Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-06

CSX Transportation (CSX)
Thornsby, Alabama
February 8, 2007

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2007-6

1.Name of Railroad Operating Train #1: CSX Transportation [CSX]	1a. Alphabetic Code: CSX	1b. Railroad Accident/Incident No.: 000028988
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident No.: N/A
3.Name of Railroad Operating Train #3: N/A	3a. Alphabetic Code: N/A	3b. Railroad Accident/Incident No.: N/A
4.Name of Railroad Responsible for Track Maintenance: CSX Transportation [CSX]	4a. Alphabetic Code: CSX	4b. Railroad Accident/Incident No.: 000028988

5. U.S. DOT_AAR Grade Crossing Identification Number: 352329H	6. Date of Accident/Incident: Month 02 Day 08 Year 2007	7. Time of Accident/Incident: 05:40: ☑ AM ☐ PM

8. Type of Accident/Indicent (single entry in code box): 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other (describe in narrative) — Code: 07

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
0	N/A	N/A	0	Atlanta

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
Thorsby	441.38	N/A	AL	CHILTON

18. Temperature (F) (specify if minus)	19. Visibility (single entry) 1. Dawn 2. Day 3.Dusk 4.Dark — Code	20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code	21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code
37 F	4	2	1

22. Track Name/Number	23. FRA Track Class (1-9, X) — Code	24. Annual Track Density (gross tons in millions)	25. Time Table Direction 1. North 2. South 3. East 4. — Code
single main	4	49	1

OPERATING TRAIN #1

26. Type of Equipment Consist (single entry) 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code	27. Was Equipment Attended? 1. Yes 2. No — Code	28. Train Number/Symbol
1	1	Q28206

29. Speed (recorded speed, if available) R - Recorded E - Estimated — Code	31. Method(s) of Operation (enter code(s) that apply)	31a. Remotely Controlled Locomotive?
43 MPH R	a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other (Specify in narrative)	0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter
30. Trailing Tons (gross tonnage, excluding power units): 3001	Code(s): e N/A N/A N/A N/A	0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	CSX7385	1	N/A
(2) Causing (if mechanical cause reported)	0	0	N/A

33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

34. Was this consist transporting passengers? (Y/N): N/A

35. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	2	0	0	0	0
(2) Total Derailed	0	0	0	0	0

36. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	38	0	0	0	0
(2) Total Derailed	0	0	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
500	0	M302	N/A

Number of Crew Members

41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	1	0

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 4 Mi 55	Hrs 4 Mi 55

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	4
Nonfatal	0	0	4

50. EOT Device? 1. Yes 2. No	51. Was EOT Device Properly Armed? 1. Yes 2. No
1	1

52. Caboose Occupied by Crew? 1. Yes 2. No: 2

OPERATING TRAIN #2

53. Type of Equipment Consist (single entry) 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
N/A	N/A	N/A

56. Speed (recorded speed, if available) R - Recorded E - Estimated — Code	58. Method(s) of Operation (enter code(s) that apply)	58a. Remotely Controlled Locomotive?
0 MPH N/A	a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track	0 = Not a remotely controlled; 1 = Remote control portable

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57. Trailing Tons (gross tonnage, excluding power units): 0

c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; o. Positive train control; p. Other (Specify in narrative) Code(s): N/A | N/A | N/A | N/A | N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	0	0	N/A
(2) Causing (if mechanical cause reported)	0	0	N/A

60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

61. Was this consist transporting passengers? (Y/N): N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: 0

65. Track, Signal, Way, & Structure Damage: 0

66. Primary Cause Code: N/A

67. Contributing Cause Code: N/A

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
0	0	0	0

Length of Time on Duty

72. Engineer/Operator: Hrs 0 Mi 0

73. Conductor: Hrs 0 Mi 0

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	0	0	0

77. EOT Device? 1. Yes 2. No: N/A

78. Was EOT Device Properly Armed? 1. Yes 2. No: N/A

79. Caboose Occupied by Crew? 1. Yes 2. No: N/A

OPERATING TRAIN #3

80. Type of Equipment Consist (single entry): 1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/switching; 8. Light loco(s); 9. Maint./inspect.car; A. Spec. MoW Equip. Code: N/A

81. Was Equipment Attended? 1. Yes 2. No Code: N/A

82. Train Number/Symbol: N/A

83. Speed (recorded speed, if available) Code: R - Recorded; E - Estimated N/A MPH: 0

84. Trailing Tons (gross tonnage, excluding power units): 0

85. Method(s) of Operation (enter code(s) that apply): a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other (Specify in narrative) Code(s): N/A | N/A | N/A | N/A | N/A

85a. Remotely Controlled Locomotive?
0 = Not a remotely controlled
1 = Remote control portable
2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	0	0	N/A
(2) Causing (if mechanical cause reported)	0	0	N/A

87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

88. Was this consist transporting passengers? (Y/N): N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

91. Equipment Damage This Consist: 0

92. Track, Signal, Way, & Structure Damage: 0

93. Primary Cause Code: N/A

94. Contributing Cause Code: N/A

Number of Crew Members

95. Engineer/ Operators	96. Firemen	97. Conductors	98. Brakemen
0	0	0	0

Length of Time on Duty

99. Engineer/Operator: Hrs 0 Mi 0

100. Conductor: Hrs 0 Mi 0

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	0	0	0
Nonfatal	0	0	0

104. EOT 1. Yes 2. No: N/A

105. Was EOT Device Properly 1. Yes 2. No: N/A

106. Caboose Occupied by Crew? 1. Yes 2. No: N/A

Highway User Involved

107. A. Auto; B. Truck; C. Truck-Trailer.; D. Pick-Up Truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other (spec. in narrative) Code: E

108. Vehicle Speed (est. MPH at impact): 15

109. geographical) 1.North 2.South 3.East 4.West Code: 3

Rail Equipment Involved

111. Equipment 1.Train(units pulling); 2.Train(units pushing); 3.Train (standing); 4.Car(s) (moving); 5.Car(s) (standing); 6.Light Loco(s) (moving); 7.Light(s) (standing); 8.Other (specify in narrative) Code: 1

112. Position of Car Unit in: 1

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110. Position	Code	113. Circumstance	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	3	1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	1
114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither	4	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	4

114c. State here the name and quantity of the hazardous materials released, if any.
N/A

115. Type Crossing Warning	1.Gates 2.Cantilever FLS 3.Standard FLS	4.Wig Wags 5.Hwy. traffic signals 6.Audible	7.Crossbucks 8.Stop signs 9.Watchman	10.Flagged by crew 11.Other (spec. in narr.) 12.None	116. Signaled Crossing (See instructions for codes)	Code	117. Whistle 1. Yes 2. No 3. Unknown	Code
Code(s)	07	08	N/A	N/A	N/A	N/A	N/A	2

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code
	1		2		2

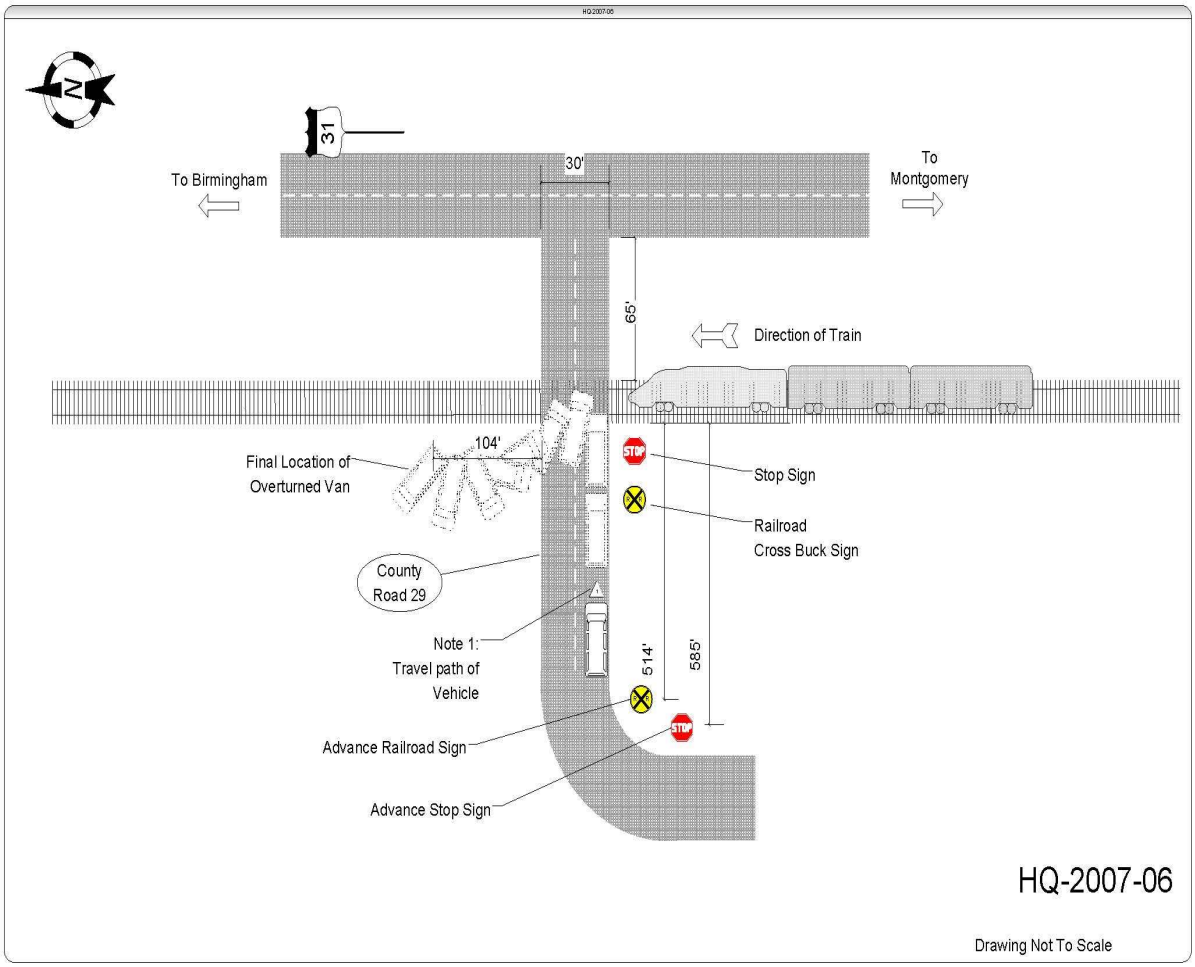
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative)	Code
30		1		2		3

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code	126. View of Track Obscured by (primary obstruction) 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed	Code
	2		8

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code	128. Was Driver in the Vehicle? 1. Yes 2. No	Code
				2		1
129. Highway-Rail Crossing Users	4	4	130. Highway Vehicle Property Damage (est. dollar damage)	5800	131. Total Number of Highway-Rail Crossing Users (include driver)	8

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code
	1		1
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code
	1		1

136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



137. SYNOPSIS OF THE ACCIDENT

On February 8, 2007, at 5:40 a.m. Central Standard Time (CST) a northbound CSX Transportation (CSX) freight Train Q28206 collided with a van at a highway-rail grade crossing in Thorsby, Alabama (AL). The accident occurred at CSX milepost (MP) 441.38 on the Atlanta Division, S&NA South Subdivision. This track segment runs from Birmingham, AL to Montgomery, AL. The method of operation is traffic control and the maximum authorized speed for freight trains is 50 miles per hour (mph).

Train Q28206 was traveling northbound on the Atlanta division at 43 mph as it approached County Road 29 in Thorsby. The van was traveling eastward on County Road 29 and the train was operating northbound on the main track. The train impacted the van as it slowly crossed the highway rail crossing.

As a result of the collision, four of the eight occupants were fatally injured. The remaining four, including the driver, sustained serious injuries. There were no injuries to the train crew. The van was totaled and the lead locomotive (CSX 7385) sustained only minor damage. No rail equipment derailed and there was no hazardous materials spilled.

At the time of the accident, it was dark, cloudy with calm winds and the temperature was 37°F.

Probable cause

Highway user inattentiveness.

138. NARRATIVE

Circumstances Prior to the Accident

The crew of CSX Train Q28206 went on duty at 1:45 a.m. at CSX Montgomery Yard in Montgomery. The crew included an engineer and conductor whose home terminal is Birmingham. The crew was dead-headed from Birmingham to Montgomery to operate the train. Their hours of service records indicate the engineer and conductor both received 19 hours and 45 minutes rest prior to being called for duty.

Train Q28206 had two locomotives, CSX 7385 (lead) and CSX 8110 (trailing), pulling 38 loads with 3,001 trailing tons and was 3,752 ft. in length. Train Q28206 was a through freight with no scheduled stops. Before departure, the crew received paperwork verifying their train had a proper airbrake test at Waycross, Georgia (GA), the originating station. The crew inspected both locomotives and completed a job briefing. Train Q28206 departed northbound at 2 a.m. on the S&NA South Subdivision for Birmingham.

The trip from Montgomery was uneventful prior to the accident. At MP 444, on the Atlanta Division, the crew received a clear signal. This is about two and one half miles south of County Road 29 near Thorsby. The engineer was seated at the console on the west side of the lead locomotive and the conductor was seated on the east side. The crew was operating the train at 43 mph and said their visibility was good.

Approaching the accident area from the south at MP 444, the main track is tangent for about 3,700 ft., then a 3-degree 15 minute curve with 4.25 inches elevation for about 1,060 ft. After the curve, the grade is 1.06 ascending, and the track is tangent for 8,400 ft. through County Road 29.

Direction throughout this report will be by CSX Timetable, which indicates all train movement is north or south.

The Accident

At 5:39 a.m., Train Q28206 was northbound, operating at a recorded speed of 43 mph as it approached County Road 29 and the maximum authorized speed is 50 mph. Both the engineer and the conductor observed a van approaching the highway-rail grade crossing traveling eastbound on County Road 29 toward the crossing. The engineer and conductor both said that the horn was blowing and the bell was ringing as the van approached the crossing. When it became apparent that the van might not stop, the engineer sounded several short horn blasts and then a solid horn blast until impact and initiated an emergency brake application prior to impact.

County Road 29 highway-grade crossing is located in Chilton County, south of Thorsby at MP 441.38 on the CSX Atlanta Division, S&NA South Subdivision. The1992 Chevrolet G20 van was traveling east on County Road 29. In this direction, the approach to the crossing is level and the road surface is smooth. The road crossing is 30 ft. in width. It is constructed of asphalt with a rubber material used as an edging for the gage side of both rails. Traveling eastward on County Road 29 there is an advance warning sign indicating a stop sign ahead located 585 feet west of the track. Proceeding 71 ft. east

toward the track there is an advanced railroad warning sign. These signs are on the right side of County Road 29 and are clearly visible and legible. There is also a railroad advanced warning sign 445 ft. west of the road crossing. It is painted on the road surface, which is faded and is difficult to see from a vehicle.

The County Road 29 highway-grade crossing is equipped with a crossbuck sign and standard stop sign. These signs are located on the right side of County Road 29 at the railroad crossing. The crossbuck sign is located at the edge of the asphalt. The stop sign is located a few feet to the right of the crossbuck. The crossbuck was faded and bent. The stop sign was also faded, but neither sign was obstructed for vehicular traffic.

At 5:40 a.m., the CSX Locomotive 7385 struck the van's front fender on the passenger side. The impact pushed the van clear of the track into the northwest quadrant of the crossing. The 1992 Chevrolet G20 van came to rest on the passenger's side facing west in the ditch on the northwest quadrant of the crossing. Three of the occupants were ejected with the other five remaining in the van. The train traveled 1,656 ft. before coming to a stop after the emergency brake application. Data from the locomotive event recorder indicated the emergency brake application at 5:40 a.m. plus five seconds and the train coming to a stop at 5:40 a.m. plus 46 seconds. At this time, the conductor dismounted the locomotive and walked back to the crossing to assist if needed. The conductor said that when he reached the crossing, several people including some emergency responders were at the accident site.

Several emergency service organizations responded including Collins-Chapel Fire Department, Thorsby Fire Department, and Life Flight air ambulance service.

Four of the occupants were pronounced dead at the scene. Two were airlifted and two others were transported by ambulances to University of Alabama Hospital in Birmingham.

Analysis and Conclusion

Analysis

Chilton County Road 29 highway-grade crossing is located at MP 441.38 on the CSX Atlanta Division, S&NA South Subdivision. This is a single main track segment between Birmingham and Montgomery. The track segment handles 49 million gross tons of freight annually. Maximum authorized track speed at this location is 50 mph for freight trains. A northbound whistle sign is located 1,326 ft. south of the crossing. It is a white concrete post with a "W" at the top. The whistle sign is located on the right (east) side of the track and is unobstructed. The crossing is clearly visible from the whistle sign.

The approaches to the crossing are unobstructed. When stopped at the crossing on the west side and looking south, the track is tangent for 1.6 miles with a descending grade. Both southwest and southeast quadrants are free of obstructions and site distance is clear. U.S. Highway 31, a two-lane highway, parallels the CSX track 70 ft. on the east side.

The locomotive event recorder was downloaded by CSX and data was retrieved relating to the train operation prior to and after the accident. This data shows the train speed just prior to impact was 43 mph and the throttle being slowly advanced from no. 5 to no. 6 and then to no. 7. This data also shows that the horn was initiated 734 ft. prior to the crossing, but does not indicate the horn blowing eight seconds prior to reaching the crossing. Since this data did not coincide with the testimony of the train crew, CSX retained the services of Full Service Railroad Consulting, Inc. to further investigate this matter. The investigation concluded that data from the engine horn was not properly recorded on the Integrated Function Computer's Permanent Core Memory (PCM) recorder. This was determined by retrieving the information from the Auxiliary Panel Recorder (AUX). Further tests were performed that duplicated the loss of data from the horn to the PCM. The Federal Railroad Administration (FRA) has reviewed this information and has concluded that is factual.

There were no witnesses to the accident. Information from the survivors of the accident has also been very limited due to the extent of their injuries and language barriers. The van driver had no proof of insurance nor a valid operator's license.

Toxicology tests were performed on the driver, but results of the test may not be available for six months.

Fatigue Analysis

FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to a blood alcohol content (BAC) of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings.

FRA obtained fatigue related information, including a 10-day work history, for two employees involved in this accident, including the locomotive engineer and conductor from Train Q28206.
FRA concluded that fatigue was probable for the following employees.

Conductor assigned to Train Q28206
Sleep setting Excellent
Overall Effectiveness = 65.09%
Lapse Index =6.4
Reaction Time = 153
Chronic Sleep Debt = 8.84
Hours of Continuous Wakefulness = 6.93
Time of Day (military) = 0640
BAC Equivalent = >0.08
Conclusion: Fatigue was probable for this employee.

Locomotive engineer assigned to Train Q28206
Sleep setting Excellent
Overall Effectiveness = 69.36%
Lapse Index = 5.3
Reaction Time = 144

Chronic Sleep Debt =8.59
Hours of Continuous Wakefulness = 15.68
Time of Day (military) = 0640
BAC Equivalent = >0.08
Conclusion: Fatigue was probable for this employee.

Conclusion

After reviewing the data from the locomotive event recorder, the AUX recorder, and interviewing both crew members, all the data is consistent. Statements made by the train crew regarding when the horn and the bell were operating, as required by CSX Operating Rules and FRA regulations were verified. FRA also agrees that the headlight and both ditch lights were working properly prior to the accident.

Even though the crossbuck sign and the stop sign were faded and bent, they did provide adequate warning to vehicles. Based on 49 CFR Part 213 vegetation regulations at highway-rail crossings, no vegetation interfered or obstructed any signs. Vehicular traffic utilizing County Road 29 crossing has good site distance to observe trains that may be approaching.

Probable Cause

The Federal Railroad Administration concluded that this accident was caused by the highway user's inattentiveness.