

**NATIONAL TRANSPORTATION SAFETY BOARD**  
Vehicle Recorder Division

April 11, 2022

## **Onboard Image Recorder & Security Video**

### **Specialist's Factual Report By Kyle Garner**

#### **1. EVENT**

Location: Houston, Texas  
Date: October 29, 2021  
Time: 04:02 central daylight time (CDT)  
NTSB Number: RRD22LR002

#### **2. GROUP**

A video group was not convened.

#### **3. DETAILS OF INVESTIGATION**

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received seven video files related to the event. Five of the video files were from the combination vehicle involved in the event, and two of the video files were from security cameras located at a nearby business that witnessed the event. The video files were downloaded by non-NTSB personnel and forwarded via a file share service to the NTSB.

##### **3.1. Onboard Image Recorder - Lytx DriveCam**

The Lytx DriveCam, model SF300, is a driver monitoring and recording device mounted on a vehicle's windshield that has both a forward and inward-facing camera, an omnidirectional microphone, a 9-axis motion sensor (accelerometer, gyro, and magnetometer), and a built-in GPS. As an option, operators can connect up to four additional cameras to record side and back-up views.

The camera continuously records, but by default only saves and transmits video and data when triggered by critical events, such as hard braking or impacts. If configured by the operator, the camera is also capable of continual video recording to internal memory or live streaming.

Five video files from the Lytx DriveCam installed in the combination vehicle on the day of the event were provided to the NTSB for review.

One video file was provided in a proprietary DriveCam video event file (DCE) format, which was viewed using the Lytx SF-Series Event Player software. This DCE video file included inward and outward-facing video with audio and embedded GPS-derived speed and engine revolutions per minute (RPM) data from 8 seconds before (04:02:19 CDT) to 4 seconds after (04:02:31 CDT) the event.

Four additional video files in MP4 format from the combination vehicle were provided. The video files were approximately five minutes and thirty seconds in duration and included inward and outward-facing video with audio and a side-facing view of the driver and passenger sides of the combination vehicle. Metadata in the files indicated the video was recorded at a resolution of 720 x 480 (side-facing) and 640 x 352 (inward/outward-facing) at a frame rate of 10 frames per second.

Video from the passenger's side-facing camera was deemed not pertinent to the investigation and is not discussed in the summary.

### **3.2. Security Video**

Two video files in MP4 format downloaded from security cameras that witnessed the event were provided to the NTSB for review. The video files were approximately 30 seconds in duration. The files did not include audio. Metadata in the files indicated the video was recorded at a resolution of 2048 x 1536 and a frame rate of about 24 frames per second.

The cameras were located outside a business on the west side of Federal Road and faced the industrial park across the street, as shown in the Google Earth overlay in Figure 1. Conditions shown in the Google Earth overlay are not representative of the conditions at the time of the event.



**Figure 1. Security camera 1 and 2 location.**

The contents of both video files were reviewed for relevancy, and video from camera 1 was deemed not pertinent to the investigation and is not discussed in this report.

### **3.3. Time Correlation**

The DCE file from the combination vehicle included embedded date and time information in event local time, central daylight time (CDT). Timing from the DCE file was then used to offset the timing in the security video to CDT. Thus, all times referenced in this summary report are CDT.

### **3.4. Summary of Recorded Events**

In agreement with the Investigator-In-Charge, a video group did not convene, and a summary report was prepared. For a list of the video files used to create this summary report, see Table A-1 in Appendix A.

#### **3.4.1. Outward-facing camera summary**

The outward-facing camera video began at about 04:02:10. Audio was recorded.

At 04:02:10, the combination vehicle was driving south on Federal Road about 250 feet from the turnout to the industrial park and grade crossing where the event occurred. The combination vehicle was driving in the right lane. The sky was dark and

operational high mast lighting was visible. There was no visible precipitation or other traffic.

At 04:02:12, the combination vehicle slowed in preparation for the upcoming left turn.

At 04:02:14, the combination vehicle began to make a left turn into the industrial park.

At 04:02:19, embedded data in the DCE video file started to record. The recorded GPS-derived speed was 10 mph and engine RPM indicated 1100 RPM.

At 04:02:20, the combination vehicle completed the left turn. Immediately ahead was a highway railroad grade crossing with a passive advance warning sign. In addition, open rail access gates with flashing red strobes on the fence posts were visible. The recorded GPS-derived speed was 11 mph and engine RPM indicated about 1200 RPM.

At 04:02:25, the combination vehicle started to traverse the grade crossing without stopping. The recorded GPS-derived speed was 12 mph and the engine RPM indicated 1000 RPM.

At 04:02:27, the outward-facing camera began to shake, consistent with a collision. The recorded GPS-derived speed was 15 mph and the engine RPM indicated about 1500 RPM.

At 04:02:37, the combination vehicle came to a stop.

Events after 04:02:46 were not pertinent to the investigation. The video ended at 04:07:42.

### **3.4.2. Inward-facing camera summary**

The inward-facing camera video began at about 04:02:10. Audio was recorded.

At 04:02:10, the view was an inward-facing view of the operating compartment of the combination vehicle. The light level in the cab was low. The driver was seated in the driver's seat upright, facing forward, and his 3-point seatbelt was buckled. The driver was also wearing a high-visibility safety vest. The driver was not wearing a face mask.

At 04:02:14, the driver glanced over his left shoulder and gripped the steering wheel to make the left turn into the industrial park. Sounds consistent with the combination vehicle's turn signal light operating were noted.

At 04:02:20, as the driver completed the left turn, he continued to look toward his left out the driver's side window.

At 04:02:23, the driver looked forward. The rear of the crossing's passive advance warning sign was visible through the passenger side window.

At 04:02:24, the driver briefly glanced down and to his left.

At 04:02:25, the lead railcar was visible through the driver's window. The conductor was not visible. The driver noticed the railcar and exclaimed, "Oh # [REDACTED]".

At 04:02:27, the lead railcar impacted the combination vehicle.

At 04:03:08, the driver stated to a witness outside the combination vehicle, "There was no lights. Nothing, nothing."

At 04:06:25, the driver exited the combination vehicle.

Events after 04:06:25 were not pertinent to the investigation. The video ended at 04:07:42.

### **3.4.3. Driver's side-facing camera summary**

The driver's side-facing camera video began at about 04:02:10. Due to the design of the camera and the lighting conditions at the time of the event, the video was in grayscale format.

At 04:02:10, the view was rear-facing on the driver's side of the combination vehicle.

At 04:02:14, the combination vehicle began to make a left turn into the industrial park.

At 04:02:25, the combination vehicle began to traverse the grade crossing. The lead railcar became visible. The conductor was riding on the westside of the end platform of the lead railcar and was facing forward<sup>1</sup>. The conductor was wearing a high-visibility safety vest. The conductor's lantern, seen in the security video summarized in section 3.4.4, was not visible in this video.

At 04:02:27, the lead railcar impacted the combination vehicle.

At 04:02:37, the train and the combination vehicle came to a stop.

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<sup>1</sup> In the direction of travel.

Events after 04:02:37 were not pertinent to the investigation. The video ended at 04:07:41.

#### **3.4.4. Security video (camera 2) summary**

The video from security camera 2 began at about 04:02:13.

At 04:02:13, the combination vehicle was seen traveling southbound on Federal Road toward the turnoff to the industrial plant. The combination vehicle had its headlights illuminated and the front left turn signal light was flashing. The train was also visible traveling south toward the highway railroad grade crossing. The conductor, who was riding on the westside of the end platform of the lead railcar, had a visible lantern.

At 04:02:14, the combination vehicle started to make a left turn into the industrial park. The train continued to travel south toward the grade crossing. The conductor's lantern was visible.

At 04:02:25, the combination vehicle began to traverse the grade crossing. Taillights on the combination vehicle were illuminated, however, as the combination vehicle traversed the grade crossing, brake lights did not illuminate.

At 04:02:27, the lead railcar impacted the combination vehicle.

At 04:02:31, the combination vehicle and the forward end<sup>2</sup> of the lead railcar went out of view of the camera.

Events after 04:02:31 were not pertinent to the investigation. The video ended at 04:02:40.

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<sup>2</sup> In the direction of travel.

## APPENDIX A

**Table A-1. List of video files used in the report.**

<b>Report Section</b>	<b>Video File Name</b>
3.4.1	2021-10-29 21029 - Outside.mp4
	XJDK52531.DCE
3.4.2	2021-10-29 21029 - Inside.mp4
	XJDK52531.DCE
3.4.3	2021-10-29 21029 - Driver Side.mp4
	XJDK52531.DCE
3.4.4	security_vid_view1_export.mp4