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WMSC Commissioner Brief: W-0068 – Person Struck by Train – Bethesda Station – October 29, 2020

Prepared for Washington Metrorail Safety Commission meeting on April 13, 2021

Safety event summary:

CCTV footage reviewed by the WMSC suggests that a Metrorail customer placed themselves on the roadway at Bethesda Station as a train approached the platform.

The train was moving approximately 12 mph when the struck the person, but the nature of the contact resulted only in a head injury. The train stopped approximately 32 feet beyond the customer's location. The person was able to walk to the end of the platform under the guidance of the Station Manager and returned to the platform using the stairs. After the collision, the person stated that they had tripped and fell onto the roadway.

The ROCC followed emergency protocols, and Montgomery County Fire and Rescue Services transported the person to a hospital with non-life-threatening injuries.

Probable Cause:

A customer placed themselves on the roadway as a train approached.

Corrective Actions:

Metrorail took no specific corrective action related to this event.

WMSC staff observations:

As part of a continuous safety improvement process, it is important to focus on ways to mitigate the risks of events or consequences occurring in the future, regardless of any direct way to have prevented this specific event from occurring given the situation at that time.

For example, while it did not impact this specific situation, forward-facing camera footage illuminates potential safety improvements to address the visibility challenges for train operators when exiting a tunnel to enter a station. Metrorail could consider improving tunnel lighting on approach to a station to improve visibility.

Staff recommendation: Adopt final report.

Washington Metro Area Transit Authority

Department of Safety and Environmental

Management (SAFE)

FINAL REPORT OF INVESTIGATION A&I E20343

Date of Event:	11/08/2020
Type of Event:	Collision
Incident Time:	08:20 hrs.
Location:	Bethesda Station, Track 1
Time and How received by SAFE:	08:25 hrs. Email Notification
WMSC Notification Time:	10:22 hrs.
Rail Vehicle:	Train ID 101 **L7658**-7659.7581-7580.7744-7745.7667-7666T

Bethesda Station, Person Struck by Train
November 08, 2020

Table of Contents

Abbreviations and Acronyms

ARS	Audio Recording System
CENV	Vehicle Program Services
CCTV	Closed-Circuit Television
CID	Crime Investigation Department
CMNT	Office of Car Maintenance
COMM	Communication Section
ERT	Emergency Response Team
ER	Event Recorder
IC	Incident Commander
MCFR	Montgomery County Fire & Rescue
MSRPH	Metrorail Safety Rules and Procedures Handbook
MTPD	Metro Transit Police Department
NVR	Network Video Recording
NOAA	National Oceanic Atmospheric Administration
ROCC	Rail Operations Control Center
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
SAFE	Department of Safety and Environmental Management
SMNT	Office of Systems Maintenance
SOP	Standard Operating Procedure
TWC	Train Wayside Communication
VMDS	Vehicle Monitoring and Diagnostic System
WMATA	Washington Metropolitan Area Transit Authority

Executive Summary

On Sunday, November 8, 2020, at approximately 08:20 hrs., a Train Operator operating a Red Line train [Train ID 101 consist **L7658**-7659.7581-7580.7744-7745.7667-7666T] in the direction of Glenmont Station reported contacting a customer within the platform limits at Bethesda Station, Track 1. The Train Operator of Train ID 101 notified the Rail Operations Control Center (ROCC) Radio Rail Traffic Controller (RTC) of the event. The Radio RTC acknowledged the transmission and asked the Train Operator if there were any signs of life. The Train Operator responded and stated that the customer was talking to the Station Manager.

Based on Audio Recording System (ARS) playback, the ROCC Assistant Superintendent notified the Montgomery County Fire & Rescue (MCFR) and Metro Transit Police Department (MTPD) to respond to the scene. A review of the ARS playback [radio and ambient] at 08:23 hrs. revealed, the ROCC Radio RTC complied with Standard Operating Procedure (SOP) 1A per the MSRPH and based on the Advanced Information Management System (AIMS) Playback, at 8:24 hrs. the Buttons RTC de-energized third rail power on Track 1. Upon the arrival of the RTRA Station Manger, the ROCC Radio RTC assigned them as the On-Scene Commander (OSC). Additionally, upon arrival, the RTRA Supervisor at 08:31 hrs., the ROCC Radio RTC appointed them as the RTRA Forward Liaison. RTRA removed the Train Operator from service for post-incident toxicology testing per (RTRA's SOP 102-1 Removing an Employee from Service).

Based on the Vehicle Monitoring and Diagnostic System (VMDS) data, Train ID 101 entered the Bethesda Station on Track 1, and initiated an emergency brake sequence after the emergency push button was depressed, with a train speed of 25 MPH. The Train Operator of Train ID 101 activated the road horn before exiting the tunnel. Train ID 101 Train Operator struck the customer at an estimated speed of 12 MPH. Train ID 101 came to a complete stop approximately 32 feet after striking the customer. Based on Vehicle Program Services (CENV) analysis, there was no data to support any anomalies with the consist that may have contributed to this incident.

Based on Closed-Circuit Television (CCTV) playback, it appeared the person tripped and subsequently fell onto the roadway, resulting in placing themselves within the train's dynamic envelope. Per ARS and CCTV, after the person was struck by the train the person walked on the roadway towards the Station's 8-car marker while being escorted by the Station Manager. The customer safely returned to the platform, waited for MTPD, and was subsequently transported to Suburban Hospital with non-life-threatening injuries for further medical evaluation.

At 10:18 hrs., the RTRA Forward Liaison reported to the ROCC all MTPD personnel were clear of the scene and relinquished the scene to RTRA personnel. The ROCC appointed the RTRA Forward Liaison as the OSC. Per ARS playback, RTRA the OSC reported that Emergency Response Team (ERT) personnel determined the area was deemed safe for rail vehicle movement. The RTRA OSC said ERT visually inspected all elements of the Track's infrastructure from the platform, and there were no signs of track defects. The ROCC resumed regular rail service at 10:44 hrs.

After reviewing the ARS, there did not appear to be any communication deficiencies over the radio.

The probable cause of the Person Struck by Train event at Bethesda Station on November 8, 2020, was that the person fell, resulting in them unintentionally placing themselves within the

train's dynamic envelope, fouling the roadway. Based on a post-incident Station's inspection, SAFE did not identify any slip or trip hazards that may have contributed to this event.

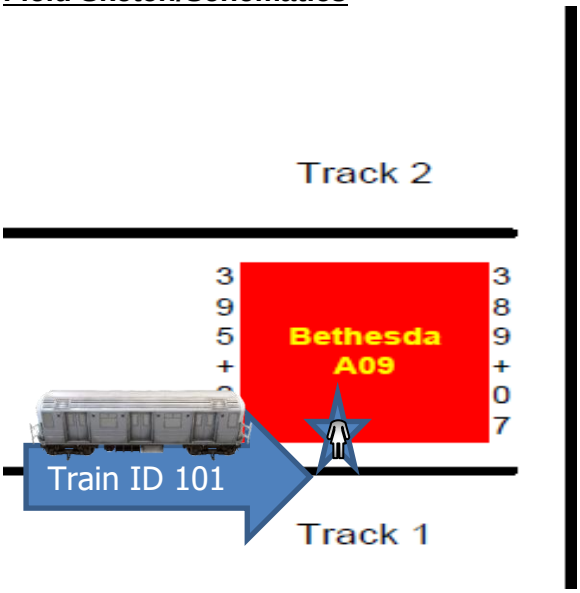
An analysis of data collected from systems of record, interviews with staff, CCTV, and MTPD incident report review, SAFE concludes there were no safety deficiencies related to any WMATA station facility, vehicle, or human factor components identified as contributors to this event.

There are no recommendations for this event because the customer appeared to unintentionally place themselves onto the roadway fouling the train's dynamic envelope.

Incident Site

Bethesda Station, Track 1

Field Sketch/Schematics



Purpose and Scope

The purpose of this incident investigation and candid self-evaluation is to collect and analyze available facts, determine the probable cause(s) of the incident, identify contributing factors, and make recommendations to prevent a recurrence.

Investigation Process and Methods

Upon receiving notification from the ROCC of a Person Struck by Train incident at Bethesda Station on November 8, 2020, SAFE dispatched a cross-functional team to assess the scene and conduct the subsequent investigation. SAFE team members worked with relevant WMATA subject matter experts to review facts and data.

Investigative Methods

The investigative methodologies included the following:

- Physical Site Assessment

- Formal Interviews – SAFE interviewed two (2) individuals as part of this investigation. Interviews included persons present during and/or after the incident and those directly involved in the response process. SAFE interviewed the following individuals:
    - Train Operator
    - Station Manager

- Informal Interviews – Collected through conversations with individuals during the course of the investigation to provide background and supporting information.

- Documentation Review – A collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
    - Employee Training Procedures & Records
    - Certification
    - The 30-Day work history review
    - MSRPH
    - National Oceanic Atmospheric Administration (NOAA)
    - ROCC Procedures Manual Review
    - Office of Communications Maintenance (COMM)
    - Maximo

- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
    - ARS playback including Radio and Phone Communications
    - CCTV playback
    - AIMS
    - Network Video Recording (NVR) Forward-Facing Camera

Investigation

On Sunday, November 8, 2020, at approximately 08:20 hrs., Train Operator operating Train ID 101 [lead Car 7658] notified the ROCC and reported contacting a customer within the platform limits; Bethesda Station, Track 1. The Radio RTC acknowledged the transmission and tried to ascertain if the Train Operator was coherent to perform their duties regarding SOP #26 Person Hit by Train operations and procedures. Based on CCTV playback, it appeared the customer tripped and subsequently fell, resulting in them placing themselves within the dynamic envelope of the train, fouling the roadway. At 08:24 hrs., third rail power was de-energized in the affected area. All appropriate personnel were notified and en route. Service was suspended at Bethesda Station, Track 1, while trains were single-tracking between Grosvenor Station and Friendship Heights Station by way of Track 2. Upon arrival, the Station Manager performed a ground walk-around and identified signs of life. The Station Manager indicated the customer was alert standing in front of the consist with an apparent head injury. The Station Manager escorted the customer while on the platform to the 8-car marker. The customer walked to the end of the platform limits [8-car marker], walked up the roadway steps, and safely returned to the platform. At approximately 08:36 hrs., MCFR was on scene with the customer on the platform conducting their medical assessment and subsequently transported them to Suburban Hospital with non-life-threatening injuries for further medical evaluation. RTRA transported the Train Operator for post-incident toxicology testing.

At approximately 10:44 hrs., ROCC restored third rail power on Track 1. Incident Train ID 101 moved towards Shady Grove Yard for post-incident inspection. The ROCC concluded single-tracking operations between Grosvenor Station and Friendship Heights Station.

Chronological Event Timeline

A review of ARS playback, i.e., phone and radio communications, revealed the following timeline:

08:20:54 hrs.	(Ops 1) Train ID 101 announced emergency, emergency, emergency, and reported their train made contact with a person on the roadway at Bethesda Station, Track 1. ROCC RTC acknowledged.
08:21:47 hrs.	(Ops 1) Train ID 101 advised there are approximately 2 cars on the platform. ROCC RTC acknowledged and asked Train ID 101 if there were any signs of life. Train ID 101 reported the person was moving and talking to the Station Manager.
08:22:28 hrs.	(Phone) ROCC Assistant Superintendent contacted Montgomery County 911 and reported a person being struck by a train at Bethesda Station, Track 1.
08:22:37 hrs.	(Ops 1) The Station Manager notified ROCC they were speaking with the customer underneath the area of refuge, and the customer stated that they had not been struck by the train; however, T/O reported that the customer was bleeding on their scalp.
08:22:55 hrs.	(Ops 1) The ROCC Radio RTC instructed Train ID 101 to key down, make good announcements to your customers, secure your cab, walk the customers through the consist and key them off cars 1 and 2 on the platform. Train ID 101 acknowledged.
08:23:22 hrs.	(Ops 1) The ROCC RTC appointed the Station Manager as the OSC. The Station Manager acknowledged.
08:24:34 hrs.	(Ops 1) The Station Manager notified ROCC the customer was standing in front of the consist bleeding from their head. The ROCC RTC acknowledged and advised medical has been dispatched. The Station Manager advised the customer was coherent, and they were escorting the customer to the platform.
08:26:25 hrs.	(Ops 1) Train ID 101 advised they are currently offloading the customers and reported the consist emergency lights were on. ROCC RTC acknowledged.
08:28:09 hrs.	(Ops 1) The Station Manager reported to the ROCC the customer returned to the platform safely without incident and were sitting on the bench near the 8-car marker, Track 1. ROCC RTC acknowledged.
08:30:05 hrs.	(Ops 1) Emergency Response Team (ERT) reported being on the scene.
08:31:33 hrs.	(Ops 1) Train ID 101 Train Operator reported the consist is clear of customers.
08:31:42 hrs.	MTPD and RTRA Supervisor arrived on the scene at Bethesda Station. ROCC appointed the RTRA Supervisor as the RTRA Forward Liaison.
08:32:17 hrs.	(Phone) ROCC Assistant Superintendent contacted SAFE and reported a person being struck by a train at Bethesda Station, Track 1. The ROCC Assistant Superintendent advised that the customer is on the platform now with the Station Manager, claiming a head injury.
08:32:30 hrs.	(Ops 1) The ROCC Radio RTC announced that MTPD is now the OSC.
08:33:33 hrs.	(Phone) ROCC Assistant Superintendent contacted MTPD and reported a person being struck by a train at Bethesda Station, Track 1.
08:36:33 hrs.	(Ops 1) RTRA Forward Liaison reported MCFR was on scene conducting their medical assessment, and the customer advised they slipped and fell on the roadway. Additionally, RTRA Forward Liaison reported that the customer stated they struck their head at the end of the platform when they fell but did not make contact with the consist. ROCC Radio RTC acknowledged.

09:14:42 hrs.	(Ops 1) SAFE reported being on the scene at Bethesda Station.
09:31:50 hrs.	(Ops 1) RTRA Superintendent reported being on the scene at Bethesda Station for support.
09:52:00 hrs.	(Ops 1) MTPD requested permission to go on the roadway at Bethesda Station, Track 1, to further their investigation. ROCC Radio RTC instructed RTRA Forward Liaison to coordinate with ERT, go on the roadway, and hot stick to verify that third rail power is de-energized on Track 1 at Bethesda Station provide a chain marker. RTRA Forward Liaison acknowledged and advised ERT will be entering the roadway and will provide a chain marker.
09:57:57 hrs.	(Ops 1) ERT confirmed that third rail power was de-energized at chain marker A1 389+00. MTPD, the OSC granted permission for ERT to set up safety equipment before MTPD start their investigation.
10:18:24 hrs.	(Ops 1) RTRA Forward Liaison reported to the ROCC that all MTPD personnel was clear of the scene and that the location had been turned back over to RTRA personnel. RTRA Forward Liaison is now the OSC.
10:19:17 hrs.	(Ops 1) RTRA the OSC reported that all personnel and equipment were clear of the roadway, and third-rail power could be restored at the ROCC's discretion. ROCC Radio RTC acknowledged and announced third rail restoration efforts are in effect, Track 1.
10:44:19 hrs.	(Ops 1) RTRA the OSC reported to the ROCC that ERT confirmed a good visual track inspection from the platform and Tracks were revenue ready.
10:44:35 hrs.	(Ops 1) Normal service resumed at Bethesda Station, Tracks 1 and 2.

Closed-Circuit Television (CCTV)

Based on a review of the CCTV playback of the Bethesda Station platform, it revealed the following information related to the person who was reported being struck by the train:

- The customer was traveling alone.
- As the train entered the Station, the customer appeared to have tripped and subsequently fell into the dynamic envelope, placing themselves in the path of the approaching train.
- While on the roadway, the customer walked to the end of the Station's 8-car marker. The Station Manager walked next to the customer on the platform. Once the customer safely returned to the platform by walking up the steps, The MCFR subsequently transported the customer to Suburban Hospital with non-life-threatening injuries for further medical evaluation. **NOTE:** There were no camera coverage showed whether the person was hit by the train or in the refuge underneath the platform.

Office of Car Maintenance (CMNT)

CMNT personnel performed an exterior and interior inspection of the affected car and found no damages. CMNT performed a Master Controller operation check and did not identify an anomalist condition.

Vehicles Program Services

Event Recorder (ER) Data Graph/Sequence of Events

Based on CENV analysis of the downloaded VMDS and ER, details from the data analysis are as follows:

08:20:08 hrs.	Master Controller was placed in the B5 brake position, with a train speed of 31 MPH. Train ID 101 Train Operator activated the train's road horn before exiting the tunnel.
08:20:09 hrs.	The Master Controller was placed in the B5 with a train speed of 25 MPH. The Train Operator activated the console emergency mushroom, and the train initiated an emergency braking sequence.
8:20:14 hrs.	CENV data shows the train made contact with the customer at an estimated speed of 12 MPH.
8:20:18 hrs.	The train came to a complete stop approximately 32 feet from the estimated point where the customer was struck.

NOTE: CENV reported that no propulsion/brake faults were observed during data analysis or in the fault logs and confirmed Train Wayside Communication (TWC) was working correctly. Data analysis collected from the VMDS and CMNT inspection of the car, there were no safety deficiencies related to the car that could've contributed to the customer being struck by the train.

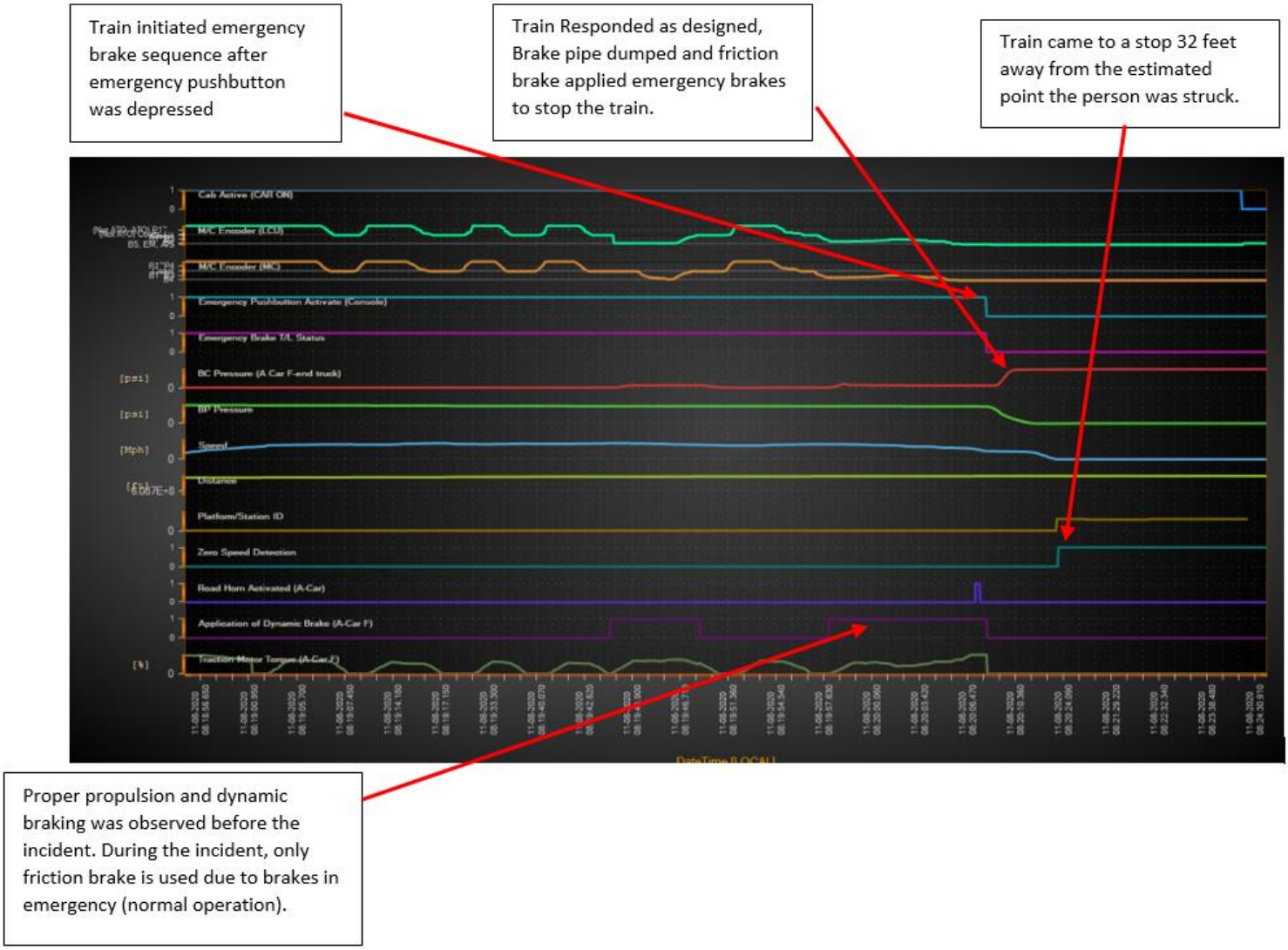


Diagram 1- ER Graphical Analysis

Network Video Recording (NVR)

Based on Network Video Recording (NVR) Forward-Facing camera, approximately 100 feet away from the end of the platform limits, Forward-Facing video shows glare from the station lights, impacting visibility. As the train entered Bethesda Station, Track 1 platform, NVR shows a human figure positioned within the dynamic envelope of the train.

Station Site Assessment

SAFE performed an inspection of the Station after the incident. There were no adverse safety concerns that contributed to the incident. All the Station's Emergency Trip Systems (ETS) and Public Address (PA) systems were reported operational.

Photo 1 – The area on the platform where the customer tripped was approximately 93 feet away from the Station platform entrance on Track 1.

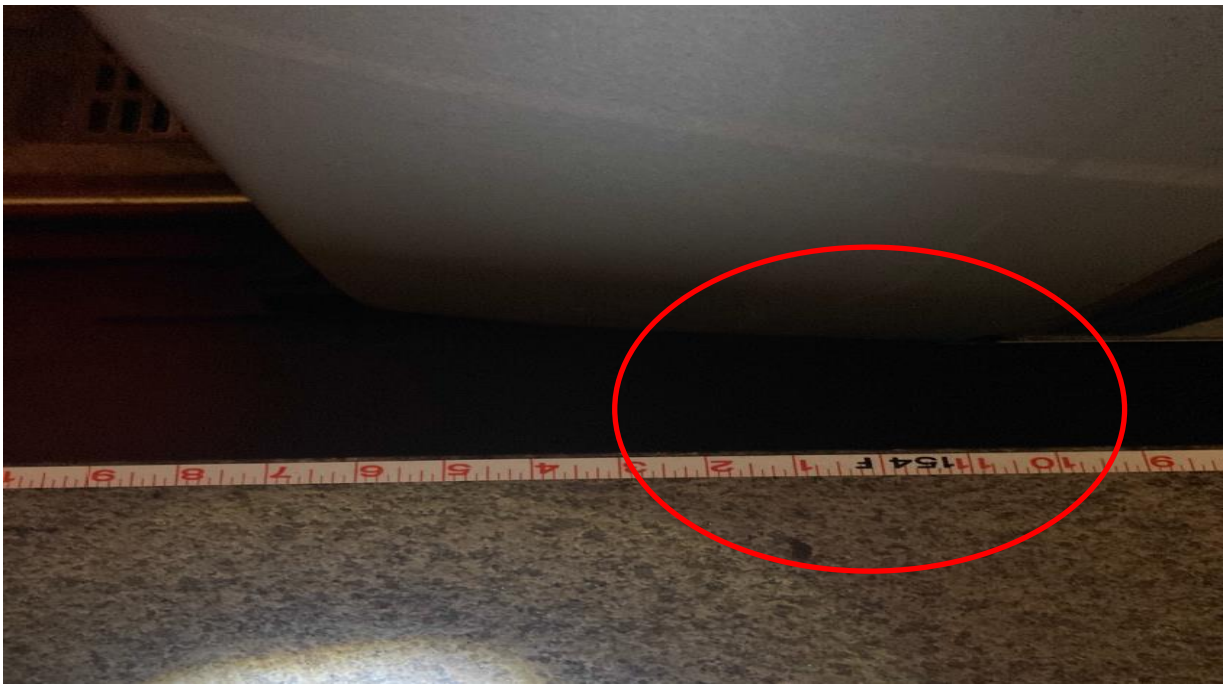


Photo 2 - Train stopped approximately 154 1/2 feet within the platform limits on Track 1.

Advanced Information Management System

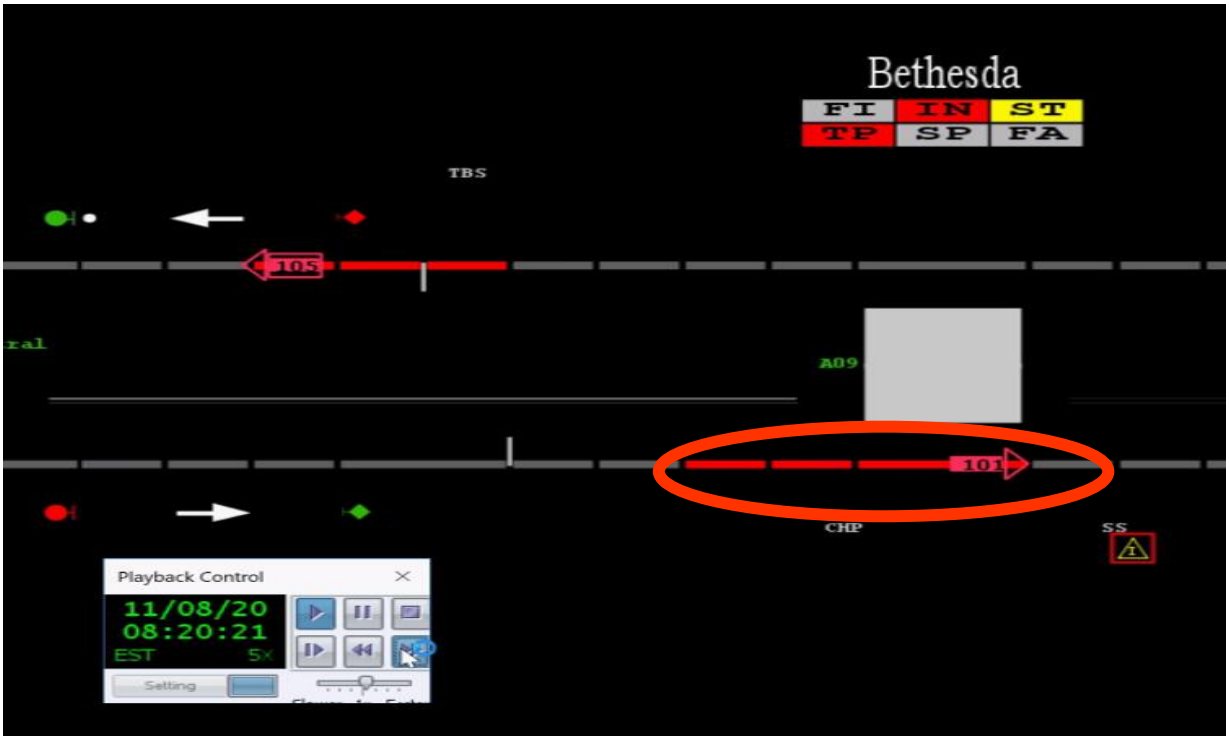


Diagram 2 - Shows Train ID 101 arrived at Bethesda Station, Track 1, which appears to be when they reported the person on the roadway per ARS. The Track is red, which shows that the track that Train ID 101 is on is energized.

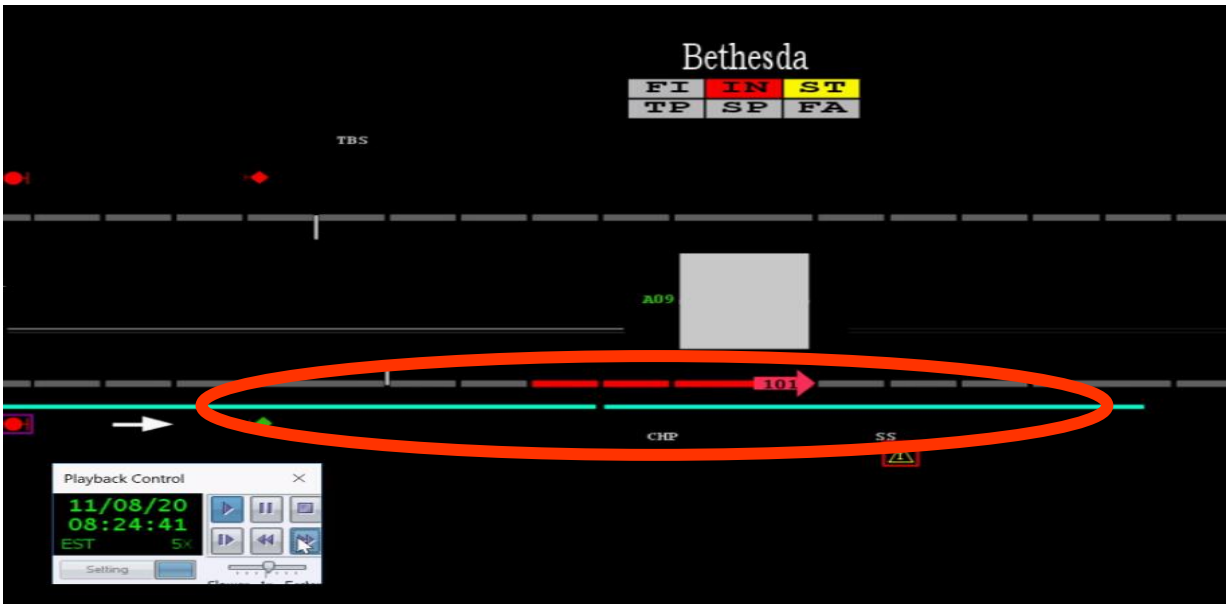


Diagram 3 – The green symbol on the AIMS power display shows that the third rail power was subsequently de-energized at Bethesda Station, Track 1.

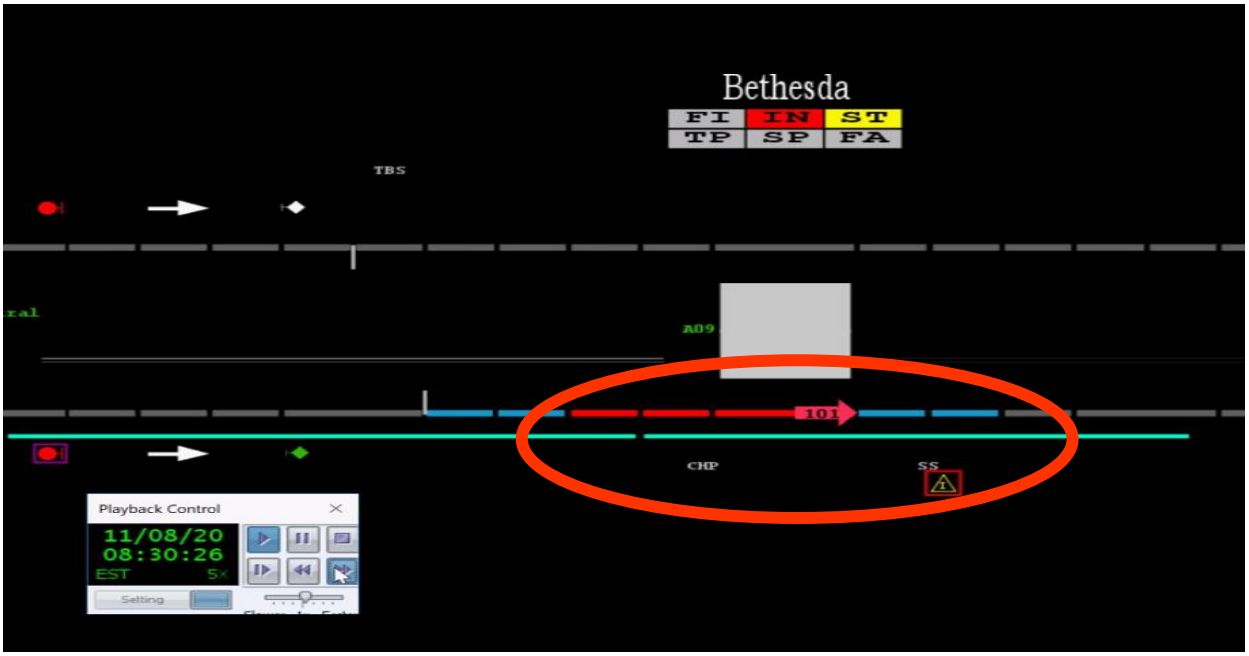


Diagram 4 - Shows prohibit exits, block calls, cancellation of automatic signals, blue block, and human form status are in place at Bethesda Station, Track 1.

Interview Findings

Based on the investigation into the reported customer being struck by train event, SAFE conducted two (2) investigative interviews and identified the following key findings associated with this event as follows:

The Train Operator indicated while approaching Bethesda Station, Track 1, they had a clear line of sight of a customer walking towards the platform's edge, so they put the consist into braking mode before entering the platform. As the train entered the platform, "it appeared that the person intentionally jumped from the platform onto the roadway." The Train Operator indicated that they immediately depressed the emergency brake function "mushroom," sounded the horn, and placed the Master Controller in the emergency position. The Train Operator indicated that they observed the customer get up quickly and extend their arms out just before losing sight of them. The Train Operator then stated they heard the impact of the train striking the customer on the roadway.

The Station Manager indicated they did a ground walk-around. When walking where the train lead car had stopped, they saw that a person was looking up at them from underneath the area of refuge platform edge, between the platform edge and the lead Car 7658. The Station Manager indicated that they asked the customer, are you okay, and they responded, yes. The Station Manager asked if they had been struck by the train, and the person said, no. The Station Manager escorted the customer back to the platform safely without further incident.

Communication Maintenance (COMM)

COMM performed a comprehensive radio operational test at Bethesda Station, Tracks 1 and 2. The test was successful, and the signal was at an optimal level.

NOTE: After reviewing the ARS playback, there did not appear to be any communication deficiencies over the radio.

Findings

- The AIMS display shows prohibit exits, block calls, cancellation of automatic signals, blue block, and human form status are in place at Bethesda Station, Track 1.
- WMATA personnel complied with SOP #1A and SOP #26 procedures when responding to this event.
- Based on CCTV playback, the person appeared to have tripped and subsequently fell on the roadway in front of the oncoming Train ID 101.
- Based on a post-incident Station's inspection, SAFE did not identify any slip or trip hazards that may have contributed to this event.
- Based on the SAFE interview, the Station Manager indicated that they asked the person if they were struck by the train, and the person said, no. The Station Manager stated the person had bleeding from a head wound. Additionally, the Station Manager indicated that the person appeared to be incoherent when asked a series of questions.
- At approximately 09:29 hrs., the third rail remained de-energized while the Office of Plant Maintenance (PLNT) personnel were on scene conducting clean-up efforts at Bethesda Station, Track 1.
- No Maximo records show any anomalies regarding the master controller, propulsion, and braking system for rail vehicles L7658-7659.
- Based on ARS, CMNT Road Mechanic (R/M) personnel performed an under-car visual inspection and deemed the consist safe for movement.
- Based on ARS, RTRA the OSC reported to the ROCC that ERT confirmed a good visual track inspection from the platform and Tracks are revenue ready. The area was deemed safe for rail vehicle movement.
- The Forward-Facing camera from lead Car 7658 shows that the Train Operator could not bring their train to a complete stop in an efficient amount of time to avoid any contact with the customer on the roadway.
- Car 7658 Console Camera recording was operating before, during, and after the event with no reporting issues.

Weather

At the time of the incident, NOAA recorded the temperature as 55°F with fog and 84% humidity. SAFE has concluded that weather was not a contributing factor in this incident. The event occurred at an underground station. (Weather source: NOAA – Location: Bethesda, MD.)

Human Factors

Fatigue

Based on SAFE's interview question related to Fatigue Factors and review of the employee 30-day work history, SAFE determined that the employee's hours of service were in accordance with WMATA's *Fatigue Risk Management Policy 10.6* and *Hours of Service Limitations for Prevention of Fatigue Policy 10.7*.

Post-Incident Toxicology Testing

Train Operator

After reviewing the Train Operator employee post-incident toxicology testing results, SAFE determined that the Train Operator involved was not in violation of the Drug and Alcohol Policy and Testing Program 7.7. 3/5.

Probable Cause Statement

The probable cause of November 8, 2020, Bethesda Station, Track 1 Person Struck by Train event was a customer unsteady on their feet and subsequently tripped and fell on the roadway. The customer inadvertently placed themselves within the train's dynamic envelope, fouling the roadway.

Appendix A - Interview Summaries - Office of Rail Transportation

Train Operator

The Train Operator is a WMATA employee with one month of experience as a Train Operator and four years of service. The Train Operator's previous role was a Bus Operator.

The Train Operator stated while approaching Bethesda Station, Track 1, they observed a person walking towards the edge of the platform, so the Train Operator went into braking mode before entering the platform. The Train Operator indicated that as soon as the train entered the platform, "it appeared that the person intentionally jumped from the platform onto the roadway." The Train Operator indicated that they immediately depressed the emergency brake function "mushroom," sounded the horn, and placed the Master Controller in the emergency position. The Train Operator indicated that they observed the customer get up quickly and extend their arms out just before losing sight of the customer. The Train Operator then stated they heard the impact of the train striking the customer on the roadway. The Train Operator advised they stopped the train and immediately notified the ROCC. The Train Operator reported no discrepancies with the train console or any distractions in the cab area. The Train Operator reported that upon making contact with the customer on the roadway, ROCC asked if they were able to complete a ground walk-around and report any signs of life. The Train Operator stated that the Station Manager was on the scene, and they observed the customer moving and underneath the area of refuge. A few minutes later, the customer crawled from underneath the area refuge and stood up in front of the train. The Train Operator stated the ROCC then instructed the Train Operator to walk the customers through the bulkhead doors to offload the train from cars 1 and 2 that were on the platform. The Train Operator indicated no mechanical discrepancies with the train, and they did not see how the customer got back to the platform.

Station Manager

The Station Manager is a WMATA employee with one year of experience and 18 years of service. The Station Manager's previous role was as a Bus Operator.

The Station Manager stated that upon hearing about the customer making contact with the train via radio, they went down to the platform to investigate. The Station Manager said they looked at the front of the train and did not see any indication of a person being struck. The Station Manager indicated they did a ground walk-around, and when walking where the train's lead car had stopped, they saw that a person was looking up at them from underneath the area of the refuge platform edge. The Station Manager indicated that they asked the customer, are you okay, and they responded, yes. The Station Manager asked the customer if they were struck by the train, and the customer said, no. The Station Manager then indicated that the customer crawled from underneath the area refuge and stood up in front of the train. The Station Manager advised that they notified the ROCC of their findings and told the ROCC they would escort the person back onto the platform. The customer returned to the platform unassisted via steps at the opposite end of Bethesda Station. The customer was bleeding from their head. The Station Manager indicated that the customer appeared to be incoherent. The Station Manager asked the customer a series of personal questions, and they could not remember their birthday or phone number. The customer was subsequently transported to Suburban Hospital for further medical evaluation.