National Transportation Safety Board
Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, D.C.

Railroad Operations Group Factual Report
Amtrak
Highway-Rail Grade Crossing Accident
Crozet, Virginia
Lanetown Road
January 31, 2018

NTSB Accident Number HWY18MH005

Group Chairman: Georgetta Gregory

1 Operations Group Members

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The Accident

NTSB Accident Number:	HWY18MH005
Date of Accident:	January 31, 2018
Location of Accident:	Near Crozet, Virginia, Lanetown Road, Crossing No. 22470E
Time of Accident:	11:16 a.m. EST
Railroad Operator:	Buckingham Branch Railroad Company
Railroad Owner:	CSX Transportation
Type of Train and ID:	Amtrak Train P923-31; Congressional Special Train
Vehicle:	2017 Freightliner refuse truck
Vehicle Operator:	Time Disposal of Ruckersville, Virginia
Injuries	8 (3 crewmembers, 3 train passengers, 2 truck occupants)
Fatalities	1 (truck passenger)

Accident Synopsis

Refer to the *Accident Summary* report within the docket for this investigation for a summary of the accident.

Damages

The Buckingham Branch Railroad Company (BBR) estimated damages to track and signal infrastructure of about $244,000. Amtrak estimated damages to the lead locomotive of about $44,000. Total railroad damage estimate was about $288,000.

Operations

Amtrak Congressional Special Train P923-31 (train), running from Washington, D.C. to White Sulphur Springs, West Virginia, consisted of two locomotives, eight passenger coaches and

two café cars. One locomotive was on the head end of the train and the other on the rear and the train was running in the push-pull configuration.[1]

Train Crewmembers included a Locomotive Engineer (engineer), Conductor, and two Assistant Conductors. Also, there were three Lead Service Attendants on the train. There were about 450 passengers on the train. (See the Survival Factors Factual Report in the public docket for more information.)

The accident happened on January 31, 2018, about 11:16 a.m.at milepost (MP) 195.85 on the BBR North Mountain Subdivision of the Richmond & Alleghany Division.[2] The collision of the train with the refuse truck occurred west of West Crozet, MP 194.8, at Lanetown Road, a public highway-rail grade crossing (crossing) assigned DOT number 224704E.[3]

The BBR leases the track on the Richmond & Alleghany Division from CSX Transportation (CSX); BBR maintains the track to meet the Federal Railroad Administration (FRA) Class 3 track safety standards.[4]

[1] Official train ID while operating on the BBR and CSX was P941-31. The train ID within this report is the originating train ID of P923-31. As usual and customary, as trains traverse from one railroad property to another, the host railroad assigns a unique train ID.

[2] Unless otherwise noted, all times in this report are eastern standard time.

[3] Geographic direction is from the *Buckingham Branch Railroad Timetable No. 2* and trains running towards the accident site are travelling west and trains running towards East Gordonville are running east and are not necessarily in concurrence with compass directions.

Highway-rail grade crossing means a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade.

[4] See 49 *Code of Federal Regulations* (CFR) Part 213.

Amtrak P923-31

The Amtrak train P923-31 consist included one locomotive on the head end, ATK 145, and one locomotive on the rear of the train, ATK 4, operating in a push-pull configuration.[5] The train consist included eight passenger coaches and two café cars.

The train departed Union Station in Washington, D.C. at 8:29 a.m. on January 31, 2018, and travelled on Amtrak tracks to Arlington, Virginia and to Orange, Virginia on the Norfolk Southern Railway (NS). The train interchanged to the Buckingham Branch Railroad at Orange and travelled westward. The engineer and conductor, who went on duty at 10:00 a.m. in Charlottesville, crew changed at Charlottesville, about 31 miles from Orange, and the train departed Charlottesville at 10:57 a.m. An Amtrak Road Foreman of Engines (RFE) also boarded the head-end of the train at Charlottesville.

Two assistant conductors went on duty in Washington. D.C. at 6:45 am and were to remain on the train to its destination and return to Union Station with the empty equipment. Three lead service attendants also went on duty in Washington, DC at 6:45 a.m. and did not crew change at Charlottesville.

Buckingham Branch Railroad

The Buckingham Branch Railroad Company (BBR) began operations in 1988 with 17 miles of track between Bremo and Dillwyn, Virginia with the first train running on March 6, 1989.

[5] *Push-Pull configuration* means that the lead locomotive provided pulling propulsion and the remotely controlled rear locomotive provided pushing power. Either locomotive can operate as the lead locomotive and the other as the rear locomotive by the engineer changing ends and setting up the respective locomotive as the point.

The BBR, a family-owned short line railroad, operated 275 miles of railroad in Virginia with more than 70 employees including seven train crews and owned 18 locomotives to serve 40 freight customers at the time of this accident. (See Figure 1.) The BBR had three divisions: 1) Buckingham Division; 2) Virginia Southern Division; and 3) Richmond – Alleghany Division. The BBR interchanged with the CSX and the Norfolk Southern Railway (NS). The BBR ran passenger excursion trains on the Buckingham Division in the spring and fall, as well as Santa trains and a Toys for Tots train in December.

Amtrak had trackage rights on the North Mountain Subdivision and the Orange Subdivision of the Richmond – Alleghany Division. About six Amtrak trains ran per week on the BBR between Orange and Clifton Forge, Virginia.

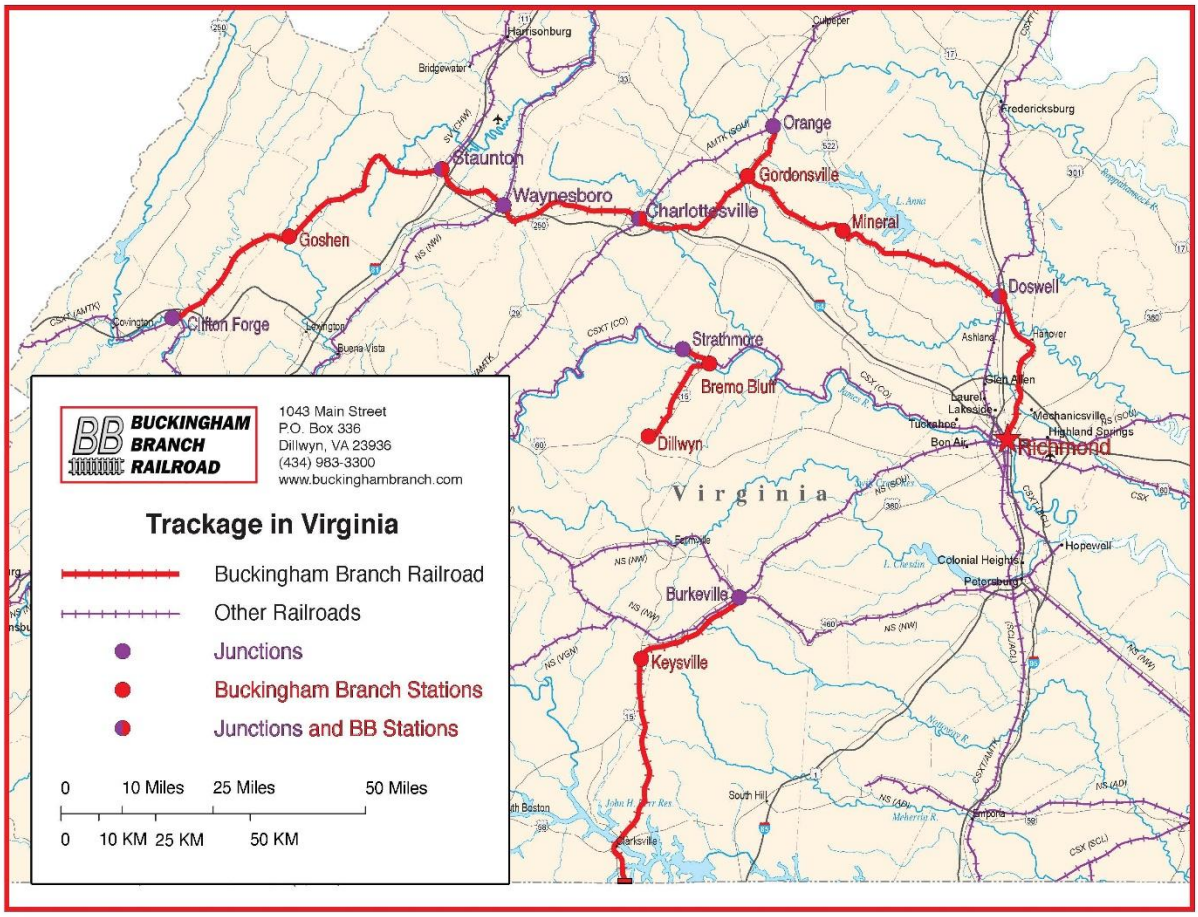

Figure 1. Buckingham Branch Railroad Company.

Method of Operation

Operating rules, timetable instructions, general orders, safety rules, train handling and air brake rules, track warrants and signal indications of a traffic control system governed train movements on the BBR.[6] A train dispatcher located in Staunton, Virginia established train routes

[6] *Buckingham Branch Railroad Operating Rules*, effective October 19, 2015 with revisions effective June 25, 2017; *Buckingham Branch Railroad Company Richmond & Alleghany Division Timetable No. 2*, effective October 19, 2015, with revisions effective June 25, 2017; Buckingham Branch Railroad Safety Rules, effective October 19, 2015, with revisions effective June 25, 2017; and CSX *Air Brake Train Handling & Equipment Handling Rule Book*, effective April 1, 2010.

at control points and issued track warrants. In additions to operating rules, the BBR draft *Rail Traffic Control Manual* governed the actions of the train dispatcher.[7]

Amtrak trains interchanged from the NS to the BBR at Orange, MP 0.0, on the BBR Orange Subdivision and ran between Orange and East Gordonville. The maximum authorized speed on the Orange Subdivision was 60 mph for passenger trains and 40 mph for freight trains.

Amtrak trains operated on the BBR North Mountain Subdivision between East Gordonville and Clifton Forge on the North Mountain Subdivision. The maximum authorized speed on the North Mountain Subdivision was 60 mph for passenger trains and 40 mph for freight trains. There were no permanent or temporary speed restrictions at the accident location. BBR operating bulletins provided instructions to train crews including track bulletins, speed restrictions, men and equipment, and track conditions.[8]

The BBR ran about six passenger trains and about 26 freight trains per week at the accident site.

Personnel

All Amtrak employees on train P923-31 at the time of the accident had all required training to perform their duties, including emergency preparedness. The engineer and conductor held

[7] *Buckingham Branch Railroad Rail Traffic Control Center Manual*, in DRAFT form at the time of this accident but was the governing document.

[8] *Buckingham Branch Railroad Richmond & Alleghany Division Current Operating Bulletin 137*, effective 15:45 January 30, 2018.

current certifications as required by Title 49 *Code of Federal Regulations* 240 and 242. One of the assistant conductors also held a conductor certificate.

Amtrak Road Foreman of Engines

Amtrak employed the RFE in 2013 as an assistant conductor. He received a promotion to the positions of conductor about one year later. He then went to engine school to become an engineer. The RFE worked as an engineer almost two years. On July 31, 2017, Amtrak promoted him to his current position on July 31, 2017.

Amtrak P923-31 Locomotive Engineer

The engineer worked for CSX Transportation (CSX) from 1994 until 2013. For the first six months with CSX, he worked as a brakeman. He then completed training to be an engineer. He was an engineer for the rest of his time with the CSX. He joined AMTRAK in 2013, where he spent two years running trains out of Huntington, West Virginia. He then went to Florence, South Carolina, then came back to Huntington.

Table 1 shows the engineer's most recent dates for certification, physical testing, skills testing and evaluation, and rules examination. Table 2 shows his 30-day work/rest history. The engineer's work history shows compliance with the Hours of Service Act.[9]

Table 1. Locomotive Engineer Certification Record.

Last Certification Date	11/3/2017
Certification Expiration Date	11/4/2020
Last FRA Hearing and Vision Exam	8/17/2017
Last Territory Physical Characteristic Exam	12/13/2017

[9] See 49 *Code of Federal Regulations* Part 228.

Last Skills Evaluation	1/26/2018
Last Rules Exam	11/3/2017

Table 2. Locomotive Engineer 30-day Work/Rest History.

Previous Time Off	On Duty – Date/Time	Off Duty – Date/Time	Total Computed Time On Duty
45’37”	12/31/17 / 1:07 p.m.	12/31/17 / 9:55 p.m.	8’48”
237’36”	1/10/18 / 8:30 a.m.	1/10/18 / 12:24 p.m.	3’54”
377’5”	1/26/18 / 6:31 a.m.	1/26/18 / 3:50 p.m.	9’19”
45’17”	1/28/18 / 1:07 p.m.	1/28/18 / 9:25 p.m.	8’28”
60’25”	1/31/18 / 10:00 a.m.	Accident trip	

Amtrak P923-31 Conductor

The CSX hired the conductor in 1969 and he began working out of St. Albans, West Virginia in 1969. He came to Amtrak in 1985 as a “loaner” from CSX. Amtrak hired him as a conductor on September 30, 2001. He continuously worked as a conductor during the period from 1969 to the time of the accident.

Table 3 shows the conductor’s recent dates for certification, physical testing, skills testing and evaluation, and rules examination. Table 4 shows his 30-day work/rest history prior to the accident. The conductor’s work history shows compliance with the Hours of Service Act.

Table 3. Conductor Certification Record.

Last Certification Date	3/25/2017
Certification Expiration Date	3/25/2020
Last FRA Hearing and Vision Exam	6/14/2016
Last Territory Physical Characteristic Exam	4/7/2017
Last Skills Evaluation	12/16/2017
Last Rules Exam	4/7/2017

Table 4. Conductor 30-day Work/Rest History.

Previous Time Off	On Duty – Date/Time	Off Duty – Date/Time	Total Computed Time On Duty
35’21”	12/31/17 / 9:31 a.m.	12/31/17 / 7:23 p.m.	9’52”
730’41”	1/31/18 / 10:00 a.m.	Accident train	

Assistant Conductors

There were two assistant conductors on the train. In this report, one referred to as assistant conductor A and the other as assistant conductor B.

Assistant Conductor A

Amtrak hired assistant conductor A on May 8, 2017. Assistant conductor A did not hold certification to perform duties of a passenger conductor at the time of this accident. Table 5 illustrates conductor A’s work schedule for 30-days prior to the accident train. Both assistant conductors were rested in accordance with he Hours of Service Act prior to going on duty the day of the accident.

Table 5. Assistant Conductor (A) 30-day Work/Rest History.

Previous Time Off	On Duty – Date/Time	Off Duty – Date/Time	Total Computed Time On Duty
35’25”	12/29/17 / 9:00 a.m.	12/29/17 / 8:05 p.m.	11’5”
91’00”	1/3/18 / 3:05 p.m.	1/4/18 / 12:03 a.m.	8’58”
29’57”	1/5/18 / 6:00 a.m.	1/5/18 / 5:00 p.m.	11’00”
46’00”	1/7/18 / 3:00 p.m.	1/7/18 / 9:20 p.m.	4’18”
45’5”	1/9/18 / 6:25 p.m.	1/10/18 / 1:51 a.m.	3’24”
37’4”	1/11/18 / 2”55 p.m.	1/11/18 / 9:55 p.m.	7’00”
56’5”	1/14/18 / 6:00 a.m.	1/14/18 / 4:44 p.m.	10’44”
47’06”	1/16/18 / 3:50 p.m.	1/6/18 / 10:35 p.m.	6’45”
30’34”	1/18/18 / 5:09 a.m.	1/18/18 / 11:38 a.m.	6’29”
29’52”	1/19/18 / 5:30 p.m.	1/20/18 / 2:35 a.m.	9’5”

23’16”	1/21/18 / 1:51 a.m.	1/21/18 / 11:08 a.m.	9’17”
74’22”	1/24/18 / 1:30 p.m.	1/24/18 / 7:58 p.m.	6’28”
10’57”	1/25/18 / 6:55 a.m.	1/25/18 / 1:55 p.m.	7’00”
48’10	1/27/18 / 2:05 p.m.	1/27/18 / 9:03 p.m.	6’58”
10’42”	1/28/18 / 7:45 a.m.	1/28/18 / 3:40 p.m.	7’55”
62’5”	1/31/18 / 6:45 a.m.	Accident train	

Assistant Conductor B

Amtrak hired assistant conductor B on June 29, 2015. Assistant conductor B held certification to work as a passenger conductor at the time of this accident. Table 6 shows assistant conductor B’s record of certification and examinations. Table 7 illustrates assistant conductor B’s work schedule for 30-days prior to the accident train.

Table 6. Assistant Conductor B Certification Records.

Last Certification Date	7/1/2016
Certification Expiration Date	7/1/2019
Last FRA Hearing and Vision Exam	5/17/2016
Last Territory Physical Characteristic Exam	6/30/2016
Last Skills Evaluation	1/18/2018
Last Rules Exam	8/25/2017

Table 7. Assistant Conductor (B) Work/Rest History.

Previous Time Off	On Duty – Date/Time	Off Duty – Date/Time	Total Computed Time On Duty
57’44”	12/31/17 / 10:00 a.m.	12/31/17 / 5:00 p.m.	7’00”
22’50”	1/1/18 / 3:50 p.m.	1/1/18 / 10:28 p.m.	6’38”
30’41”	1/3/18 / 5:09 a.m.	1/3/18 / 11:52 a.m.	6’43”
123’58”	1/8/18 / 3:50 p.m.	1/8/18 / 11:12 p.m.	7’22”
29’57”	1/10/18 / 5:09 a.m.	1/10/18 / 11:40 a.m.	6’31”
28’10”	1/11/18 / 3:50 p.m.	1/11/18 / 20:51 p.m.	7’01”
32’39”	1/13/18 / 7:30 a.m.	1/13/18 / 1:54 p.m.	6’24”
49’56”	1/15/18 / 3:50 p.m.	1/15/18 / 10:42 p.m.	6’52”
30’27”	1/17/18 / 5:09 p.m.	1/17/18 / 11”39 a.m.	6’30”
28’11”	1/18/18 / 3:50 p.m.	1/18/18 / 10:35 p.m.	6’45”

50’00”	1/20/18 / 7:30 a.m.	1/20/18 / 1:50 p.m.	6’20”
50’00”	1/22/18 / 3:50 p.m.	1/22/18 / 22:35 p.m.	6’45”
30’34”	1/24/18 / 5:09 a.m.	1/24/18 / 11:41 a.m.	6’47”
28’09”	1/25/18 / 3:50 p.m.	1/25/18 / 10:37 p.m.	6’47”
32’53”	1/27/18 / 7:30 a.m.	1/27/18 / 2:03 p.m.	6’33”
86’42”	1/31/18 / 6:45 a.m.	Accident train	

Toxicology

Federal regulation did not require drug and alcohol testing following this accident. However, Amtrak, under its company policy, conducted toxicology testing on the engineer and the RFE. The results of the AMTRAK testing were negative for alcohol and major drugs and drug classes of abuse.[10]

Following the collision, the Albemarle County Police Department (ACPD) obtained a voluntary blood sample from the engineer for the purposes of toxicological testing. Testing of that sample by the Commonwealth of Virginia Department of Forensic Science found Fluoxetine at 72 ± 20 mg/L.

Alcohol and additional drugs/drug classes were not detected in the blood sample. The Albemarle County Police completed toxicology testing for the refuse truck driver with positive results for tetrahydrocannabinol (THC) and two prescriptions medications: Gabapentin and Midazolam. The testing detected no blood alcohol.

[10] The AMTRAK testing checked for amphetamines, barbiturates, benzodiazepines, cocaine metabolites, marijuana (THC), methadone, ecstasy, opiates, 6-monoacetylmorphine, oxycontin, and phencyclidine (PCP).

For more information see the *Human Performance Factual Report* in the public docket for this accident.

Interviews

Amtrak Road Foreman of Engines

During an interview, the RFE told investigators that on the day of the accident he began with a conference call at 9:00 a.m. He then drove to the Charlottesville Station with the engineer from the hotel where they had spent the night before. At the station, he met the conductor along with the Superintendent of Operations, Assistant Superintendent, and Special Duty Trainmaster. The RFE held a job briefing will all. The train arrived about 10:50 a.m., they boarded relieving the inbound engineer and conductor, and departed the station at 10:57 a.m. He said that the crew completed a running brake test when the train departed.

He said that the trip was normal with no unusual occurrences until he saw the garbage [refuse] truck drive around the crossing gates. The RFE said that had the truck kept moving there was time for the truck to clear the crossing before the train arrived. He said that the truck stopped on the crossing for an unknown reason as the train approached.

The RFE said that he could clearly see that the north side of the crossing gates were in the down position and that he saw the truck drive around the gates on the north side (the truck was travelling in a north – south direction). He also said that lights and bells were activated on the north side of the crossing). He said that the engineer was sounding the locomotive horn and that he began sounding the horn at the whistle board, continuing until the time of impact.

The RFE said he was sitting in the fireman's seat (left-hand side of locomotive cab). He said that he could see the truck about one-quarter of a mile before reaching the crossing. He told investigators that when it became clear that the collision was imminent, he got down to stay out of the windshield and that he heard the engineer place the train into emergency braking. The next thing he remembered was being in a pile [of bodies] in the back of the engine [locomotive] with all those in the cab.[11] He told investigators that the train was travelling about 60 mph before the engineer applied the emergency brakes.

The RFE said that there were no visibility issues with this crossing, that there was a slight curve but that he could see the garbage truck. He further said that a "normal" vehicle might pose some difficulty in sight until the train was closer to the crossing.

The RFE was transported for medical attention following the accident. He told investigators that he was first placed in an ambulance with the driver of the garbage truck. He said that the driver said he, "was trying to beat the train and that he was stupid, and that his life was over, amongst complaining a lot."

The location of this accident was within the RFE's assigned territory. He said that he had ridden with this engineer several times and that he was one of the best engineers on his territory.

Amtrak Locomotive Engineer

During an interview the engineer told investigators that he arrived the station about 9:30 a.m. and that Amtrak employees planning to board the train at Charlottesville held a job briefing

[11] Personnel in the locomotive cab included the locomotive engineer, road foreman of engines, a locomotive technician, and a Capitol Police officer.

about 10:00 a.m. [redacted] He said that it was "a clear day" and that he could see the signals. The engineer said that as the train approached Crozet (MP 194.1) he could see the signals were clear (proceed) at both ends. There was a curve and a private road crossing just west of Crozet and he said that he sounded the horn in the proper sequence for the private crossing and that he continued to sound this sequence to the next crossing, Lanetown Road, where the accident happened.

The engineer said that he saw a garbage truck and that the crossing gates were in the down position. He said that the truck went around the gates and started to drive across the crossing and that he did not think too much about it since he thought there was plenty of time for the truck to clear the crossing before the train arrived. He said that the train was running at 60 mph. The engineer said that as the train was about 100 feet from the highway-rail grade crossing he realized the truck would not clear the crossing in time and that he placed the train into emergency braking.

Amtrak Conductor

The conductor told investigators during an interview that he began working in freight service in St. Albans, West Virginia in 1969 and that he came to Amtrak in 1985 as a

"loaner" from CSX and that he became a permanent conductor with Amtrak in 2001. He said that he was a conductor during the period from 1969 to the present time.

He said that he arrived the Charlottesville station about 9:30 a.m. on the day of the accident and waited for the RFE and engineer. He had spent the previous night in the hotel and drove himself to the station. Upon their arrival, he said that they discussed the train orders. After arrival of the superintendent of operations, assistant superintendent, and the trainmaster, he said they had an in-depth job briefing including the train orders, job descriptions, and what each would be doing once on the train. He also said that once on the train, he held a job briefing with the two assistant conductors who got on the train in Washington, D.C.

The conductor said that there was nothing unusual with the train until reaching the crossing at Lanetown Road. He said that he was sitting in the first coach behind the café car, the second car behind the locomotive along with the security personnel ("armed guards"). He told investigators that at the time of the collision, he was sitting with the train orders in front of him and was getting ready to call for the speed restrictions the train was approaching at MP 204.

He said that upon impact he lifted out of his seat and hit his head on the ceiling and then went back down on his knees. The conductor said that he immediately tried to call the headend of the train on his radio but did not get an answer and tried again but with no answer. He then heard the "Emergency, Emergency, Emergency" broadcast on the radio and heard the RFE say that he was going to walk the train and inspect it. The security officers would not allow the conductor to get off the train at this time. Once the security personnel allowed the conductor to get off the train,

about 10 minutes later, he said that he stayed with the superintendent of operations and followed his instructions and that he did not inspect the train since the RFE had done that task.

Amtrak Assistant Conductors and Lead Service Attendants

Investigators held a joint interview with the two assistant conductors and the three lead service attendants. As in the earlier section, the assistant conductors are referred to as assistant conductor A and assistant conductor B. For the ease of the reader, the lead service attendants are designated as LSA 1, LSA 2, and LSAE 3 below.

Assistant conductor A said that he began working for Amtrak in May 2017, that he trained in Wilmington, Delaware through July 2017 at which time he began working the Washington, D.C. crew base on the extra board. He told investigators that the assistant conductor "backs up the conductor on the train, helps with collecting revenue, and making sure passengers get on and off safety, and just basically the general safety and operation of the train. He said that he arrived Union Station around 6:00 a.m. and helped the conductor collect paperwork and took part in a job briefing. He said they left Union Station and proceeded towards Charlottesville for a crew change.

Assistant conductor A said he was in the second car from the rear engine of the train at the time of the accident. He said that on impact, the power went off and that it was, "a pretty nice jostle". He said he did not see anyone injured in the car he was in.

Assistant conductor B said she began working for Amtrak in May 2015, went to Wilmington, Delaware for training through October 2015 at which time she began working as an assistant conductor. She then became a qualified (certificated) conductor in Washington, D.C.; however, on the day of the accident she was working as an assistant conductor.

On the day of the accident, assistant conductor B said that she arrived Union Station about 6:30 a.m. where she met the conductor, engineer, and the other assistant conductor. She told investigators they got the paperwork for the train together and had a job briefing with the managers and the onboard service members [lead service attendants]. Following the job briefing, they boarded the train and left Union Station. She told investigators that the plan was for the assistant conductors to stay on the train from Union Station to its destination at While Sulfur Springs, West Virginia and return to Washington, D.C. with the empty train equipment after arrival.

Assistant conductor B said that the train activated a hot box detector (wayside warning device that checks for hot journals), but that the mechanical personal on the train checked it out and that nothing was wrong with the car,

Assistant conductor B said she was standing in the second café car (car number 8) at the time of the accident. She said she did not see any injured passengers in this car. She said that the train, "jumped forward, the HEP went out, the lighting, the lights on the train, power on the train …" She said that she immediately went to go see what was wrong. She said that she, "looked around, I went to go check on passengers to make sure everyone was okay, looked out the window, and at that point I was aware there was an accident, saw the, you know, trash, the dump truck and the trash in the grass. And then I just walked the train to make sure everybody on the train was okay, and I made my way forward to the conductor." Assistant conductor B said that the Capitol Police were inspecting the outside of the train first because of the Congress members on the train and that she and the conductor had to wait until they finished their inspection. She also said that the Capitol Police instructed her to not open the doors until they finished checking out the surroundings of the train. She said she checked on the passengers to make sure they were okay and

that there were two medical doctors on the train to help with the injured passengers. Both assistant conductors reported hearing the radio broadcast, “Emergency, Emergency, Emergency.”

The LSA 1 told investigators that she began working for Amtrak in 2012 as a lead service attendant in Washington, D.C. and that she worked onboard the trains in the café cars, serving food to the passengers. On the day of the accident she said that she reported for duty at 4:00 a.m. and got the car set up for departure. She said that at 7:00 a.m. she met with the others for a safety briefing and that following the briefing, she went back to the train.

After departing Union Station, LSA 1 said that the trip was normal and that when the train stopped following the collision at Lanetown Road the only thing she noticed was that the power on the train went out. She said that she received no injuries during the accident and that she did not see any injured passengers in the café car she was working in.

The LSE 2 started with Amtrak in November 2015 working on the auto train. She said she worked on the auto train for a year and then transferred to Washington, D.C.[12] She has worked the extra board as an LSA for the past year.

The LSA 2 was in the first café car from the head end of the train at the time of the collision and was behind the counter. She said the train jolted and that there was a “loud crash and bang”. She also said that her, “whole body was jolted” but that she did not see anyone fall to the floor. She said there were about 20 to 25 people in that café car.

[12] The auto train is an Amtrak train equipped with special cars to transport automobiles. The auto train leaves out of Lorton, Virginia and goes to Sanford, Florida. Passengers ride in coaches and their automobiles move in the special cars to the destination.

The LSA 3 began working for Amtrak in August 2006. He said that on the day of the accident he reported for duty about 4:00 a.m., went on the train, setup, and got everything done.[13] About 7:00 a.m. he said he went back for a safety meeting and briefing with the other crew members and then back to the train. He told investigators everything was normal, "just like a regular day that we would work. And nothing was wrong, everything was good."

He said that he was in the back (closer to the read of the train) café car, behind the counter serving someone when he felt a jolt. He said that everyone in the café car was okay, not injured but that he could not estimate how many passengers were in the car at the time of the collision, but that there were a lot. He said that, "nobody was hurt from my recollection."

Both assistant conductors and all three lead service attendants said they received emergency response training every two years.

Locomotive Technician

The locomotive technician who was riding in the cab of the lead locomotive at the time of the accident told investigators that he began working for Amtrak in September 1992 as an electrician in the car department. About two years later he progressed into the locomotive department and became a locomotive technician and has worked in this position since then. He said that a locomotive technician troubleshoots and makes repairs on various types of engines, electric engines, diesel engines, and yard engines.

[13] "Setting up the train means making sure that the food is at the correct temperature and that food requiring refrigeration is put into the refrigerator, arranging the display in the café car, and setting out the chips for purchase.

He told investigators that the day of the accident started normally, just like any other train trip and that everything was fine when the train departed Washington, D.C. He said that when they got to Charlottesville, they changed engineers and the RFE got on the train there. He said they departed Charlottesville and went down the Buckingham Branch Railroad. After going a little way down the Buckingham Branch Railroad, he said that he saw a trash truck ahead come into the crossing. He said that the truck looked as if it were stuck. However, he said that as the train got closer, the truck pulled to the left of the track and then stopped. He told investigators that he thought the truck was going to clear the track, but that it stopped again with the rear tires just to the left of the fireman's side rail (left side of the tracks). He said that as the train approached, he realized that the train was not going to clear the truck and that the train then collided with the truck.

He told investigators that he could not say if the crossing gates were lowered or not but that he did notice that the warning lights were flashing. He did not recall any other vehicles or pedestrians in the area at the time of the accident. He said that he did recollect the train horn and bell sounding.

The locomotive technician said that he was sitting in the center seat in the locomotive cab but that he ended up on the floor with everyone else. He did receive minor injuries during the collision.

When asked about the mechanical condition of the train and the report of the wayside detector activation, the locomotive technician said there was no issue with the journals. He said that the detectors to his knowledge only sensed the outboard journals and that these cars had with inboard journals. The locomotive technician told investigators that a car inspector inspected the

car with the wayside detector notification and found no defects with the car. He further said that neither locomotive had any issues with the journals.

Site Distance Observation

On February 2, 2018, investigators conducted site distance observations about the same time of day as the accident to determine:

- The distance at which the engineer could see the refuse truck traveling south on Lanetown Road and the warning devices activated
- The distance at which the RFE could see the truck traveling south on Lanetown road with the warning devices activated
- Point where both the engineer and the RFE could see the refuse truck drive around the crossing gates
- Point where activation of emergency brake application occurred

The BBR established Form B on-track safety for participants in the site distance observation. The Virginia Department of Transportation closed the roadway to protect participants from vehicular traffic during the observation. Investigators participated in a job briefing with the BBR and established a point of contact for the railroad group and one for the highway group with the responsibility to communicate with the employee-in-charge before fouling the track. No other trains operated through the area during the observation.

Investigators used an exemplar train consisting of two locomotives in push-pull configuration and two passenger coaches and an exemplar refuse truck to conduct the sight

distance observations. An Amtrak crew operated the exemplar train with the conductor positioned on the rear locomotive and the engineer and the RFE in the locomotive cab. An NTSB unmanned aviation vehicle (UAV) (commonly referred to as a drone) captured both video and still photographs during the observations. (See Figure 2.) At each reference point the wayside was marked with fluorescent paint and a measuring wheel on top of the rail measured each distance noted. Table 1 shows the sight distances for each reference point.

Table 8. Site Distance Observation.

REFERENCE NUMBER	REFERENCE DESCRIPTION	DISTANCE EAST OF HIGHWAY-RAIL GRAD GROSING
R1	Exemplar engineer first saw the refuse truck travelling south on Lanetown road with the warning devices activated	1148 ft.
R2	Road Foreman of Engines first saw the refuse truck travelling south on Lanetown road with the warning devices activated	1082 ft.
R3	Point at which the Road Foreman of Engines reporting seeing the refuse truck drive around the crossing gate	896 ft.
R4	Distance from the highway-rail grade crossing of the emergency brake application	410 ft.

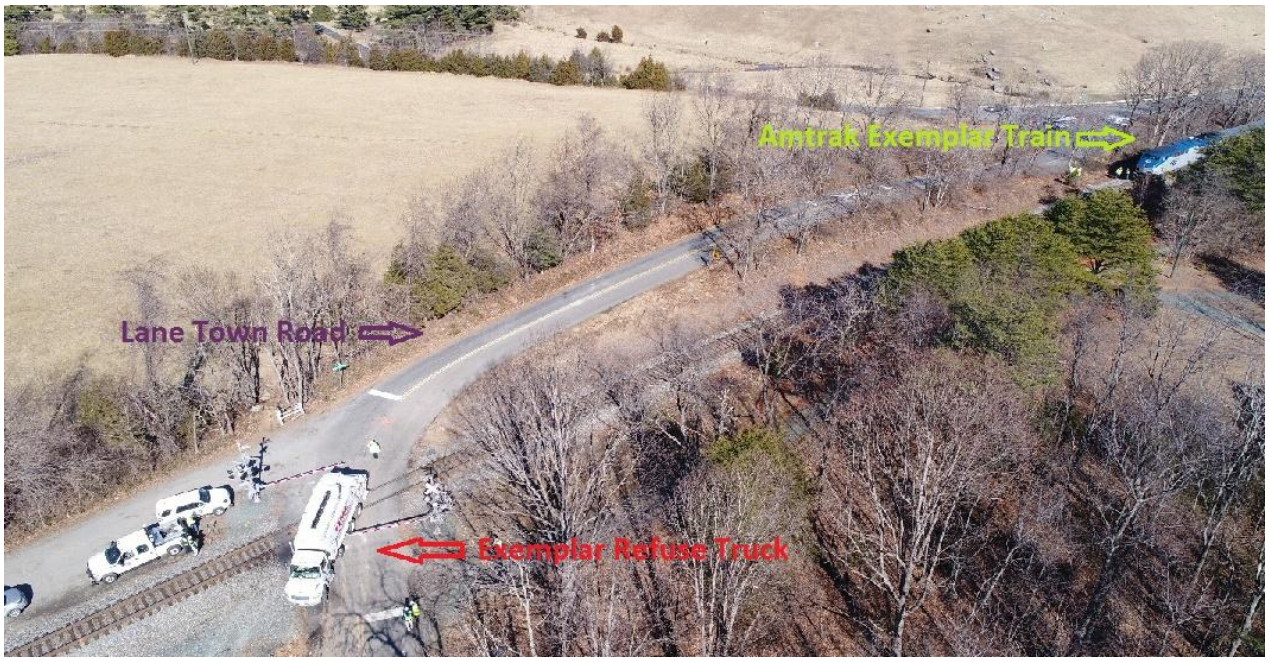

Figure 2. Observation of Exemplar Train and Refuse Truck. (Photo NTSB)

See the *Highway Human Performance Factual Report* in the public docket for this accident for information about the highway part of the site distance observation.

Personal Electronic Devices

Investigators subpoenaed the cell phone records of the engineer. Review of those records showed that there was no cell phone usage by the engineer between Charlottesville, Virginia and the accident location. The engineer's last outbound telephone call was at 10:52 a.m., before departing Charlottesville, Virginia and there was no other activity until 1:46 p.m.

For more information see the *Human Performance Factual Report* in the public docket for this accident.

Track and Engineering

The BBR North Mountain Subdivision consisted of single main track with eleven sidings for meeting and passing trains. The BBR maintains the track in the accident area to FRA Class 3 standards.[14] The last Sperry rail test was on September 20, 2017.

The Federal Railroad Administration (FRA) inspector along with a Virginia Public Utilities Commission inspector conducted a walking inspection between MP 195.7 and MP 196.1. Track elements inspected included gage, alignment, and degree of curvature. The inspection revealed no deviations in track measurements.

No significant track or engineering defects were found upon review of FRA Inspection Reports dated January 2, 2018, and September 5, 2017

Mechanical

The consist of train P923-31 was as follows:

Table 9. Amtrak Train P923-31 Consist.

Position in Train	Equipment Number	Type of Equipment	Comments
1	ATK 145	Lead Locomotive	Lead truck derailed
2	ATK 9800	Coach	
3	ATK 82519	Coach	
4	ATK 82591	Coach	
5	ATK 82675	Coach	
6	ATK 43391	Café Car	
7	ATK 82750	Coach	
8	ATK 82777	Coach	
9	ATK 43377	Café Car	

[14] See Title 49 *Code of Federal Regulations* Part 213 – Track Safety Standards.

10	ATK 82783	Coach	
11	ATK 82565	Coach	
12	ATK 4	Trailing Locomotive	

The lead locomotive, ATK 145, had all required safety devices installed, including bell, horn, locomotive event recorder, and alerter. The ATK 145 also had outward facing video (track image recorder) and trip optimizer installed on ATK 145; however, the trip optimizer was not engaged at the time of the accident.[15]

The train received a Class I inspection prior to departure at Union Station; no defects were noted.[16]

On February 2, 2018, an FRA inspector performed a postaccident inspection of the lead locomotive at the accident site; however, due to the accident damage an air brake inspection could not done. On February 5, 2018, investigators conducted an inspection of the coaches, café cars, and the trailing locomotive at the Amtrak Ivy Yard. Investigators noted no defects with the equipment.

Highway-Rail Grade Crossing

For more information about the Highway-Rail Grade Crossing at Lanetown Road near Crozet, Virginia, see the *Signal Factual Report* and the *Highway Factual Report* in the docket.

[15] A video group reviewed the outward facing video.
Trip optimizer is an intelligent, fuel-saving cruise control for a locomotive that optimizes fuel consumption based on a specific train's make up and the route traveled. The locomotive engineer must take charge of the train when encountering a signal with a less favorable indication than proceed, operate the train manually, and comply with signal indication requirements.

[16] See Title 49 *Code of Federal Regulations* Part 238.313.

Weather

Investigators examined the weather conditions reported at an automated weather observing system (AWOS) located at the Eagle's Nest Airport in Waynesboro, Virginia that was located about 13 miles west of the accident location at an elevation of about 1,4355 feet. Observations between 9:55 am and 11:55 am on the day of the accident identified calm or very light wind from various directions, 10 miles or greater visibility, clear sky below 12,000 feet, and temperatures of 28 to 37°F. Weather conditions from an AWOS at the Charlottesville-Albemarle Airport in Charlottesville, located about 15 miles east-northeast of the accident location at an elevation of about 640 feet, between 8:53 am and 10:53 am showed calm wind and with of 8 mph or less from the southeast to south-southeast, 10 miles or greater visibility, clear sky below 12,000 feet, and temperatures of 25 to 36°F.

For more information see the *Meteorology Report* in the docket.

Parties to the Investigation

Parties to this investigation included the Federal Railroad Administration, Amtrak, Buckingham Branch Railroad, Brotherhood of Locomotive Engineers and Trainmen, International Association of Sheet Metal, Air, Rail, and Transportation Workers, Brotherhood of Railroad Signalmen, Virginia Department of Transportation, and the Albemarle County Police.

#END OF REPORT#