Issued: October 31, 2025 Railroad Investigation Report: RIR-25-17

New York City Transit Train Collision

Location	Manhattan, New York
Date	January 4, 2024
Accident type	Collision and derailment
Striking train	Train 1345-1-SFT-242 4 crewmembers 10 railcars
Struck train	Train 1427-1-SFT-242 2 crewmembers 10 railcars
Track	Main track, signalized
Hazardous materials	None
Fatalities	0
Injuries	24
Damages	$13 million

1 Summary

On January 4, 2024, about 2:59 p.m., northbound New York City Transit (NYCT) non-revenue train 1345 (striking train) collided with northbound passenger train 1427 (struck train) during a shoving movement on the underground Number 1 Line north of 96th Street Station in Manhattan, New York.[1] The struck train was crossing over from express track 3 to local track 4 when the striking train overran a red signal at the north end of the station platform, entered the crossover, and collided with the fifth railcar of the struck train.[2] (See figure 1.) Two railcars on the striking train derailed and three railcars on the struck train derailed. The collision resulted in minor injuries to 18 passengers and 6 NYCT employees. NYCT estimated the damages to be about $12,975,187.

[1] (a) Visit ntsb.gov to find additional information in the public docket for this NTSB accident investigation (case number RRD24MR004), including detailed factual reports about the circumstances of the accident. (b) All times in this report are local. (c) A non-revenue train is any train in test, maintenance, emergency, or inspection service that may not be used by the public.

[2] Under NYCT operating rules, a red signal at the entrance of an interlocking (in this case, a crossover) requires a train to stop.

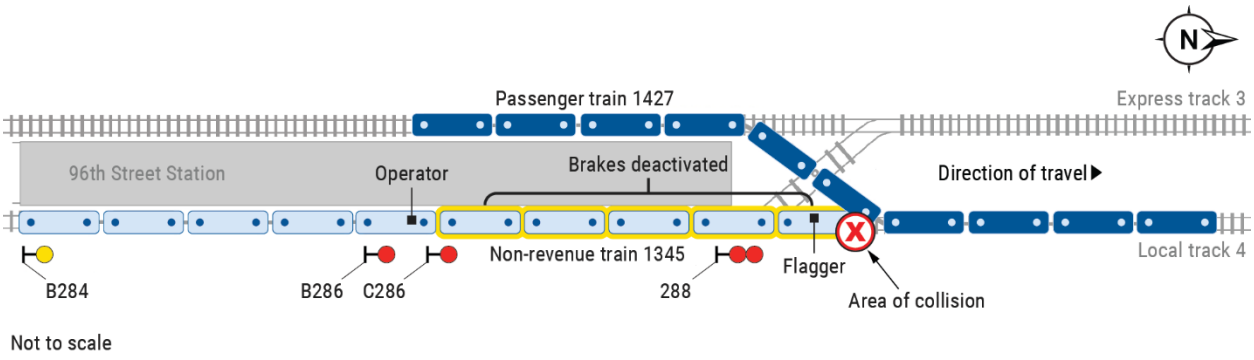

Figure 1. Illustration of the collision location showing the operator who was moving the train positioned in the sixth railcar.

1.1 Accident Sequence

About 2:11 p.m., after the striking train arrived at 79th Street Station, a passenger illicitly pulled the emergency brake valve (EBV) cords in multiple railcars, triggering an emergency braking application of the 10-railcar train.[3] The crew, which consisted of one train operator (operator) and one conductor, was unable to reset the emergency brakes to continue service, so they contacted the operations control center (OCC) for assistance. The OCC dispatched a train service supervisor (TSS) and a railcar inspector (RCI) to investigate and troubleshoot the equipment, but they could not reset the brakes because of an air leak on one of the EBVs. The crew then announced over the public address system (PA) that the train was no longer in service and cleared passengers from the train. The OCC then instructed the crew to prepare the disabled train for a movement to a maintenance facility.

The TSS and RCI next contacted the OCC and received permission to sectionalize the train (divide the 10-car train into two 5-car sections) and deactivate the brakes and traction motors on the first set of five railcars allowing the train to operate in an emergency mode using the motors and brakes from the second set of cars in the consist to control the train.[4] Sectionalizing also isolated the internal communication systems (the buzzer, PA system, and intercom system) such that

[3] An emergency braking application uses all available braking efforts to stop a train as quickly as possible. Emergency brake valve cords are accessible to the public within each railcar.

[4] The consist for NYCT trains that operate on the 1 Line is made up of two sections with 5 railcars in each section (referred to as a "set"). *Sectionalizing* involves isolating the air brake and electrical on one set of railcars from another set of railcars. Railcars on this train could not be individually isolated; they could only be isolated in sets of five. Each section of cars includes controls to operate the train from the cab of lead and trail cars (first and fifth car).

messages from the five lead railcars (first set) could not reach the five rear railcars (second set). Following sectionalization, the train could only be operated from the lead cab in the second set of cars—the sixth car in the train.

To maneuver the train to the maintenance facility, the TSS assumed the role of train operator in a position in the sixth railcar, while the original operator assumed the role as the flagger and relocated to the first or lead railcar to provide movement protection by issuing radio commands.[5]

The OCC then instructed the crew to move the out-of-service train to a maintenance facility for repairs. During this movement, the operator and flagger communicated via handheld radio, on the "Train-to-Train Channel" to coordinate the train's movements. The striking train departed 79th Street Station, northbound on track 4 toward 96th Street Station, destined for 240th Street Rail Yard.

During interviews with the National Transportation Safety Board (NTSB), the flagger and conductor, both positioned in the lead car, recalled that the flagger was continuously informing the operator over the radio that the path was clear until they approached 96th Street Station.[6] As the train neared the station they were given a yellow entrance signal, the flagger said he directed the operator to slow down but did not receive a reply.[7] The train then passed the yellow signal at 2:58:51. The flagger then reported trying other methods to communicate with the operator: the buzzer, the intercom, the PA system, and finally switched his radio channel to the "A Command" channel, which broadcasts system-wide, while urgently calling for the operator to stop the train. The A Command channel is used to communicate from the OCC to trains across multi-station segments.

When interviewed, the operator stated that he no longer heard any commands from the flagger once the train reached the mid-point of 96th Street Station and began to apply the train's full-service brakes.[8] The operator stated that he did not receive the flagger's instruction to slow down or stop the train.

[5] NYCT operating rule 2.39(I).

[6] The conductor was positioned in the lead railcar near the flagger.

[7] A *yellow signal* indicates that the operator must slow down and be prepared to stop at the next signal.

[8] As the train had no event recorder, the NTSB could not confirm brake activations or other control inputs.

At 2:59:01 p.m., the struck train on Track 3 operated on a clear signal for his train to proceed and cross over from Track 3 to Track 4 in front of the striking train. At 2:59:19 p.m., the lead section of the striking train on Track 4 passed a signal displaying a red stop indication (signal 288) at the end of 96th Street Station platform. On the NYCT subway system, when a red stop signal is given, an automatic train-trip stop arm on the track bed raises. However, because the striking train's brakes were deactivated (cut out) on the lead section of the train, the train's brakes were not activated when it encountered the automatic train-trip stop.[9] Consequently, the train continued past the red stop signal (signal 288) and collided with the struck train.

After the collision, NYCT, New York City Fire Department and the New York City Police Department personnel arrived on scene and evacuated passengers.

1.2 NYCT Rules and Procedures

NYCT's operating rule 2.39(l)1 addresses shoving trains from the non-leading end of the movement. The rule required the employee operating the train to have another employee provide point protection (a flagger), meaning that the second employee (flagger) had to be in a position to visually determine that the track ahead was clear and give instructions to control the movement. Before the train could move, the crew was required to test that the operator, who would be operating the train from other than the lead cab, could communicate clearly with the flagger while using sound-powered telephones or radio communication. The operator was required to continuously receive and answer voice signals from the flagger in the lead railcar while the train was moving. If the communications were lost at any time, the flagger or operator was required to immediately stop the train and investigate. Additionally, the rule stated that if sound-powered phones or radio communication were not available or became disabled, intermediate flaggers were required to be positioned between the flagger and the train operator.

NYCT operating rule 2.43(e)1 required that train operators moving a sectionalized consist must operate at "restricted speed with extreme caution" and that a qualified

[9] *Automatic train trip stops* devices are designed to enforce compliance with a "stop" signal. When a signal is clear, the stop arm on the device is positioned below the ball of the running rail. When a signal is at "stop," the stop arm is raised above the ball of the rail in the tripping position. When the stop arm is up when a train encounters it, the trains emergency brakes will be applied.

employee must ride in the section with the deactivated brakes to apply handbrakes or normalize the deactivated brakes, if necessary, to stop the train.[10]

1.3 Postaccident Tests, Observations, and Examinations

1.3.1 Communications Challenges

Interviews with the crew members of train 1345 (the striking train), and the conductor of train 1427 (the struck train) revealed ongoing radio communication challenges throughout the subway network during train service operations. As the crew of the striking train was using handheld radios, the efficacy of their train-to-train radio communications was impacted by objects in the subway environment, like tunnel portals, doors, columns, and people, which interfere with frequency effectiveness and degrades the signal strength. Handheld radios using the Train-to-Train channel can also inadvertently receive an A Command channel broadcasts through the base station radio repeater network.[11] Communications from the A command channel can overrun, interfere with, and obstruct communication on the Train-to-Train channel.

Further, only the Rail Control Center (RCC) can broadcast to all radios, whether on the Train-to-Train channel or the A Command channel, through the base station radio repeater network. Thus, an employee monitoring or using the Train-to-Train channel will receive transmissions from other employees transmitting on the Train-To-Train channel and from the segment wide RCC broadcasts through the base station radio repeater network. If employees are conversing on the Train-to-Train channel and the RCC broadcasts at the same time in the same segment, the RCC transmission will almost always overrun the Train-to-Train conversation. These interruptions inhibit communication on the Train-to-Train channel, for everyone within the segment limits, of that queued base station repeater network.

[10] (a) Under NYCT operating rules, restricted speed requires a crew to operate a train below 10 mph and at a speed that allows them to stop with one-half the range of vision. (b) To normalize the brakes, a qualified employee has to physically push the brake cylinder cut-out lever back down and into place. This action places that particular railcar into emergency braking.

[11] A *radio repeater network* is a system of interconnected radio repeaters that receive and retransmit signals to extend communication range and reliability. These networks are commonly used in emergency services, transportation, and industrial operations to maintain consistent radio coverage across large or obstructed areas.

Following the accident, NTSB investigators conducted a test of handheld portable radio communications on the section of track where the accident occurred. Three NTSB investigators rode a northbound non-revenue train between 79th Street Station and 96th Street Station (the route of the striking train), testing and measuring the Train-to-Train radio frequency performance using the handheld portable radios that the crew used on the day of the accident. Investigators observed that when employees communicated on the Train-to-Train channel during an A Command channel broadcast in the same track segment, the A Command channel transmission was louder and interfered with hearing all Train-to-Train conversations. Further, NTSB investigators conducted 25 verbal radio test transmissions between the flagger and the operator while the train was in motion between 79th Street Station and 96th Street Station.[12] NTSB investigators used the same handheld portable radios that were in use during the accident for the test and were positioned at the exact physical locations occupied by the flagger and operator at the time of the accident.

In total, only 5 of the 25 transmissions (20 percent) were clearly and completely received, indicating that 80 percent of the transmissions failed. These results demonstrated a significant degradation in radio communication reliability between the lead and sixth railcars while the train was in motion.

1.3.2 Signal Examination and Testing

The post-accident signal examinations and testing determined the signal system was functioning as designed. Signal system data logs for track 3 showed that the switches were lined and locked for the struck train's designated route. Track 4 was not equipped with wayside signal event recorders, so signal system data logs were not available for this track. Just before the collision, the striking train traveled 207 feet from the moment it passed the red signal. Due to the absence of an event recorder, the exact speed of the train during this period remains unknown. Train 1345 (the striking train) passed the red signal at 2:59:19 p.m., and train 1427 (the struck train) came to a complete stop after being hit at approximately 2:59:32 p.m., a span of 13 seconds.

[12] The tests included 16 transmissions from the flagger's handheld radio located in the operating cab of the first (lead) railcar, of which only 3 were clearly and completely received by the operator, and 9 transmissions from the operator's handheld radio located in the operating cab of the sixth railcar, where the operator was positioned during the accident, of which only 2 were clearly and completely received by the flagger.

1.3.3 Automatic Train-trip Stops

The track in the area was equipped with automatic train-trip stops, mechanical devices located on the wayside that work in conjunction with the wayside signal system that support the prevention of trains running a stop signal. Examinations and tests of the automatic train-trip stops did not identify any defects or problems that would have prevented them from functioning. The automatic train-trip stops were operating properly and functioning as designed.

Figure 2. Stop arm in the raised position.

2 Analysis

2.1 Accident Summary

In this accident, non-revenue train 1345 (the striking train) struck passenger train 1427 (the struck train) after failing to stop at a red signal. Radio commands from the flagger to the operator of the striking train to stop the train were not received and the automatic train-trip stops, which were designed to prevent signal overruns and train

collisions were ineffective because the sectionalized train had its leading five railcars' brakes deactivated.

2.2 Communication Challenges

Interviews revealed that NYCT's radio communication challenges were known to exist throughout their subway network before the accident. The NTSB also observed these radio communications shortcomings during post-accident testing, where investigators found 80 percent of the radio test transmissions sent over NYCT's Train-to-Train radio channel failed to be clearly and completely received by the flagger and operator. These findings reveal a substantial loss of radio communication integrity between the lead and sixth railcars during train movement.

Radio communications between the flagger and the operator were lost before the accident. The flagger realized radio communications had been lost around the yellow signal, while the operator recalled applying the train's brakes when he realized that communication had been lost at about the mid-point of 96th Street Station. The distance between these two locations was about 300 feet.[13]

With no forward- or inward-facing cameras and no on-board train event recorder, the NTSB could not determine if the operator did or did not apply the brake.[14] Further, 96th Street Station did not have station platform cameras. However, NTSB's postaccident testing did confirm that the brakes were working as intended on the last 5 railcars.

Although NYCT required its flaggers and train operators to immediately stop the train and investigate when communications were lost, there were no established procedures in place to specifically address how much time or distance traveled without communication should prompt brake application. Furthermore, once communications were lost, the flagger did not have a way to stop the train in a timely manner. The only means available to the flagger and nearby conductor were to normalize the deactivated brakes or apply the hand brakes. Because the crew at the front of the train only had a short time to stop the train and prevent the collision, neither normalizing the deactivated brakes nor applying hand brakes would have been effective in stopping the train in time.

[13] Because there was no data to confirm when radio communications were lost or when the operator activated the brakes, the NTSB could not determine exactly how long the radio communications were lost before passing signal 288.

[14] The NTSB has previously recommended event data recorders and in-cab cameras. (Safety Recommendations R-15-23 and R-17-13.)

2.3 Lack of Safeguards

New York City Transit may, under specific circumstances, operate trains from a position other than the lead car because of mechanical failures affecting any of the first five rail cars in the consist. These failures may include inoperative braking systems, EBV malfunctions, or traction motor issues. Although this method of operation is not standard practice within the transit industry, it may be necessary to safely remove disabled trains from the mainline. Operating a train from a location other than the lead railcar as the crew was doing on the day of the accident, presented challenges because the operator could not see his path of travel and hence obstacles, relying on radio communications from the flagger.

The sectionalized configuration reduced the number of safeguards typically available to the crew. Specifically, the buzzer, PA system, and intercom system were cut out between the flagger and the operator, leaving them dependent on NYCT's unreliable radio communication system to relay critical train movement communications between the flagger and the operator. Because the brakes had been deactivated in the first five railcars, the trip stops were rendered ineffective in placing the train into an emergency stop. The flagger was unable to quickly stop the train in an emergency if communications with the operator were lost. Although the conductor was also present in the lead car, the operator did not assign any crew members to the section with the deactivated brakes (to apply handbrakes or normalize the deactivated brakes) as required by NYCT rules.

NYCT operating rules did not account for the safety gaps created by operating the train in this manner nor were sufficient safeguards provided, such as a mandatory and established railcar count between the flagger and operator which would have led them to quickly determine that communication was lost; or a rule to move a train operated from a railcar other than the lead railcar using the command channel.[15]

3 Probable Cause

The National Transportation Safety Board determines that the probable cause of the collision between New York City Transit (NYCT) train 1345 and NYCT train 1427 was

[15] NYCT successfully completed testing of a radio system that can significantly improve audio clarity and signal reliability and would likely have prevented the communication breakdown that contributed to the 96th Street incident. However, according to NYCT, systemic challenges including technical infrastructure limitations, resource-intensive maintenance, and the inherent constraints of the single-channel analog structure limit the feasibility of implementing this solution.

NYCT's inadequate procedures for operating sectionalized trains from positions other than the head end, leading to the crew's failure to stop non-revenue train 1345 at a red signal at 96th Street station and collide with revenue train 1427. Contributing factors included the mechanically cut-out brakes on the first five railcars, which disabled the automatic emergency braking system, and NYCT's outdated communications network, which hindered reliable transmission of critical train movement information.

4 Lessons Learned

The accident revealed deficiencies in NYCT's operational protocols for the movement of sectionalized trains with deactivated braking systems, particularly when operated from a position other than the lead cab. Although procedures existed at the time, the incident exposed gaps in safety assurance and communication reliability.

In direct response to the accident, NYCT issued Service Delivery Bulletin No. 32-24 on February 23, 2024, establishing comprehensive and permanent operating procedures for "Other Than Front End Operation on the Mainline with Sectionalized Revenue Cars." This directive mandates the deployment of a specified number of qualified personnel, clearly delineates individual responsibilities, and requires pre-movement face-to-face briefings to reinforce situational awareness and coordination. It further prescribes detailed train movement protocols, with an emphasis on maintaining continuous, positive verbal communication. The bulletin stipulates that any interruption or loss of communication must result in the immediate cessation of train movement, without exception.

On June 10, 2024, NYCT issued Rail Control Center Directive No. 11-24, establishing clear protocols for OCC personnel, including desk superintendents and console dispatchers when managing movements of trains being operated from locations other than the front cab. The directive mandates that no other train will be allowed to operate within the same segment or block of track at the same time, neither in front of nor behind, the train that is operating from other than the front.[16] Further, trains operating from other than the front cab will only be allowed to move at the direction of the desk superintendent. The desk superintendent will issue all movement instructions conveying each segment of the move one segment or interlocking at a time until the train clears the mainline. Additionally, strict radio silence is required during movement, except in emergencies, to prevent interference and ensure compliance with Bulletin 32-24.

[16] An *absolute block* is a section of track on which a train is not permitted to enter while it is occupied by another train operating as other than head end.

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