsement and a corrective lenses restriction. Both remain in effect on his current license.

1.3.2. Training / Experience

1.3.2.1. General Experience

In his September 2011 application to work for Smith Industries, the driver indicated he had approximately 27 months experience driving trucks, including van, tank, and flatbed straight trucks and tractor semi-trailer trucks. In addition to his civilian experience, the driver indicated he had served as a driver examiner in the United States Army (USA) and had earned the driver's badge[22] while serving. Counting his

[20] A Texas class "A" CDL allows the operation of any combination of vehicles with a gross combination weight rating of 26,001 pounds or more, provided the gross vehicle weight rating of the vehicle or vehicles towed exceeds 10,000 pounds.

[21] The driver's license also allows the operation of a motorcycle.

[22] Per Army Regulation 600-8-22, revised 15 September 2011, the Driver and Mechanic Badge is awarded to drivers, mechanics, and special equipment operators to denote the attainment of a high degree of skill in the operation and maintenance of motor vehicles. For drivers to qualify, they must: (1) qualify for and possess a current U.S. Government Motor Vehicles Operator's Identification Card, issued as prescribed by

employment with Smith Industries, the driver would have had a total of approximately 41 months of civilian commercial driving experience.

1.3.2.2. Training

The driver completed a road test as part of his 2011 application for employment with Smith Industries. The safety/compliance officer rated his performance as satisfactory and qualified the driver to operate straight trucks and tractor-semitrailers.

When interviewed, the driver stated he had received training through his high school prior to obtaining his first driver's license and had taken training and classes through the United States Army. He stated his last training had been within the past year, through the Army. He stated he did not receive any recurrent training through his employer.

1.3.2.3. Specific Experience

1.3.2.3.1. Route Experience

When interviewed, the driver stated this was his first experience with the Hunt for Heroes parade. He told investigators he had been over the Garfield crossing many times, but believes the accident was the first time he had gone over the crossing in a commercial vehicle.

1.3.2.3.2. Vehicle Experience

When interviewed, the driver told NTSB investigators he had "years" of experience with Peterbilt truck-tractors, but the accident trip was his first time driving this particular truck. His usual, everyday truck was a Peterbilt. He stated there were no problems with either the truck or the trailer the day of the accident.

1.3.3. Accident / License History

A National Driver Register[23] inquiry revealed no pointers for the driver.[24] The driver's Texas driver's history is discussed in the Motor Carrier Group Chairman's Factual Report.

AR 600-55 and, (2) Be assigned as a driver or assistance driver of a government vehicles for a minimum of 12 consecutive months, or during at least 8,000 miles with no government motor vehicle accident or traffic violation recorded on his or her DA Form 348-1-R, or (3) Perform satisfactorily for a minimum period of 1 year as an active qualified driver instructor or motor vehicle driver examiner.

[23] The National Driver Register (NDR) is a database containing information on U.S. drivers who have had their licenses revoked or suspended, or have been convicted of serious traffic violations.

[24] Human Performance Factual Report Attachment 5: Results of National Driver Register inquiry for the 2006 Peterbilt Driver.

1.3.4. Company Policies

When interviewed, the driver told investigators his employer requires pre-trip inspections and that he completed one the day of the accident. According to the driver, the company also has policies on seat belt use (drivers are to wear them), cell phone use (hands-free only), and what to do in case of an accident (driver was unsure of what the policy said). The driver stated he was wearing his seatbelt and was not using his phone at or near the time of the accident. According to the driver, the company has a drug and alcohol policy and uses pre-employment and random drug testing. The driver had completed pre-employment test and had been selected for random testing.

1.4. Task Factors

1.4.1. Accident Trip

At the time of the accident, the 2006 Peterbilt combination vehicle was participating in a parade organized by Show of Support Military Hunt, Incorporated.[25] The parade began at 117 West Wall Street, Midland; proceeded west on West Wall Street to south on S. Garfield Street and proceeded to the accident location at S. Garfield and W. Front Avenue. The parade was scheduled to end at the Midland County Horseshoe Arena, 2514 Arena Trail. The complete route was approximately 3.1 miles long and the accident occurred approximately 2.0 miles into the route. The parade route is depicted graphically in Figure 1.

[25] For more information on this organization, please see the Motor Carrier Group Chairman's report.

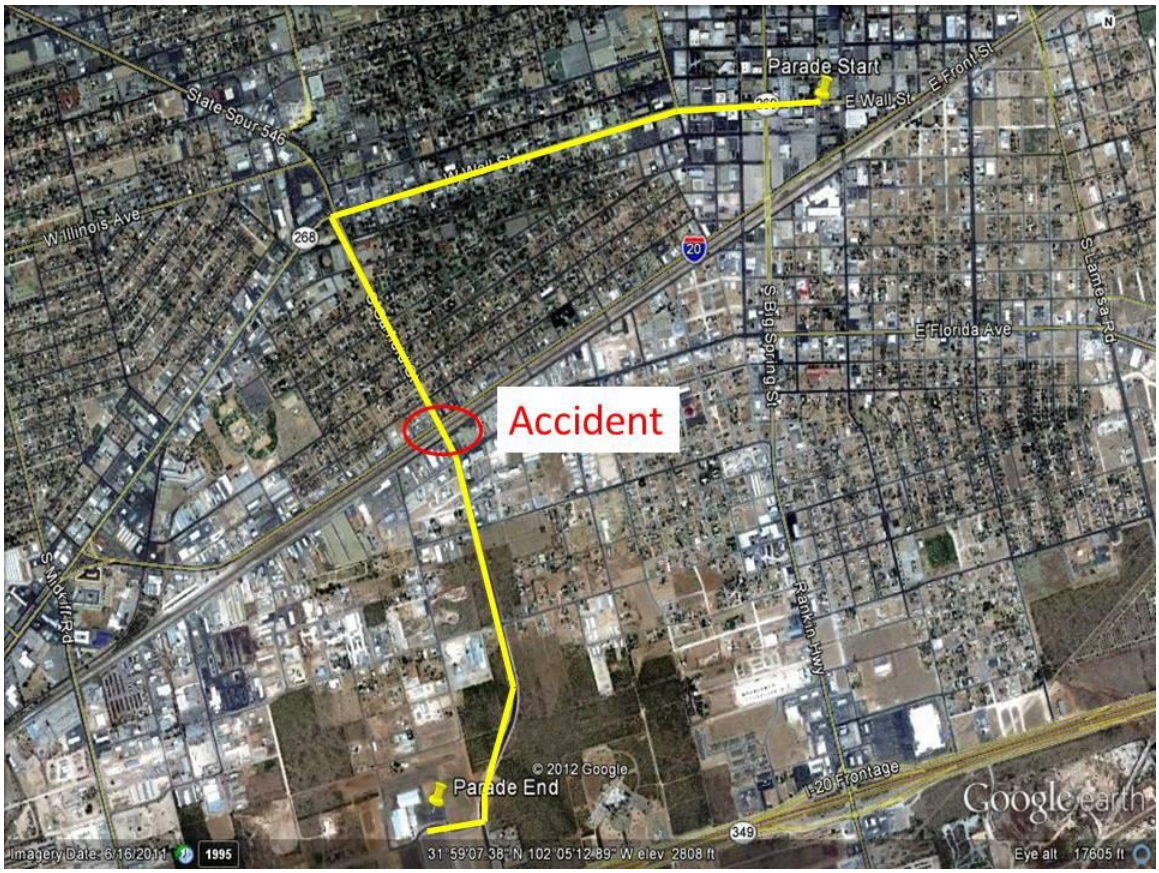

Figure 1. The parade route with the accident location circled in red. (Base image taken from Google Earth)

When interviewed, the Peterbilt driver told investigators this was his first parade and his first involvement with Show of Support Military Hunt, Incorporated. He stated he had been asked if he would be interested in driving in the parade. When asked, he stated he did not participate in any meetings about the parade. He got information on the route of the parade and the time and place of the start from a co-worker who was also going to be participating by driving a commercial vehicle carrying passengers.[26]

During his interview with NTSB investigators, the driver stated he asked driver of the commercial vehicle immediately ahead of him in the parade (first truck) about spacing between the vehicles and was told to stay a couple of truck-lengths behind. The Peterbilt driver told investigators he was in "1 gear" for the entire parade. He stated he made a left onto Garfield and, a block later, the marching band left the parade and the Patriot Guard motorcycle club took their place. According to the driver, the speed of the parade increased at this point. As his speed was near 20 miles per hour (MPH), he radioed the first truck and was told that the speed always increased at this point. The driver also told investigators that he did not want to shift gears with people on the trailer.

[26] The co-worker had participated in the parade previously and was operating the vehicle immediately in front of the accident vehicle in the parade.

The driver stated that as he approached the accident crossing, he was concerned about its height and his speed as he passed over the bump at the bottom of the hill. He told investigators he was looking in his left-side mirror to see when the tires on the trailer cleared the bump. When his tires had cleared the bump, he shifted to looking in his right-side mirror. He stated he saw flashing lights in that mirror, but he did not attach any meaning to them, as they were "just more flashing lights". The driver also stated he looked down the tracks and saw the train, but that it appeared stationary. Through his mirror, the driver saw the crossing gate come down and strike one of the flags mounted on the trailer. The driver stated he saw, through his mirrors, people jumping off the trailer just before impact.

When asked by investigators about the warning bells and train horn, the driver stated the first truck had a train horn and it was blowing the whole parade; he was not sure if he heard that or the horn from the train. He stated he did not remember hearing the warning bells at the crossing.

When asked by investigators about the police presence during the parade, the driver stated he was escorted by two police cars, one on either side of his truck. He noted there were police blocking off the intersections all along the parade route as well. He stated he thought the officers were there to keep his path clear. The driver could not recall how many intersections he passed through during the parade. The driver stated he did not specifically recall seeing the traffic light at Front and that he never bothered to look at the traffic lights during the parade because the intersections were blocked off.

1.4.1.1. Observations of Lead Driver

The driver of the commercial vehicle immediately ahead of the accident vehicle in the parade (first truck) provided a statement to the NTSB describing various aspects of the parade and its operation.[27]

According to the driver of the first truck, he was not provided any written information of the operation of the parade or its route. He stated he just followed the vehicle in front of him. He also told investigators there were fire trucks and police cars participating in the parade, with sheriff's deputies escorting both trucks and Midland police cars blocking the intersections. The lead driver stated he was going through red lights at those blocked intersections as the parade progressed.

When asked about the highway-railroad grade crossing where the accident occurred, the lead driver that stated as he approached, he saw the cross traffic was stopped because police officers had the intersection blocked. He described the crossing as a "[big] deal", stated he was going slow, and was concerned with the trailer bouncing. He also told investigators he never saw red lights or heard bells or the train horn. When asked, he stated he did not recall the traffic signal color as he approached the crossing, because the police had the intersection "blocked and under control." He went on to state

[27] Please see Human Performance Factual Report Attachment 2.

he was looking forward and at his mirrors as he crossed. He told investigators he did not stop as he crossed the tracks.

1.4.1.2. Sheriff's Office Patrol Car Video

NTSB investigators obtained and reviewed a copy of a video from the Sheriff's Office patrol car immediately to the right of the accident truck.[28] The video showed that from the start of the parade, the accident truck passed through six intersections controlled by a traffic light prior to the intersection with West Front Avenue. Of those six intersections, five were observed to be directly under the control of police officers.[29] Also, five of the traffic signals were red as the accident truck passed through the intersection. The speed of the accident vehicle was constant as it passed through each of those intersections. Time elapsed from the start of the parade until the accident was approximately 34 minutes. The vehicles did not stop once the parade began.

The traffic light at West Front Avenue was observed to be red in color as the accident truck approached and it remained red in color as the accident truck passed it and entered the crossing. This intersection and the one on the other side of the railroad tracks were under police control as well.

1.4.1.3. Lead Vehicle Horn

As part of the investigation, NTSB investigators spoke with a professional photographer hired to take pictures and video of the Show of Support parade. According to the photographer,[30] the driver of the lead truck, where one of the cameras was mounted, was concerned that what he described as a "train horn" would bother the camera. The driver told the photographer there was an actual train horn installed on his truck.

1.4.2. Workload / Distraction

1.4.2.1. External Workload / Distraction

Following the accident, NTSB investigators examined the environment outside the vehicle at the accident location. [31] In the direction of the Peterbilt's travel, investigators noted no unusual or complex billboards, displays, or lighting. No other potential distractions were noted by investigators and none were visible on the video from the Sheriff's office patrol car. A picture of the crossing, taken from an exemplar vehicle, can be found as an attachment to this report.[32]

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[28] Please see the Video Group Chairman's Factual Report for additional details.
[29] The traffic light without a police presence was the first encountered, shortly after the start of the parade.
[30] See Human Performance Factual Report Attachment 2.
[31] For a detailed description of the roadway and intersection, please see the Highway Group Chairman's Factual Report.
[32] Human Performance Factual Report Photograph 1: View of Crossing from Exemplar Peterbilt.

When interviewed by NTSB investigators, the driver stated that he was concerned for the comfort and safety of his passengers as he passed through the Garfield crossing.

1.4.2.2. Internal Workload / Distraction

1.4.2.2.1. Portable Electronic Devices

The driver told investigators the only portable electronic device in the truck was his personal cellular telephone. He stated he was not using it at or near the time of the accident and this was confirmed by records from his service provider.

1.4.2.2.2. Other Distractions Internal to the Vehicle

The accident truck-tractor was equipped with a Citizen's Band (CB) radio. According to the driver, the CB was on and he used it during the parade to communicate with the driver of the vehicle immediately ahead of him (another commercial vehicle carrying passengers). The driver could only communicate with the vehicle ahead of him; he specifically stated he could not communicate with any police officials. The driver told investigators the CB was not in use when either commercial vehicle was using the Garfield crossing.

2. Factors Associated With the Locomotive Engineer

Information in this section and subsections was drawn from interviews of the locomotive engineer conducted by NTSB investigators[33] and his cell phone records.[34]

2.1. Behavioral Factors

2.1.1. Activities Prior to the Accident

Based on the above-mentioned sources of information, the following table of the locomotive engineer's activities preceding the accident was generated.

Table 2. Locomotive engineer activities

Monday, November 12, 2012		
Time	Event	Source
6:00 a.m.	Engineer awakes	Interview
6:46 a.m.	Engineer makes an outgoing cell call (first activity of day)	Cell records
6:50 a.m.	Engineer sends text message (first activity of day)	Cell records
7:10 a.m.	Engineer leaves home for Sweetwater, Texas	Interview
8:00 a.m.	Arrives in Sweetwater	Interview
4:00 p.m.	Rules class ends; departs Sweetwater	Interview
6:21 p.m.	Engineer receives cell call (last activity of day)	Cell records
7:51 p.m.	Engineer receives text message (last activity of day)	Cell records
11:00 p.m.	Engineer goes to bed	Interview
Tuesday, November 13, 2012		
Time	Event	Source
6:00 a.m.	Engineer awakes	Interview
6:16 a.m.	Engineer sends text message (first activity of day)	Cell records
7:05 a.m.	Engineer makes an outgoing cell call (first of day)	Cell records
unknown	Engineer departs for Sweetwater	Interview
3:00 p.m.	Rules class ends; departs Sweetwater	Interview
unknown	Engineer arrives at family ranch in Sylvester, Texas	Interview
unknown	Engineer hunts, returns to ranch house	Interview
11:00 p.m.	Engineer goes to bed	Interview
11:19 p.m.	Engineer receives text message (last activity of day)	Cell records
11:43 p.m.	Engineer makes outgoing cell call (last of day)	Cell records
Wednesday, November 14, 2012		
Time	Event	Source
5:30 a.m.	Engineer awakes	Interview
~5:50 a.m.	Engineer in deer blind	Interview
6:33 a.m.	Engineer gets text message (first activity of day)	Cell records
8:31 a.m.	Engineer checks voicemail (first cell activity of day)	Cell records
8:40 a.m.	Engineer receives call to report for duty	Interview

[33] See Human Performance Factual Report Attachment 2.
[34] Human Performance Factual Report Attachment 6: Cellular Telephone Records for Train Engineer.

Wednesday, November 14, 2012 (continued)		
Time	Event	Source
~10:00 a.m.	Engineer departs ranch	Interview
unknown	Engineer stops at Whataburger and picks up breakfast	Interview
unknown	Engineer arrives in Sweetwater	Interview
unknown	Engineer departs Sweetwater onboard train	Interview
unknown	Engineer assumes control of train in Big Spring, Texas	Interview
unknown	Arrives in Pecos, Texas and ties up	Interview
unknown	Goes to La Fiesta for dinner	Interview
unknown	Engineer texts his wife	Interview
9:58 p.m.	Engineer makes cell call (last activity of day)	Cell records
11:00 p.m.	Engineer goes to bed	Interview
11:06 p.m.	Engineer receives text message (last activity of day)	Cell records
Thursday, November 15, 2012		
Time	Event	Source
~9:15 a.m.	Engineer awakes	Interview
9:30 a.m.	Engineer sends text message (first activity of day)	Cell records
~11:00 a.m.	Engineer has lunch at Old Mill BBQ & Burritos	Interview
11:30 a.m.	Engineer makes cell call (first of day)	Cell records
11:40 a.m.	Engineer called by Union Pacific for 1:40 p.m. on-duty	Interview
unknown	Engineer returns to Oak Tree Inn; watches TV	Interview
1:17 p.m.	Engineer makes last cell call before accident (lasts 36 seconds)	Cell records
~1:25 p.m.	Engineer reports to crew room in hotel; goes on-duty	Interview
1:57 p.m.	Engineer checks out of hotel	Hotel
unknown	Called by inbound train; departs hotel for crew change	Interview
2:06 p.m.	Engineer receives text message (last activity before accident)	Cell records
2:15 p.m.	Train departs	Interview
4:36 p.m.	**Accident Occurs**	

2.2. Medical Factors

As part of the investigation, the Engineer's medical records were obtained. A preliminary review of these records by the Human Performance Investigator did not reveal any medical issues relevant to this accident.

2.2.1. General Health

The engineer was a 35 year-old male. When interviewed, he described his health as "extremely fit". He stated he sees a nurse practitioner in his hometown when necessary, and she was his only medical provider. He stated he is six feet two inches tall and weighs 210 pounds, which corresponds to a Body Mass Index of 27. [35]

[35] For BMI information, see: http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html.

2.2.2. Vision

When interviewed, the engineer described his vision as good. He stated his only regular eye exam is conducted every three years, as part of his employment with the railroad. His last such exam was two and a half years ago. The engineer does not wear glasses or contacts.

2.2.3. Hearing

When interviewed, the engineer described his hearing as good and stated his hearing is examined every three years, along with his vision, as part of his employment with the railroad.

2.2.4. Medications (Prescription, Over-the-Counter, Other)

When interviewed, the engineer stated he did not take any prescription medications or herbal supplements. The engineer stated he does occasionally take a multi-vitamin, when he remembers. He did not take the multi-vitamin on the day of the accident. A canvas of pharmacies in the area of the engineer's residence did not indicate the engineer had any current prescriptions[36] at the time of the accident.

2.2.5. Alcohol and Drug Consumption

When interviewed, the engineer stated he drinks alcohol occasionally and does not take illicit drugs. He stated he had not consumed any alcohol on the day of the accident.

2.2.6. Post-accident Toxicology

Post-accident toxicological testing of railroad employees is governed by 49 CFR §219, Subpart C; section 219.210(b) specifically states that no testing may be required if the accident occurs at a grade crossing; therefore, no testing was performed on the engineer.

2.2.7. Psychological Factors

When asked about sources of stress or recent major changes in his life, the engineer stated there had been no recent changes and no major life events.

[36] A current prescription would be one filled on a date and in a quantity such that the engineer would be expected to be taking the medication on the day of the accident.

2.2.8. Sleep Habits

When interviewed, the engineer stated he sleeps well, has never had a hard time falling asleep, and does not wake up in the middle of the night. He described himself as a sound sleeper and an early riser. He has never been told he snores.

Based on the engineer's statements during the interview and his cell phone records, he received the following time in bed the three nights prior to the accident:

- A minimum of 5.75 hours;
- A maximum of 10.25 hours;
- A total of 23 hours; and
- An average of 7.7 hours.

2.3. Operational Factors

2.3.1. Training / Experience

2.3.1.1. General Experience

According to the Rail Operations Group Chairman's Factual Report, the engineer had nine years of experience working for the railroad, all of it with the Union Pacific Railroad. This experience consists of 2 years as a brakeman/conductor and 7 years as an engineer. At the time of the accident, the engineer was fully certified and qualified.

2.3.1.2. Training

Information on the engineer's training can be found in the Rail Operations Group Chairman's Factual Report.

2.4. Task Factors

2.4.1. Accident Trip

Union Pacific Train ZLCAI-14 originates in Los Angeles, California, with an ultimate destination of Atlanta, Georgia. From Los Angeles to Shreveport, Louisiana the train is controlled by Union Pacific. In Shreveport, the train is handed off to the Kansas City Southern Railroad, which takes the train from Shreveport to Meridian, Mississippi. In Meridian, the train is handed off to the Norfolk Southern Railroad, who takes the train to Atlanta. The crew on the train at the time of the accident was scheduled to operate the train from Pecos, Texas to Sweetwater, Texas, where they were to hand off the train to another Union Pacific crew to continue the train's movement.

The engineer described the departure from Pecos, Texas as ordinary with the train handling well. As the train was in the vicinity of Pyote, Texas, they received a radio

notification of a speed restriction at a crossing west of the accident crossing. The engineer stated they were cleared through that crossing by a maintainer.[37]

As the train was approaching Metz, TX,[38] they received a stop signal as part of a stop test.[39] According to the engineer, they performed well and were debriefed. The train proceeded on and the engineer described normal operation of the train through Odessa and the west end of Midland.

The engineer stated that as the train came to the start of the quiet zone, his speed was 62 or 63 miles per hour (MPH) and he was in "Throttle 5". As the train approached the Garfield Street crossing, the engineer saw a truck-tractor in combination with a flatbed trailer cross the tracks at a "fairly slow" speed. When asked, he could not estimate how close to the crossing the train was at that time. The engineer remarked this is not an uncommon sight, as flatbed trailers are common in west Texas, but this one struck him as odd, and he could not identify the cargo. As the train got closer to the vehicle, the engineer saw an individual on the flatbed turn his head; the engineer saw his eyes and realized there were people on the flatbed. He remarked that he had never seen people on a flatbed before.

The engineer stated he turned his attention to the second tractor-trailer. He noted that it was moving very slowly, and he thought it was about to stop – it was moving that slowly. The engineer blew the train's horn. The engineer stated the tractor-trailer never stopped; it just kept going at a constant speed. When the engineer realized the tractor-trailer was not going to stop he threw the train into emergency. He could not recall the train's exact speed, but believes it was 62 or 63 MPH. The engineer could not estimate how many people were on the float, but stated he saw them jumping off the flatbed. He specifically recalled one pair, directly over the tracks, hold hands and jump off the trailer. He stated he saw them hit the ground and their feet go out from under them, then the train struck the trailer.

The engineer stated he called 911 while the train was still moving. He characterized the emergency response as quick, stating that two police vehicles passed the train going to the accident scene before the train came to a stop. An officer boarded the train shortly after the collision to see if the crew was okay or needed anything.

2.4.2. Workload / Distraction

When interviewed, the engineer was asked about distractions at the time of the accident, including distractions internal to the vehicle (radios, other crew, GPS devices,

[37] A Union Pacific Railroad employee working on that section of track.
[38] Metz, TX is located approximately 69 miles east of Pecos, TX and 40 miles west of Midland, TX.
[39] Per the Operations Group Chairman, the crew received a signal displaying approach and a signal displaying stop. Upon receiving the first signal, the train should immediately slow to the required speed. Upon receiving the second signal, the train must stop before any part of the train passes the signal. These tests are specified in 48 CFR 217.9, which requires the railroad to periodically conduct operational tests to determine compliance with operating rules, timetables, and timetable special instructions.

cell phones, etc.) and distractions external to the vehicle (trains, vehicle traffic, glare/light, signs, etc.).

2.4.2.1. External Workload / Distraction

The engineer described the environment inside the train cab as he approached the Garfield Street crossing as being the same as any other trip (ordinary).

2.4.2.2. Internal Workload / Distraction

2.4.2.2.1. Portable Electronic Devices

When interviewed, the engineer stated he had his personal phone with him, but that it was stowed and not in use at any time while he was on the train. He identified his phone as being made by Samsung and provided his phone number and service provider.

2.4.2.2.2. Other Distractions Internal to the Vehicle

When asked, he stated he had no portable electronic devices, other than his phone, with him at the time of the accident.

3. Factors Associated With the Train Conductor

3.1. Behavioral Factors

Information in this section and subsections is based on an interview of the conductor by NTSB investigators[40] and his cell phone records.[41]

3.1.1. Activities Prior to the Accident

Based on the above-mentioned sources, the following table of the conductor's activities preceding the accident was generated.

Table 3. Train conductor activities

Monday, November 12, 2012		
Time	Event	Source
6:35 a.m.	Conductor receives incoming call (first of day)	Cell records
10-noon	Conductor awakes	Interview
5:57 p.m.	Conductor receives text message (first/last of day)	Cell records
8:39 p.m.	Conductor makes outgoing call (last of day)	Cell records
11:30-mid	Conductor goes to bed	Interview
Tuesday, November 13, 2012		
Time	Event	Source
9:54 a.m.	Conductor receives incoming call (first of day)	Cell records
10-noon	Conductor awakes	Interview
6:12 p.m.	Conductor receives incoming call (last of day)	Cell records
8:03 p.m.	Conductor receives text message (first/last of day)	Cell records
10:00 p.m.	Conductor goes to bed	Interview
Wednesday, November 14, 2012		
Time	Event	Source
6:00 a.m.	Conductor awakes using his alarm	Interview
Unknown	Conductor checks board to see where he is on list	Interview
8:30 a.m.	Conductor is called to go on duty	Interview
8:41 a.m.	Conductor receives incoming call (first of day)	Cell records
Unknown	Conductor drives from Abilene to Sweetwater	Interview
10:40 a.m.	Conductor goes on duty	Interview
10:55 a.m.	Train departs Sweetwater	Interview
3:09 p.m.	Conductor receives text message (first of day)	Cell records
3:15 p.m.	Conductor receives text message (last of day)	Cell records
6:30 p.m.	Train ties up in Pecos; conductor goes off duty	Interview
Unknown	Conductor has dinner at La Fiesta	Interview
Unknown	Conductor goes to Oak Tree Inn	Interview
9:13 p.m.	Conductor makes outgoing call (last of day)	Cell records
10:00 p.m.	Conductor goes to bed	Interview

[40] See Human Performance Factual Report Attachment 2.
[41] Human Performance Factual Report Attachment 7: Cellular Telephone Records for Train Conductor.

Thursday, November 15, 2012		
Time	Event	Source
9:00 a.m.	Conductor awakes	Interview
9:45 a.m.	Conductor makes outgoing call (first of day)	Cell records
11:44 a.m.	Conductor receives text message (first of day)	Cell records
11:48 a.m.	Conductor receives text message (last before accident)	Cell records
12:58 p.m.	Conductor receives incoming call (last prior to accident)	Cell records
1:40 p.m.	Conductor goes on-duty	Interview
1:57 p.m.	Conductor checks out of hotel	Hotel
2:15 p.m.	Train departs Pecos, Texas	Interview
Unknown	Undergoes a stop test	Interview
Unknown	Meets a train in Pegasus	Interview
4:36 p.m.	**Accident Occurs**	

3.2. Medical Factors

As part of the investigation, investigators attempted to locate doctors who had provided care to the train conductor. No records were found.

3.2.1. General Health

The conductor was a 27 year-old male. When interviewed, he described his health as good and stated he rarely gets sick. He stated he does not have a family doctor and does not regularly see a doctor for any reason. He stated he was five and a half feet tall and weighs 190 pounds, which corresponds to a Body Mass Index of 30.7. [42]

3.2.2. Vision

The conductor said he wears glasses because he is near sighted. He stated his glasses are comfortable, correct his vision appropriately, and he has not had any problems with them. He stated he has his eyes checked yearly and his last exam was in December 2011 at the Mohave Eye Center in Bullhead City, Arizona.

3.2.3. Hearing

When interviewed, the conductor stated he hears pretty well. He stated his hearing is checked yearly, through the railroad, at the same time they check his vision. His last hearing check was June 6, 2011.

[42] For BMI information, see: http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html.

3.2.4. Medications (Prescription, Over-the-Counter, Other)

When interviewed, the conductor stated he does not take prescription drugs. He stated he takes over the counter medication for allergies, switching between Zyrtec[43] and Allegra.[44] The conductor does not take any herbal supplements. A canvas of pharmacies in the area of the conductor's residence did not indicate the conductor had any current prescriptions[45] at the time of the accident.

3.2.5. Alcohol and Drug Consumption

When interviewed, the conductor told investigators he does not take any illicit drugs or drink alcohol.

3.2.6. Post-accident Toxicology

Post-accident toxicological testing of railroad employees is governed by 49 CFR §219, Subpart C; section 219.210(b) specifically states that no testing may be required if the accident occurs at a grade crossing; therefore, no testing was performed on the conductor.

3.2.7. Psychological Factors

When interviewed, the conductor denied having any significant stressors in his life. He is married and lives with his wife. The conductor did tell investigators that he had recently moved (November 9th to Abilene, Texas). He told investigators he spent the time from June, when he was hired, through September in a hotel at Union Pacific's expense. In October and the first part of November he lived with a friend from the railroad. When asked, he specifically stated that he had experienced no problems moving and the new apartment was working out.

3.2.8. Sleep Habits

When interviewed, the conductor stated he never has a hard time falling asleep, although he occasionally finds it tough to wake up. He estimated that it usually takes 15-20 minutes for him to fall asleep. He usually sleeps straight through the night and usually feels refreshed in the morning. He does snore, but has never been diagnosed with restless legs syndrome or sleep apnea. He has never had a sleep study (polysomnography) performed. He stated he uses an alarm on days he has to work because his job has no set

[43] Zyrtec (cetirizine) is an antihistamine used to temporarily relieve the symptoms of hay fever and allergy to other substances, as well as the itching and redness caused by hives. Available from: http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001035/ (accessed November 22, 2012).

[44] Allegra (fexofenadine) is an antihistamine used to relieve the symptoms of seasonal allergic rhinitis (hay fever) and the symptoms of hives. Available from: http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001008/ (accessed November 22, 2012).

[45] A current prescription would be one filled on a date and in a quantity such that the engineer would be expected to be taking the medication on the day of the accident.

schedule and when he is at home he sleeps until he wakes up. He told investigators that his sleep the night before the accident was undisturbed.

Based on the conductor's statements during the interview and his cell records, he received the following time in bed the three nights prior to the accident:

- A minimum of 8 hours;
- A maximum of 11 hours;
- A total of 29.5 hours; and
- An average of 9.83 hours.

3.3. Operational Factors

3.3.1. Training / Experience

3.3.1.1. General Experience

According to the Rail Operations Group Chairman's Factual Report, the conductor had eighteen months of railroad experience, all of it with the Union Pacific Railroad as a brakeman and conductor. At the time of the accident, the conductor was fully certified and qualified.

3.3.1.2. Training

Information on the conductor's training can be found in the Rail Operations Group Chairman's Factual Report.

3.4. Task Factors

3.4.1. Accident Trip

When interviewed, the conductor stated the train had clear signals from Pecos until they were east of Metz, [46] where they underwent a stop test.[47] After the stop test, the crew was debriefed and continued under a clear signal. The conductor stated they met (passed) a train in Pegasus under a clear signal during the approach and the departure.

The conductor stated he recalled the train passing the detector at milepost 560.7, as they were closing on the Garfield crossing. The conductor saw the first truck going over the crossing, and focused his attention there. When he saw the second truck pull onto the crossing, he knew the train was going to hit it. The conductor told investigators he couldn't tell what was on the trailer at first, but he realized it was people when they stood up and began jumping off the trailer. He stated that at the time he and the engineer realized there were people on the trailer they immediately put the train into emergency.

[46] Metz, TX is located approximately 69 miles east of Pecos, TX and 40 miles west of Midland, TX.
[47] See Footnote 30 for a description of a stop test.

The conductor stated he saw two people fall to the ground directly in front of the train. As the train was slowing to a stop, the crew attempted to contact the dispatcher, but the dispatcher was already calling them. As the engineer was describing the situation to the dispatcher, EMS units began arriving. The crew was told Union Pacific management was on the way. The conductor stated the crew remained on the train, as emergency units were on-scene and the crew would not have been able to do anything to help. The conductor recalled a police officer boarding the train to check on them.

3.4.2. Workload / Distraction

When interviewed, the conductor was asked about distractions at the time of the accident, including distractions internal to the vehicle (radios, other crew, GPS devices, cell phones, etc.) and distractions external to the vehicle (trains, vehicle traffic, glare/light, signs, etc.).

3.4.2.1. External Workload / Distraction

The conductor described outside environment during the accident trip as normal.

3.4.2.2. Internal Workload / Distraction

3.4.2.2.1. Portable Electronic Devices

When interviewed, the conductor said he had his personal phone with him, but that it was stowed and not in use at the time of the accident. He identified his phone as an iPhone 4S and provided his number and service provider.

3.4.2.2.2. Other Distractions Internal to the Vehicle

The conductor described the environment inside the cab as they approached the Garfield Street crossing as comfortable, with general conversation. He also stated he was enjoying the trip. When asked, he specifically stated the temperature and the noise were okay. He said the trip on the day of the accident was the same as previous trips he'd made.

4. Other Factors

4.1. Environmental Factors

In order to acquire accurate weather and illumination information, NTSB investigators used a Garmin® eTrex Global Positioning System (GPS) unit to obtain the coordinates of the accident scene. The following values were recorded:

Latitude:	N 31° 59.135’
Longitude:	W 102° 5.615’

The application Smart Compass (version 1.4.5), running on a Samsung Galaxy III-S was used to measure the following at the accident scene on November 16, 2012.

Truck tractor heading:	125° from magnetic north
Train heading:	111° measured from magnetic north

4.1.1. Illumination

Using the GPS coordinates obtained by NTSB investigators, astronomical data for the accident location and date was downloaded from the United States Naval Observatory[48] (USNO). Downloaded astronomical data is summarized in the table below.

Table 4. Sun and Moon Data for Midland, TX for November 15, 2012

Event	Time
Begin civil twilight[49]	6:52 a.m.
Sunrise	7:18 a.m.
Sun Transit	12:33 p.m.
Accident	**4:36 p.m.**
End civil twilight	6:14 p.m.

According to the USNO, at 4:36 p.m. CST on November 15, 2012 in Midland, Texas, the sun was at an altitude of 12.9° above the horizon at 237.9° east of true north.

On Tuesday, November 20, 2012, NTSB investigators recorded video from the cab of an exemplar Peterbilt. The camera used was a Canon Rebel T3i with a lens set to 18 mm, positioned to capture an approximation of the driver’s view out the passenger side window. At the time the video was recorded, the truck-tractor was moving at approximately 5 miles per hour across the accident rail crossing. The truck began

[48] http://www.usno.navy.mil/USNO/astronomical-applications

[49] Morning civil twilight begins when the geometric center of the sun is 6° below the horizon and ends at sunrise.

moving through the crossing at 4:43 p.m. CST; a time at which the sun was at the same azimuth as the time of the accident.[50]

4.1.2. Weather

Weather data for November 15, 2012 from the weather station at Midland International Airport (approximately 7 miles from the accident scene) was located; information from the observations immediately prior and immediately after the accident is shown in the table below.

Table 5. Weather Data from Midland International Airport (KMAF)

Time	3:53 p.m.	4:53 p.m.
Temperature	71.1° F	71.1° F
Dew Point	36.0° F	34.0° F
Humidity	28%	26%
Pressure	30.08 in	30.10 in
Wind	Calm	Calm
Wind Speed	Calm	Calm
Wind Gust	N/A	N/A
Precipitation	N/A	N/A
Conditions	Clear	Clear
Visibiliy	10.0 mi	10.0 mi

4.2. Line-of-Sight Examination

On Tuesday, November 20, 2012, NTSB investigators conducted line of sight documentation using an exemplar truck-tractor and an exemplar locomotive. The Human Performance Group focused on the truck-tractor, specifically the forward view and view out the right side window. For details on the documentation of line of sight, please see the Reconstruction Group Chairman Factual Report. Pictures taken by the Human Performance Group can be found as attachments to that report.

4.3. Highway Vehicle Global Positioning System (GPS) Data

The accident vehicle was NOT equipped with a GPS; however, the tractor-trailer combination vehicle immediately ahead of the accident vehicle in the parade was so equipped. NTSB investigators obtained an idling report and an event report from the motor carrier.[51]

The idling report shows the lead truck idling at 127 S Loraine Street in Midland, Texas from 2:25 p.m. to 4:02 p.m. (1 hour 37 minutes) and from 4:35 p.m. to 6:43 p.m. (2 hours 8 minutes) at 977 Garfield Street in Midland, Texas.

[50] According to the USNO, at 4:43 p.m. on November 20, 2012, the sun was at an azimuth of 237.9° east of true north and an altitude of 11.1° above the horizon.
[51] Human Performance Factual Report Attachment 8: Motor Carrier Idling and Event Report.

The event report for the lead truck shows the following information:

Table 7: Lead Tractor-trailer Event Report Data

Time	Action	Location	Latitude	Longitude
2:12 p.m.	Depart Site	Yard	31.980301	-102.029678
2:25 p.m.	Stopped	Undefined	31.997208	-102.075516
4:02 p.m.	Moving	Undefined	31.997437	-102.076447
4:35 p.m.	Stopped	Undefined	31.984756	-102.092957
6:43 p.m.	Moving	Undefined	31.984879	-102.091965

E. ACCIDENT DOCKET MATERIAL

The following attachments and photographs are included in the docket for this investigation:

LIST OF ATTACHMENTS

Attachment 1: Narratives/Transcripts of Investigative Interviews

Attachment 2: 2006 Peterbilt Driver's Cellular Telephone Records.

Attachment 3: 2006 Peterbilt Driver's Commercial Driver Fitness Determination Exam

Attachment 4: 2006 Peterbilt Driver's Post-Accident Toxicological Testing Results.

Attachment 5: Results of National Driver Register inquiry for the 2006 Peterbilt Driver.

Attachment 6: Cellular Telephone Records for Train Engineer.

Attachment 7: Cellular Telephone Records for Train Conductor

Attachment 8: Motor Carrier Idling and Event Report

LIST OF PHOTOGRAPHS

Photograph 1: View of Crossing from Exemplar Peterbilt.

END OF REPORT

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