



NATIONAL TRANSPORTATION SAFETY BOARD
Investigative Hearing

Norfolk Southern Railway general merchandise freight train 32N
derailment with subsequent hazardous material release and fires,
in East Palestine, Ohio, on February 3, 2023

GROUP	B
EXHIBIT	
1	

Agency / Organization

NTSB

Title

**Witness Video Group- Examination of
Train Routing and Movement of NS Train
32N**

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A. ACCIDENT

Location: East Palestine, Ohio
Date: February 3, 2023
Time: 8:54 p.m. (Local Time)
Track: Fort Wayne Line MP 49.5
Railroad: Norfolk Southern Railway Company
Train: Train 32N

B. GROUP CHAIR

Sheryl Harley
NTSB
Washington, D.C.

C. ACCIDENT SUMMARY

For a summary of this accident, refer to the Accident Synopsis available in the docket for this investigation

D. DETAILS OF THE INVESTIGATION

The purpose of this investigation was to examine and document the route taken by NS Train 32N and its movements along the route in an attempt to determine the point where the first indication of a potential problem was evident. To achieve this goal, the group retraced the movements of the train starting south of the large railyard in the community of Macedonia, Ohio and at locations in populated areas where business and industries were located adjacent to the tracks, attempted to obtain video surveillance or eyewitness statements regarding the train's movements. Lastly, the investigation looked at recent incidents that have occurred along this route.

1.0 TRAIN ROUTING

The movement of Train 32N along the route is governed by a timetable. The timetable covers approximately 137 miles of the train's movement along the Cleveland Line, identified by the railroad as eastbound¹ towards Alliance, Ohio. At Alliance, Ohio, Train 32N enters the route designated as the Fort Wayne Line to continue eastward towards East Palestine, Ohio and the Pennsylvania state line.

¹ Cleveland to Alliance, Ohio is geographically southbound; however, NS timetable identifies the track direction as east.

1.1 Cleveland Line

The Cleveland Line connects the various train routes through Cleveland, Ohio to the north to routes such as the Fort Wayne Line to the south. At Cleveland, Ohio, the route starts at Milepost marker (MP) 193.0. During the investigation, the first major community on the line to be canvassed was Macedonia, Ohio, located at Mile Post (MP) 104. 5. Train 32N proceeded eastbound passing through the populated communities of Hudson, Ravenna, Rootstown, Atwater, and Limaville, Ohio before intersecting with the Fort Wayne Line junction at Alliance, Ohio. During the trip eastward, Train 32N passed over two hotbox detectors (HBDs) along the Cleveland Line. The HBDs are track side devices designed to detect the build up of heat that indicate a potential wheel defect that could lead to a derailment. The HBDs along the Cleveland Line route that the train traveled on are located in Twinsburg, Ohio at MP 101.64 and Rootstown, Ohio at MP 81.85. The train exited the Cleveland Line in Alliance Ohio at MP 66.9 and entered the Fort Wayne Line at MP 83.2. **Figure 1** is Google map showing the direction of travel the train along the route, the major populated areas and the location of the hotbox detectors (indicated by the stars) on the route.

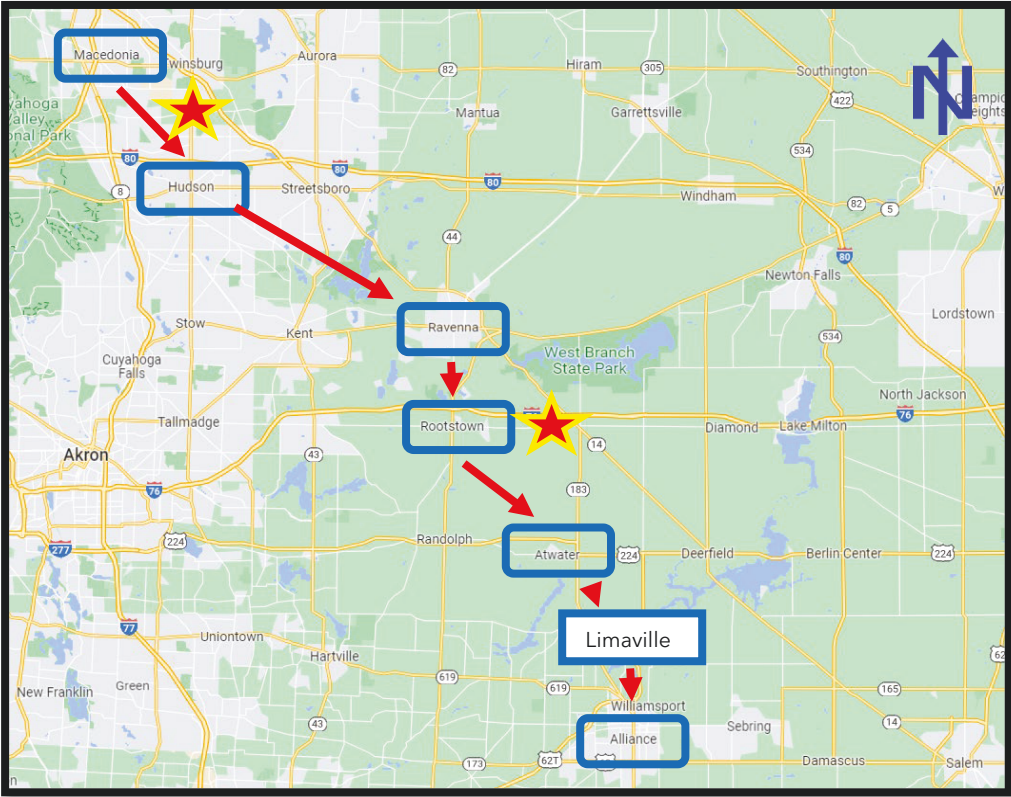


Figure 1 Google Map image of the populated communities Train 32N passed along the Cleveland Line. The hotbox detectors along the route are indicated by the stars. (Source: Google Map)

1.2 Fort Wayne Line

Train 32N entered the Fort Wayne Line at MP 83.2 and continued eastbound towards the Pennsylvania state line located at MP 48.8. The major cities, towns and communities along this route include Sebring, Beloit, Salem, Columbiana, and New Waterford. The last major community before the PA state line is East Palestine, the site of the derailment. On the Fort Wayne Line, there are three HBDs between Alliance, Ohio and the PA state line. The HBDs are located in Sebring, Ohio at MP 79.8, Salem, Ohio at MP 69.01 and East Palestine, Ohio at MP 49.81. The investigation determined that Train 32N derailed at MP 49.5 and the overturned cars came to rest east of MP 49.2 in East Palestine. The head end of the train came to a stop inside the state of Pennsylvania at about MP 48.4. **Figure 2** is a Google map image showing the direction of travel and the populated areas passed by the train. Also shown in the figure is the location of the hotbox detectors (HBDs). The Pennsylvania state line is shown as a broken black line.

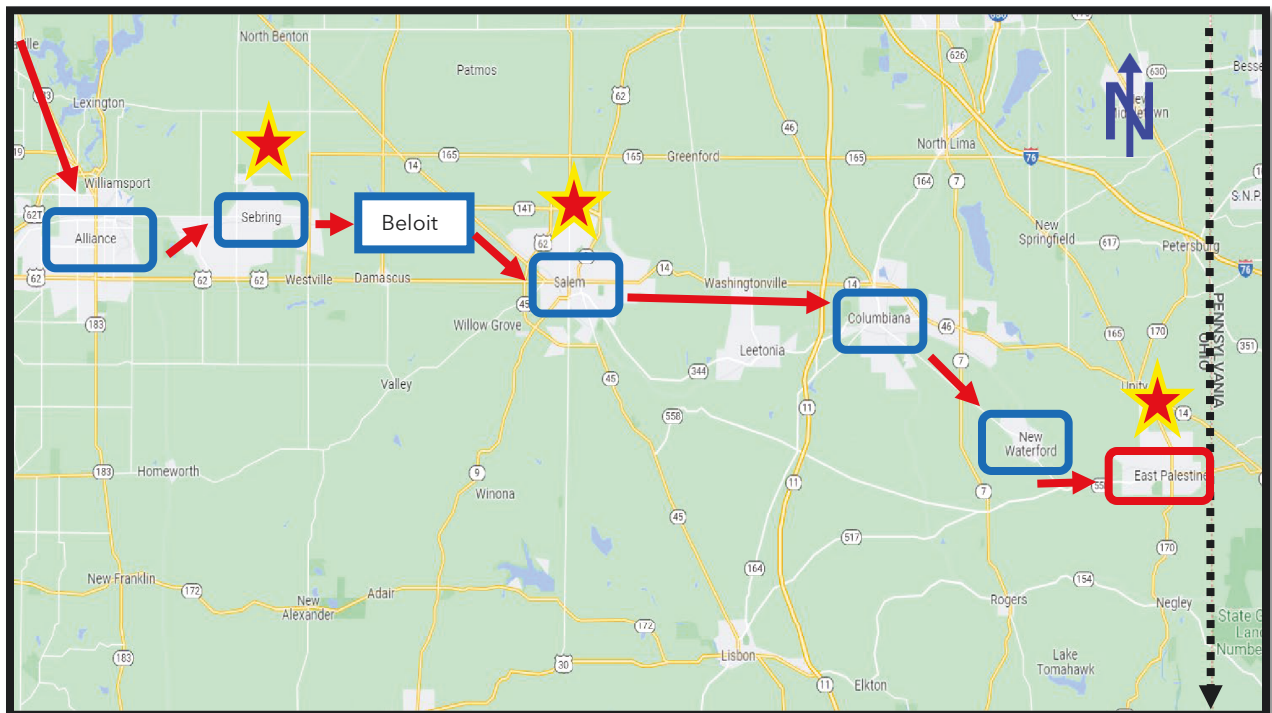


Figure 2 Google map image of the Fort Wayne Line showing the direction of travel of the train, the major populated areas and the location of the hotbox detectors along the route. The Pennsylvania state line is indicated by the broken black line. (Source: Google Map)

2.0 TRAIN MOVEMENT DOCUMENTATION

Initially, investigators on the scene received and reviewed a video that was supplied by the owner of a private residence located in New Waterford, OH approximately 3.5 miles west of the derailment site. The video showed Train 32N with fire emanating from underneath one of the hopper cars as the train traveled eastbound towards East Palestine. The NTSB reached out to various individuals and entities to obtain additional documentation of the train's movements and the condition of the train prior to the derailment.

2.1 Video Documentation

The search for documentary evidence extended from Macedonia, Ohio, to East Palestine, Ohio. The canvass of businesses along the Cleveland Line covered the approximate 37.6 miles the train traveled on that route and an additional 33.7 miles was canvassed along the Fort Wayne Line.

The various videos obtained by the NTSB were reviewed and cataloged. The first video that showed visible sparks or fire coming from the suspected hopper car involved in the derailment was observed on video obtained by two industries in Salem, Ohio about 13 miles east of Alliance, Ohio and about 21 miles from the point of derailment in East Palestine. Additional video documentation of the fire underneath the hopper car is captured by a "Ring" doorbell system in New Waterford, an industry security system located in East Palestine just east of the Market Street HBD, and the private residence security system located within a couple hundred feet of the derailment point. The video from the private residence also provides an audio of the derailment to include a high pitch scragging sound as the train passes and two loud bangs followed by a flash, visible fire and the train braking.

2.2 Witness Statements

In addition to video evidence, investigators conducted interviews of witnesses who saw or heard Train 32N pass their location. Several of these witnesses reported hearing a loud metallic scragging or dragging sound coming from the train as it traveled past their location but none of these witnesses reported seeing fire or sparks coming from the train. The first witness was located at approximately MP 79.0 in Rootstown on the Cleveland Line. In addition to providing a statement regarding what he heard, this witness also captured the event on his home security system. A copy of the video was sent to the NTSB and reviewed by the investigator. As reported by the witness, the train passes the camera for approximately 10 seconds before a loud screeching sound is heard. The sound intensifies between 12-14 second mark in the video and then stops. The sound appears to be coming from the front portion of

the train consist and stops before half the train has passed the camera. The witness's location is approximately 26.56 miles from the Norfolk Southern Motor Yard located in Macedonia, Ohio. The second witness was located at approximately MP 59.64 in Columbiana on the Fort Wayne Line. Again, this witness reports hearing an unusually loud, almost piercing metallic scrapping or dragging sound coming from the passing train. This witness also advised that she did not see any sparks or fire coming from the train. This is approximately 10.14 miles west of the derailment point.

Table 1 is a compilation of the search for documentary evidence along the route of 32N starting on the Cleveland Line and ending on the Fort Wayne Line in East Palestine. The table shows the closest mile post to the location searched and/or where video or other documentary evidence was obtained. The five hotbox detectors (HBD) that 32N would have passed over are shown in relation to the locations searched. The table shows the results of the area canvass and a brief notation of what the search found.

Table 1 Compilation of the search for documentary evidence regarding the movement of Train 32N along the Cleveland and Fort Wayne Lines

Cleveland Line	Mile Post	Documentation	Timing	Location	Remarks
Macedonia	MP 105.56	None			
	MP 104.5	Video		Industry	
*HBD	MP 101.64				
Hudson	MP 96.70	None			
Ravenna					
	MP 84.76	Video		Local Government	Nothing remarkable
	MP 82.4	Video		Private	Nothing remarkable
Rootstown					
*HBD	MP 81.85				
	MP 79.00	Video	6:23:08-6:23:14	Private	High pitch metal squeal
Atwater		None		-----	-----
Limaville		None		-----	-----
Alliance	MP 67.62	Video		Industry	Nothing remarkable
Fort Wayne Line					
Sebring					

*HBD	MP 79.8				
	MP 79.32	Video		Industry	Nothing remarkable
Beloit	MP 77.22	None		-----	-----
				-	
Salem	MP 70.14	Video	8:11:04	Industry	Visible fire
	MP 69.86	Video	No time noted	Industry	Visible fire
*HBD	MP 69.01				
	MP 68.81	Video	8:13:48	Industry	
Columbiana	MP 59.64	Video	8:35:48	Industry	Visible fire
	S/A	Statement		Private	Reported high pitch metal squeal
New Waterford	MP 54.1	Video	8:46:46	Private	Visible fire
East Palestine					
*HBD	MP 49.81				
	MP 49.75	Multiple Videos-2 site locations	1 st location- 22:44:01- 22:45:16 2 nd location- 20:51:55- 20:52:22	Industry	Fire/sparks (recorder time incorrect at first location)
	MP 49.5	Multiple Videos	8:53:13- 8:54:43	Private	Loud bangs, high pitch metal squeal/ bright flash of light and fire

3.0 Prior Incidents along the Route

3.1 Cleveland Line

In the community of Ravenna, Ohio, four railroads operate trains on or adjacent to the NS Cleveland Line. The other railroads include CSX, Amtrak and a local railroad. As many as 60 trains a day pass through the area. Amtrak runs two trains, one northbound and one southbound during the early morning hours. CSX runs fewer trains through the community since taking over the former Conrail tracks that route the trains around the township.

On November 1, 2022 at about 7:05 p.m. local time, a Norfolk Southern train comprised of four locomotives on the head end, 188 loaded and 50 empty cars was heading eastbound towards Rootstown, Ohio when it derailed 20 cars in the Ravenna Township. Of the 20 derailed cars, NS reported that 2 were identified as hazardous materials cars and both sustained damage but no breach or product loss occurred. Witnesses on the scene reported that three rail cars had spilled a white powder substance which NS later identified as salt. The initial report filed by NS with the National Response Center (NRC) indicated that only 5 cars derailed. The NRC

report did not mention damage to property other than the railroads. NS filed a Rail Equipment Accident/ Incident Report Form 54 with the FRA again stating that only 5 cars derailed and not documenting the damage to the adjacent private properties. During the follow up investigation for the East Palestine derailment, the NTSB was notified of this earlier derailment on the Cleveland Line.

The investigator reached out to representatives of the township and the Portage County Sheriff's Office and obtained reports documenting the incident. Interviews were conducted with these representatives which included the fire department, Incident Commander, as well as the various locals to include an eyewitness to the derailment. A summary of the interviews conducted is provided below.

3.1.1 The Eyewitnesses

A resident was standing outside of his home watching the local fireworks display at 7:05 p.m. when the southeastbound train passed him heading towards Rootstown, OH. The resident reported that, in his estimation, the train was traveling approximately 50-55 miles per hour. He heard a bang that occurred from a part of the train that was to his right and behind him. When he turned, he observed heavy sparks radiating out from underneath the front of one of the rail cars. As he watched, the sparks seemed to engulf the whole underside of the car and spread to the trailing car. At that time, he heard a second bang followed by an object flying off the train and sailing over a small shed in the backyard. The resident advised that at that time he could hear and see the railcars compacting on top of one another and coming off the tracks. The resident advised that he was standing between the backyard shed and his boat. A rail car filled with brand new automobiles (Jeeps) flew off the tracks and landed on top of his boat. It was at this point he decided to run, stopping to get the other older resident out of the house.

The individual inside of the residence at the time of the derailment advised that he was hard of hearing and didn't hear or see the derailment. He felt the house shake followed by the other resident running inside and telling him to run for his life. When the two men alighted from the residence, it appeared that the rail cars had stopped moving. The two men began to walk down their driveway towards the track while the first resident called 911. The dispatcher inquired about injuries and the presence of hazardous materials but in the dark and being unable to see the cars properly, the two men were unable to provide that information. The first resident advised that within 3-4 minutes a sheriff's deputy arrived followed by the fire department. The resident along with five firefighters walked down the track towards the head end of the train which was estimated to be ½ to one mile south of the derailment. After arriving at the front of the train, the resident advised that the emergency responders spoke to a member of the crew who indicated that they (the crew) didn't know that

the train had derailed only that the train's emergency brake had activated and that was why they had stopped.

3.1.2 The Incident Commander

The former Ravenna Township fire chief had been the incident commander during the emergency response to the derailment. He advised that the conductor of the train, who was also a volunteer firefighter, quickly provided a manifest of the rail cars and their content to him. However during the operation, he had to rely heavily on the "Ask Rail app" that he had installed on his phone. The Incident Commander advised that the railroad arrived quickly to the scene but that the responding personnel advised him that they were not empowered to make decisions for the railroad. Approximately one hour later, an unidentified female arrived on the scene. The railroad personnel already present identified her as the person in charge. However, the female NS employee only went door to door handing out legal documents and did not concern herself with the immediate operation. The fire chief advised that it was about two hours after the initial response to the incident that a representative of the railroad arrived who had the authority to represent the railroad and provide instructions to the railroad personnel on the scene. The chief advised that he noted the time of the individual's arrival and his name in his incident report.

The Incident Commander noted that several safety issues were not immediately addressed by the railroad. The first being the spilled white powder substance from several rail cars. Again, he noted that "Ask Rail" provided a lot of assistance that the railroad had been unable to provide. The second, and most concerning safety issue was, per the Incident Commander, the railroad's decision to leave the derailed train on the track that blocked a small enclave of residents. The trailing end of the train blocked a private crossing located north of Summit road off of South Prospect street. This was the site of an earlier fatal grade crossing accident involving a 15 year-old driver. The crossing separates three residences from the main road. The only way out of the neighborhood was across the tracks which was blocked. Residents were forced to physically climb over the rail cars to get out of the area. In addition, emergency responders were unable to access the area except by having personnel climb over the rail cars left on the scene. NS was aware that it was trapping three families in the cul-de-sac with no way out. The community was enraged to find that the railroad had cleared one track and was operating trains as normal within 16 hours of the derailment but had elected to leave three local families trapped and cut off from the community and emergency help. The train cars were moved three days after the derailment.

3.1.3 Other Witnesses

One of the properties that sustained extensive damage in the derailment belonged to the local Fraternal Order of Police Lodge. Representatives from the FOP advised that the derailed cars tore up the organization's parking lot, causing approximately \$81,500.00 in damages. Both the representatives of the FOP as well as the two witnesses that lived next door advised that the railroad's response to the derailment seemed timely and appropriate. However, by mid-January, NS crews left the scene and the railroad stopped communicating with the community which still had derailed rail cars and debris left on the scene and none of the property owners were commensated for the damage to their property to include a septic tank that was leaking raw sewage above ground and into the adjacent property.

The FOP representatives also noted that the train cars were left parked on the track for days and blocked the community's access in certain location. The witnesses noted that for years there had been an effort to close the private crossing north of the derailment site due to safety concerns. The efforts started in response to the fatal grade crossing accident involving a local teenage. However, the private crossing cannot be closed because three residences are located on the opposite side of the track with no other alternative route available to the occupants. It was noted that the railroad has shown no willingness to assist the community in finding a solution to the safety issue.

The FOP representatives noted that after the derailment, the frequency of the trains coming through the community has lessen but the obvious change has been to the length of the trains. Before the derailment, it was not unusual for trains to be over 200 cars long, now the trains appear to be shorter. (Note: the next door neighbor disagreed noting that he observed a passing train recently that was 228 cars long.) The representatives advised that after the NTSB reached out to the community about the derailment, NS reached out and sent a representative out to assure the community that it was in the process of completing the clean up and compensating those individual who suffered losses due to the derailment. This communications occurred in March 2023.

3.2 Fort Wayne Line

The East Palestine Police Department reported a prior incident involving a report of a moving train traveling through the community that was on fire.

On January 28, 2023 at 9:23:06 in the morning, a citizen called 911 to report observing a moving train that appeared to be on fire traveling eastbound through the area. A police officer, dispatched to the call, observed the train as it passed the North Market Street crossing. The officer identified the train as being comprised of a

locomotive and 6 rail cars. The officer advised that three of the rail cars had sparks coming from underneath the cars as it moved along the tracks. Two of the six cars had visible flames coming from underneath the cars. At about 9:24 a.m., the police dispatcher contacted Norfolk Southern to report the incident. At that time, the NS dispatcher reported that the railroad had two trains in the immediate area and that they would attempt to contact the train engineers. In the meantime, the police officer while standing at the crossing, attempted to get the train engineer's attention. The officer reported that the engineer gave him a thumbs up, smiled and continued eastbound without stopping. At about 9:30 a.m., the NS dispatcher advised the police dispatcher that no further action was required since the train had now entered the state of Pennsylvania and was out of their jurisdiction. The call was cancelled for both the police and fire departments.

Note: Some time later, a representative from NS reported that the equipment was not a train but rather a "track grinder"². NS provided the NTSB with documentation that a Loram Grinder unit was operating in the area of East Palestine on the day in question.

E. LIST OF ATTACHMENTS

1. Documentation of Train 32N Movements
2. Ravenna Township Fire Department Incident report #2022-2201389.
3. Portage County Sheriff's Office Incident report #22-35046
4. NS Train Consist Ravenna Township Derailment
5. Factual Report of Investigation Interviews, Statements and Documentation
6. Photographs Ravenna Township Derailment
7. Photographs Ravenna Township Derailment Five Months Later
8. East Palestine Police Department CAD/Incident report # 23-00970
9. NS Loram Daily Field Report-RG417 1-28-23

Submitted by:

Sheryl Harley
Rail Accident Investigator

² A track grinder also called a rail grinder is a specialized piece of maintenance of way equipment that is used to restore the profile and remove irregularities to the worn track. The grinding wheels are attached to the bottom of the train which reshapes the track. The process can produce sparks and sometimes flames are visible underneath the train during the operation.