



**SURVIVAL FACTORS GROUP CHAIRMAN'S
FACTUAL REPORT**

Cranbury, NJ

HWY14MH012

(33 pages)

**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY
WASHINGTON, D.C.**

**SURVIVAL FACTORS GROUP CHAIRMAN'S
FACTUAL REPORT**

A. CRASH INFORMATION

Location: New Jersey Turnpike (I-95) northbound near milepost 71.4; Cranbury, Middlesex County, New Jersey

Vehicle #1: 2011 Peterbilt truck-tractor in combination with a 2003 Great Dane semitrailer

Operator #1: Walmart Transportation, LLC

Vehicle #2: 2012 Mercedes-Benz Sprinter limo van

Operator #2: Atlantic Transportation Services, LLC

Vehicle #3: 2011 Buick Enclave

Vehicle #4: 2011 Ford F-150

Vehicle #5: 2005 Nissan Altima

Vehicle #6: 2006 Freightliner truck-tractor in combination with a 2001 Utility semitrailer

Operator #6: 4 Way Transport, LLC

Date: June 7, 2014

Time: Approximately 1:00 a.m. eastern daylight time

NTSB #: HWY14MH012

B. SURVIVAL FACTORS GROUP

Thomas Barth, Ph.D., Survival Factors Investigator, Group Chairman
NTSB Office of Highway Safety
490 L'Enfant Plaza East, S.W., Washington, DC 20594

Detective Sergeant Robert Nuber
New Jersey State Police
278 Prospect Plains Road
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Detective Mark Smith
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C. CRASH SUMMARY

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

D. DETAILS OF THE SURVIVAL FACTORS INVESTIGATION

The survival factors investigation collected evidence pertaining to survivability, safe design, and safe operation of the vehicles. This report is organized into six sections. The first section has vehicle information and the second has design and operational information pertaining to the Mercedes-Benz limo van. The third section has occupant information. The last three sections address the law enforcement response, emergency response, and interviews conducted during the investigation. All supporting information is provided in the accident docket in the form of Survival Factors Attachments. The docket also contains Survival Factors Photos. A list of the attachments and photos is provided at the end of the report.

1. Vehicle Information

There were six vehicles involved in the crash. The primary impact occurred when a 2011 Peterbilt Tractor-trailer combination unit struck a 2012 Mercedes-Benz Sprinter limo van (limo van) which had slowed due to traffic near a construction zone. Both vehicles struck other vehicles in secondary collisions and the limo van came to rest on its left, or driver, side.

1.1. 2011 Peterbilt Tractor and 2003 Great Dane semitrailer

The 2011 Peterbilt Tractor in combination with a 2003 Great Dane semitrailer (Peterbilt truck) had extensive damage to the front end, as detailed in the Vehicle Group Chairman's Factual Report.¹ The driver seat was intact and functional with no apparent damage. The driver 3-point seatbelt was intact and functional, with no apparent damage and no clearly visible load marks.

1.2. 2012 Mercedes-Benz Sprinter Limo Van

1.2.1. Original Configuration (Cargo Van)

The Mercedes-Benz Sprinter limo van was registered in Delaware with Vehicle Identification Number (VIN) WD3PE8CC1C5XXXXXX.² The limo van was originally manufactured as a cargo van and reconfigured with limousine-style seating and entertainment accommodations by Midwest Automotive Designs Corporation under Invoice #2382.³ The

¹ See the Vehicle Factors Group Chairman's Factual Report available in the accident docket.

² The last six digits of the VIN were removed and replaced with Xs.

³ SF Attachment 1: Midwest Automotive Designs Invoice and Seat Tests.

original designation as listed on the invoice was a Mercedes-Benz Sprinter 2500 170 EXT Sprinter HT 3.0L Turbo Diesel. The VIN indicates that it was manufactured in 2012 by Mercedes-Benz in Dusseldorf, Germany. The trim level was a 2500 High Roof 170-inch WB EXT (170 inch wheel base, extended). It had a 3.0 Liter DOHC 24 Volt Turbo Diesel engine driving the rear wheels through a 5-speed automatic transmission.

It was equipped with a driver and passenger seat with three-point active (pretensioner) seatbelts. It had driver and passenger airbags, traction control, electronic brake assistance, an Anti-lock Braking System (ABS), and vehicle stability control, all as standard equipment. It was fitted with disc brakes and 4-wheel ABS, and had 245/75R16 tires. The basic dimensions were listed as:

Overall Length: 289.2 inches,	Overall Height: 107.5 inches
Overall Width: 79.7 inches,	Cargo Volume: 547.0 cubic feet.

The curb weight was listed as 5,695 lbs with a maximum payload of 2,855 lbs and a Gross Vehicle Weight Rating (GVWR) of 8,550 lbs.⁴ The Federal Regulations define the GVWR as:

“Gross Axle Weight Rating” or “GAWR,” followed by the appropriate value in pounds, for each axle, identified in order from front to rear (e.g., front, first intermediate, second intermediate, rear). The ratings for any consecutive axles having identical gross axle weight ratings when equipped with tires having the same tire size designation may, at the option of the manufacturer, be stated as a single value, with the label indicating to which axles the ratings apply.”⁵

The nominal occupant weight for a motor vehicle is described in the Federal Regulations as:

“Gross Vehicle Weight Rating” or “GVWR” followed by the appropriate value in pounds, which shall not be less than the sum of the unloaded vehicle weight, rated cargo load, and 150 pounds times the number of the vehicle's designated seating positions. However, for school buses the minimum occupant weight allowance shall be 120 pounds per passenger and 150 pounds for the driver.”⁶

A query of the National Highway Traffic Safety Administration (NHTSA) database for recalls or other information about this vehicle was done on August 25th, 2014, and indicated no recalls, no investigations, 2 complaints, and 1 service bulletin. The complaints were on the subjects of the windshield wipers and exterior lighting. The service bulletin was on the subject of the engine electrical system, specifically the software for the engine control module.

The cargo van configuration consisted of four doors: a driver and passenger door; a sliding door on the passenger side; and double doors at the back. There was no separation between the cab and cargo area in the original configuration of the cargo van.

⁴ Further information about the vehicle weight and load capacity is contained in the Vehicle Group Chairman's Factual Report, available in the accident docket.

⁵ Title 49 CFR Part 567 Certification, paragraph 567.4 Requirements for Manufacturers of Motor Vehicles.

⁶ Title 49 CFR Part 567 Certification, paragraph 567.4 (3) Requirements for Manufacturers of Motor Vehicles.

1.2.2. Altered Configuration (Limo Van)

Atlantic Transportation Services bought the vehicle from TCF Equipment Finance in Minnetonka, MN, through Lakeview Custom Coach in Oaklyn NJ. The vehicle was originally delivered as a complete cargo van and was altered into a limo van by Midwest Automotive Designs in Elkhart, IN. The Federal Regulations define an altered vehicle as:

“Altered vehicle means a completed vehicle previously certified in accordance with §567.4 or §567.5 that has been altered other than by the addition, substitution, or removal of readily attachable components, such as mirrors or tire and rim assemblies, or by minor finishing operations such as painting, before the first purchase of the vehicle other than for resale, in such a manner as may affect the conformity of the vehicle with one or more Federal Motor Vehicle Safety Standard(s) or the validity of the vehicle's stated weight ratings or vehicle type classification.”⁷

The limo was manufactured according to a configuration referenced as “2012 Platinum Business Class Sprinter Series.” The invoice shows there were standard features for the limo conversion and separate platinum package special features. This limo van had the platinum package features with the exception of 18 inch wheels, overhead side cabinets, and satellite TV, which were marked as deleted from the invoice. However, there was a folding apparatus that appeared to be a satellite dish mounted on the center aft portion of the limo van roof.

Midwest Automotive Designs was asked to provide the vehicle weight as delivered in the limo van configuration. They were unable to provide measured values, but estimated vehicle weight as 6,910 lbs in the completed (post alteration) configuration.⁸

The external modifications consisted of a change to aluminum wheels and retaining the original tire size, the addition of fiberglass running boards with a step at the sliding door, bumpers painted to match the body, and the addition of other body moldings. The back section of the limo had three fixed windows on the driver side and three fixed windows on the passenger side, the most forward of which was mounted in the sliding door. All the windows in the passenger compartment were tinted.

The internal modifications were extensive. The basic configuration of the cab area was retained, but the interior trim, headliner, and driver and passenger seat upholstery were changed. The back (cargo) area was fitted with a front partition separating the cab from the passenger area, seats and folding tables, cabinets, a bar, and a rear partition separating the passenger area from an electronics bay and luggage area at the back. The partitions were permanent and removed access to the cab area and rear doors from the passenger compartment. A large sliding door on the passenger side provided passenger access. The side windows in the passenger area were fixed and not intended to be used as or labeled as emergency exits. Photos of the accident vehicle prior to the crash were provided by Atlantic Transportation Services.⁹

⁷ Title 49 CFR Part 567 Certification, paragraph 567.3 Definitions.

⁸ The accident vehicle was weighed, refer the Vehicle Group Chairman’s Factual Report in the accident docket.

⁹ SF Attachment 2: Atlantic Transportation Services Photos of the Accident Vehicle.

The partition separating the cab area from the passenger area was fitted with a large flat panel television monitor in the upper third section of the partition. The middle section contained a small removable panel, approximately 10 inches high by 40 inches wide, positioned approximately halfway between the floor and ceiling. Audio speakers were mounted on each side of the divider, just above the removable panel and near the lower edge of the flat panel monitor.

The rear passenger compartment consisted of three rows of captain's chairs and a three-place bench seat at the aft wall of the limo. The first row of captain's chairs was facing aft and positioned against the divider next to the cab. There was a small drink pedestal between the chairs with a height approximately equal to the seat cushions. The second row consisted of one forward-facing chair on the left (driver side), and no seat next to it on the passenger side in order to provide access to the sliding door. Next to the driver-side sidewall, extending from the first to the second row seat, was a pedestal about 5 inches wide with a height approximately equal to the top of the armrests. Next to the passenger-side sidewall, just aft of the sliding door was a pedestal approximately the height of the seat cushions and roughly the length of the third row seat. It was fitted with storage compartments. Just above this pedestal, at the lower window line was a bar extending about 10 inches from the sidewall. It had cup holder recesses on the top surface and a stemware rack below the bar and above the pedestal. A cabinet with two glass doors was mounted above the bar, aft of the sliding door, having a height approximately the same as the windows, and extending into the passenger compartment approximately 4 inches. The third row consisted of two forward-facing chairs, one on the left and the other on the right.

The captain's chairs were adjustable forward and aft and had adjustable recline but did not swivel. They had folding armrests on both sides. All captain's chairs had integrated three-point restraints and adjustable headrests. The seat cushions were about 21 inches wide, 20 inches deep, and 20 inches from the floor. The backrest cushion was about 20 inches wide and 26 inches tall; in the down position, the headrest added about 2 inches of height to the backrest, in the upper position, it added about 6 inches of height to the backrest. The armrests were about 2 inches wide and 18 inches long; when in the down position, they were about 8 inches above the seat cushion.

The outboard sides of the row 2 and 3 (forward-facing) seats had a narrow pedestal with a folding table, measuring approximately 4 inches wide and having a height approximately equal to the seat cushions. The three-position bench seat at the back was fitted with three-point restraints. The outboard seat positions had shoulder belt anchor points mounted on the sidewall near the roof, and the center seat belt was mounted on the floor behind the seat. The bench seat did not have armrests, but each side had a narrow cabinet measuring approximately 4 inches wide with a height extending to the midpoint of the backrest. The bench seat had headrests that were not found in place in the accident vehicle. Midwest Automotive remarked that the bench seat headrests must be removed in order to fold down the bench seat.

The partition at the back of the passenger compartment contained a flat panel monitor in line with the windows. Just above this monitor was a cabinet extending to the ceiling, which contained lights, speakers, and climate control vents. The rear doors of the limo van opened at the middle and swung out to the left and right sides. Each door had a window in the upper third portion. There was a folding satellite dish mounted on the center back portion of the roof.

1.2.3. Mercedes-Benz Limo Van Damage

The most extensive damage to the Mercedes-Benz was at the rear from the initial impact, with damage also occurring to other areas from impacts with other vehicles and to the left side and roof from the vehicle overturning onto its left side.

1.2.3.1. Exterior

The front bumper was missing and the headlights were intact, but the passenger-side headlight was cracked and damaged. The hood was dented and scraped on the front passenger corner, and the grill was intact. The windshield was broken out, and the windshield frame was 36 inches tall and 66 inches wide at the lower edge and 60 inches wide at the upper edge. The driver-side rearview mirror was missing and the passenger-side rearview mirror was intact. The left front quarter panel and driver door were dented and scraped. The roof section over the driver door was crushed inward. Damage restricted opening of the driver door to about half its normal range. The right front quarter panel was dented aft, and the passenger door was lightly dented. The front door glass on both driver and passenger sides was intact. Each door window consisted of a front “wing” section that measured 9.5 inches wide, 13 inches tall at the front edge, and 22 inches high at the aft edge. The primary glass section of the front doors measured 24 inches tall and 20 inches wide.

The driver side of the van was crushed inward along the entire length, with all windows broken out. The body seams of the van were ruptured, and dents extended from the side into the roof region. Heavy scraping was also evident. Running board mounting brackets were evident along the lower body portion, but the running board was missing. The driver side had three large window frames aft of the driver door; all were deformed, and all were missing glass. The first and second window frames aft of the driver door measured about 24 inches tall and 48 inches wide. The third window frame aft of the driver door was crushed inward from the bottom and aft edges. The remaining, roughly triangular-shaped opening measured about 10 inches at the front edge, 20 inches at the top edge, and about 28 inches along the diagonal edge.

The sliding door on the passenger side had minor damage and dents with some small dents in the roof above the door, and it was not operational. The sliding door measured 90 inches tall and 59.5 inches wide. The sliding track was 55 inches long. The window on the sliding door was 30 inches tall and about 55 inches wide. The bottom edge of the window was about 44 inches from the bottom of the door. The glass was intact. There were two windows aft of the sliding door on the passenger side. The first had intact glass, which measured 28 inches tall and 55 inches wide. The second window frame aft of the sliding door was damaged; the glass was missing, and the frame measured about 30 inches tall and 48 inches wide. The right rear quarter panel aft of the rear wheels was crushed forward, with the lower aft portion of the body approximately in line with the aft edge of the aft window.

Severe impact damage forced the left rear taillight assembly to the proximity of the upper left rear wheel and displaced the rear axle forward. The left rear tire was flat and the left rear wheel was damaged. The right rear corner aft of the rear wheel was also crushed inwards with the maximum crush measuring about 5.6 feet at the lower left corner. The deformation of the limo van is illustrated in Figures 1 and 2, which consist of 3-D laser scan images of the accident

van with a wireframe overlay of a 3-D laser scan of an exemplar vehicle. The top view of the van shown in figure 1 also has an overlay of the interior seating layout.¹⁰

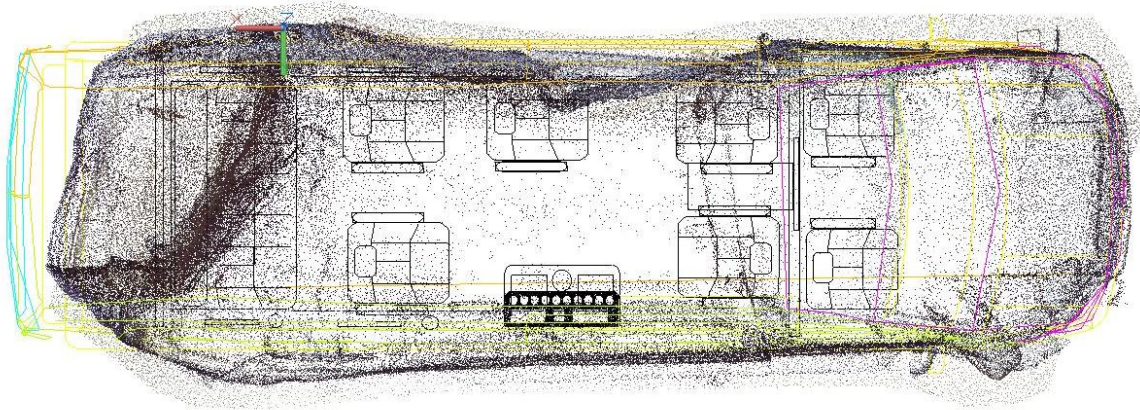


Figure 1. Top View of the Limo Van Illustrated from 3-D Laser Scans.

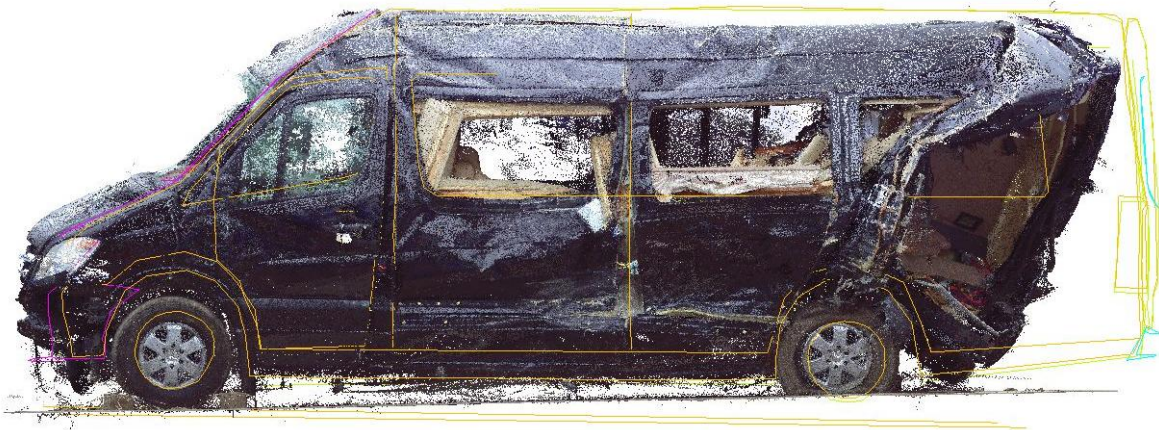


Figure 2. Driver's Side View of the Limo Van Illustrated from 3-D Laser Scans.

¹⁰ Refer to the Technical Reconstruction Group Chairman's Factual Report, available in the accident docket.

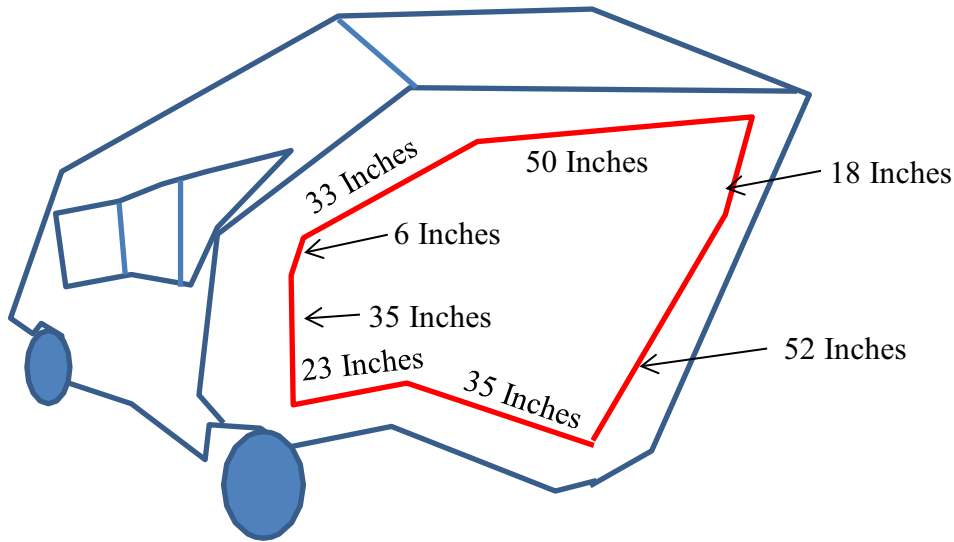


Figure 3. Illustration of Mercedes-Benz Rear Door Frame.

The rear doors were displaced from the van and the hinges exhibited signs of being cut. The doors were crushed and found with the center latch still closed. The center latch was about 34 inches from the base of the doors. The rear door windows were broken out. The left window frame was deformed and buckled inward with the crease about 12 inches from the bottom window edge. The deformed left window opening measured approximately 26 inches wide and 24.5 inches tall. The deformed right window opening measured approximately 30 inches wide and 27 inches tall. The rear door frame was crushed inwards with the dimensions and shape as illustrated in figure 3.

1.2.3.2. Interior

The driver and front passenger airbags deployed, and the front seat passenger-side seatbelt pretensioner was activated. The driver's airbag had blood spots. The driver and front passenger seats did not show signs of deformation, and the fore/aft and recline adjustments were functional. The seatbelts did not show obvious load marks and were functional. The front seat headrests were missing. The cab had wood and aluminum debris from the partition. A large amount of fabric was partially attached to the partition, and contained many blood spots and stains. The debris and interior were contaminated with blood and biological material. The large flat screen mounted in the partition was missing, and the moldings and frame support structure was damaged; this created an opening between the cab and the back of the van. The opening measured approximately 2 feet 4 inches tall by 4 feet wide, but the fabric, wood, metal, and other debris encroached into the opening in some areas.

The left front (row 1) captain's chair was deformed on the outboard side and in contact with the intruding left sidewall of the van as well as the interior furnishings, including the folding table. There was a large amount of blood and biological material in the region of the roof and left sidewall across the whole interior side of the van. The right-side seat in row 1 was intact with minor damage but had some blood spots. The seatbelts in both seats of row 1 were in the stowed position, and the connector on the left-side seat was wedged in a damaged portion of the

interior. The headrests were intact and in the lowest position. The mounting attachments for both row 1 seats were intact, and the seat adjustments were functional.

The row 2 seat was displaced inward by the intruding side panel and sustained significant damage. The headrest was missing, and there was a square section of seat upholstery missing adjacent to the inboard headrest mounting hole. The seat had blood stains on the seat cushion and backrest. The mounting points were damaged and the seat adjustments were not functional. The seatbelt was in the stowed position. The aft door of the bar upper cabinet was broken. The lower portions of the bar were intact, but the glassware and other contents were displaced and broken in the interior.

The row 3 seats were heavily damaged and displaced. The left-side seat was pushed forward and inward, and it was in contact with the row 2 seat and row 3 right seat. The seatbelt was in the stowed position. The headrest was intact and in the lowest position. The right-side row 3 seat was deformed towards the left (inboard), and the top and right portion of the seatback was deformed aft. The headrest was damaged, and the headrest frame remained in the seat but the cushion portion was missing. The seatbelt was in the stowed position.

The three-place bench seat was displaced upwards and to the right into the row 3 seats, with the seat cushion and backrest in a roughly flat relative to each other, and at an approximately 45-degree angle to the floor. The electric folding seat was not functional. Damage obscured a clear indication if the seat was folded down during the crash. The seatbelt on the left side was found to be displaced by the intrusion of the sidewall. No seatbelt was visible for the middle seat due to damage and deformation around the mounting area for this belt. Midwest Automotive indicated that the center seat belt is mounted to the floor behind the seat. The right seatbelt webbing was cut, and the connector was found in the buckle. Some webbing was spooled into the inertia reel, and the fixed length of webbing had some creases.

The headliner was broken and displaced in areas from the back left side extending along the left side to the front, and it contained numerous blood spots and biological material. The center and right-side portions of the headliner were intact, except in the cab area.

1.3. 2011 Buick Enclave

The Buick had VIN 5GAKVCED5BJXXXXXX. The Buick sustained damage to the right front corner and rear of the car, extending to both rear quarter panels. The driver and passenger airbag modules deployed, but the side airbags did not. The airbag unit was accessed and data were downloaded by NTSB investigators from the office of Research and Engineering, Vehicle Recorders Group.¹¹

The right front corner of the car sustained an impact that buckled and partially lifted the hood and tore off body panels and portions of the car extending from the right front to the right quarter panel. The right front tire was flat and the wheel damaged. The rear hatch door sustained an impact that crushed the door inward. The rear door glass and right taillight were broken, and most parts were missing. The left taillight was intact. The right side of the rear bumper was scraped and dented, but it remained in place. The right rear quarter panel was dented and

¹¹ See the Vehicle Data Recorders Specialist's Factual Report, available in the accident docket.

scraped, and the region just aft of the rear portion of the wheel well was partially separated from the body of the car.

The interior of the car, including the front seats, seatbelts, airbags, and common occupant impact areas on the doors, headliner, and dash were inspected. No impact marks or damage were noted (other than damage typical to the deployment of the airbags). The seatbelt webbing on the left (driver) seat was bunched up at the forward corner of the shoulder attachment D-ring. Both buckle latches and inertia reels were functional. The seats just behind the driver and front passenger seats were fitted with child seats. The airbags were inspected, and no biological material or anomalies were found. The side blow-out vents on the passenger bag were not ruptured.

1.4. 2006 Freightliner Truck-Tractor and 2001 Utility semitrailer

The Freightliner sustained minor damage in the crash. The truck had a damaged right rearview mirror, a damaged right saddle fuel tank, and damage to the faring on the left side aft of the sleeper unit. There were also scrapes and minor damage to the trailer of undetermined origin.

1.5. 2011 Ford F150 pickup

The Ford had VIN 1FTFW1EF0BKDXXXXX, and it sustained minor damage, mostly to the rear bumper, tailgate, and left rear quarter panel. The underside of the left rear corner of the truck was deformed with a wedge-shaped crease evident just aft of the left rear wheel well and forward of the bumper. A portion of the rear bumper was pushed up into the crease. The bumper on the left side of the license plate was crushed, and the outer skin of the rear bumper was displaced aft on the right side. The quarter panel was crushed upward in the region between the rear wheel and rear bumper, and the left taillight was cracked but remained in place. The rear tailgate had a number of minor dents and scratches.

The airbag modules did not deploy, but the airbag unit was accessed by NTSB investigators from the Vehicle Recorders Group. The airbag control unit data were downloaded and indicated that the system sensed a non-deployment event and recorded some limited data. No anomalies of the seats or seatbelts were identified.

1.6. 2005 Nissan Altima

The Nissan had VIN 1N4AL11DX5NXXXXXX. There was minor damage to the front of the car and damage to the left rear quarter panel, trunk, and bumper. The left rear taillight assembly was broken. The airbags did not deploy.

2. Vehicle Design and Operational Information and Laws

2.1. Multi-passenger Van Design

Midwest Automotive provided federal standards compliance documentation for the Limo-Van.¹² The compliance worksheet, created by Midwest Automotive Designs, listed all of

¹² SF Attachment 3: Midwest Automotive Compliance Worksheet.

the standards deemed to be potentially affected by the modifications to the Mercedes-Benz Sprinter, with a summary of the compliance requirement and a statement of the compliance action to show conformity.

The limo van was considered to conform to most of the Federal Motor Vehicle Safety Standards (FMVSS) on the basis that the alterations and modifications did not affect the Original Equipment Manufacturer (OEM) configuration pertaining to these standards. The FMVSS standards that were unaffected by the alterations and modifications were:

FMVSS 101, 102, 103, 104, 111, 113, 114, 124, 125 (controls and features);
FMVSS 105, 106, 116, 121, 135 (brakes and brake-related systems);
FMVSS 107 (lamps and reflective devices);
FMVSS 111, 113, 114 (mirrors, hood, theft);
FMVSS 118 (power-window and panel systems);
FMVSS 301: (fuel system integrity).

The FMVSS standards related to tires and wheels were met by using OEM-specified parts. These were FMVSS 109, 110, 117, 119, 120, 138, and 139. The flammability of interior materials standard (FMVSS 302) was met by using materials that were certified via testing by the material supplier; see SF Attachment 4, Midwest Automotive Compliance and Testing Documents.

The Occupant Protection Interior Impact Standard (FMVSS 201) was met by noting that the components were provided by Daimler Chrysler and were not replaced or removed. These included the front seating, armrests, instrument panels, visors, and interior compartment doors. The cosmetic coverings were stated not to affect the conformity. The armrests and seating added by a subsequent stage manufacturer were stated to conform to the requirements.

FMVSS 202 concerns head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions. The compliance statements for this noted that front seating was supplied and installed by the OEM and was not removed, replaced, or altered. Additional seating added by subsequent manufacturers was stated to comply by the suppliers: Superior Seating, Atwood, and Adnik. The compliance checklist noted that the front seats met FMVSS 202 as originally installed by Mercedes-Benz, and that the back section passenger seats met FMVSS 202 from the supplier. The supplier test data were requested and provided for the captain's chairs. Information about the lack of headrests on the bench seat was requested and is pending.

Compliance with FMVSS 203, Impact Protection for the Driver from Steering Control System, was affirmed based on the statement that the steering control system was not altered, removed or modified in any way.

Compliance with FMVSSs 205 and 219, concerning window glazing and the windshield, was affirmed based on the statement that no alterations were made to OEM-installed glazing materials. Any windows added were manufactured by Creation Windows only and were stated to conform to the requirements of FMVSS 205.

Compliance with FMVSS 206, Door Locks and Door Retention Components, was affirmed based on the statement that no alterations or adjustments had been made to the door,

door pillar structures, latches, hinges, or attaching hardware. It was stated that no doors had been added to this vehicle by the subsequent manufacturer.

Compliance with FMVSS 207, Seating Systems, was affirmed by the statement that the seats added to this vehicle conformed to the standard. Front seating, frames, pedestals, and adjusters were stated to have been provided and installed by the OEM and were not removed or relocated. The mid-ship pedestals were supplied by Adnik; mid-ship seat frames, adjusters, and sofa frames were supplied by Atwood. The statement was made that these suppliers performed all required testing to ensure conformity to federal standards.

Compliance with FMVSS 208, Occupant Crash Protection, was affirmed by the statement that the vehicle did not exceed the appropriate weight requirements. It was stated that the front seating was supplied and installed by the OEM and was not altered or removed; all secondary seating had been installed to manufacturers' specifications and conformed to FMVSS 208. It was also stated that the steering column, steering intermediate and coupling shaft, steering gear, steering linkage, and related components had not been removed or altered in any way.

Compliance with FMVSS 209, Seat Belt Assemblies, was affirmed by the statement that no alterations or replacements had been made to the front seatbelt assemblies and attaching hardware; no action had been taken that would impair the integrity of the OEM seatbelt system. It was also stated that the seatbelts and seatbelt systems added conformed to FMVSS 209 and were provided by LaVanture Products and installed to specifications.

Compliance with FMVSS 210, Seat Belt Assembly Anchorages, was affirmed by the statement that no alterations were made to the front seatbelt anchorages, front seatbelt assemblies, floor pan, floor pan reinforcements, or body mounts; no alterations were made to the rear cab panel or roof for the cab chassis. It was also stated that a seatbelt system had been installed for each additional designated seating position, and each system had been designed to meet or exceed the requirements of FMVSS 210.

Compliance with FMVSS 214, Side Impact Protection, was affirmed by the statement that no alterations, modifications, or replacements were made to the door, surrounding structure, door hinges, door latches, and strikes or any attaching hardware in any way. Compliance with FMVSSs 213 and 225, Child Restraint Systems, was affirmed by the statement that any systems installed met the standards. Midwest Automotive provided test data for FMVSSs 205, 207, 208, 209, 210, and 302.¹³

2.2. Multi-passenger Van Design – Exits and Evacuation

The federal standards were reviewed to determine the requirements for the Mercedes-Benz limo van related to exits and evacuation. Part 571 of the FMVSS contains the definition pertinent to this vehicle under paragraph 571.3 (b). The FMVSS states that a "Bus means a motor vehicle with motive power, except a trailer, designed for carrying more than 10 persons." Further detail defining a designated seating position is provided in the FMVSS. The Mercedes-Benz limo van had a total of 10 seating positions according to these definitions and

¹³ SF Attachment 1: Midwest Automotive Vehicle Invoice and Seat Test and SF Attachment 4: Midwest Automotive Seat Belt Compliance Testing.

did not meet the definition of a “bus.” The federal standards do not have requirements for emergency exits or evacuation for vehicles other than a “bus.”

The European standards were reviewed, and a commercial vehicle designed to transport more than nine people falls into a category with requirements for emergency exits under ECE Regulation No. 107.

2.3. Multi-passenger Van Operation

The Mercedes-Benz limo van was defined as a commercial motor vehicle according to 49 CFR 390.5 which states that the vehicle “is designed or used to transport more than 8 passengers (including the driver) for compensation and used in interstate commerce.” As a commercial vehicle, it was required to have a US Department of Transportation (DOT) registration under the Federal Motor Carrier Safety Administration (FMCSA).¹⁴ The vehicle was a DOT Class 2, in the range of a vehicle with a gross vehicle weight rating from 6,001 to 10,000 pounds. The FMCSA also classifies vehicle types for safety resource guidance. This vehicle falls below the classification for a “Mini-bus,” which are designed to transport 16 or more people, and falls into the classification for a “Limousine,” which is designed to transport 9 to 15 people, as well as the classification for a “passenger van,” which is also described as designed or used to transport 9 to 15 people. While the Mercedes-Benz limo van falls under an operation category subject to oversight, there are no federal operational requirements related to passenger occupant restraint or emergency evacuation.

The FMCSA maintains a webpage titled “Safety Resources for Limousines,”¹⁵ which provides information resources and regulatory information. This includes a brochure providing an overview of federal requirements for interstate vehicles with 9 to 15 passengers.¹⁶ Topics concerning operating authority, financial responsibility, and safety oversight are addressed. Use of seatbelts or emergency exits is not required or addressed for this class of vehicle. The FMCSA provides guidance to ensure compliance with 49 CFR 392.62: Safe Operation, Buses.¹⁷ This information includes examples of pre-trip safety information. They also have brochures encouraging bus drivers to wear their seatbelts.¹⁸ The National Limousine Association (NLA) website provides links to the FMCSA information.¹⁹ Atlantic Transportation Services LLC has been a member of the NLA since 2006. The NLA is a non-profit organization representing members from the luxury chauffeured ground transportation industry; it includes owners, operators, suppliers, manufacturers, and regional and state limousine associations. Atlantic Transportation Services LLC did not have established procedures for pre-trip safety briefings or seatbelt policies.²⁰

¹⁴ www.FMCSA.gov.

¹⁵ <http://www.fmcsa.dot.gov/carrier-safety/carrier-safety-resources/safety-resources-limousines>.

¹⁶ <http://www.fmcsa.dot.gov/safety/passenger-safety/overview-federal-requirements-interstate-9-15-passenger-vehicles>.

¹⁷ <https://cms.fmcsa.dot.gov/safety/passenger-safety/pre-trip-safety-information-bus-passengers>.

¹⁸ <http://www.fmcsa.dot.gov/safety/carrier-safety/buckle-safety-belt-use-busmotorcoach-drivers-brochure>.

¹⁹ <http://www.limo.org/news/story/2014/06/federal-motor-carrier-safety-adminstration-provides-guidelines-9-15-passenger-vehicles.aspx>.

²⁰ Refer to the Motor Carrier Group Chairman’s Factual Report, available in the accident docket.

Atlantic Transportation Services LLS was based in Delaware and operating in New Jersey, where seatbelt laws apply. Seat belt laws vary by state and can be classified into primary laws, which authorize law enforcement to ticket drivers or passengers without other traffic offenses taking place, and secondary laws, which require another infraction.²¹ The state of Delaware had a primary seatbelt law that applied to all occupants 16 years of age or older for any seat position in the vehicle, and it was a civil penalty. The state of New Jersey had a primary law for front seat occupants and some rear-seat passengers for all passenger vehicles, including vans, pickup trucks, and SUVs that are required to be equipped with seatbelts.²² The New Jersey primary seatbelt law applied to rear-seat passengers who are at least 8 years of age but less than 18 years of age, and the secondary seatbelt law applied to all passengers not in the front seats. All of the occupants are required to wear a properly adjusted and fastened seatbelt system.²³

3. Occupant Information

There were six vehicles and a total of 21 people involved in the accident. The two commercial trucks (2011 Peterbilt and 2006 Freightliner) were each occupied only by a driver; both drivers were uninjured. The Mercedes-Benz limo van was occupied by a driver and a passenger in the cab area, who both sustained minor injuries, and five passengers in the back of the limo van, one of whom was pronounced dead at the scene and four of whom sustained serious injuries. The Buick was occupied by a driver and passenger, who both sustained minor injuries. The Ford pick-up and the Nissan both had a driver and four passengers; none of these vehicle occupants was injured in the crash.

Table 1: Occupant Injury Summary²⁴

	Uninjured	Minor	Serious	Fatal
2011 Peterbilt Driver	1	0	0	0
2012 Mercedes-Benz Sprinter Driver	0	1	0	0
2012 Mercedes-Benz Sprinter Passengers	0	1	4	1
2011 Buick Enclave Driver	0	1	0	0
2011 Buick Enclave Passenger	0	1	0	0
2011 Ford Pick-up Driver	1	0	0	0
2011 Ford Pick-up Passengers	4	0	0	0
2005 Nissan Driver	1	0	0	0
2005 Nissan Passengers	3	1 ²⁵	0	0
2006 Freightliner Driver	1	0	0	0
Total	11	5	4	1

²¹ A summary of seat belt laws for each state: http://www.ghsa.org/html/stateinfo/laws/seatbelt_laws.html.

²² <http://www.nj.gov/oag/hts/seatbelts.html>.

²³ New Jersey Driver Manual, Chapter 3. Driver Safety and the Rules of the Road, www.njmvc.gov.

²⁴ The NTSB classifies serious injuries as any injury which: (1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface. (49 CFR 830.2)

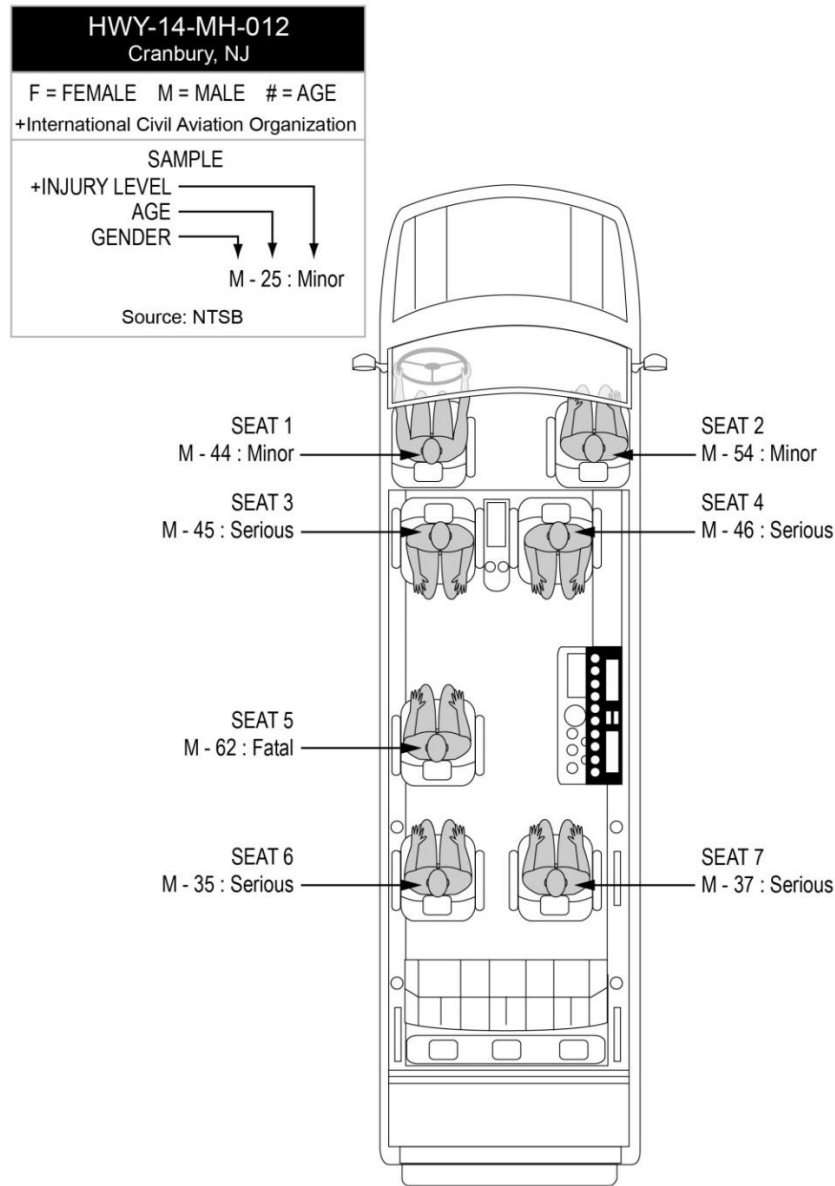
²⁵ The minor injuries suffered by the passenger of the Altima were sustained while assisting with the evacuation of the victims in the limo van on scene.

3.1. 2011 Peterbilt Truck-Tractor Occupant

The only occupant was the driver, a 37-year-old male. He was not injured in the accident.

3.2. 2012 Mercedes-Benz Sprinter Limo Van Occupants

The limo van had a driver and a passenger in the front cab area, and 5 passengers in the passenger compartment. The seat positions have been numbered, and the age, gender, and level of injury sustained by the occupants have been provided as shown in figure 4. The occupants of the limo van are referred to by their seat positions in following sections of this report.



14.10.001.HW_Fig1b

Figure 4. Limo Van Seat Locations.

The seat positions of the passengers in the back of the limo van (seats 3 to 10) are estimated based on evidence and interviews with the driver and a statement from the passenger who occupied seat 7. Seat numbers 8, 9, and 10 were likely not occupied. The surviving passengers declined requests for information, except for the seating chart previously mentioned. Each occupant is referred to by seat position. The agencies providing care or transport are listed below in table 2, followed by a more detailed description of the on-scene treatment for each occupant.²⁶ Table 3 provides a summary of the injuries. Abbreviations used in the following tables for medical units include: Basic Life Support (BLS), Advanced Life Support (ALS) and Medical Rescue (MR). The Robert Wood Johnson University Hospital is abbreviated as RWJUH.

Table 2. On-Scene Treatment and Transport Agencies for Each Occupant.*

Seat / Occupant	On-Scene Treatment	Transport
1	none	NJ State Trooper to barracks
2	none	NJ State Trooper to barracks
3	Cranbury BLS 4815	Ground Cranbury BLS 4815 RWJUH ALS MR03
4	Hightstown BLS 4112	Ground: Hightstown BLS 4112 Air: NorthStar
5 (fatal)	RWJUH ALS MR06	Ground by Middlesex Co. Medical Examiner
6	Monroe BLS 508 RWJUH ALS MR06	Ground: Monroe BLS 508 RWJUH ALS MR06
7	Cranbury BLS 4815 Monroe BLS 501	Loaded into Cranbury BLS 4815 ²⁷ Ground Monroe BLS 501

3.2.1. Seat 1, Male 44 Years Old

Seat number 1 was occupied by the driver. He suffered minor injuries and did not seek medical treatment at the scene. He was taken to the New Jersey State Police (NJSP) station and gave a statement. Data obtained from the Mercedes-Benz airbag module indicated that he was not wearing his seatbelt at the time of the crash.²⁸ The seatbelt pretensioner did not deploy, and the airbag deployed. Attempts to obtain further information from the computer module were unsuccessful.²⁹

This occupant was not treated on scene and was not transported by Emergency Medical Services (EMS). The driver described his injuries to an NTSB investigator as a sore right calf and general cuts and bruises, including cuts on his hands. He indicated that he did not realize it at first, but his leg became stiff and sore after the accident. He remembered that he was limping at the scene and reported neck and back pain.

²⁶ SF Attachment 5: EMS Patient Reports.

²⁷ The occupant of seat 7 was loaded into Cranbury BLS 4815 but was then removed to accommodate the occupant of seat 3.

²⁸ See the Vehicle Factors Group Chairman's Factual Report, in the accident docket.

²⁹ Refer to the Vehicle Data Recorder's Factual Report, available in the accident docket.

3.2.2. Seat 2, Male 54 Years Old

The passenger in seat number 2 suffered minor injuries and did not seek medical attention at the scene. He was taken to the NJSP station and gave a statement. The Mercedes-Benz airbag module computer indicated that his seatbelt was in use at the time of the crash. The passenger-side seatbelt pretensioner and airbag deployed.

This occupant was not treated on scene and was not transported by EMS. This occupant did not respond to interview requests. The driver was interviewed by NTSB investigators and indicated that this passenger had minor injuries, such as general bruises and scrapes or cuts. Passenger 1 indicated that he went to Beebe Medical Center in Lewes Delaware for a checkup. A subpoena was issued to this medical center for any records pertaining to this patient. The medical center responded that no records were found.

3.2.3. Seat 3, Male 45 Years Old

The passenger in seat number 3 was likely occupied by the male who suffered injuries as described in table 3. This passenger sustained serious injuries and was treated enroute by Cranbury BLS Unit 4815 and RWJUH ALS MR03. He was transported by Cranbury 4815 to RWJUH.

Cranbury BLS 4815

The Cranbury BLS 4815 Patient Report indicated that the passenger from seat 7 was initially loaded into the ambulance but was then removed (see paragraph for seat 7). This patient (from seat 3) was then loaded into the ambulance, joined by paramedics from RWJUH MR03, and transported to RWJUH. Oxygen was given on scene and then in the ambulance. Only one approximate time of 1:20 a.m. was given for the Cranbury BLS 4815 patient report.

RWJUH ALS MR03

The RWJUH ALS MR03 patient report included the following information: MR03 arrived on scene at 1:20 a.m. and contacted this patient at 1:22 a.m. The patient was found on the road being assessed by a paramedic at 1:23 a.m.; was immobilized on a backboard and given a cervical collar at 1:26 a.m. The paramedic also noted that no BLS was available at 1:26 a.m. The patient was given oxygen and put on a cardiac monitor at 1:35 a.m. The patient was secured to a “long board” and still awaiting a BLS at 1:40 a.m. The patient’s head and leg were bandaged at 1:45 a.m., and he was loaded into the Hightstown BLS Unit 4112 at 1:53 a.m. and left the scene at 1:56 a.m. The patient was given an IV at 1:58 a.m., lab values were obtained at 2:04 a.m., and paramedics consulted with the hospital at 2:06 a.m. A trauma code was issued at 2:08 a.m. The patient arrived at RWJUH at 2:14 a.m. and was transferred to the trauma center care at 2:20 a.m.

3.2.4. Seat 4, Male 46 Years Old

Seat number 4 was likely occupied by the male who suffered serious injuries as described in table 2. He was transported from the scene by Hightstown BLS Unit 4112 to the police barracks, which were used as the landing zone for air medivac. He was then transported by a NorthStar helicopter to RWJUH New Brunswick NJ.

Hightstown BLS 4112

The Hightstown BLS 4112 patient report contained notes from each of the responders from BLS 4112, referred to as EMT 1 and EMT 2. Responders described their actions on scene. EMT 2 noted that the patient was extricated from the van and placed on a backboard. Medivac was requested as the patient was being tended to and prepared for medivac. EMT 2 was told that his unit would transport the patient to the landing zone. EMT 2 requested his partner (EMT 1) to assist, but the Incident Commander (IC) assigned an EMT/FF because EMT 1 was assisting with the van extrication. The passenger from seat 4 was loaded into BLS 4112 and transported to the landing zone. They waited there, as the medivac still had an estimated arrival time of 4 minutes. Shortly after the medivac landed, the patient was further secured and then loaded into the medivac and flown to RWJUH. The patient report provided the following times for the events: Dispatch at 1:10 a.m., enroute at 1:11 a.m., at reference at 1:30 a.m., leave reference at 2:30 a.m., and available at 4:00 a.m.

NorthStar Air Medivac

The patient report from NorthStar indicated that the patient was delivered to the landing zone by a Cranbury BLS at 1:55 a.m. The patient report noted that at 1:55 a.m., two crewmembers from the Cranbury BLS removed the patient from the BLS. They started walking toward the helicopter with the patient, who was experiencing periods of combativeness, unsecured on a backboard with no cervical collar, no head immobilization, and no oxygen in place. The flight crew stopped the BLS crew, assessed the patient, secured him to the backboard, and put a cervical collar on him; they then moved him to the aircraft. At 2:05 a.m., the patient was loaded into the aircraft, secured, and placed on oxygen. A secondary assessment was begun. At 2:05 a.m., an IV was initiated, and the patient was placed on a cardiac monitor. The helicopter left enroute to RWJUH at 2:05 a.m. At 2:18 a.m., the patient was intubated and noted to be combative and to have a head injury. At 2:22 a.m., the patient was packaged for transfer out of the aircraft. At 2:25 a.m., the patient was removed from the aircraft onto a stretcher and transferred to the care of the trauma team at RWJUH.

3.2.5. Seat 5, Male 62 Years Old

Seat number 5 was likely occupied by a 62-year-old male. This passenger sustained fatal injuries. He was the last victim to be removed from the limo van by firefighters and EMS responders. This occupant was treated and pronounced deceased on scene by RWJUH ALS MR03. The deceased was transported to the Middlesex County Medical Examiner's office.

RWJUH ALS MR03

The RWJUH ALS MR03 patient report indicated that this patient was found supine on the ground and was unresponsive and apneic at 1:49 a.m.; a manual attempt to find a pulse at the carotid artery was unsuccessful. Also at 1:49 a.m., the patient was placed on monitor and asystole was recorded in multiple leads. At 1:53 a.m., there was a consultation with RWJUH, and the patient was pronounced deceased at 1:53 a.m.

Middlesex County Medical Examiner

The deceased was transported to the Middlesex County Medical Examiner's Office in North Brunswick, New Jersey. The autopsy was conducted on June 7, 2014, at the Middlesex County Medical Examiner's office. The autopsy report noted that there was evidence of medical intervention in the form of EKG leads on the anterior torso, and the height and weight were noted as 71.5 inches and 216 pounds respectively. The evidence of injuries and pathological diagnosis described injuries that included cervical fractures; multiple left and right, lateral, and anterior rib fractures; contusions; and left leg fractures. A more detailed summary of the injuries is provided in table 3. The cause of death was noted as multiple blunt force injuries.

3.2.6. Seat 6, Male 35 Years Old

The passenger in seat number 6 was likely a 35-year-old male who suffered serious injuries as described in table 3. He was transported from the scene by Monroe BLS 508 to RWJUH with treatment enroute by RWJUH ALS MR06.

Monroe BLS 508

The Monroe BLS 508 patient report indicated that the patient was found lying supine on a backboard and unrestrained, on the ground at 1:46 a.m. The patient was transferred to a stretcher and placed in the BLS at 1:56 a.m. The patient was treated for bleeding, restrained, and transported to the medivac landing zone at the police barracks. At 2:03 a.m., the patient was reassessed at the landing zone and was awaiting the second medivac. An ETA of 8 minutes was given, and an IV was started. At 2:14 a.m., the patient was reassessed and the updated medivac ETA was again 8 minutes; the decision was made to transport the patient by ground to RWJUH. At 2:24 a.m., vitals were taken, and the patient was enroute to the ER. At 2:30 a.m., the patient was transferred to the care of ER staff.

RWJUH ALS MR06

The RWJUH ALS MR06 indicated that the patient in seat 6 was found in the care of RWJUH ALS MR03 and already had complete spine immobilization. At 1:46 a.m., care was transferred from RWJUH ALS MR03 to RWJUH ALS MR06, and he was placed on a cardiac monitor. At 1:50 a.m., the patient was provided with oxygen. At 2:00 a.m., Monroe BLS unit 501 arrived. At 2:02 a.m., a consultation with the hospital determined to transport the patient by air, with the medivac estimated to be 4 to 5 minutes away, and at 2:03 a.m., a trauma code was issued. At 2:07 a.m., an IV was initiated, and at 2:10 a.m., the trauma alert was updated, and it was decided that if the helicopter did not arrive within 2 to 3 minutes, they would transport by ground. Medications were also administered. At 2:12 a.m., lab values were obtained. At 2:14 a.m., it was decided to transport the patient by ground. A consultation with the hospital occurred at 2:25 a.m., and the patient arrived at RWJUH at 2:31:54 a.m. The patient was transferred to the care of the ER trauma unit at RWJUH at 2:35 a.m.

3.2.7. Seat 7, Male 37 Years Old

The passenger in seat number 7 was likely occupied by the 37 year old male who suffered injuries as described in table 3. This passenger sustained serious injuries and was treated on scene and enroute by RWJUH paramedics from Unit MR06. He was first loaded into Cranbury

BLS Unit 4815 but was then removed and placed back on the ground. Later, he was transported from the scene by Monroe BLS Unit 501 to RWJUH.

Cranbury BLS 4815

The Cranbury BLS 4815 patient report indicated that approximately 1:20 a.m., the IC directed the EMT to begin assessment of this patient and asked a Cranbury firefighter to hold in-line stabilization. A cervical collar was applied, and the patient was loaded onto a backboard and secured. The patient was loaded and secured in the BLS, and a secondary assessment was begun. The IC opened the BLS and stated that a more critically injured patient was to be transported first. Fire fighters unloaded the patient, removed him from the cot, and placed him on the ground (on the backboard) at the scene.

Monroe BLS 501

The Monroe BLS 501 patient report indicated that they arrived on scene at 1:45 a.m. and found the occupant from seat 7 on a backboard and wearing a cervical collar. He was secured to a stretcher, loaded into the BLS, and given an initial assessment. At 1:50 a.m., the patient was given a detailed assessment and monitored enroute to the hospital. The patient was enroute to RWJUH at 2:15 a.m. and arrived at 2:30 a.m. The patient was transferred to RWJUH care at 2:35 a.m.

Table 3. Summary of Occupants and Injuries in the Mercedes-Benz Limo Van.

Seating Row	Age	Sex	Notes and Summary of Injuries	NTSB Injury Severity
Seat 1	44	M	Injury Summary: - Contusions, right calf - General cuts and bruises, cuts on hands from evacuation and helping to extricate victims - Neck and back pain, with a diagnosis of 2 herniated disks	Minor
Seat 2	54	M	Injury Summary: - General cuts and bruises	Minor
Seat 3 (rear-facing)	45	M	Injury Summary: - Pneumocephalus (air in skull cavity) - Multiple fractures, skull base - Contusions, bilateral temporal lobes - Scalp laceration - Multiple non-displaced facial fractures - Fractures, right ribs 9 & 10 - Fractures, left ribs 10-12 - Minimal compression fractures, T2 and T7-T9 - Fractures, left transverse processes L1-L4 - Fracture, left femur shaft - Fracture, posterior right acetabulum - Laceration, left shin	Serious

Seating Row	Age	Sex	Notes and Summary of Injuries	NTSB Injury Severity
Seat 4 (rear-facing)	46	M	<p>Injury Summary:</p> <ul style="list-style-type: none"> - Bilateral subdural hematomas - Traumatic subarachnoid hemorrhage - Hemorrhagic contusions, bilateral frontal lobes - Hemorrhagic contusion, right temporal lobe - Contusion, occipital scalp - Bilateral nasal bone fractures - Facial laceration, right - Open, comminuted fracture, distal right femur - Dislocation, left third finger 	Serious
Seat 5	62	M	<p>Injury Summary:</p> <ul style="list-style-type: none"> - Abrasions and lacerations of the scalp - Small abrasions and contusions of the face - C3 fracture dislocation with spinal canal compression - C6 and C7 fracture dislocation with small laceration of right jugular vein - Superior sternal fracture - Right rib fractures: posterior #3-#9; lateral #3-#10; - Left rib fractures: lateral #4-#10, posterior #9-#10 - Bilateral lung contusions - Contusion of right diaphragm - Bilateral hemothoraces, 100cc each - Abrasions and contusions of the back and chest wall - Contusions of the lower anterior abdomen - Open dislocation of the left wrist - Abrasions of the left forearm, left anterior knee, and left heel - Multiple transected fractures of the left tibia and fibula - Contusion on the dorsal surface of the left foot 	Fatal
Seat 6	35	M	<p>Injury Summary:</p> <ul style="list-style-type: none"> - Laceration left scalp/face, 4 inches - Multiple bilateral small hemorrhages in the frontal lobes, possible diffuse axonal injury - Small focus of hemorrhage in the left midbrain - Fracture, left frontal bone - Multiple pulmonary contusions, right - Liver laceration - Multiple splenic lacerations - Fracture, left radial shaft - Fracture left acetabulum - Fracture, left sacrum - Fractures, left superior and inferior pubic rami 	Serious
Seat 7	37	M	<p>Injury Summary:</p> <ul style="list-style-type: none"> - Comminuted fracture, distal radius, left wrist - Contusion, left ankle 	Serious

3.3. 2011 Buick Enclave Occupants

The Buick was occupied by the driver and a passenger in the right front seat. The driver was a 39-year-old female. She sustained minor injuries from the accident and did not seek medical treatment at the scene. She described her injuries during an interview with an NTSB investigator, which included general soreness and stiffness with pain to the neck, left shoulder, and lower back. The airbag module data indicated that she was wearing the seatbelt, and the driver-side airbag deployed during the crash.

The Buick passenger was a 43-year-old male. He sustained minor injuries and did not seek medical attention at the scene. He described his injuries during an interview with an NTSB investigator, which included minor whiplash of the neck, and pain that was caused by something that struck his lower right side, just above the waistline and back, near the kidney. The airbag module data indicated that he was wearing the seatbelt and the passenger-side airbag deployed during the crash.

3.4. 2011 Ford F150 Occupants

The Ford was occupied by the driver and four passengers. They did not seek medical attention at the scene. They were taken to the NJSP Troop D barracks and gave statements. The driver was a 32-year-old male, and the passengers were four males, aged 26, 27, 43 and 48 years old.

3.5. 2005 Nissan Altima Occupants

The Nissan was occupied by the driver and four passengers. They did not seek medical attention at the scene. They were taken to the NJSP Troop D barracks and gave statements. The driver was a 33-year-old male, and the passengers were three males, aged 28, 35, and 35, and a 26-year-old female.

The 28-year-old male passenger stated to police that he assisted with the extrication of the victims from the limo van. He was interviewed by an NTSB investigator, see Attachment X: Victim Interviews. He reported minor injuries sustained during his actions on scene after the accident. He described cuts and scrapes on his hands and arms.

3.6. 2006 Freightliner Truck-Tractor Occupant

The only occupant was the driver, a 29-year-old male. He was taken to the NJSP Troop D barracks and gave a statement. He was not injured in the accident.

4. Law Enforcement Information

4.1. New Jersey State Police Emergency Management Section

The NJSP Homeland Security Branch contains the Emergency Management Section, which has the Emergency Response Bureau and the Communications Bureau (among others). The NJSP website described the Emergency Management Section as follows:

The Emergency Management Section Supervisor holds the rank of Major and also serves as Assistant Deputy State Director, Office of Emergency Management. The Section is under the command of the Deputy Superintendent of Homeland Security, who is the Deputy State Director, Office of Emergency Management. The Section organizes, directs, staffs, coordinates and reports the activities of the Communications Bureau, Emergency Preparedness Bureau, and Recovery Bureau. The Supervisor and staff facilitate the flow of information to and from the various Bureaus supervised and serve as a conduit for communication with other Division entities. The Section is also responsible for planning, directing and coordinating emergency operations within the State which are beyond local control. The following three Bureaus make up Emergency Management Section, the Communications Bureau, the Emergency Response Bureau, and the Recovery Bureau.

The accident occurred in Middlesex County, which is in the Central Regional Unit of the Emergency Response Bureau. This bureau coordinates emergency management activities. The emergency calls were processed by the Communications Bureau, as described in Section 4.3. The fire/rescue and emergency medical response agencies are managed by the Turnpike Authority through an agreement with the NJSP, as described in section 5.3.

4.2. New Jersey State Police, Troop D, Cranbury Station, Squad 4

Troop D is composed of two regions: the Parkway Region and the Turnpike Region. The Parkway Region is responsible for the Garden State Parkway and the Turnpike Region is responsible for the New Jersey Turnpike. The New Jersey Turnpike consists of 148 miles, incorporating areas of 4 to 12 lanes, with a total of 1,194 lane-miles. It is nation's busiest, limited access non-stop toll road. Troop D Headquarters is located in Cranbury between Interchanges 8 and 8A at milepost 71.5 in Cranbury Township.

The NJSP investigation had two components, the Criminal Investigation and the Traffic Collision Investigation. The NJSP provided the preliminary report for Case D010-2014-00731A³⁰. The report provided information about the vehicles, occupants, and circumstances of the accident. The report also provided statements given to the NJSP from the drivers and passengers involved in the crash.

4.3. Law Enforcement Dispatch

4.3.1. New Jersey State Police Dispatch

The NJSP dispatch services for this area were handled primarily by the Woodbridge Operational Dispatch Unit (ODU) at exit 11. The NJSP website described this as a communications hub staffed with 46 public safety telecommunicators and 7 enlisted supervisors. Critical job functions were described as follows:

- Tracking patrols and specialty units for the three Parkway road stations, and three Turnpike road stations that cover the entire length of the roadways by means of computer-assisted dispatch and the 800 MHz radio system.

³⁰ SF Attachment 6: Preliminary NJSP Reports.

- Processing State Police emergency and non-emergency phone lines.
- 24-hour monitoring of the Criminal Justice Information System (CJIS)

The NJSP website indicated that all state police public safety telecommunicators are required to attend a 6-week training course designed specifically for the needs of the Division. This training meets the requirements as outlined under the state 9-1-1 regulation.

Central ODU Dispatch

The Central ODU in Hamilton at Exit 7A was also a possible dispatcher for this crash. The Central ODU was contacted, and it indicated that it did not have logs for this incident.

Woodbridge ODU Dispatch

The Woodbridge ODU CAD log was obtained for the crash.³¹ The initial call was received at 1:00:52 a.m., and the first unit was dispatched at 1:02:01 a.m. Within 15 minutes of the first call, four NJSP units arrived on scene. The first arrived on scene at 1:06:21 a.m. (unit 7116), the second at 1:07:22 a.m. (unit 5905), the third at 1:11:24 (unit 7026), and the fourth at 1:15:21 a.m. (unit 4975).

The dispatch audio was reviewed. The duration of the first 911 call was 0:01:21, and was followed immediately by a second 911 call that lasted 0:01:24. The dispatcher obtained the location and basic information of the accident from these calls. Approximately 7 seconds after the second 911 call, the dispatcher started placing the call to Mercer County, and it took about 19 seconds for the call to go through and be picked up by Mercer County. The total time between receipt of the initial 911 call and the transfer to Mercer County dispatch for fire and EMS was about 3 minutes and 11 seconds.

4.4. Middlesex County Medical Examiner's Office

The fatality was pronounced deceased at the scene at 1:53 a.m. by a physician at RWJUH, working through an ALS paramedic according to standard protocol. The Middlesex County Medical Examiner was dispatched to the scene. The deceased was retrieved and transported to the Middlesex County Medical Examiner's office, where an autopsy was performed.

5. Fire and EMS Information

5.1. Federal EMS Oversight

The DOT National Highway Traffic Safety Administration (NHTSA) EMS division was contacted for background information regarding state oversight of EMS services and information about US national guidelines and certification. NHTSA established guidance with the basic goal to provide guidance for state and local EMS stakeholders to establish standardized decision-making, policy, and education for EMS services. An agenda was created in 1996 and updated in 2000 as the *Emergency Medical Services Education Agenda for the Future*.³² This

³¹ SF Attachment 7: NJSP Woodbridge CAD Log.

³² <http://www.nhtsa.gov/people/injury/ems/edagenda/final/index.html>.

document was a position paper created by the National Association of EMS Physicians (NAEMSP) and the National Association of State EMS Directors (NASEMSD).

The agenda led to standard EMS instructional guidelines, standard curriculums, and other guidelines.³³ The National Standard Curricula (NSC) establishes levels for a First Responder, an Emergency Medical Technician (EMT) – Basic, an EMT – Intermediate, and an EMT – Paramedic.

Guidance for managing incidents is also available through the Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS).³⁴ Guidance is provided for various aspects of incident management, including the incident command structure, resource management and mutual aid, and training. Various documents available through NIMS cover the aspects that need to be considered when making incident command decisions.

5.2. New Jersey Department of Health

The NJ Department of Health Office of Emergency Medical Services state coordinator was contacted and information about current law and legal history of EMS oversight in the state of New Jersey was obtained (see SF Attachment 7: New Jersey EMS Law). In the state of New Jersey, the fire departments (FD) and first aid squads (FAS) consist of a combination of career and volunteer or fully volunteer staff. The agencies (FD or FAS) are under the jurisdiction of the local municipality, and they ultimately report to the elected official of the municipality they serve.

First Aid Squads are subject only to the requirements and oversight of the local municipality. Oversight and requirements can range from adopting the national standards to having no established requirements. Many first response agencies belong to an umbrella organization that provides a volunteer level of standardization, called the New Jersey State First Aid Council (NJFAC).³⁵ The EMS agencies involved in the response to this accident that were found to be part of the NJFAC were Cranbury FAS, East Windsor Rescue Squad District 2, and Hightstown FAS.

Career first responders are certified according to the education level of their position, such as an EMT basic, intermediate, or paramedic. Volunteer responders range in their level of qualification from having nationally recognized certifications to having none. There have been legal attempts to increase the required oversight of EMS in the state of New Jersey.³⁶ Assembly Act No. 2095 was introduced in the 214th State of New Jersey Legislature on February 11, 2010, and Senate Bill No. 1650 was introduced in the 215th State of New Jersey Legislature on February 16, 2012, to revise the requirements for EMS delivery. The Senate bill was vetoed by Governor Chris Christie.

³³ <http://www.ems.gov/educationstandards.htm>.

³⁴ <http://www.fema.gov/national-incident-management-system>.

³⁵ <http://www.njsfac.org/>.

³⁶ SF Attachment 8: New Jersey EMS Law.

5.3. New Jersey Turnpike Authority

The Emergency Services Supervisor for the Turnpike Authority was contacted and background information about the organization of EMS management on the turnpike was obtained. The local EMS agencies work out the boundaries for response with oversight from the Turnpike Authority. In general, the turnpike is segmented by exits or mileposts and, in some cases, by the direction of travel. The details change as construction continues and is established on an individual basis for ramps or other features.

The accident occurred in the northbound travel lanes on the segment of freeway between exit 8 (south of the accident at milepost 67.6) to exit 8A (north of the accident at milepost 73.7). Although the accident happened in Middlesex County, this is near the border of Mercer County, and the pre-established fire/rescue and BLS services were based in Mercer County. The northbound lanes of this portion were served by Robinsville Fire and First Aid Squad. The southbound lanes were assigned to Hightstown Fire Department and Hightstown First Aid Squad. The bordering turnpike segments were served by Cranbury Fire and First Aid Squad to the south (milepost 71.7 to 67.9 for both northbound and southbound lanes), and Monroe Fire and First Aid Squad to the north (milepost 72.3 to 76.3 for both northbound and southbound lanes).

The pre-established ALS medical services were organized as follows. The two major trauma centers near this section of turnpike were Robert Wood Johnson University Hospital in New Brunswick, a level 1 trauma center, north of the crash site; and Capital Health Systems – LifeComm in Trenton, NJ, a level 2 trauma center, south of the crash site. The pre-established air medical evacuation services in the region were NorthStar and SouthStar, both of which were part of the aviation division of the NJSP.

The fire/rescue and EMS agencies that responded to this accident were as follows:

- Incident Command: Hightstown FD Fire Chief
- Fire/Rescue: Hightstown FD, Cranbury FD, Monroe FD, East Windsor Rescue Squad District 2
- BLS First Aid Squad (FAS): Hightstown FAS, Cranbury FAS, Monroe FAS
- Air Medivac: NorthStar
- ALS Medical Support: Robert Wood Johnson University Medical Center (RWJUH)

5.4. Emergency Services Dispatch

5.4.1. Fire and EMS Dispatch

There were four dispatch centers that dispatched fire and EMS agencies to the accident. The dispatch and arrival on scene details are provided below.³⁷ Further detail, with a master timeline, including law enforcement resources, is provided in Section 5.4.2.

³⁷ SF Attachment 9: Fire and EMS Dispatch Logs.

Mercer County

The Mercer County Emergency Services Communications Center provides coordinated fire and EMS communications within Mercer County with the exception of the city of Trenton, which has a separate dispatch center. Both Hightstown and Cranbury were dispatched from Mercer. Cranbury was recently added in early June 2014, making this one of the first major accidents in which Mercer dispatched Cranbury services.

The Mercer County dispatch call was created at 1:04:03 a.m. and one fire/rescue command vehicle (C-41) was dispatched at 1:05:56 a.m., and two BLS (A41-11 and A41-15) were dispatched at 1:05:57 a.m. and a third (A41-12) was dispatched at 1:07:01 a.m. One rescue vehicle (R-41) and two fire engines (E41 and E48-1) were also dispatched at 1:07:01 a.m. BLS A41-11 was recalled at 1:07:15 a.m. because unit A41-12 was closer to the site.

The BLS A21-12 was enroute at 1:07:10 and the command vehicle (C-41) was enroute at 1:07:53. BLS ambulance A146-1 was later dispatched at 1:54:36 a.m., and then recalled at 2:09:09 a.m. because BLS resources from Monroe Township had been dispatched and were available.

The fire chief in C-41, who was the first Mercer County resource on scene at 1:14:24 a.m., assumed incident command. The first engine (E48-1) and two BLS units (A48-15 and A41-12) were on scene by 1:15:37 a.m. The rescue vehicle (R-41) and the second engine (E41) arrived by 1:23:39 a.m.

Monroe Township

The Monroe Township Fire and First Aid dispatch center created the call at 1:34:47 a.m. It dispatched BLS Ambulance 501 at 1:39:26 a.m. and BLS Ambulance 508 at 1:43:32 a.m. Both units arrived on scene by 1:47:16 a.m. Monroe also dispatched a supervisory vehicle (unit 406).

East Windsor Rescue Squad, District 2

The East Windsor Rescue Squad, District 2, dispatched engine E46-1 at 1:42:15 a.m. and command vehicle C46 at 1:42:18 a.m. The command vehicle arrived on scene at 1:47:34 a.m., and the engine arrived on scene at 2:31:24 a.m.

Hospital-Based EMS – Advanced Life Support (ALS)

The crash location was near the border of two jurisdictions for EMS with Advanced Life Support (ALS) capability, with RWJUH to the north and Capital Health Systems to the South. The hospitals have an EMS department with their own dispatch services and paramedics, which are stationed at local Municipal FAS. RWJUH dispatched ALS unit MR06 at 1:09:14 a.m. and unit MR03 at 1:09:16 a.m. Unit MR03 arrived on scene at 1:20:27 a.m. and unit MR06 arrived on scene at 1:23:36 a.m. Capital Health Systems did not have any EMS units respond to the crash.

Air Medivac

The NJSP sent out a medivac request at 1:21:05 a.m., which can bring resources from either Northstar or Southstar air medivac. Based on a longer estimated time of arrival, Southstar was not dispatched. The NorthStar air medivac helicopter was dispatched by the Regional

Emergency Communications System (REMCS) of Metropolitan New Jersey, located at the University Hospital in Newark, New Jersey.³⁸ NorthStar can be requested by public safety agencies or by a private citizen by calling the dispatch center directly. REMCS picked up the call at 1:23:39 a.m. and dispatched the NorthStar helicopter at 1:29:22 a.m. An ETA of 1:43 a.m. was given, and the helicopter was enroute at 1:38:12 a.m. It arrived at the landing zone at 1:53:47 a.m., was transporting the patient at 2:05:28 a.m., and arrived at RWJUH at 2:14:05 a.m.

NorthStar has operational bases out of Somerset Airport and at University Hospital in Newark. It operates a fleet of four Agusta AW-139 medivac helicopters, which are piloted and maintained by the NJSP Aviation Unit. The medical support staff consists of a flight paramedic and flight nurse from University Hospital. The aircraft that responded to this crash was based out of Somerset Airport.

³⁸ <http://www.uh-ems.net/remcs.html>.

5.4.2. Event Timeline for all Agencies

The NJSP and fire/EMS CAD log entries were combined into a Master CAD log.³⁹ A summary of important events are provided in table 4 below.

Table 4. Selected Events from Master CAD log.

Time (a.m.)	Event
1:00	NJSP call initiated.
1:02	First NJSP dispatched.
1:04	Mercer County call initiated.
1:05	Fire and BLS ambulances dispatched.
1:06	First NJSP arrived on scene.
1:09	ALS medics dispatched.
1:11	Report of 3 entrapped males;
1:14	IC and first engine arrive on scene.
1:15	First 2 BLS arrived on scene.
1:16	First ALS arrived on scene.
1:21	Air Medivac requested, second ALS arrived on scene.
1:22	ALS MR06 makes contact with Patient No. 4
1:29	Medivac dispatched by REMCS
1:33	Highway closed.
1:34	Serious injuries and possible fatality reported, additional BLS requested.
1:36	ALS requested additional BLS.
1:38	First patient extricated.
1:39	Second patient extricated. Second BLS requested by ALS.
1:47	Additional BLS arrived on scene.
1:49	Air medivac (NorthStar) arrived at helipad.
1:50	Patient No. 7 loaded into Monroe BLS 501.
1:53	Patient No. 4 loaded into BLS A4112.
1:54	Reported that a fatality was pronounced deceased on scene.
1:56	Patient No. 6 enroute to landing zone in BLS 508.
1:57	Patient No. 3 enroute to RWJUH in BLS A4815.
2:05	Patient No. 4 enroute by air to RWJUH in medivac NorthStar.
2:15	Patient No. 6 enroute by ground to RWJUH in BLS 508.
2:16	Patient No. 7 enroute by ground to RWJUH in BLS 501.
2:21	Patient No. 3 transferred to care at RWJUH.
2:25	Patient No. 4 transferred to care at RWJUH.
2:35	Patient No. 5 transferred to care at RWJUH.
2:35	Patient No. 7 transferred to care at RWJUH.

³⁹ SF Attachment 10: Master CAD Log.

5.5. Fire Departments

Three fire departments responded. Hightstown FD was the primary responding FD with units responding as noted in Section 5.4.1. The Hightstown fire chief was the IC. There was no fire on scene, but rescue operations were required to extricate three victims from the limo van. The Hightstown FD also dispatched rescue vehicle 41, which arrived on scene at 1:21:58 a.m. and engine 41, which arrived on scene at 1:23:39 a.m. These units assisted with the rescue operations. In its report, the Hightstown FD noted that it had been dispatched for a motor vehicle accident with entrapment. The report noted that upon arrival, the fire chief found multiple vehicles, including one on its side with three victims entrapped. The report indicated that the fire chief began to work to remove the entrapped victims, and that the victims were removed from the front window in the order they were found and handed over to EMS for transport. The report noted that the rescue crews remained on location to assist state police with lights for their investigation of the scene.

The Cranbury FD had one rescue/pumper truck respond and the East Windsor Rescue Squad, District 2, had a command vehicle and a rescue truck respond, as noted in section 5.4.1. These units assisted with rescue operations, provided support at the landing zone, and gave support in clearing the scene. The IC and firefighters were interviewed by NTSB investigators.⁴⁰

5.6. Municipal First Aid Squads and Advanced Life Support

The Hightstown FAS and Cranbury FAS had the first three BLS ambulances initially dispatched, with one recalled a short time later, as noted in section 5.4.1. An additional unit from Cranbury was dispatched later, but then recalled because two BLS units subsequently dispatched from Monroe Township were available. RWJUH had two ALS units respond with a total of four EMT-paramedics, as noted in section 5.4.1. BLS and ALS responders from all of the FAS were interviewed by NTSB investigators.

6. Interviews

6.1. Mercedes-Benz Limo Van Occupants

6.1.1. Driver

The driver of the Mercedes-Benz was interviewed by NTSB investigators. The interview focused on motor carrier issues is contained in the Motor Carrier Chairman's Factual Report. A follow-up interview was conducted with a focus on survival factors.⁴¹

6.1.2. Cab (Front Seat) Passenger

The Mercedes-Benz passenger in seat 1 gave a statement to the NJSP. He indicated that the driver kicked out the windshield. He unfastened his seatbelt and fell. He heard screams for help from the back of the limo bus and exited to get his bearings. He then assisted in breaking through the partition to access the passengers in the back.

⁴⁰ SF Attachment 11: First Responder Interviews.

⁴¹ SF Attachment 12: Victim Interviews and Statements.

6.1.3. Mercedes-Benz Limo Van Passengers

None of the surviving passengers in the back of the limo van were contacted directly. The attorneys representing the passengers were contacted, and requests were made to interview or obtain statements from the surviving passengers. A written questionnaire was also provided to the attorneys. All of the surviving victims of the limo van declined to make a statement or to be interviewed, as communicated through the attorneys.

6.2. Other Vehicle Occupants

Some of the occupants of the other five vehicles involved in the crash provided statements to police, and an occupant of the Nissan who assisted with the on-scene extrication of the limo van occupants was interviewed by NTSB investigators.

E. DOCKET MATERIAL

The following attachments and photographs are included in the docket for this investigation:

LIST OF ATTACHMENTS

Survival Factors Attachment 1 -	Midwest Automotive Designs Invoice and Seat Tests
Survival Factors Attachment 2 -	Atlantic Transportation Services Photo of Accident Vehicle
Survival Factors Attachment 3 -	Midwest Automotive Compliance Worksheet
Survival Factors Attachment 4 -	Midwest Automotive Seat Belt Compliance Tests
Survival Factors Attachment 5 -	EMS Patient Reports
Survival Factors Attachment 6-	Preliminary NJSP Reports
Survival Factors Attachment 7 -	NJSP Woodbridge CAD Log
Survival Factors Attachment 8 -	New Jersey EMS Law
Survival Factors Attachment 9 -	Fire and EMS CAD Dispatch Logs
Survival Factors Attachment 10 -	Master CAD Log
Survival Factors Attachment 11 -	First Responder Interviews
Survival Factors Attachment 12 -	Victim Interviews

LIST OF PHOTOGRAPHS

- Survival Factors Photo 1 – Limo Van Left Side
- Survival Factors Photo 2 – Limo Van Right Front
- Survival Factors Photo 3 – Limo Van Left Rear
- Survival Factors Photo 4 – Limo Van Rear Doors
- Survival Factors Photo 5 – Limo Van Cab
- Survival Factors Photo 6 – Limo Van Partition from Cab
- Survival Factors Photo 7 – Limo Van Partition from Passenger Compartment
- Survival Factors Photo 8 – Limo Van Interior from Cab
- Survival Factors Photo 9 – Limo Van Seats 3 and 4
- Survival Factors Photo 10 – Buick Right Front
- Survival Factors Photo 11 – Buick Right Rear
- Survival Factors Photo 12 – Buick Interior
- Survival Factors Photo 13 – Ford Left Side
- Survival Factors Photo 14 – Ford Left Rear
- Survival Factors Photo 15 – Ford Interior
- Survival Factors Photo 16 – Nissan Left Rear
- Survival Factors Photo 17 – Nissan Interior

END OF REPORT

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