



***Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch***

***Accident Investigation Report
HQ-2016-1140***

***Amtrak (ATK)
Trinidad, CO
June 26, 2016***

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, 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.

SYNOPSIS

Synopsis

On June 26, 2016, at 9:45 a.m., MDT, westbound Amtrak Train ATK 3-1-25 struck a 2005 Chrysler Town & Country passenger van with six occupants on BNSF Railway's (BNSF) Powder River Division, Raton Subdivision near Trinidad, Colorado. The collision occurred at Las Animas County Road 75.1 (CO 75.1), BNSF Milepost 632.75. The U.S. DOT National Highway-Rail Crossing Inventory Number is 003324M. The CO 75.1 highway-rail grade crossing consists of a two-lane road with a gravel surface south of the crossing, and pavement north of the crossing. At the time of the incident, passive crossbuck warning signs were posted at the crossing for each direction of travel. No other signage was present at this crossing other than the emergency notification systems signs on each post.

There were five fatalities and one injury that resulted from the incident. The passenger van was destroyed. The weather was clear with a calm wind and a temperature of 77 degrees Fahrenheit. There were no injuries to the train crew. The total damage was \$34,658.00, and there was no derailment. The accident was caused by failure of the passenger van's driver to yield to Train ATK 3-1-25. According to the Colorado State Highway Patrol's report: "The accident occurred due to the driver's careless actions of not yielding the right-of-way to a train crossing." The Federal Railroad Administration's investigation concluded the probable cause was cause code M302: highway user inattentiveness.

TRAIN SUMMARY

1. Name of Railroad Operating Train #1 Amtrak (National Railroad Passenger Corporation)	1a. Alphabetic Code ATK	1b. Railroad Accident/Incident No. 143003
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GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance BNSF Railway Company		1a. Alphabetic Code BNSF	1b. Railroad Accident/Incident No. PR-0616-201	
2. U.S. DOT Grade Crossing Identification Number 003324M		3. Date of Accident/Incident 6/26/2016	4. Time of Accident/Incident 9:45 AM	
5. Type of Accident/Incident Hwy-Rail Crossing				
6. Cars Carrying HAZMAT 0	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0	9. People Evacuated 0	10. Subdivision Raton
11. Nearest City/Town Trinidad		12. Milepost (to nearest tenth) 632.7	13. State Abbr. CO	14. County LAS ANIMAS
15. Temperature (F) 77 °F	16. Visibility Day	17. Weather Clear	18. Type of Track Main	
19. Track Name/Number Single MainTrack		20. FRA Track Class Freight Trains-60, Passenger Trains-80		21. Annual Track Density (gross tons in millions) 1.38
				22. Time Table Direction West

OPERATING TRAIN #1

1. Type of Equipment Consist: Passenger Train-Pulling					2. Was Equipment Attended? Yes		3. Train Number/Symbol ATK 3-1-25					
4. Speed (recorded speed, if available) R - Recorded 75 MPH E - Estimated		Code R	5. Trailing Tons (gross excluding power units)		6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter					Code 0		
6. Type of Territory Signalization: <u>Signaled</u> Method of Operation/Authority for Movement: <u>Direct Train Control</u> Supplemental/Adjunct Codes: <u>P, D</u>												
7. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded (yes/no)		8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box		Alcohol	Drugs	
(1) First Involved <i>(derailed, struck, etc.)</i>		AT 112		1		no						
(2) Causing <i>(if mechanical, cause reported)</i>								9. Was this consist transporting passengers?			Yes	
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded		Empty		e. Caboose	
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.		
(1) Total in Train	2	0	0	0	0	(1) Total in Equipment Consist	0	10	0	0	0	
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	0	0	0	
12. Equipment Damage This Consist 34658			13. Track, Signal, Way & Structure Damage 0									
14. Primary Cause Code M302 - Highway user inattentiveness												
15. Contributing Cause Code												
Number of Crew Members						Length of Time on Duty						
16. Engineers/Operators		17. Firemen		18. Conductors		19. Brakemen		20. Engineer/Operator		21. Conductor		
3		0		2		0		Hrs: 2 Mins: 0		Hrs: 2 Mins: 0		
Casualties to:		22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?		26. Was EOT Device Properly Armed?		
Fatal		0		0		5		No		N/A		
Nonfatal		0		0		1		27. Caboose Occupied by Crew?				N/A
28. Latitude 37.216703000				29. Longitude -104.464547000								

CROSSING INFORMATION

Highway User Involved		Rail Equipment Involved	
1. Type Van		5. Equipment Train (Units Pulling)	
2. Vehicle Speed (<i>est. mph at impact</i>) 5	3. Direction (<i>geographical</i>) North	6. Position of Car Unit in Train 1	
4. Position of Involved Highway User Moved over Crossing		7. Circumstance Rail Equipment Struck Highway User	
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? Neither		8b. Was there a hazardous materials release by N/A	
8c. State here the name and quantity of the hazardous material released, if any.			
9. Type of Crossing 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (<i>spec. in narr.</i>) 3. Standard FLS 6. Audible 9. Watchman 12. None 7		10. Signaled Crossing Warning	11. Roadway Conditions Dry
12. Location of Warning Both Sides		13. Crossing Warning Interconnected with Highway Signals N/A	14. Crossing Illuminated by Street Lights or Special Lights No
15. Highway User's Age 32	16. Highway User's Gender Male	17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train No	18. Highway User Stopped and then proceeded
19. Driver Passed Standing Highway Vehicle No		20. View of Track Obscured by (<i>primary obstruction</i>) Vegetation	
Casualties to:	Killed	Injured	21. Driver was Killed 22. Was Driver in the Vehicle? Yes
23. Highway-Rail Crossing Users	5	1	24. Highway Vehicle Property Damage (<i>est. dollar damage</i>) 3500 25. Total Number of Vehicle Occupants (<i>including driver</i>) 6
26. Locomotive Auxiliary Lights? Yes		27. Locomotive Auxiliary Lights Operational? Yes	
28. Locomotive Headlight Illuminated? Yes		29. Locomotive Audible Warning Sounded? Yes	

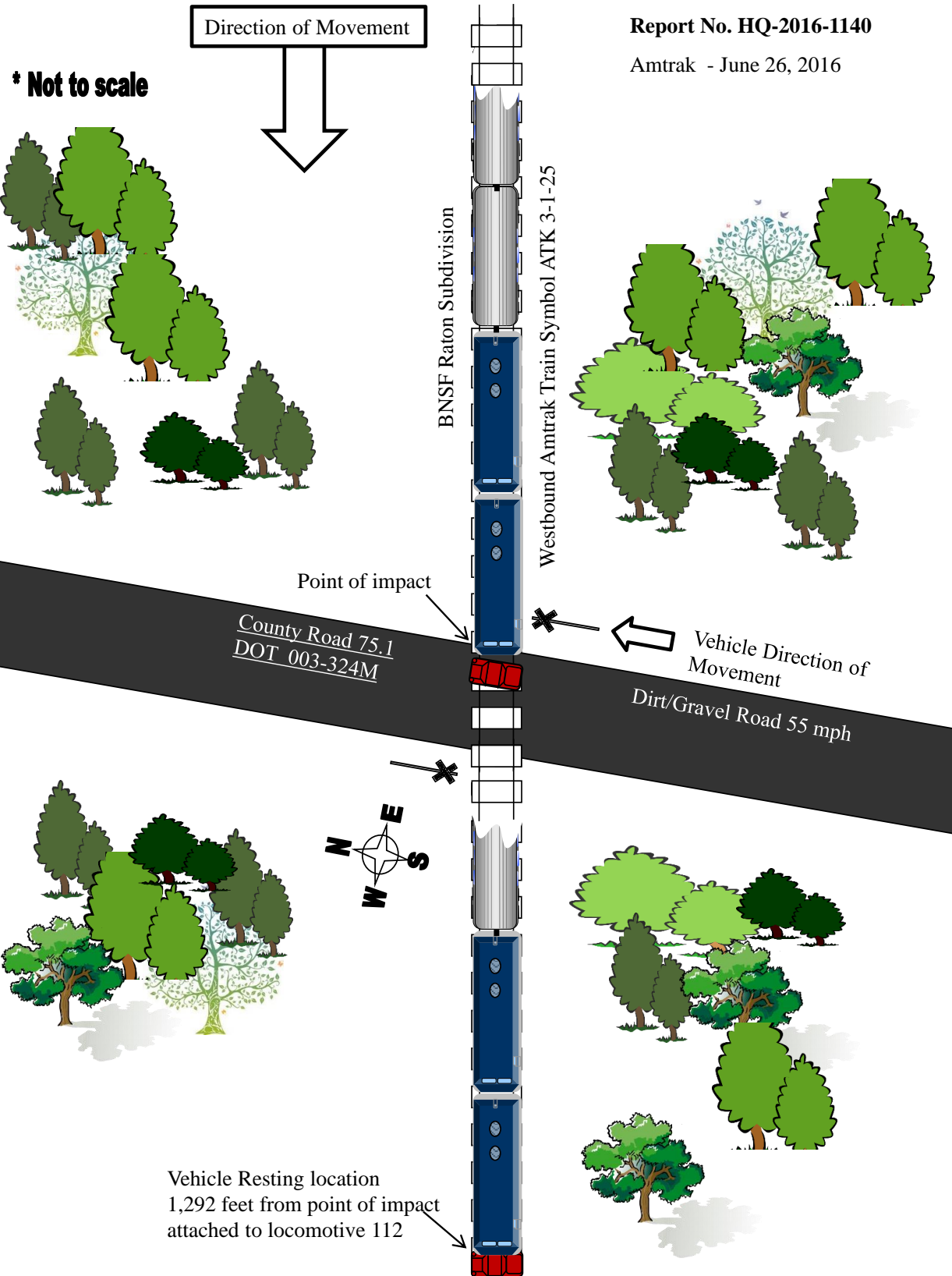
10. Signaled Crossing Warning

Explanation Code

- | | |
|--|--|
| 1 - Provided minimum 20-second warning | A - Insulated rail vehicle |
| 2 - Alleged warning time greater than 60 seconds | B - Storm/lightning damage |
| 3 - Alleged warning time less than 20 seconds | C - Vandalism |
| 4 - Alleged no warning | D - No power/batteries dead |
| 5 - Confirmed warning time greater than 60 seconds | E - Devices down for repair |
| 6 - Confirmed warning time less than 20 seconds | F - Devices out of service |
| 7 - Confirmed no warning | G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present |
| N/A - N/A | H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled) |
| | J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits |
| | K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit |
| | L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction |
| | M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed |
| | N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach |
| | O - Warning time less than 20 seconds attributed to violation of special train operating instructions |
| | P - No warning attributed to signal systems failure to detect the train |
| | R - Other cause(s). Explain in Narrative Description |

SKETCHES

HQ-2016-1140 Sketch



NARRATIVE

Circumstances Prior to the Accident

The operating crew of Train ATK 3-1-25 included five crew members. The operating crew consisted of three locomotive Engineers, two of which Amtrak refers to as firemen. Only the Engineer who was seated at the controls of the train was considered an "Engineer" by Amtrak's Senior Safety Reporting Analyst. The Federal Railroad Administration (FRA) refers to all three employees in the locomotive on this train as Engineers. Of the three Engineers, one Engineer was an on-the-job training instructor (OJTI Engineer) and another was a Student Engineer. The two other crew members were Conductors located in the passenger cars. The operating crew went on duty at 7:45 a.m., MDT, on June 26, 2016 at La Junta, Colorado. Their home terminal is Albuquerque, New Mexico. They had received more than the statutory off-duty period prior to reporting for duty.

Train ATK 3-1-25 consisted of two lead locomotives, four Superliner coach cars, two Superliner sleeper cars, one Superliner dining car, one Superliner lounge car, one Superliner II dorm/sleeper car, and one Superliner II baggage car. It was 1,130 feet long with 718 trailing tons. Train ATK 3-1-25 was to proceed from La Junta, Colorado to Albuquerque, New Mexico. Train ATK 3-1-25 received a Class 1 initial terminal air brake test and inspection in Chicago, Illinois on June 25, 2016.

Train ATK 3-1-25 departed La Junta at 8:35 a.m., MDT. There were no restrictions in effect per the Amtrak Western Region, Southern Subdivision Timetable. The method of operation in this area is by track warrant control supplemented by signal indications of an automatic block signal system. Authority to operate on the Raton Subdivision is granted by BNSF Railway's (BNSF) Dispatcher located at BNSF's Network Operations Center in Fort Worth, Texas. At the site of the accident, the Raton Subdivision is a single main track. The Raton Subdivision operates east and west with mileposts decreasing when traveling eastbound. This incident occurred near Trinidad, Colorado.

As westbound Train ATK 3-1-25 approached the accident area, the Student Engineer was seated at the controls on the north side of the leading locomotive. The OJTI Engineer was seated on the south side in the conductor's seat. The third Engineer did not state his position on the leading locomotive. As Train ATK 3-1-25 approached the accident site, it was operating on tangent track. There is a 1.04-percent ascending grade at this location.

At the time of the accident, it was daylight with calm winds. The temperature was 77 °F.

The Accident

Train ATK 3-1-25 was being operated at 75 miles per hour (mph) approaching the accident area as recorded by the event recorder of the controlling locomotive. The train crew's view of the crossing was obstructed by vegetation adjacent to the tracks on the south side. The Student Engineer stated that he became aware of the impending collision when he saw a vehicle crossing the bridge at a rapid pace, and initiated an emergency air brake application. Train ATK 3-1-25 then collided with the vehicle. The maximum authorized speed for this train was 79 mph, as designated in the current BNSF Timetable No. 11.

A 2005 Chrysler Town & Country passenger van with six occupants was traveling north on County Road 75.1. The Student Engineer stated that it looked like the driver of the passenger van attempted to slow

down, and he thought the driver might stop initially. The Student Engineer then stated that the passenger van appeared to accelerate, and entered the highway-rail grade crossing (HGC) in the train's path. Amtrak video evidence shows the estimated speed of the passenger van at the time of the collision was 5 mph. The police report states that the speed limit is 55 mph on this roadway, although the speed limit was not posted.

At 9:45 a.m., MDT, Train ATK 3-1-25 struck the right side of the passenger van at approximately the midpoint of the vehicle in the HGC. The passenger van was carried west along the track for approximately 1,292 feet before coming to a stop on the front of the train.

After Train ATK 3-1-25 stopped, the Student Engineer was told by other crew members to stay on the locomotive. The OJTI Engineer established radio communications with the BNSF Dispatcher and reported the incident. The OJTI Engineer then climbed down from the locomotive cab, went to the front of Train ATK 3-1-25, and saw it had struck the passenger van. The crew then awaited arrival of emergency response personnel.

A Las Animas County deputy sheriff arrived on the scene of the accident at 9:57 a.m., MDT. Trinidad ambulance personnel arrived minutes later. Colorado State Police took over the investigation from the Las Animas County Sheriff department and interviewed all three Engineers that were located in the locomotive cab of Train ATK 3-1-25.

The driver of the passenger van and four passengers were pronounced dead at the scene by the Trinidad Coroner and removed from the scene. The remaining passenger was air lifted to Denver, Colorado, with severe injuries.

Analysis and Conclusions

Analysis -Toxicological Testing: The driver of the passenger van was a 32-year old male. The remaining passengers consisted of his 34-year old wife and their four daughters, ages 7, 5, 3, and 1. The Las Animas County Coroner performed toxicological testing on the remains of the driver, and the results were positive for amphetamines. There were no toxicological tests performed on the train crew. FRA does not require such testing for this type of accident.

Conclusion: No tests were conducted on the crew members. A postmortem toxicology test was performed on the driver of the vehicle and the results were positive for amphetamines. FRA was unable to determine if toxicology was a contributing factor in this accident.

Fatigue Analysis: FRA obtained fatigue-related information for the 10-day period preceding this incident, including the 10-day work history (on duty/off duty cycles) for the crew of Train ATK 3-1-25.

Conclusion: Upon analysis of that information, FRA concluded fatigue was not probable for the crew of Train ATK 3-1-25.

Analysis-Highway-Rail Grade Crossing: An inspection of the HGC where the incident occurred indicated it was equipped with crossbucks. However, there was no advance warning sign in the direction of the passenger van's direction of movement at the time of the accident, and there are no pavement markings in advance of the HGC. There is vegetation near the crossing, not on railroad property, that obscures visibility of an approaching train. This area near the scene of the accident is on private property. A sight distance evaluation was conducted of the HGC in accordance with the method described in the Federal Highway Administration's (FHWA) Railroad-Highway Grade Crossing Handbook (Revised Second Edition, August 2007). Based on the 79 mph maximum authorized train speed on the section of track

and through the HGC where the incident occurred, and a roadway speed limit of 55 mph, measurements from FHWA Table 30 prescribed the following placement of measurement cones:

- “Cone A” was located 1,030 feet south of “Cone B” at the beginning of the “Approach Zone.” The “Approach Zone” is the distance required for a driver to detect a crossing and formulate action needed to avoid a collision with a train.
- “Cone B” was located 535 feet south of “Cone C” at the beginning of the “Non-recovery Zone.” The “Non-recovery Zone” is an area that includes the last safe stopping point based on vehicle speed where the driver must be able to see an approaching train so that a safe stop can be made if necessary. “Cone B” also represents the “Ideal” Recommended Sight Distance based on the roadway speed and maximum authorized train speed through the HGC.
- “Cone C” was located in the center of the roadway at the HGC, 15 feet south of the nearest rail (there was no “Stop Line” at this crossing due to the gravel surface).
- “Cone D” was located 888 feet east of the crossing along the railroad tracks in accordance with FHWA Handbook Tables 30 and 32.

Except for a very narrow view of the crossing directly ahead, a vehicle driver traveling north on County Road 75.1 approaching this HGC would not be able to observe a train approaching the HGC from the east while in the “Approach Zone” (between “Cone A” and “Cone B” - 1,030 feet to 535 feet from the HGC) due to trees, brush, and other vegetation east of the roadway and south of the railroad tracks. As a vehicle continues north into the “Non-recovery Zone” (between “Cone B” and “Cone C” - 535 feet to the crossing stop line), visibility for the driver continues to be obstructed until the vehicle is 94 feet from the crossing stop line. This is the “Actual Sight Distance,” and the point at which a driver would now be able to see an approaching train approximately 895 feet away. The “Actual Sight Distance” along with “Cone C” and “Cone D” represents the “Approach Sight Triangle” where a driver’s view would remain relatively unobstructed to the HGC.

Conclusion: By the time the vehicle operator would have had an unobstructed line of sight with the train (94 feet from the safe zone), the vehicle would be well past the point of non-recovery.

Analysis- Locomotive Engineer Operating Performance: The lead locomotive was equipped with a speed indicator and event recorder as required by Federal Regulations. The recorder was downloaded and analyzed by Amtrak officials.

Conclusion: The Student Engineer was operating in compliance with all applicable railroad operating and train handling requirements.

Analysis- Mechanical and Safety Devices: Train ATK 3-1-25 received a Class 1 initial terminal air brake test and inspection in Chicago, IL on June 25, 2016. The lead locomotive was equipped with a headlight, auxiliary lights, and the audible warning device required by Federal Regulations. The Amtrak mechanical department sent personnel to make a post-accident inspection of Train ATK 3-1-25.

Conclusion: Train ATK 3-1-25’s brakes and locomotive safety devices were in full compliance with Federal requirements.

Overall Conclusions

Amtrak was in full compliance with its own standards and all applicable Federal standards. The three engineers were the only witnesses to the accident, and they had no information that could be used to

determine why the passenger van failed to stop at the crossing. The passenger van's driver tested positive for amphetamines, however FRA could not determine if this contributed to the accident.

Probable Cause and Contributing Factors

FRA has completed its investigation and determined the probable cause of the accident was cause code M302: highway user inattentiveness. No contributing factor was identified.