

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

October 25, 2022

Onboard Image Recorder

Specialist's Factual Report
By Kyle Garner

1. EVENT

Location: Phoenix, Arizona
Date: June 9, 2021
Vehicle: Truck-tractor with stainless equipment tank trailer
Operator: Arizona Milk Transport Inc.
NTSB Number: HWY21MH008

For a summary of the event, refer to the *Crash Summary Report* which is available in the docket for this investigation.

2. ONBOARD IMAGE RECORDER GROUP

An onboard image recorder group was not convened.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received three video files documenting the event. The video files were downloaded by non-NTSB personnel from an onboard image recorder on the truck-tractor¹ and forwarded to the NTSB for review.

3.1. Onboard Image Recorder

3.1.1. Lytx DriveCam Video Event Recorder

The Lytx DriveCam video event recorder, model DC3P, 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 3-axis accelerometer, and built-in GPS. The camera continuously records, but only saves and transmits video and data when triggered by critical events, such as hard braking or impacts. Each event video file is approximately 12 seconds long, beginning 8 seconds before the event and continuing for 4 seconds after the event.

3.2. Time Correlation

Time in this report is expressed as the time to impact, which is the amount of time, in seconds, before and after the impact event as displayed on the video. Time before the

¹The truck-tractor was combined with a fully-loaded stainless equipment tank trailer. For the remainder of this report, the truck-tractor and trailer combination are referred to as a *combination unit*.

impact event is shown as a negative value, and time after the impact event is shown as a positive value.

3.3. Summary of Recorded Events

The video from the Lytx DriveCam, provided in .mp4 format, was 12 seconds in duration and had a frame rate of 4 frames per second (fps). The left side of the recording displayed footage from the inward-facing camera (IFC) and the right side of the recording displayed footage from the forward-facing camera (FFC).

Below the two camera views, values for longitudinal acceleration, lateral acceleration, time to impact, and speed in miles per hour (mph) and kilometers per hour (km/hr) were displayed. Figure 1 is a snapshot of the first frame of the video recording.



Figure 1. Snapshot of the first frame of video recording (time to impact = -8.00s).

In agreement with the Investigator-in-Charge, an onboard image recorder group did not convene, and a summary report was prepared.

The following events from the FFC and IFC were observed at the indicated times as shown in Table 1. Only events deemed relevant to the investigation are included in Table 1.

Table 1. Observations from the onboard image recorder.

Time to Impact, seconds	Observation from the forward-facing camera (FFC) and inward-facing camera (IFC)
-8.00	<p><i>[Start of video]</i></p> <p>FFC: The combination unit was traveling in the far-right eastbound lane of State Route Loop 202. The exit-only lane for exit 4: 52nd St/Van Buren St was visible on the right. The sky was dark and operational high mast lighting was visible. There was no visible precipitation. Brake lights from other vehicles in the combination vehicle's lane of travel were visible in the distance. Passenger vehicles in the eastbound travel lanes to the left appeared to be traveling at or near the speed of the combination unit. The displayed speed was 64 mph.</p> <p>IFC: The light level in the cab was low. The driver was seated in the driver's seat, their 3-point seatbelt was buckled, and they were seated upright, facing forward, with their head not on the headrest. The driver was using wired earphones² and was wearing glasses³. The driver's left hand was on the steering wheel and their right hand was resting on their lap. The passenger seat was not occupied.</p>
-6.75	<p>FFC: The combination unit was perpendicular to the exit advisory speed sign for exit 4. Brake lights from other vehicles in the lane of travel of the combination unit were visible in the distance. The displayed speed was 63 mph.</p>
-5.50	<p>FFC: The exit 4 gore sign was visible to the right. Brake lights from other vehicles in the lane of travel of the combination unit were visible in the distance. Vehicles in the travel lanes to the left of the combination unit began to brake and their brake lights illuminated. The displayed speed was 63 mph.</p>
-3.25	<p>FFC: The combination unit passed the exit 4 gore sign. Brake lights from other vehicles in the lane of travel of the combination unit and the lanes to the left were illuminated. The displayed speed was 63 mph.</p>
-2.25	<p>FFC: The combination unit passed the crash cushion in place for the exit 4 exit ramp. Brake lights from other vehicles in the lane of travel of the combination unit and the lanes to the left were illuminated. A three-line variable message sign was seen ahead, however, the displayed message was not legible due to the resolution of the video. The displayed speed was 62 mph.</p>
-1.00	<p>FFC: Brake lights from vehicles stopped in the lane of travel of the combination unit were visible. The displayed speed was 62 mph.</p> <p>IFC: The reflection of brake lights from vehicles stopped in the lane of travel of the combination unit was noted on the stainless equipment tank trailer.</p>

² Only the earphone in the driver's right ear was visible. It could not be determined if there was an earphone in the driver's left ear.

³ Due to the low resolution of the video, it was not possible to determine if the driver's eyes were open or closed for the duration of the recording.

Time to Impact, seconds	Observation from the forward-facing camera (FFC) and inward-facing camera (IFC)
-0.25	IFC: The driver's left hand was on the steering wheel. The driver lifted their right hand from their lap and gripped the steering wheel.
+0.00	<p>FFC: The combination unit impacted a stopped passenger vehicle in the far-right lane of travel. The displayed speed was 62 mph. The displayed longitudinal acceleration was -2.72 and lateral acceleration was -1.73 g.</p> <p>IFC: During the initial impact, the driver's body moved forward but was restrained by the 3-point seat belt.</p>
+0.25	<p>FFC: The combination unit impacted additional stopped vehicles in the far-right lane and began to lean toward the left. The displayed speed was 62 mph, longitudinal acceleration was +1.59 g and lateral acceleration was +1.46 g.</p> <p>IFC: The driver's body moved back and to the right. Unsecured items began to spread around the cab.</p>
+0.50	FFC: The combination unit continued to lean toward the left. The three-line variable message sign, now legible on the camera, read "LAW ENFORCEMENT, AT PRIEST, EXPECT TO STOP". The displayed speed was 62 mph.
+1.50	FFC: The view was obstructed. The displayed speed was 55 mph.
+2.00	IFC: The driver's hands returned to the steering wheel. The driver turned the steering wheel to the left.
+2.75	FFC: The view obstruction cleared. The combination unit continued to collide with stopped vehicles in the far-right lane. The displayed speed was 46 mph.
+4.00	<p>FFC: The combination unit began to move toward the left. The displayed speed was 42 mph.</p> <p><i>[End of video]</i></p>