

July 20, 2026

HIR-26-06

Multivehicle Collision with Combination Vehicle Parked on Shoulder, I-485

Charlotte, North Carolina
July 26, 2025

On July 26, 2025, about 11:03 a.m., a multivehicle collision occurred between a sport utility vehicle (SUV), a minivan, and a truck-tractor in combination with a refrigerated semitrailer (combination vehicle; operated by Leonard's Express, Inc.) that was parked on the shoulder of Interstate 485 (I-485) Outer Loop, near mile marker 7, in Charlotte, Mecklenburg County, North Carolina.¹ A 2014 Honda CR-V SUV, operated by a 16-year-old driver and traveling in the middle lane, initiated a lane change and struck the side of a 2002 Chrysler Town & Country minivan (minivan) traveling in the right lane. Both vehicles traveled toward the right shoulder and struck the semitrailer of the combination vehicle parked on the right shoulder (see figure 1). The driver and four passengers of the minivan and the driver of the SUV died. A passenger in the minivan sustained serious injuries.

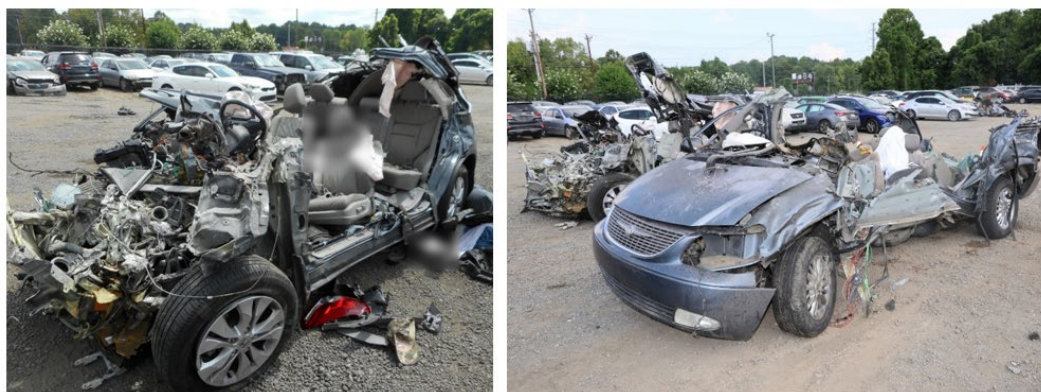


Figure 1. Postcrash photographs of the SUV (left) and minivan (right) after occupant extrications and vehicle recoveries. (Redactions by NTSB)

¹ (a) In this report, all times are eastern daylight time. (b) Visit [nts.gov](https://www.nts.gov) to find additional information in the [public docket](#) for this NTSB investigation (case no. HWY25MH011). Use the [CAROL Query](#) to search safety recommendations and investigations.

Location	Interstate 485 Outer Loop, about 134 feet north of the Dixie River Road overpass, Charlotte, Mecklenburg County, North Carolina (see figure 2)
Date	July 26, 2025
Time	11:03 a.m.
Involved vehicles	3
Involved people	8
Injuries	6 fatal (SUV driver, minivan driver, 4 minivan passengers) 1 serious (minivan passenger) 1 uninjured (combination vehicle driver)
Weather	Dry, clear, and daylight
Roadway information	Divided 6-lane concrete roadway (3 inner-loop and 3 outer-loop travel lanes); right lane bordered by 11-foot-wide concrete shoulder; straight alignment; about 50-foot-wide traversable and recoverable clear zone, and 70-mph posted speed limit ²

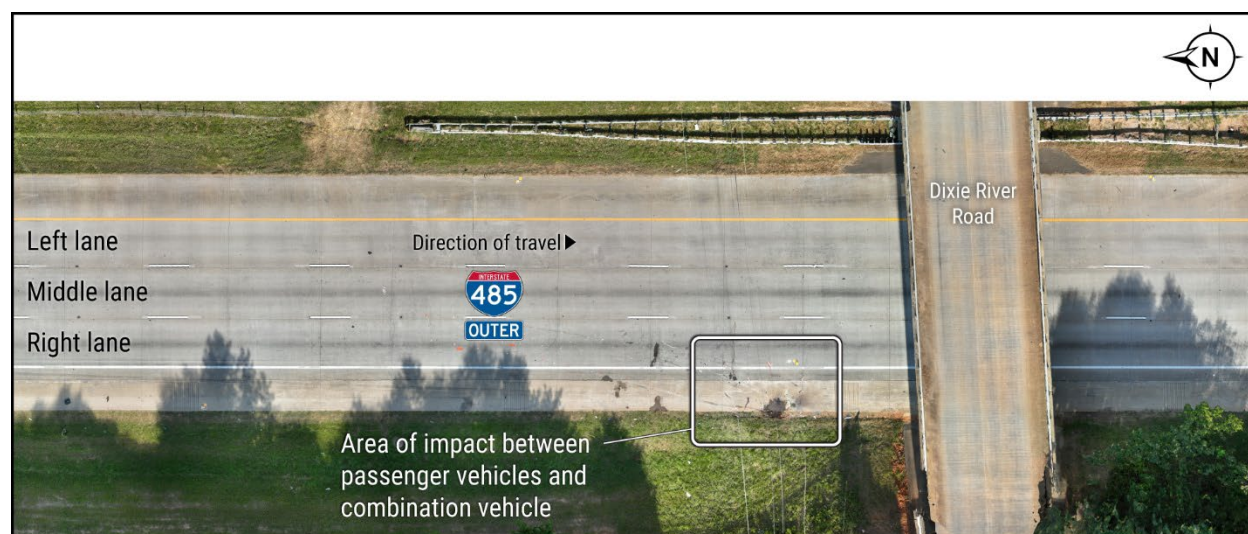


Figure 2. Aerial image of the crash location. (Source: North Carolina State Highway Patrol; compiled and annotated by NTSB)

² *Clear zone* is the unobstructed, traversable area provided beyond the edge of the travel lane (i.e., shoulder and area to the right) for the recovery of errant vehicles (American Association of State Highway and Transportation Officials [AASHTO] *Roadside Design Guide*, 4th edition, 2011). To be unobstructed, a clear zone must be free of rigid fixed objects or fixed hazards.

1 Factual Information

1.1 Event Sequence

On Saturday, July 26, 2025, about 11:03 a.m., a 2014 Honda CR-V SUV was traveling south in the middle lane of Outer Loop Interstate 485 (I-485) at a speed between 76 and 78 mph, approaching the Dixie River Road overpass (near mile marker 7), in Charlotte, Mecklenburg County, North Carolina. The posted speed limit was 70 mph. At the same time, a 2002 Chrysler Town & Country minivan (minivan) was traveling in the right lane near the SUV at 66 mph. An uninvolved commercial motor vehicle (CMV) was traveling in the middle lane in front of the SUV at a constant speed of 69.6 mph. The SUV and minivan were both approaching the location where a 2023 Kenworth T680 truck-tractor in combination with a 2019 Wabash refrigerated semitrailer (combination vehicle), operated by Leonard’s Express, Inc., was parked on the right shoulder partially under the overpass.

About 1.5 seconds before impact, when the SUV driver was 30.9 feet behind the uninvolved CMV, he had increased his speed to 78 mph and briefly turned the steering wheel to the right 5 degrees and then back to neutral (see figure 3).³

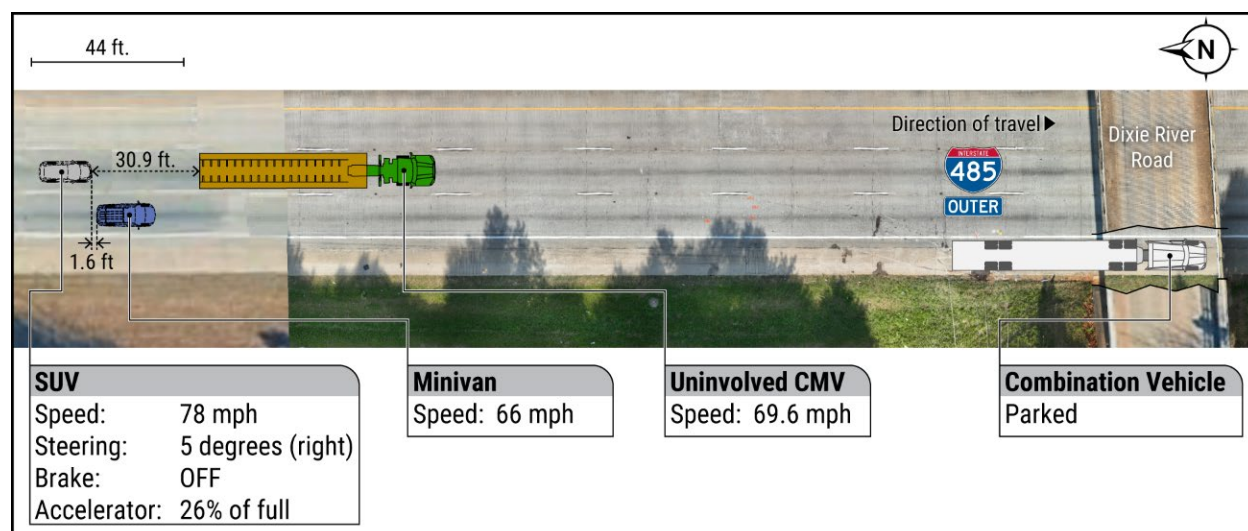


Figure 3. Position of the vehicles 1.5 seconds before the impact between SUV and minivan. (Source: Google Earth and North Carolina State Highway Patrol; annotations by NTSB)

At 0.5 seconds before impact with the minivan, the SUV driver turned the steering wheel 55 degrees to the right while still traveling at 78 mph. Data from the

³ NTSB investigators reconstructed the collision sequence using multiple data sources including roadway physical evidence, vehicle damage, electronic vehicle data, data from a mobile device application, video evidence from an onboard dash camera on the parked combination vehicle, and witness statements from the combination vehicle driver and a driver traveling behind the minivan. See Technical Reconstruction Attachment – NTSB Time Position Diagram in the docket for this investigation.

vehicle's airbag control module (ACM), which had an event data recording capability, showed that the vehicle's electronic stability control became engaged. The minivan's speed was obtained from Life360 application data, which was recorded near the crash location by a minivan passenger's cell phone. The SUV was positioned adjacent to the minivan and 18.8 feet behind the uninvolved CMV. Both passenger vehicles were about 134 feet from the parked combination vehicle (see figure 4).

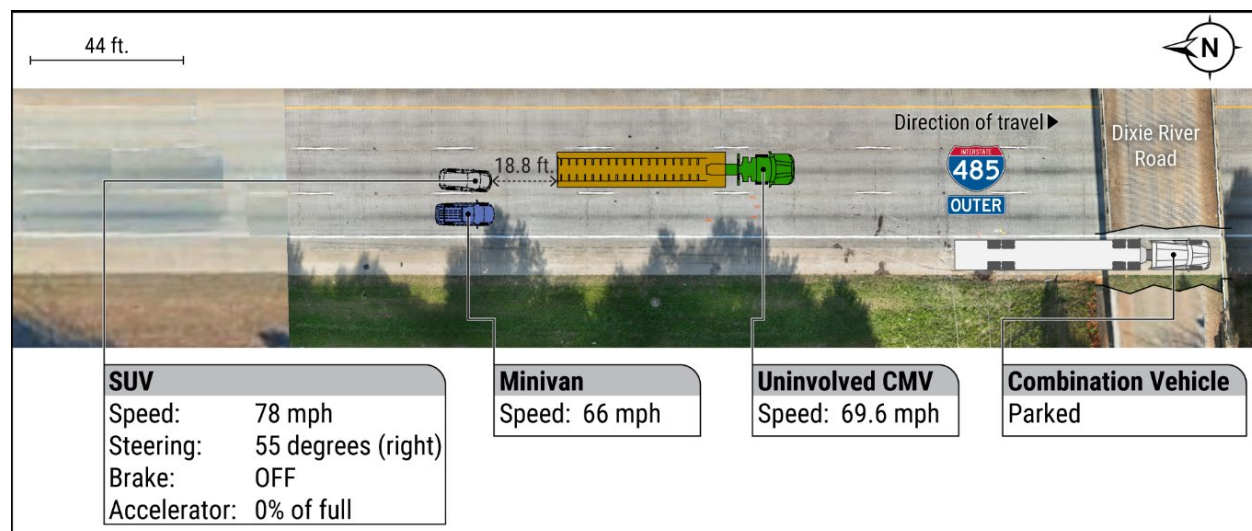


Figure 4. Position of the vehicles 0.5 seconds before impact between SUV and minivan. (Source: Google Earth and North Carolina State Highway Patrol; annotations by NTSB)

Subsequently, the SUV moved from the middle lane into the right travel lane where its right-rear door struck the left-front tire of the minivan when both vehicles were 128 feet north of the overpass (see figure 5). At or immediately before impact with the minivan, the SUV driver turned the steering wheel 90 degrees to the left and applied the accelerator to 58% of full. The impact caused the SUV's right-side curtain airbag to deploy. At the time of impact, the SUV's right-side tires were in the right travel lane and its left-side tires were in the middle travel lane. The minivan was fully in the right travel lane.

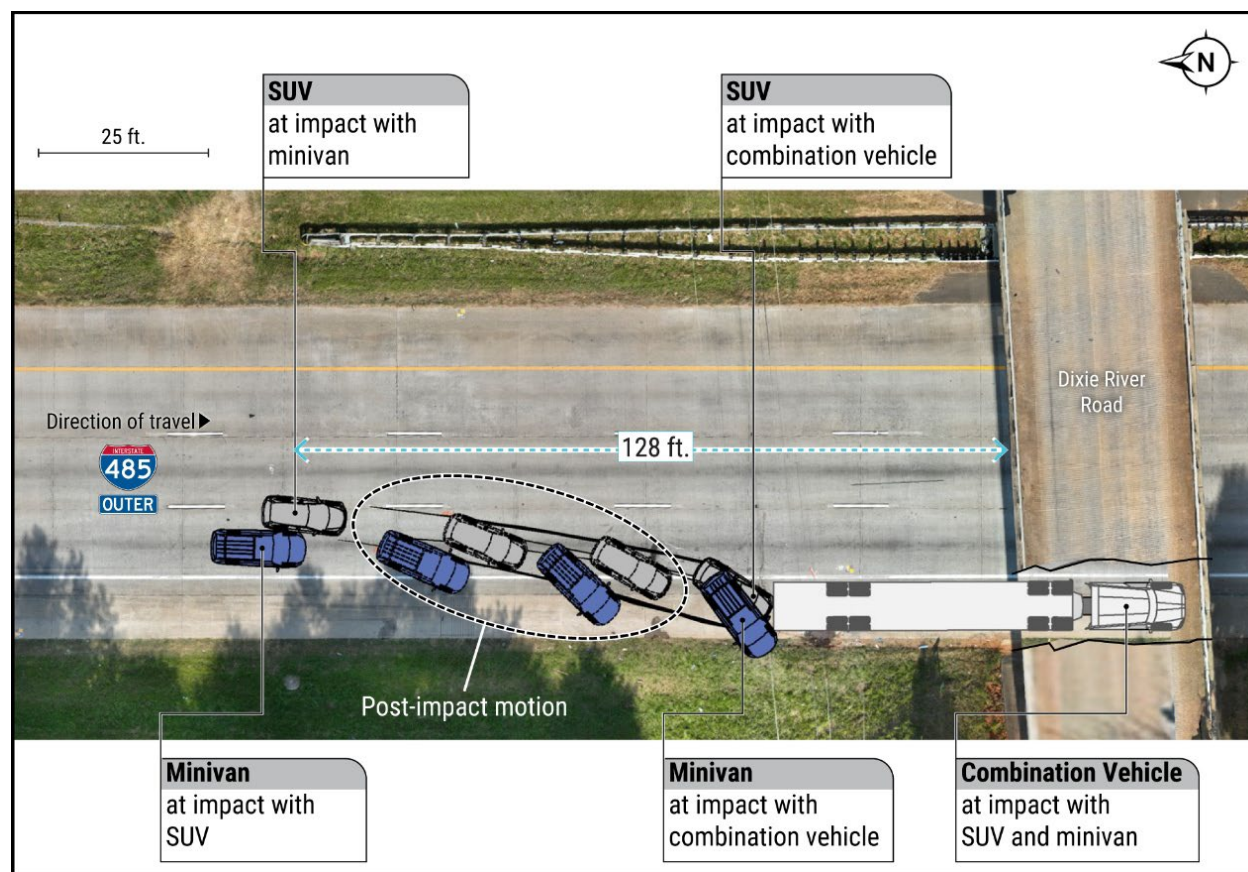


Figure 5. Post-impact motion of the crash-involved vehicles. (Source: North Carolina State Highway Patrol; annotations by NTSB)

The impact induced changes in both vehicles' forward and lateral velocity, causing the SUV and minivan to rotate clockwise and move toward the right shoulder, with the SUV leading (refer to figure 5). NTSB investigators used data recovered from the SUV's ACM and telematics data from the uninvolved CMV, as well as tire friction marks, to calculate the impact location and distances. From the initial impact location, the SUV traveled 77.3 feet before the left front of the vehicle struck the rear of the combination vehicle's semitrailer just left of center. The minivan traveled 85.5 feet before the left fender struck the rear of the semitrailer near the right-rear corner.

The vehicles' impact with the semitrailer slightly displaced it, rotating it about 4 degrees counterclockwise from its original parked position (see figure 6). The SUV came to rest facing southwest on the right shoulder with its rear partially in the right travel lane, 37.7 feet north of the overpass. The front half of the SUV was lodged beneath the left side of the semitrailer. The SUV's speed was 75 mph when it struck the semitrailer's rear-impact guard, commonly referred to as rear-underride guard.⁴

⁴ The SUV's ACM-recorded speed at the time of impact with the trailer was 75 mph. NTSB investigators calculated the magnitude of the longitudinal and lateral velocity vectors of the SUV at the time of impact with the trailer, 72.9 mph and 17.8 mph respectively, to account for the curvilinear path of the SUV after impact with the minivan.

The left side and portions of the right side of the minivan were lodged beneath the semitrailer, and the minivan came to rest facing in a southwesterly direction on the right shoulder and vegetated area west of the shoulder, 40.3 feet north of the overpass. The minivan's estimated speed at the time of impact with the semitrailer was 66 mph. There was no evidence of brake application for either vehicle before the initial impact or the impact with the combination vehicle, and there was negligible speed reduction from the time of the first impact to the impact with the semitrailer.

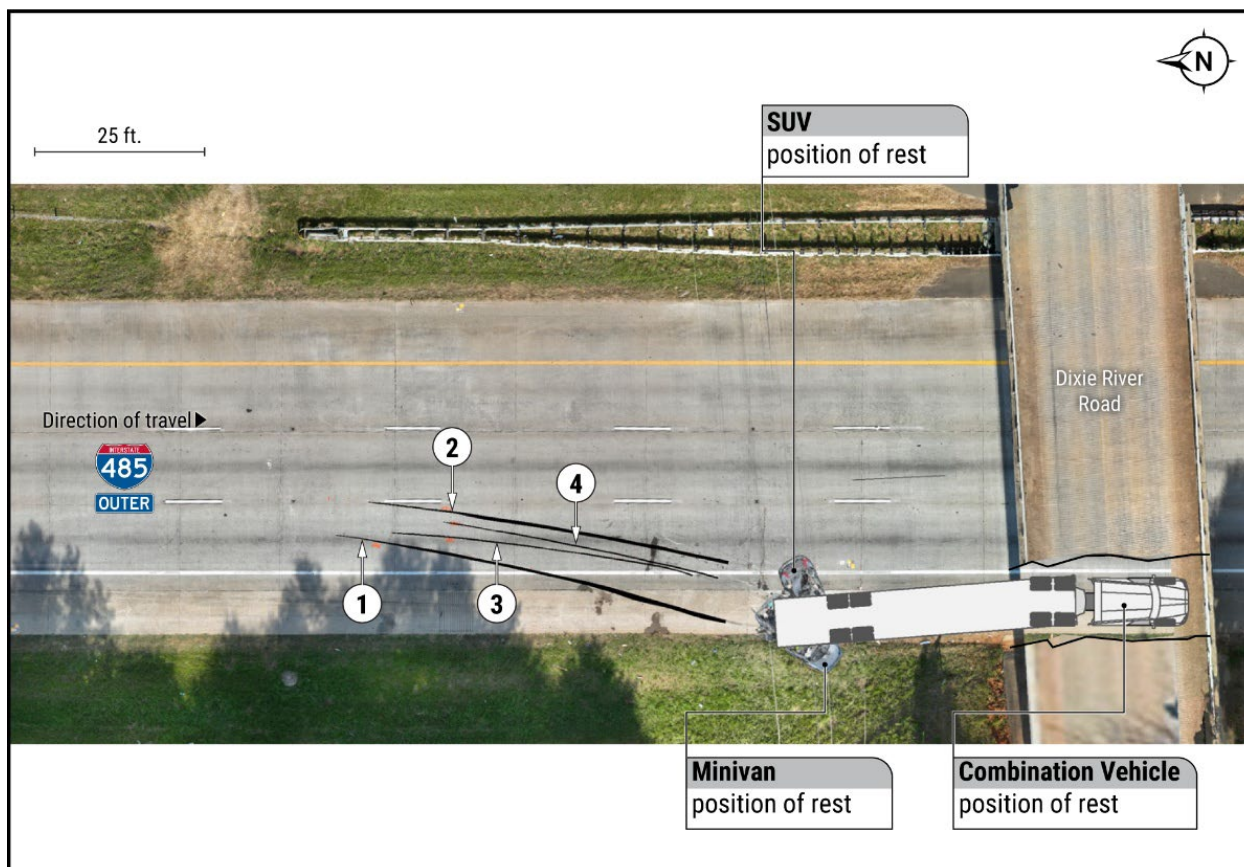


Figure 6. Diagram showing the vehicles' position of rest; also shown are curvilinear tire friction marks (labeled 1 through 4) located in the right lane and shoulder. (Source: North Carolina State Highway Patrol, Collision Reconstruction Unit; annotations by NTSB)

Injuries, Occupant Protection, and Emergency Response. Eight individuals were involved in this collision. The 63-year-old male driver of the combination vehicle was uninjured. A 16-year-old male driver was the sole occupant of the SUV and sustained fatal injuries.⁵ The minivan driver—a 27-year-old male—and four passengers

⁵ Electronic data from the SUV's ACM indicated that driver's seat belt was buckled. Postcrash photographs by emergency responders show the driver was wearing his seat belt, which responders cut during extrication.

(ages 23, 8, 3, and 1) died.⁶ One passenger in the minivan, positioned behind the second-row seating positions, survived but was seriously injured. The minivan had four seats installed: two seats in each of the first and second rows. Occupants in the second row were seated in child safety seats. The two rearmost occupants were positioned behind the second-row seating positions, where the third-row seats would have been positioned if installed. Figure 7 shows the seating positions, restraint use, and injury outcome of the minivan occupants.

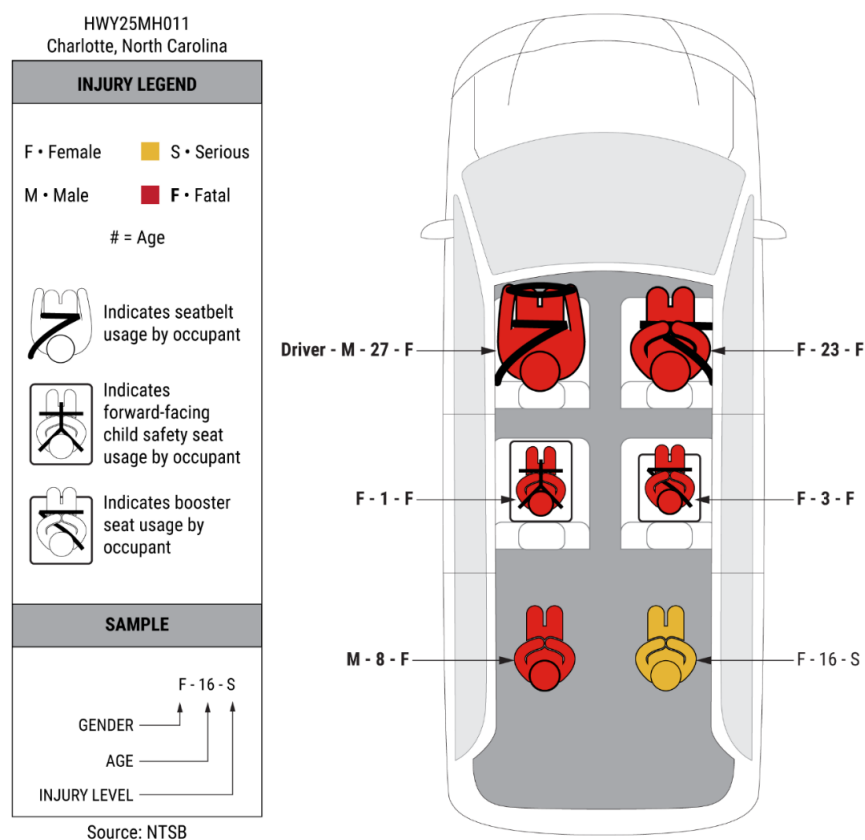


Figure 7. Minivan seating diagram with gender, age, and injury severity.

The Charlotte-Mecklenburg computer-aided dispatch received the first 911 call at 11:03 a.m. The Charlotte-Mecklenburg Police Department was dispatched at 11:08 a.m. and was the first law enforcement agency to arrive on scene, at 11:16 a.m. The West Mecklenburg Volunteer Fire Department and Steele Creek Fire Department were dispatched about 11:07 a.m. and arrived at 11:14 a.m. and 11:17 a.m., respectively. The Mecklenburg Emergency Medical Services Agency responded with 10 units. The first advanced life support (ALS)-equipped patient transport vehicle

⁶ (a) The seat belt restraints for both front-row seats were cut with the respective latch plates still inserted in the buckles and the frontal airbags deployed. (b) The front-seated passenger was partially ejected.

arrived at 11:18 a.m. and transported the seriously injured passenger of the minivan from the scene at 11:31 a.m., arriving at Carolinas Medical Center at 11:46 a.m.

Units from the North Carolina State Highway Patrol were dispatched beginning at 11:09 a.m.; the first unit arrived at the crash site at 11:29 a.m. About 12:08 p.m., assistance from the Charlotte Fire Department was requested. Additional support was requested to facilitate extrication, and a heavy-duty wrecker (rotator) arrived on scene about 12:54 p.m. After the rotator arrived, the vehicles were removed from underneath the semitrailer and the remaining extrications were completed.

1.2 Additional Information

1.2.1 Trailer Rear-Impact Guards

The combination vehicle was equipped with a rear-impact guard designed to mitigate rear-end collisions. Federal Motor Vehicle Safety Standards 223 and 224 specify the performance strengths of these guards, including impact speeds, and the vehicles on which they must be installed.⁷ The standards were updated in 2022 to “require rear impact guards to provide sufficient strength and energy absorption to protect occupants of compact and subcompact passenger cars impacting the rear of trailers” at 35 mph in center and partial overlap crashes. The guard on the combination vehicle was installed before the 2022 update. However, no rear-impact guards are designed to sustain multiple impacts at the speeds involved in this crash.

1.2.2 Roadside Design

The combination vehicle was parked on the shoulder partially under the Dixie River Road overpass. It was obstructing the shoulder as well as the area adjacent to the shoulder known as a clear zone, or vehicle recovery area. This area is defined as an unobstructed, traversable area beyond the roadway where an errant vehicle that departs the roadway can recover or come to a safe stop. According to the AASHTO *Roadside Design Guide*, suggested clear zone widths depend on the roadway’s design speed, average daily traffic, and roadside slope geometry. The clear zone in the area of the crash was 50 feet wide, which exceeded AASHTO’s suggested width of 38 to 46 feet for this section of the roadway. The area where the combination vehicle was parked is also near a diverge influence area, which began 1,260 feet ahead, for an upcoming offramp 2,760 feet ahead.⁸

⁷ See 49 *Code of Federal Regulations* (CFR) [Part 571.223, Rear Impact Guards](#) and [CFR Part 571.224, Rear Impact Protection](#).

⁸ *Diverge influence area* refers to a section of a freeway where traffic flow is disrupted when a single traffic stream separates into two separate streams as vehicles decelerate while attempting to exit the freeway.

1.2.3 Combination Vehicle: Driver and Motor Carrier Information

The combination vehicle was owned by Leonard's Express, Inc., and was operated by a company driver. He held a Georgia Class A commercial driver's license (CDL) and a 1-year medical certificate.⁹ He joined Leonard's Express in 2021, and he was familiar with his vehicle and the route.

In an interview with NTSB investigators on July 29, 2025, the truck driver said he stopped on the shoulder because his electronic logging device (ELD) had malfunctioned: "I found a safe spot to pull over, and once I pulled over to the shoulders, I put on my emergency flashers, set my brakes, put [the vehicle] in park, shut the system down to let it reboot, and once it did that, I was getting ready to proceed." According to video evidence from a dashboard camera on the combination vehicle, the truck driver had been parked on the shoulder for 1 minute and 28 seconds. He was preparing to get back on the highway by putting on his seat belt when the crash occurred. His postaccident Department of Transportation alcohol breath test and drug test were both negative.¹⁰

Leonard's Express was registered as a "For Hire" interstate carrier of property and, at the time of the crash, had active operating authority. The Federal Motor Carrier Safety Administration (FMCSA) did not conduct a postcrash compliance review or take enforcement action with the carrier or the driver.¹¹ At the time of the crash, the FMCSA's Motor Carrier Management Information Systems (MCMIS) profile for the carrier did not show any critical or acute safety violations in the past 12 months.¹²

1.2.4 Passenger Vehicles: Driver Information and Vehicle Damage

SUV Driver. The 16-year-old driver held a North Carolina Class C Level 2 limited provisional (intermediate) driver's license. His license was issued 18 days before the crash. He had held a Level 1 provisional license (learner's permit) for

⁹ (a) See 49 *CFR* Part 391.41, [Physical qualifications for drivers](#); (b) The medical examiner granted the truck driver a 1-year medical certificate because of the driver's history of hypertension.

¹⁰ See 49 *CFR* Part 382.303, [Post-accident testing](#).

¹¹ The purpose of a compliance review is to "determine whether a motor carrier meets the safety fitness standard" in 49 *CFR* Part 385.3, [Safety fitness procedures](#).

¹² The FMCSA organizes carrier data into seven Behavioral Area Safety Improvement Categories, or BASICS: unsafe driving, crash indicator, hours of service compliance, vehicle maintenance, controlled substances/alcohol, hazardous materials compliance, and driver fitness. The FMCSA uses BASICS to determine a motor carrier's safety performance and compliance relative to other carriers. Acute or critical safety violations found during inspections will prioritize the carrier for further interventions such as inspections or compliance reviews. For more information, see the FMCSA's [Safety Measurement System \(SMS\) Methodology](#).

1 year before obtaining the intermediate license.¹³ In interviews with NTSB investigators, the SUV driver's parents asserted that he was familiar with the SUV, having trained with it during the year he held his learner's permit. They also said he was familiar with the roadway near the crash location and had no health issues. Examination of his cell phone records indicated cell phone use during the crash trip and leading up to the crash, but not at the time of the crash. Records showed no regular phone calls or text messages at the time of the crash.¹⁴

Toxicology testing conducted by the Federal Aviation Administration's (FAA) Forensic Science Laboratory showed that the SUV driver's blood and urine were positive for delta-9 tetrahydrocannabinol (THC; 12.6 ng/mL and 6.7 ng/mL, respectively). THC is the primary psychoactive compound found in cannabis, a potent central nervous system depressant that is listed as a Schedule I controlled substance under Title 21 *United States Code* (U.S.C.) Section 812. It is also illegal under North Carolina law.¹⁵

SUV Damage. As shown in figure 1, the SUV sustained significant crush damage that extended beyond the front roof line and intruded into the occupant compartment (refer to figure 1, left photo). According to the National Highway Traffic Safety Administration (NHTSA) recall database, there were no open recalls for the SUV.¹⁶ The most recent state safety inspection of this vehicle was completed in April 2025. The investigation did not discover any pre-collision issues with the vehicle.

Minivan Driver. The 27-year-old driver held a North Carolina Class C noncommercial driver's license. Cell phone records did not show any regular phone calls or text messages at the time of the crash.

¹³ See the [North Carolina Driver Handbook](#), *Graduated Licensing, Licensing for Drivers 15 to 18*, pp. 12-15. All 50 states, including North Carolina, have a form of graduated driver licensing. According to the [Insurance Institute for Highway Safety](#), North Carolina's program is consistent with that of most states.

¹⁴ Regular phone calls are telephone calls using the traditional telephone network and not including phone calls through the internet. Regular text messages are text messages sent/received via mobile carriers using short message service (SMS) or multimedia messaging service (MMS) protocols, and do not include any text messages sent/received through software applications, which use mobile data over the internet.

¹⁵ (a) See [21 U.S.C. 812: Schedules of controlled substances](#). (b) See the [North Carolina Controlled Substances Act, Chapter 90, Article 5](#), and see [G.S. 90-95](#) for details on violations and penalties. (c) A State Advisory Council on Cannabis is studying and recommending a comprehensive approach to regulate cannabis in the state. State statutes outline topic areas that must be taught during driver education, including "at least six hours of instruction on the offense of driving while impaired and related subjects."

¹⁶ See NHTSA's [Check for Recalls: Vehicle, Car Seat, Tire, Equipment](#).

Toxicology testing conducted by the FAA Forensic Science Laboratory showed the presence of ethanol in several specimens for the minivan driver, including in body cavity blood (0.05 g/dL), gastric fluid (0.013 g/dL), and spleen tissue (0.01 g/hg).¹⁷

Minivan Damage. The minivan sustained significant rearward and rightward crush damage. The roof was displaced rearward and downward and the left side of the vehicle collapsed into the occupant compartment (refer to figure 1, right photo). According to the NHTSA recall database, there were no open recalls for the minivan. The most recent state safety inspection of this vehicle was completed in December 2021. The damage to the minivan was consistent with collision damage. The investigation did not discover any pre-collision issues with the vehicle.

1.2.5 Postcrash Actions

1.2.5.1 Motor Carrier

Before this crash, Leonard's Express did not have a policy that addressed parking on roadway shoulders. Parking on freeway shoulders is illegal in North Carolina with certain exceptions for emergencies. Federal Motor Carrier Safety Regulations as listed in 49 *CFR* 395.34 specify what a driver should do if an ELD malfunctions.¹⁸

After the crash, on July 31, 2025, NTSB investigators met with the carrier's director of fleet safety and director of risk management to discuss company policies as well as any postcrash actions taken by the company to address potential safety improvements. The carrier developed and implemented a new policy, "Emergency Stops on Roadway Shoulder." Under the new policy, drivers are not authorized to pull off onto roadway shoulders unless there is an emergency or when directed by law enforcement. Emergency events include mechanical breakdown, medical emergency involving the driver or passenger, flat tire or other unsafe vehicle condition, fire or smoke detected from the vehicle, load shift causing unsafe operation, or direct stop by law enforcement or emergency services.¹⁹

¹⁷ (a) In tissue, concentrations in grams per hectogram (g/hg) are approximately equivalent to concentrations in grams per deciliter (g/dL). (b) Ethanol was not detected in urine.

¹⁸ See 49 *CFR* 395.34, [ELD malfunctions and data diagnostic events](#): Recordkeeping during ELD malfunctions. "(1) Note the malfunction of the ELD and provide written notice of the malfunction to the motor carrier within 24 hours; (2) Reconstruct the record of duty status for the current 24-hour period and the previous 7 consecutive days, and record the records of duty status on graph-grid paper logs that comply with 49 *CFR* Part [395.8](#), unless the driver already possesses the records or the records are retrievable from the ELD; and (3) Continue to manually prepare a record of duty status in accordance with [49 *CFR* Part 395.8](#) until the ELD is serviced and brought back into compliance with this subpart."

¹⁹ In the docket for this investigation, see the Motor Carrier Factors Attachment: Leonard's Emergency Stops on Roadway Shoulder Policy.

2. Analysis

2.1 Exclusionary Factors

Driver licensing, cell phone use, weather, roadway conditions, and visibility were not factors in this crash. Although ethanol was identified in specimens from the minivan driver, the inconsistent levels indicated postmortem production and were not contributory. Vehicle examinations found no pre-existing mechanical issues.

Emergency response actions were adequate. Because of the severe underride damage and the semitrailer's weight, first responders needed to request additional heavy equipment to complete vehicle extrications. An underride collision occurs when the force of a collision is primarily applied above stiffer components (such as the bumper reinforcement bar and frame or subframe) and instead to the more-compliant vehicle components (such as the hood, grille, headlight assemblies, radiator/cooling system). This causes a vehicle to move underneath a higher vehicle.

The combination vehicle was equipped with a rear-impact guard, but the dynamics of this crash (multiple impacts at highway speeds) exceeded the capabilities of the impact guard. The collision speeds—66 mph for the minivan and 75 mph for the SUV—were likewise too great for a vehicle to maintain its structural integrity on impact with the semitrailer. The crash configurations (vehicle underride due to semitrailer height) therefore eliminated the survivable space for most of the passenger vehicle occupants. The seriously injured passenger was an unbelted occupant positioned on the floor of the cargo area of the minivan without a seat, and the primary factor contributing to her survival was the preservation of sufficient survivable space in that lower area of the minivan. Proper seating and belt use may not have changed the severity of her injuries. While they may have reduced crash loading, they also likely would have reduced her survival space due to the extensive roof deformation.²⁰

2.2 Crash Sequence and Driver Inexperience

In the 5 seconds before the crash, the SUV driver was driving in the middle lane of I-485 at a speed of 76 to 78 mph, 6 to 8 mph above the 70-mph speed limit, and rapidly closing the distance between a slower moving uninvolved CMV that was traveling slightly under the speed limit—about 69 mph. On his approach to the uninvolved CMV, the SUV driver partially overtook a minivan that was traveling in the right lane at a speed of 66 mph. The SUV driver performed a sharp steering

²⁰ See North Carolina General Statutes 20-135.2A: [Seat belt use mandatory](#): "Except as otherwise provided in G.S. 20-137.1, each occupant of a motor vehicle manufactured with seat belts shall have a seatbelt properly fastened about his or her body at all times when the vehicle is in forward motion on a street or highway in this State."

maneuver as he attempted to pass between the rear of the uninvolved CMV and the minivan on the right but miscalculated the distance needed to pass safely in front of the minivan.²¹ As a result, his vehicle struck the minivan in the adjacent lane. At or immediately before impact, the SUV driver turned the steering wheel 90 degrees to the left likely in an attempt to avoid the minivan. The SUV's impact with the minivan met the SUV's ACM predictive threshold for airbag deployment, and the right-side curtain airbag deployed.

The force of the impact caused both vehicles to experience changes to their forward and lateral velocity and lose control, rotate, and travel toward the shoulder area, where the combination vehicle was parked, with the SUV leading. The distance from the point of impact to the rear of the parked combination vehicle was 85.5 feet. After the initial impact between both vehicles, less than 1 second elapsed before both vehicles subsequently collided with and catastrophically underrode the combination vehicle. In the NTSB's safety study *Crashes Involving Single-Unit Trucks that Resulted in Injuries and Deaths*, an underride was defined as "catastrophic" if "the entire front-row space [is] compromised by passenger compartment intrusion" (NTSB 2013).

Naturalistic driving studies have found that young novice drivers who have held their intermediate license for less than 3 months are substantially more likely than older drivers to perform risky driving maneuvers such as speeding, rapid accelerations, sudden decelerations, swerves, and hard turns (Gershon and others 2018). Furthermore, a study of improper lane changes found that "when the workload of novice drivers is increased, as when executing a lane-change maneuver, their general driving performance deteriorates" (Yang, Jaeger, and Mourant 2006). The SUV driver obtained his intermediate license only 18 days before the crash. Therefore, his experience driving a vehicle alone, without supervision, and on the highway was limited to those 18 days. The driver made four high-risk behaviors: speeding, following too closely, attempting to pass on the right without maintaining safe passing distance, and making a sharp steering maneuver.

A recent NTSB investigation of a crash that occurred in Teutopolis, Illinois, found that the cause of the crash was a teen driver's unsafe passing maneuver (NTSB 2025). The driver, who was 17 and possessed a probationary license, misjudged the time, speed, and distance needed to complete a safe passing maneuver. As a result, the vehicle she was passing ran off the road to avoid a collision, leading to several deaths and severe injuries. The report noted that teen drivers are likely to make poor judgments because, despite having completed a formal driver education program, they lack the driving experience necessary to safely execute high-risk maneuvers such as overtaking. The NTSB also recognized that agencies responsible for driver

²¹ According to North Carolina law, this maneuver did not meet the listed criteria for safe passing distance. For details, see North Carolina [General Statutes 20-150.3](#).

education should emphasize the importance of conservative decision-making in driving situations until more driving experience can be gained.

2.3 Cannabis-Impaired Driving

Postmortem toxicological results showed that the SUV driver had used one or more cannabis products. Generally, the levels of THC and its metabolites cannot be used to determine timing of last use or potential level of impairment. However, studies have shown that reviewing the ratio of the sum of the concentration in the blood of THC to the inactive metabolite carboxy-delta-9-THC in living persons may be useful in assessing cannabis smoking within the prior 2 hours.

The levels found in the testing indicated that the SUV driver was likely experiencing the acute psychoactive and impairing effects of cannabis around the time of the crash, and that this impairment affected his ability to safely complete the lane change maneuver. Performance studies indicate that perceptual functions important to driving, including judging distances, may be significantly adversely affected by the psychoactive effects of cannabis (NHTSA 2024). Furthermore, compared to adults using comparable doses of cannabis, adolescents may be more sensitive to the performance-impairing effects of cannabis and exhibit dose-dependent impairment in reaction time, response accuracy, and time perception (Murray and others 2022).

The NTSB recently investigated an intersection crash that occurred in Tishomingo, Oklahoma, in which a teen driver transporting several teenage passengers in a passenger car failed to come to a complete stop at an intersection and failed to yield to an oncoming combination vehicle (NTSB 2024). Instead, she accelerated through the intersection, where her car was struck, and she and the other occupants of the passenger car died. The NTSB found that the teen driver had limited driving experience: she had obtained her intermediate license only 4 months before the crash. The NTSB also found that she was likely impaired from effects of cannabis at the time of the crash, which adversely affected her driving skills, including her judgment of the time needed to safely execute her turn and cross through the intersection. As a result of that crash, the NTSB issued several safety recommendations aimed at increasing awareness of the risks of cannabis-impaired driving.²²

²² Although not as a result of this crash, recent legislative proposals for the North Carolina General Assembly's 2025-2026 session concern driver education instruction and impaired driving. [House Bill 217](#), "An Act To Require a Driver Education Course, Including Alcohol and Drug Use Awareness, for Unlicensed Persons Eighteen Years and Older," would add instruction on drugs and alcohol to the driver education curriculum. [House Bill 1091](#), "The DUI Modernization Act of 2026," would expand the state's testing and enforcement procedures for impairment beyond alcohol. At the time of publication, neither bill had been enacted.

2.4 Truck Parking on Shoulder

The truck driver's decision to pull the combination vehicle onto the shoulder and park in the clear zone resulted in several safety issues, including (a) obstructing the clear zone, (b) creating a potential conflict when accelerating to reenter the travel lanes, and (c) parking near a diverge influence area. Parking on the freeway shoulder is prohibited by North Carolina law except for certain emergencies.²³

Although the combination vehicle was parked completely on the right shoulder, its presence in the clear zone created a barrier to errant vehicles. As a result, the shoulder area that might otherwise have been available for recovery was occupied by the parked combination vehicle, leaving the drivers of the out-of-control SUV and minivan with little or no opportunity to use that area to regain control or to minimize hazards as they departed the roadway.

The truck driver stated that he stopped on the shoulder because his ELD had malfunctioned. However, after the malfunction occurred, he continued operating the combination vehicle for nearly 15 miles on I-485 before parking on the right shoulder. During that time, he passed several exits that would have provided opportunities to leave the freeway and address the malfunction in a safe location, including commercial areas, a travel center, and other locations with available parking. FMCSA guidance for ELD malfunctions requires drivers to notify their motor carrier within 24 hours and, when necessary, maintain hours-of-service records using an alternative method until the ELD is repaired or replaced. The guidance does not require an immediate stop nor authorize parking on the shoulder of an interstate highway. Therefore, the ELD malfunction did not constitute an emergency under North Carolina law that would have justified parking on the shoulder. After the crash, the motor carrier adopted a new policy that addressed the specific criteria in which an emergency stop on the roadway shoulder is permitted, and this policy did not include ELD malfunction.

3. Conclusions

3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the Charlotte, North Carolina, multivehicle crash on I-485 was the teen SUV driver's risky driving behavior, including speeding and approaching a vehicle at high closing speed and sudden incursion into an adjacent lane occupied by another vehicle. Contributing to the crash were the SUV driver's limited driving experience and impairment from cannabis. Contributing to the severity of the crash was the presence

²³ See North Carolina General Statutes G.S. 20-140.3: [Unlawful use of National System of Interstate and Defense Highways and other controlled-access highways](#).

of a combination vehicle that was illegally parked on the shoulder in the highway clear zone for a nonemergency event, which eliminated the SUV and minivan drivers' opportunity to safely recover after the initial impact. Also contributing to the severity of the crash was underride of the semitrailer, which resulted in occupant compartment intrusion and loss of survivable space in both passenger vehicles.

3.2 Lessons Learned

Risks of Cannabis Impairment While Driving. This crash demonstrates the dangers of cannabis-impaired driving. Cannabis use decreases motor coordination, reaction time, and judgment of distances—all of which are necessary for safe driving. Driving while impaired is always against the law. Teens are especially vulnerable because impairment compounds their limited driving experience, which can lead to poor decisions in traffic scenarios requiring quick judgment.

Truck Parking on Shoulders. Large vehicles such as trucks that are parked on shoulders are especially dangerous because they become hazards to errant vehicles, which can strike them at highway speeds. Collisions between passenger vehicles and large trucks can lead to more severe crash outcomes because of the larger trucks' greater height and weight. Parking on shoulders for nonemergency reasons is illegal in most states. The Federal Motor Carrier Safety Regulations list what drivers should do if an electronic logging device (ELD) malfunctions, and they do not require drivers to pull over immediately.

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NTSB investigators worked with the **North Carolina State Highway Patrol** and the **North Carolina Department of Transportation** throughout this investigation.

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