

National Transportation Safety Board
Office of Highway Safety
Washington, DC 20594



HWY23FH005

HUMAN PERFORMANCE

Group Chair's Factual Report

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A. CRASH

Location: Louisville, St. Lawrence County, New York
Date: January 28, 2023
Time: 6:00 a.m. Eastern Standard Time

B. HUMAN PERFORMANCE GROUP

Group Chair Rafael Marshall
 NTSB - Office of Highway Safety
 490 L'Enfant Plaza, S.W., Washington, D.C. 20594

C. CRASH SUMMARY

For a summary of the crash, refer to the *Crash Information and Summary Report*, in the docket for this investigation.

D. DETAILS OF THE HUMAN PERFORMANCE INVESTIGATION

The Human Performance factual investigation focused on the driver of the 2021 Freightliner M2 box truck (truck driver) and the behavioral, medical, operational, and environmental factors that may have contributed to the crash. Information is also provided about the driver of the 2013 Chevrolet Express bus (bus driver).

1.0 Truck Driver

1.1 Background and License History

The 25-year-old truck driver held a noncommercial driver's license (Class D) issued by the State of New York. He was first issued an unrestricted driver's license in January 2019. His current license was issued May 2021 and was set to expire June 2029. The truck driver's license history did not include any suspensions, withdrawals, restrictions, and crashes.¹ Although he did not hold a commercial driver's license (CDL), he was still required to possess a medical certificate, and his certificate was valid from May 2022 until May 2024 (Section 1.4).²

The NTSB interviewed the truck driver on February 1, 2023.³ He completed truck driving school in 2018 in the Bronx, New York. His application to his employer at the time of the crash, Aero Global Logistics (AGL), indicated that he worked for

¹ Human Performance Attachment - Truck Driver CDLIS.

² Medical | FMCSA (dot.gov)

³ Human Performance Attachment - NTSB Interview with Truck Driver.

Battery Delivery Corp. from October 2018 until December 2022. According to the driver, during that time, he delivered batteries as a contractor for FedEx Corporation and United Parcel Service (UPS). He left his former job to relocate to Utica, New York. NTSB investigators attempted to contact his former employer for more information but was unsuccessful because it had gone out of business.

1.2 Employment at Aero Global Logistics

1.2.1 Pre-employment and Training

The truck driver applied to AGL on January 6, 2023. His date of hire was January 9. Because the truck driver did not operate vehicles for which a commercial driver's license was required, he was not subject to the Federal Motor Carrier Safety Administration's (FMCSA) alcohol and controlled substances testing requirements in 49 *Code of Federal Regulations* Part 382. The driver passed a non-United States Department of Transportation (DOT) pre-employment alcohol test on January 10 and a non-DOT pre-employment drug test on January 12. The truck driver stated to NTSB investigators that after joining AGL as a short-haul driver, he received training consisting of learning his route and deliveries. He stated that he did not receive further training because he had experience driving straight trucks from his previous jobs. The manager of the Foxboro terminal, where the truck driver was based, confirmed that the truck driver did not receive training beyond familiarization with the fixed route for which he would be responsible. Trip sheets obtained from AGL indicated that, between January 10-13, 2023, the truck driver was accompanied by a driver trainer during the four days along the fixed route for which the truck driver would be responsible.⁴ According to the driver trainer, he drove the route on January 10, 2023, and the truck driver drove on the route the other three days while the driver trainer accompanied him.⁵ Records show that the driver trainer operated his route after training the truck driver, which would have resulted in him violating federal hours of service regulations; however, he denied that this occurred.⁶ According to the veteran truck driver, he completed the truck driver's evaluation road test on January 13, 2023, but dated it January 16, 2023, on the day he turned in the paperwork. The evaluation stated that the truck driver "demonstrated an experienced level of vehicle operations."

⁴ The trip sheets were dated January 9-12th. However, according to AGL representatives, this reflects the days when the automobile parts were picked up from Foxboro, Massachusetts. The actual days they were delivered, and therefore the actual days the training took place, were January 10-13th.

⁵ Motor Carrier Attachment - Interview with Veteran Driver.

⁶ The Foxboro terminal manager stated that he would look into this but failed to respond to investigators with an explanation. See Motor Carrier Attachment - Interview with Foxboro Terminal Manager.

1.2.2 Policies

When NTSB investigators met with AGL representatives at its headquarters in Winchester, Virginia, office, on February 6-7, 2023, they were given several policies and documents that they were told applied to the truck driver, including the following:

- Driver Safety Manual (2014)
- Driver Safety Policy (October 2020)
- Accident & Equipment Policy (undated)
- Drug and Alcohol Policy (undated)
- Hours of Service (HOS) Policy (undated)
- Policy on Roadside Inspection Citations (undated)
- Driver Incentive Program (undated)
- Driver Training Presentation (undated)

When interviewed on May 10, 2023, the AGL terminal manager in Foxboro, Massachusetts stated that AGL sends all its applicants a standard hiring packet, which includes an application and the company's policies.⁷ He added that, in February 2022, "some policies were added to the end of the packet, as well as some different federal forms and stuff that were changed or that expired and had to be renewed." Original documents provided by the terminal manager confirmed that the truck driver signed off on receipt of the Safety Manual and the drug and alcohol policy and not the additional policies.

AGL's Safety Manual provided to the NTSB was last modified in 2014. Among the topics covered were driver pre-qualification, drug and alcohol policy, vehicle inspections, safety rules, vehicular accidents, cell phones, and seat belts. The 2014 Safety Manual did not cover topics such as fatigue or recording duty hours. The 2014 Safety Manual stated that hands-free mobile phone use was acceptable.⁸ When asked about a fatigue policy, the terminal manager stated that AGL did not have a fatigue policy at the time of the crash, but that the company had implemented one since; however, AGL still does not have a fatigue management program.

Among the policies that the truck driver did not receive was the 2020 Driver Safety Policy. This policy covered many of the topics in the 2014 Safety Manual, but the content differed. For example, the Driver Safety Policy prohibits hands-free use of any mobile phone.^{9,10} According to the Driver Safety Policy, "Talking or texting on a

⁷ Motor Carrier factual report.

⁸ The terminal manager confirmed with investigators that hands-free cell phone use was permissible; however, handheld cell phone use was grounds for termination.

⁹ Human Performance Attachment - Extracted Pages from AGL Safety Manual.

¹⁰ Human Performance Attachment - AGL Driver Safety Policy.

Company or personal cell phone or using hands free (including Bluetooth) while driving is forbidden.” In addition, whereas the 2014 Safety Manual stated that, “Any driver involved in a preventable accident during their first 90 days of employment will be terminated,” this was not repeated in the 2020 Driver Safety Policy nor in a separate Accident & Equipment policy. In addition, the 2020 Safety Policy states, “any employee involved in an accident or incident resulting in damage to any equipment or physical injury to any person(s) will immediately report the accident or incident to their immediate Supervisor and/or AGL dispatcher. All accidents will be investigated to determine if it [*sic*] were preventable or not preventable. It is highly encouraged that drivers collect any supporting information they can to support a complete investigation and an accurate classification of the accident.” The information in the 2020 Safety Policy is substantially like the Accident & Equipment Policy, although the Driver Safety Policy expands on the consequences of driver involvement in preventable accidents.

Among other items, the Driver Safety Policy listed 3 “unsafe acts,” which, if not avoided, will result in a written warning after the first occurrence, and termination after the second occurrence in a 12-month period. These acts include: 1) Talking or texting on a Company or personal cell phone or using hands free (including Bluetooth) while driving, 2) not wearing a seatbelt when a company vehicle is in motion, and 3) failing to obey all speed limits, traffic signs, and construction zone postings while operating Company equipment, and failing to adjust vehicle speed (slowing down) with respect to weather and road conditions.

The 2014 Safety Manual does not describe the hours-of-service regulations, except to say “Compliance with the Hours of Service Regulations is required” without any further explanation of the differences between regulations that govern short-haul and long-haul drivers. According to the AGL HOS policy, any driver found to be in violation of the Hours-of-Service Rules as stated by the FMCSA 49 CFR 395 will be subject to disciplinary action up to and including termination.¹¹ It includes information on long-haul HOS regulations as well as short-haul HOS regulations. Specifically, it states for short haul operations:

A driver is exempt from the requirements of § 395.8 and § 395.11 if: the driver operates within a 150 air-mile radius of the normal work reporting location, and the driver does not exceed a maximum duty period of 14 hours. Drivers using the short-haul exception in § 395.1(e)(1) must report and return to the normal work reporting location within fourteen consecutive hours and stay within a 150 air-mile radius of the work reporting location.¹²

49 Code of Federal Regulations 395.8 refers to the requirement for commercial drivers to prepare a record of duty status for each 24-hour period. Failure

¹¹ Human Performance Attachment - AGL Hours of Service Policy.

¹² [Summary of Hours-of-Service Regulations | FMCSA \(dot.gov\)](#)

to record, complete, or retain the log, or knowingly falsifying logs or other reports, makes the driver and/or carrier liable to prosecution. 49 Code of Federal Regulations 395.11 refers to the requirements that commercial drivers submit supporting documents to the driver's employer within 13 days of either the 24-hour period to which the documents pertain or the day the document comes into the driver's possession, whichever is later. Short haul drivers are exempt from these requirements if they travel within a 150-mile radius of their normal work reporting location and return to that location within 14 hours on duty. Short haul drivers are exempt from the requirement to utilize an electronic logging device or logbook but must still maintain a record of their hours.

Based on the documents provided by AGL, the company had a weekly and a monthly incentive program based on a driver's ability to complete all tasks flawlessly and avoid citations, accidents, and speeding alerts. However, according to the terminal manager at the Foxboro terminal, no such program existed in the Foxboro terminal. He also stated that unlike the Winchester terminal, the Foxboro terminal was unionized.

The Driver Training Presentation presented an overview of the policies and regulations that govern AGL's operations. It includes additional information on whistleblower protection and driver health and wellness. According to the Foxboro terminal manager, this presentation was not given to the truck driver.

1.2.3 Incentive Program

When meeting with AGL executives in Winchester in February 2023, they mentioned that they had an incentive program at each of their three terminals to reward drivers on a weekly and monthly basis if they complete their routes on-time, without mistakes, without traffic violations, and without crashes. Drivers who achieve this during the week are rewarded with a \$50 bonus. In each terminal, drivers who achieve perfect performance for the month are entered into a drawing to win an extra \$1000.

However, when NTSB investigators interviewed the Foxboro terminal manager in May 2023, he stated that there was no such program in his terminal.

1.2.4 Work Schedule

The truck driver worked 5 days a week, from Tuesday to Saturday, and his route each day was the same (i.e., it was a set route). He would log in and out of work using a company phone. Besides his phone, he stated that he also used a scanner for his deliveries. He generally worked from 1 a.m. until 11:30 a.m. each day. The electronic trip sheets for the truck driver were generated via an in-house phone

application (iTracker) and confirmed that he generally worked for AGL from 1:00 a.m. until 11:30 a.m. (Table 1).¹³

The truck driver stated that it was about a 14-minute commute from the location he picked up the truck to his home. After he reached home between 11:40 a.m. and 12:00 p.m., he would eat then go to bed around 12:30 p.m. He described his sleep quality as good. He would wake between 5:00 and 6:00 p.m. to eat a light meal, then head back to sleep until it was time to return to work. He would leave for work around 12:40 a.m. The truck driver stated that in the days before the crash, nothing unusual disturbed this on-duty and off-duty routine.

Table 1. Truck driver hours based on trip sheets supplied by Aero Global Logistics.¹⁴

Date	Logged in	Logged out	On-duty hours
1/17/2023	12:54 AM	11:44 AM	10:50
1/18/2023	1:04 AM	11:44 AM	10:40
1/19/2023	1:15 AM	11:36 AM	10:21
1/20/2023	12:44 AM	11:01 AM	10:17
1/21/2023	12:55 AM	11:04 AM	10:09
1/22/2023	Off duty	Off duty	N/A
1/23/2023	Off duty	Off duty	N/A
1/24/2023	12:49 AM	11:26 AM	10:37
1/25/2023	12:56 AM	11:38 AM	10:42
1/26/2023	1:27 AM	12:00 PM	10:33
1/27/2023	1:12 AM	11:32 AM	10:20
1/28/2023	1:04 AM	crash	

1.3 Pre-Crash Activities

The driver stated that he usually drove the same truck for work, but that on the day of the crash, he used a different truck. It was the first time he operated the crash truck. He did not notice anything unusual about the performance of this truck. When asked to recount the events leading up to the crash, the truck driver stated that there was no traffic. As he was driving, he saw a bus in the opposite side of the road. The bus had its high beams on so he could not see anything.¹⁵ The bus drove into his lane and he tried to turn right to avoid a collision but did not have enough time to avoid

¹³ Human Performance Attachment - AGL iTracker Application Data for Truck Driver.

¹⁴ The shift dates on the iTracker show the driver working the day before the date he actually worked. A logout time was not included in the iTracker tripsheets for January 19, 20, 21, 24, 25, and 27. In these cases, the "Actual Time In" time or the "Delivery Totals" Actual Finish time was used to approximate the logout time.

¹⁵ Examination results of the bus headlights suggests that the low beams were in use at the time of the crash. See Vehicle Factors factual report.

the bus.¹⁶ He then tried to stop the truck to avoid going off the roadway. The truck driver stated that at the time of the crash, it was not snowing. The roadway was a little wet and cleared of snow so he could see the lane markings. He stated that it was still dark when the crash occurred.

1.4 Health History

According to the truck driver, he did not have any pre-existing medical conditions. He stated that he did not have a primary care physician. He did not take any prescription medication, although around 6:00 p.m. on the day prior to the crash, he took a Tylenol. The driver stated that he was not sure he had health insurance with the company and the NTSB confirmed with AGL that it did not provide medical insurance to the driver.

While interviewed by the NTSB, the truck driver produced his DOT medical examiner's certificate, which was valid from May 2022 until May 2024.¹⁷ The NTSB verified that the physician's assistant who signed the certificate was registered as a DOT medical examiner. The NTSB obtained a copy of the May 2022 long form from the clinic where the examination was performed. The long form indicated that the truck driver was 5'11" and 170 lbs. The long form also indicated that he had uncorrected 20/20 vision and good hearing. The truck driver indicated that he did not have any medical issues, and none were found by the medical examiner.

NTSB staff issued subpoenas on February 4, 2023, to pharmacies near the truck driver's former residence in The Bronx, as well as a pharmacy near his current home in Utica. The pharmacies responded that they did not have records for the truck driver.

1.5 Toxicology

The New York State Police (NYSP) performed a toxicological analysis of the truck driver's blood and found it to be negative for alcohol and drugs of abuse.¹⁸

The NTSB secured a small sample of the truck driver's blood for testing at the FAA Office of Aerospace Medicine. However, because of the comprehensive testing performed by the NYSP, coupled with the lack of evidence that the truck driver was

¹⁶ According to the New York State Police Collision Reconstruction Findings Report, roadway evidence indicated that the truck crossed the centerline and was partially in the westbound lane when it collided with the bus. See Human Performance Attachment - New York State Police Collision Reconstruction Findings Report.

¹⁷ Human Performance Attachment - DOT Medical Examiner's Certificate.

¹⁸ The NYSP tested the blood sample for ethanol, amphetamines, benzodiazepines, buprenorphine, cannabinoids, carisoprodol, cocaine, methadone, fentanyl, opioids, methamphetamines, oxycodone, phencyclidines, tramadol, and zolpidem.

prescribed any impairing prescription medications, the NTSB decided there was no reason for further testing.

1.6 Phone Records

When asked about any activities he would engage in while driving the truck (such as using his phone, listening to music), the truck driver stated that he just concentrated on operating his vehicle. The NYSP obtained two cell phones from the truck driver, an iPhone 13 Pro Max (personal phone) and an iPhone 7 (company phone). The NYSP performed a full file system download of the data from both phones and provided a copy of the data to the NTSB's Office of Research and Engineering. The data from both phones were examined to identify indications of usage 72 hours prior to the crash. The extractions also included GPS data, which was used to determine the truck driver's phone activities up to the time of the crash.

1.6.1 Work Phone Records

The truck driver's work phone was an iPhone 7, with cellular service provided by AT&T. According to the truck driver, his work phone stayed with the truck and was used primarily to log in and out of work, as well as to record deliveries. According to the records obtained from AT&T, in the 72-hours before the crash, only two outgoing calls were made - one at 10:57:18 a.m. on January 26 and the other at 6:01:19 a.m. on January 28.¹⁹

The latter call lasted 2 minutes and 57 seconds and was initiated about 1 minute before police dispatch received the first 9-1-1 call about the crash. The truck driver had called an AGL toll-free number. NTSB investigators were unable to arrange a subsequent interview with the truck driver to discuss this phone call; however, they did discuss the call with the AGL terminal manager. According to the terminal manager, the truck driver's work phone included a link at the bottom of the screen that a driver could use to quickly call the company (Figure 1). He stated that among the reasons a driver might use this number is to report that a delivery could not be made because a door was locked. He could not think of a reason the truck driver would use this phone number during transit unless it was to report an incident. The terminal manager stated that at the time the truck driver called the toll-free number, no one was at the terminal to answer the call, so the truck driver's call would have been routed to an automated answering system that presented the truck driver with options as to where he'd like his call directed. The terminal manager stated that the truck driver would not have had the option to leave a message. After terminating this call, the truck driver made a call directly to the terminal manager using his personal phone (Section 1.6.2).

¹⁹ Human Performance Attachment - Truck Driver Work Phone Records. The reason this call was not captured during the Cellebrite full file system download of the work phone is not known.



Figure 1. Exemplar AGL phone supplied to drivers, showing the “Call Office” link.

From December 29, 2022, to January 24, 2023, there were 12 incoming texts. Only the texts from January 8, 14, and 17 were read. There were no outgoing texts made on the work phone. See the Personal Electronic Device Data report for more information.

The Cellebrite extraction included location data for the phone; however, the location data was not sensitive enough to be useful.

1.6.2 Personal Phone Records

1.6.2.1 Usage

The truck driver’s personal cell phone was an iPhone 13 Pro Max, with cellular service provided by T-Mobile. Based on data extracted directly from his personal phone and records obtained from the driver’s phone carrier, the truck driver used his phone throughout the day, except for a few hours during the afternoons, around the time he told investigators that he slept.²⁰ Figure 2 provides an illustration of the truck driver’s active phone use (in blue). This includes calls and texts using the phone’s native applications, use of third-party applications, and browsing activities. The narrow yellow bars indicate when the truck driver was on-duty, based on AGL’s iTracker electronic trip sheets. The brown segments along the yellow bars indicate the times when the truck driver was at each of the nine stops he made during his shift. The red segment represents when the crash occurred.

²⁰ Human Performance Attachment - Truck Driver Personal Phone Records. See the Personal Electronic Device Data report for additional social media and web browsing phone interactions.

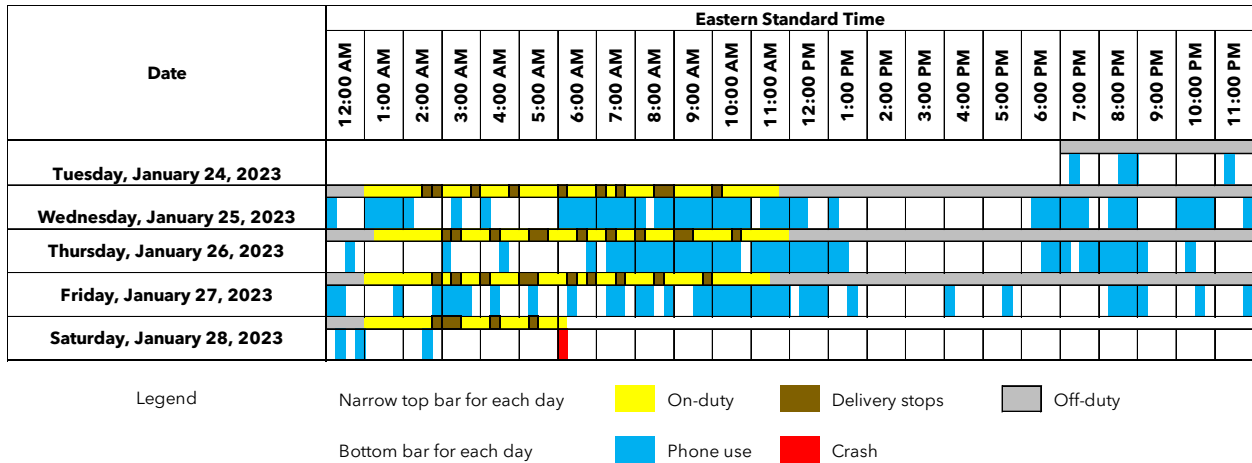


Figure 2. Graphical representation on the truck driver’s on-duty and off-duty times, with each of his nine stops also indicated. Phone use is shown as a contiguous block if less than 15 minutes separated the time between outgoing texts or phone calls.

After the crash, at 6:04 a.m., the truck driver made a one-and-a-half-minute call to the terminal manager using his personal phone. According to the terminal manager, he asked the truck driver if he was ok, told the truck driver to call 9-1-1, and said that he would call him back shortly. The truck driver called 9-1-1 at 6:06 a.m.²¹ The terminal manager called the truck driver back at 6:15 a.m. in a call that lasted about nine minutes.

The graphic indicates that the driver frequently used his phone while driving. As shown in Figure 3, NTSB investigators found a Bluetooth right earphone in the driver’s floorboard area of the truck during its post-crash inspection, suggesting that the truck driver might have been using his personal phone in hands-free mode while driving. As mentioned previously, the driver denied using his phone while on-duty. According to 49 Code of Federal Regulations 392, Subpart H, no driver may use a hand-held mobile telephone or engage in texting while driving a CMV. The only occasion where either is permissible is when drivers are communicating with law enforcement officials or other emergency services.

²¹ T-Mobile does not include 9-1-1 calls in an individual’s phone records; however, T-Mobile confirmed that a call to 9-1-1 was made from the truck driver’s phone at 6:06 a.m. local time.



Figure 3. Bluetooth earphone that was found in the truck during the NTSB’s post-crash inspection.

1.6.2.2 Location Data

The Cellebrite extraction for the truck driver’s personal phone included location data. These location data were generally accurate to a radius of 4.7 meters (15.42 feet). Investigators created a *.csv file of the data for the day of the crash and imported it into Google Earth Pro. The phone generally recorded a latitude and longitude for each second it was in motion, creating a path that mirrored the truck driver’s route for the day of the crash. Between 5:59:51 a.m. and 5:59:53 a.m., the truck’s speed decreased abruptly. At 5:59:55 a.m., the GPS location of the phone was essentially stationary on the south shoulder of the roadway, near a small cluster of trees and on the opposite side of an electrical pole (Figure 4).²² This location was confirmed to be correct using drone images taken of the vehicles after the crash.

²² See Personal Electronic Device Data report.



Figure 4. Google Earth Pro map with points indicating GPS locations of the truck before and after the crash.

1.7 Truck Driver Sleep

The truck driver generally worked from about 1:00 a.m. until 11:30 a.m. five days per week. He lived with his partner and young child. Based on the information summarized in Figure 1, the truck driver had about five hours of uninterrupted sleep opportunity each day on January 25 and 26, with additional hours of sleep possible after phone use. He had more sleep opportunity on January 27; however, it was fragmented by several occasions of phone use.

At the location of the crash, New York State Route 37 had a speed limit of 55 mph and included rumble strips on the center line. The purpose of rumble strips on the center line was to alert inattentive drivers that they are at risk of entering the lane of opposing vehicles. Vehicle evidence indicated that the truck driver was traveling at a speed of approximately 59 mph at the time of the crash.²³ Based on roadway evidence, the truck driver overrode the center lane rumble strips and entered 3-feet into the bus's travel lane at a shallow angle. There were no roadway markings prior to the point of impact to indicate that the truck driver attempted to avoid the crash; however, markings on the steering gearbox showed evidence of a slight right-turn input at the time of the crash.

Research has shown that fatigue crashes largely occur during two times of day - during the nighttime period (12 a.m. - 7 a.m.) and mid-afternoon.²⁴ Fatigue crashes

²³ See Vehicle Factors factual report.

²⁴ Pack, Allan I., Andrew M. Pack, Eric Rodgman, Andrew Cucchiara, David F. Dinges, and C. William

usually occur on high-speed roadways (speed limits above 50 mph) and there is usually no evidence that the driver attempted to avoid the crash (lack of braking or steering). The population most at risk for fatigue-related crashes include young males and shift-workers whose sleep is disrupted by working at night or working long or irregular hours.²⁵

Based on the hours he worked, the truck driver would be considered a shift worker. Shift work is defined as working outside the hours of 7 a.m. to 6 p.m.²⁶ Studies have shown that individuals engaged in shift work experience more sleepiness and disturbed sleep than daytime workers, and health problems often experienced by shift workers are associated with their sleep-wake schedules, which are desynchronized with their circadian rhythms.^{27,28,29} Shift work can result in desynchrony between the body's circadian physiology and environmental (e.g., light/dark) and societal synchronizers (e.g., school and store hours).³⁰ Difficulty limiting light exposure is a major reason why most shift workers aren't able to obtain the rest they need.³¹ Societal pressures and family obligations, such as children in the household, have also been found to affect the amount of sleep a shift worker obtains and subsequent feelings of fatigue.³² This desynchrony often results in insomnia, fragmented, or disturbed sleep, thereby leading to sleepiness throughout the day. Sleep loss accumulates over successive nights, and this sleep debt often has safety implications. Chronic sleep restrictions have been found to result increased

Schwab. "Characteristics of crashes attributed to the driver having fallen asleep." *Accident Analysis & Prevention* 27, no. 6 (1995): 769-775.

²⁵ National Center on Sleep Disorders Research. "Drowsy Driving and Automobile Crashes: Report and Recommendations." (2013).

²⁶ Rosa, Roger Rudolph. Plain language about shiftwork. US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, Division of Biomedical and Behavioral Science, Education and Information Division, 1997.

²⁷ Rosa R.R., Colligan M.J. Plain Language About Shiftwork. U.S. Department of Health and Human Services, Publication No. 97-145, 1997.

²⁸ Shift work is defined as regular employment outside of the normal "day work" hours. See Kryger MH, Roth T, Dement WC. *Principles and Practice in Sleep Medicine*, 4th Edition, Elsevier-Saunders, Philadelphia, PA, 2005, p. 673.

²⁹ Drake CL, Roehrs T, Richardson G, Walsh JK, Roth T. Shift work sleep disorder: prevalence and consequences beyond that of symptomatic day workers. *Sleep* 27, no. 8 (2004): 1453-62.

³⁰ Shen J, Botly LCP, Chung SA, Gibbs AL, Sabanadzovic S, et al. Fatigue and shift work. *Journal of Sleep Research* 15 (2006): 1-5.

³¹ Sack RL, Blood ML, Lewy AJ. Melatonin rhythms in night shift workers. *Sleep* 15 (1992): 434-441.

³² Fernandes-Junior SA, Ruiz FS, Antonietti LS, Tufik S, Túlio de Mello M. Sleep, Fatigue and Quality of Life: A Comparative Analysis among Night Shift Workers with and without Children. *PLoS ONE* 11, no. 7 (2016): e0158580. doi:10.1371/journal.pone.0158580. Van Dongen HP, Maislin G, Mullington JM, Dinges DF. The cumulative cost of additional wakefulness: dose response effects on neurobehavioral functions and sleep physiology from chronic sleep restriction and total sleep deprivation. *Sleep* 26 (2003) :117-26.

attentional lapses, such as microsleep.^{33,34} Increases in attentional lapses were observed for those whose sleep was restricted to less than seven hours per night over a span of a week (the National Sleep Foundation recommends that adults get 7-9 hours of sleep a night). For those whose sleep is restricted to 5-7 hours per night, lapses in attention plateaued after a week. These results are consistent with research that has found an increased incidence of sleep-related crashes in drivers reporting less than 7 hours of sleep per night on average.³⁵

At the time of the Louisville crash, AGL did not have a fatigue policy. As detailed in the Motor Carrier Group Chairman's Factual Report, AGL has been involved in an inordinate number of crashes that have the characteristics of being fatigue related. About four months after the Louisville crash, AGL presented NTSB investigators with a one-page "fatigue policy" that included 12 items that a driver should consider regarding the effects of fatigue, illness, medication, equipment safety, and distractions. The Policy is presented more as a checklist of items to consider, but did not provide the driver with procedures, guidelines, or resources to manage fatigue.³⁶

2.0 Bus Driver

2.1 Background and License History

The bus driver was a 36-year-old male who did not have a valid New York state driver's license or any other state-issued license. The driver stated that he did not have a DOT medical certificate. When interviewed by NTSB staff, he presented two identification cards. One was a "complimentary" nongovernment identification card that listed his place of residence as Duluth, Georgia. The other appeared to be a driver's license issued in Venezuela. Both identification cards had the same birth date listed but the names were not identical. The NYSP were subsequently able to obtain a copy of the bus driver's Venezuelan passport, which validated the information on the Venezuelan driver's license.

The NTSB interviewed the bus driver on January 31, 2023. The bus driver stated that he was trained to drive buses in Venezuela and drove "encava" buses there for 17-18 years. He joined LBFNY in June 2022 and started driving for them that same month. He said that LBFNY did not have a formal training program for drivers.

Van Dongen HP, Maislin G, Mullington JM, Dinges DF. The cumulative cost of additional wakefulness: dose response effects on neurobehavioral functions and sleep physiology from chronic sleep restriction and total sleep deprivation. *Sleep* 26 (2003) :117-26.

³⁴ Belenky G, Wesensten NJ, Thorne DR, et al. Patterns of performance degradation and restoration during sleep restriction and subsequent recovery: a sleep dose-response study. *Journal of Sleep Research* 12 (2003): 1-12.

³⁵ Stutts JC, Wilkins JW, Osberg JS, Vaughn BV. Driver risk factors for sleep-related crashes. *Accident Analysis and Prevention* 35 (2003):321-31.

³⁶ Human Performance Attachment - AGL Post-Crash Fatigue Policy.

The bus driver was assigned to the crash bus at the beginning of the year. Aside from driving the bus, he also operated a skid steer while at the work site. He was also getting trained to operate an excavator. The bus driver stated that he worked 45-47 hours a week and was paid on a weekly basis.

The bus driver was interviewed by NYSP on January 28, 2023, the day of the crash.³⁷ In that interview, the bus driver stated that he had been staying at the hotel in Massena for about a month as the crew worked on a solar farm construction contract. He and the crew would work at the worksite 6 to 7 days a week, depending on weather conditions. The bus driver further stated that he performed a pre-trip inspection daily prior to ferrying the crew.³⁸

2.2 Work Schedule

The bus driver stated to NTSB investigators that he worked Monday-Wednesday, had Thursday off due to inclement weather, and worked Friday (Table 2). He was on his way to the work site on the morning of the crash.³⁹

Table 2. Bus driver’s work schedule.

Date	Start of shift	End of shift	On-duty hours	Notes
1/25/2023	5:40 a.m.	5:40 p.m.	12	Drove crew to Walmart after returning to hotel
1/26/2023	N/A	N/A	0	Did not work due to inclement weather
1/27/2023	5:50 a.m.	5:40 p.m.	11:50	
1/28/2023	5:41 a.m.	N/A	N/A	Day of crash

He described his routine as consistent from day-to-day. On Wednesday, he woke at 5:00 a.m., turned the bus on, and prepared for the day (etc., showered, ate, prepared lunch), then went back to the bus around 5:40 a.m. to wait for passengers. The bus driver departed the hotel around 5:50 a.m. and stopped at a gas station so that the crew could buy breakfast. They arrived at the worksite around 6:50 a.m. and he was assigned by the supervisor to operate the skid steer until lunch. He drove the crew to lunch around 12:00 p.m. and returned to the worksite before 1:00 p.m. (the crew received one hour for lunch). He was again assigned to operate the skid steer for the rest of the afternoon. About 30 minutes before departure, the crew began cleaning the machinery. The bus driver drove the crew back to the hotel around 4:30 or 5:00 p.m. and arrived at the hotel around 5:30-5:40 p.m. He drove some of the

³⁷ Human Performance Attachment - Bus Driver Interview with NYSP.

³⁸ Video evidence from the hotel indicated that the bus driver did not perform a pre-trip inspection on the morning of the crash.

³⁹ Human Performance Attachment - NTSB Interview with Bus Driver.

crew to Walmart that night for supplies. He stated that he went to bed between 8:30 p.m. and 9:00 p.m. He stated that he didn't stay awake past 10:00 p.m.

The crew did not work on Thursday due to inclement weather. He woke around 8:30-9:00 a.m. and stayed at the hotel. He went to bed between 8:30 p.m. and 9:00 p.m.

On Friday, he again awoke at 5:00 a.m. and left the hotel about 5:50 a.m. He stated that they arrived at the work site about 6:50 a.m. He again operated the skid steer while there. They left the job site around 4:30 p.m. and arrived at the hotel about 5:40 p.m. He went to bed at 8:30 p.m. and drifted off to sleep.

2.3 Pre-Crash Activities

On Saturday, the day of the crash, he again awoke at 5 a.m. Unlike the other days, he was the last one to board the bus that day. He boarded the bus and made a left out of the hotel lot to head west on State Route 37 (SR 37) to go to the work site, like every other day. He stated that it was snowing lightly when he departed but that he could see the lines on the roadway. Traffic was very light at this time. SR 37 is a two-lane roadway with one lane for eastbound traffic and one lane for westbound traffic. As he drove, he saw the truck in the eastbound lane. As they were about to pass each other, he saw the truck encroach into his lane. He screamed out then felt the impact. He steered right and tried his best to control the bus. Once stopped, he screamed out at the crew to see if everyone was ok. He then unbuckled his seatbelt and left the bus to check on the crew.

The bus driver stated that it was still dark when the crash occurred. He usually had music on when driving but not on that day. Glare from opposing traffic was not an issue. He also stated that he would use his high beams where there was no traffic but would switch to his low beams when traffic approached. He stated that as the truck approached, he had his low beams on. The driver stated that he was driving slower than the speed limit of 55 mph because of the snow.

In his interview with the NYSP, the bus driver stated that it was snowing when he left the hotel with snow accumulating on parts of the roadway. As he drove, he leaned forward in his seat to concentrate on the roadway and drove between 45-50 miles per hour, which was the normal speed he traveled. Approximately 5 miles after passing County Road 14, he observed a truck with both headlights on traveling east towards the bus and in his lane of travel. He attempted to steer right to avoid the collision but was struck at the driver's side with the truck's driver's side. He didn't recall the dynamics of the bus after the collision but remembered that it came to rest on the north shoulder facing west, the opposite direction that he was traveling. The first thing he did after the bus came to rest was attempt to remove his seatbelt and yell back at his passengers to see if they were okay. He had difficulty removing his seatbelt, so he believed that he was the last one to get off the bus.

The NYSP obtained surveillance video from the hotel where the LBFNY crew stayed. The video showed that on the morning of the crash, the bus driver walked to the bus and started it at 5:16 a.m. He then left it idling while he went back inside the hotel. At 5:41 a.m. he returned to the bus and waited for passengers. The first passengers arrived at 5:42 a.m. The bus departed the hotel at 5:51 a.m. under a light flurry of snow. Investigators were also able to download the bus's airbag control module (ACM), which indicated that the bus had been traveling at a speed of 53-54 mph during the 2.5 seconds leading up to the crash.⁴⁰

2.4 Health History

NTSB investigators interviewed the bus driver three days after the crash. He stated that he did not go to hospital immediately after crash but was at the crash site for about 6-7 hours doing interviews. He stated that he did not have any pre-existing health conditions and did not take any medications. He did not have a DOT medical certificate. During the interview, the bus driver appeared alert and did not exhibit issues with his hearing.

The bus driver went to the emergency room the day after the crash complaining of arm and neck pain. He was discharged from the emergency room with a left-wrist splint. Medical records from this visit indicated that he was an 'otherwise healthy male' who did not have pertinent past medical history and no previous surgeries.

2.5 Toxicology

The surveillance video showed the bus driver at 5:16 a.m. and at 5:41 a.m. His gait and behavior in both instances appeared normal. Blood was not collected from the bus driver post-crash and the carrier did not submit the driver to a DOT post-crash drug test.

The NYSP interviewed the bus driver on-scene about 3.5 hours after the crash. According to the bus driver, he occasionally consumed wine on special occasions but did not drink alcohol the night before the crash. He also stated that he had used edible cannabis and vape pens in the past, but not recently. The NYSP did not indicate that the bus driver exhibited signs of impairment during the interview.

The bus driver stated to NTSB investigators that he does not take any prescription or over-the-counter medications.

⁴⁰ See Vehicle Factors Factual report.

2.6 Phone Records

According to the bus driver, he never used his phone when driving. The bus driver’s phone records were obtained from his phone carrier.⁴¹ A subpoena was issued to the bus driver’s phone service provider, and based on an analysis of the records, the bus driver was not using his phone for texting or calls at the time of the crash.

Figure 5 provides an illustration of the bus driver’s phone use (in blue). This only includes calls and texts from the phone’s native applications since a forensic analysis was not conducted on this phone. The narrow yellow bars indicate when the bus driver stated he was on-duty. The red segment represents when the crash occurred.

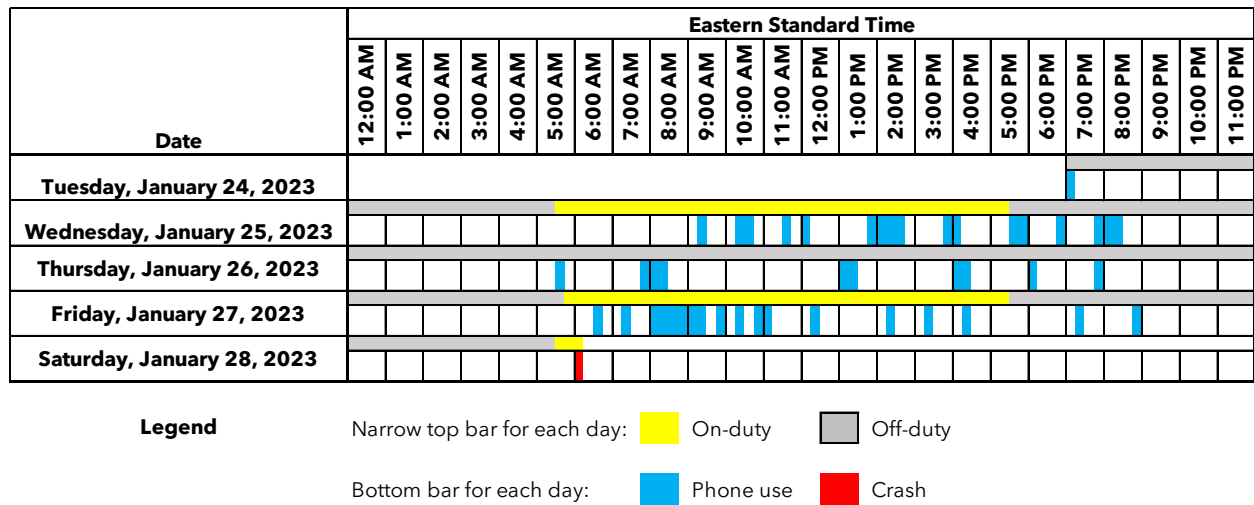


Figure 5. Graphical representation on the bus driver’s on-duty and off-duty times. This figure also indicates when the bus driver was using his phone. Records obtained from the phone carrier began at 7:02 p.m. on January 24, 2023. Phone use is shown as a contiguous block if less than 15 minutes separated the time between outgoing texts or phone calls.

2.1 Bus Driver Sleep

The bus driver stated that he was usually in bed by 9:00 p.m. and didn’t stay awake past 10:00 p.m. He also stated that he awoke at 5:00 a.m. each workday. His statements were consistent with his phone usage. In the days prior to the crash, his phone use ceased by 9:00 p.m. every night and did not begin until after 5:00 a.m. Based on the available evidence, the bus driver had eight or more hours of sleep opportunity each of the four nights prior to the crash.

⁴¹ Human Performance Attachment - Bus Driver Personal Phone Records.

E. GENERAL FACTORS

3.0 Weather

The closest official National Weather Service weather station to the crash site was located approximately 11 miles east, at Massena International Airport (KMSS). Observations closest to the time of the crash are shown in Table 3.

Table 3. Weather data from weather station KMSS.

Time (EST)	5:53 a.m.
Temperature	17° F
Dew Point	13° F
Humidity	84%
Pressure	30.04 in
Wind Dir.	W
Wind Speed	6 mph
Wind Gust Speed	0
Precipitation	0.0
Events	None
Conditions	Cloudy

4.0 Astronomical Factors

According to the Earth System Research Laboratory/Global Monitoring Division of the National Oceanic and Atmospheric Administration, apparent sunrise in the immediate area of this crash occurred at 7:24 a.m., and apparent sunset occurred at 5:02 p.m. This crash occurred at 6:02 a.m., during the nighttime hours.

5.0 Docket Material

The following attachments are in the docket for this investigation:

LIST OF ATTACHMENTS

Human Performance Attachment - Truck Driver CDLIS

Human Performance Attachment - NTSB Interview with Truck Driver

Human Performance Attachment - Extracted Pages from AGL Safety Manual

Human Performance Attachment - AGL Driver Safety Policy from October 2020

Human Performance Attachment - AGL Hours of Service Policy

Human Performance Attachment - AGL iTracker Application Data for Truck Driver

Human Performance Attachment - DOT Medical Examiner's Certificate
Human Performance Attachment - Truck Driver Personal Phone Records
Human Performance Attachment - AGL Post-Crash Fatigue Policy
Human Performance Attachment - Bus Driver Interview with NYSP
Human Performance Attachment - NTSB Interview with Bus Driver
Human Performance Attachment - Bus Driver Personal Phone Records
Human Performance Attachment - Truck Driver Work Phone Records
Human Performance Attachment - New York State Police Collision
Reconstruction Findings Report

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