

# National Transportation Safety Board

Office of Highway Safety

Washington, DC 20594



HWY23FH005

## **SURVIVAL FACTORS**

Group Chair's Factual Report

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## **A. CRASH**

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

## **B. SURVIVAL FACTORS GROUP**

Group Chair Ronald Kaminski  
National Transportation Safety Board  
Washington, D. C.

Group Member John Humm, PhD  
National Transportation Safety Board  
Washington D. C.

## **C. CRASH SUMMARY**

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

## **D. DETAILS OF SURVIVAL FACTORS INVESTIGATION**

The survival factors investigation focused on the interior damage sustained to the 2021 Freightliner box truck, hereafter referred to as truck, and the 2013 Chevrolet Express 4500 (Micro Bird school bus), hereafter referred to as a bus, the sustained injuries, the restraint systems, and the emergency response.

### **1.0 2021 Freightliner Box Truck**

The vehicle was examined at New York State Police (NYSP) Troop B facility and at New York Department of Transportation (NYDOT) facility in Ray Brook, New York, on January 30, and February 1, 2023.

The Freightliner was equipped with three-point lap/shoulder belts in the driver and right passenger seat positions. The vehicle description refers to the left-side (driver-side) and right-side (passenger-side). Vehicle terrestrial laser scanning of the vehicles' interior and exterior were completed jointly by the NYSP and the NTSB.

### **1.1 2021 Freightliner Box Truck Exterior Damage**

The Freightliner sustained extensive damage to the front left bumper corner with contact damage extending past the front-left wheel assembly down the left-side

into the A-pillar, windshield, occupant seating compartment and front-left side of the 24-foot cargo area, as shown in **Figures 1-2**. Contact damage to the front-left bumper corner was 19 inches wide and extended aft 303 inches with contact to driver's A-pillar and driver door. The left-front wheel assembly was deformed aft approximately 33 inches. The wheelbase on the left side was measured at 237 inches with the right side measuring 288 inches (original wheelbase is 270 inches). The passenger side window was broken out by first responders while extricating the driver. The left-side of the windshield was separated from the header and A-pillar with the A-pillar being torn from the roof header. The driver's door panel was peeled back into the B-pillar, with the door window frame displaced downward and rearward. The diesel fuel tank (located on the vehicle left side, behind the driver's door and below the cargo area) was punctured. Measurements and additional damage descriptions are in the *Vehicle Group Chairman's Factual Report*.



**Figure 1.** Front-left view of damage to 2021 Freightliner box truck.



**Figure 2.** Left side view of damage to 2021 Freightliner box truck.

## **1.2 2021 Freightliner Box Truck Interior Damage**

Examination of the interior of the cab revealed extensive damage and intrusion to the driver's seating area of the Freightliner starting at the driver's A-pillar. Intrusion was approximately 3-inches longitudinally at the driver's A-pillar and windshield header and no less than 2 inches laterally through the driver's door panel. The driver's seat was shifted laterally to the right approximately 8 inches. According to the vehicle build sheet, the driver's seat was an air suspension high back with an integral headrest, lumbar, and integrated cushion extension. As shown in **Figures 3-4**, the left-side dashboard and steering wheel were damaged and the driver's seating compartment was intruded from the front and rear.

The truck was equipped with a tilt and telescoping steering column. The interior examination showed there was deformation to the steering wheel at the 1 o'clock sector. The post-crash measurement of the steering wheel was 16.5 X 18 inches (original steering wheel diameter was 18 inches). The lower dashboard at the truck driver's knee level showed scuffing. Examination to the driver's D-ring, latchplate and seat belt webbing revealed visible evidence of usage. The D-ring exhibited a heat abrasion and the webbing above and below the latchplate had a large area of heat



abrasion as shown in **Figures 5-6**. Additionally, the webbing was twisted in the latch plate.



**Figure 3.** Interior view of deformed steering wheel.



**Figure 4.** View of driver seating area.



**Figure 5.** View of loading evidence on latchplate and webbing.



**Figure 6.** View of backside of latchplate.

### **1.2.1 Injuries to Freightliner Driver**

According to the 25-year-old male truck driver's medical records and his interview with the NTSB, he was restrained by his lap and shoulder belt and sustained fractures to his left hip, left leg and right hand and sustained facial lacerations. Seaway Valley Ambulance Unit 845 arrived on-scene at 6:14 a.m. and departed the scene with this patient at 6:35 a.m. arriving at Massena Memorial Hospital emergency room (ER) at 6:52 a.m. and was later transferred to a Trauma facility, SUNY Upstate Medical Center in Syracuse.

## **2.0 2013 Chevrolet Express (Micro Bird school bus)**

The vehicle was examined at NYSP Troop B and NYDOT in Ray Brook, New York on January 30, and February 1, 2023.

The bus was manufactured in two stages. The first stage build was the Chevrolet Express chassis, known in the industry as an incomplete vehicle, or commercial cutaway, which was completed in 2013. The second and final stage build was performed by Micro Bird, Inc. of Drummondville, Quebec, in April 2013 when the Chevrolet chassis was topped with a 16-passenger school bus body. The bus's curb weight was 9,600<sup>1</sup> pounds and had a gross vehicle weight rating (GVWR) of 14,200 lbs.

According to the manufacturer of the school bus body (Micro Bird), FMVSS testing was done on the same model or on a similar model for the following FMVSS standards: 207-*Seating Systems* /210- *Seat Belt Assembly Anchorages* (combined), 217- *Bus Emergency Exits and Window Retention and Release*, 220-*School Bus Rollover Protection*, 221- *School Bus Body Joint Strength* and 222- *School Bus Passenger Seating and Crash Protection*. Some standards were certified by the chassis manufacturer, and Micro Bird relied on that certification as long as they (Micro Bird) complied with the chassis manufacturer's restrictions in modifications Micro Bird can make to the chassis during final manufacture. Micro Bird provided the NTSB successful testing certifications for the six FMVSS's.<sup>2</sup>

The bus was equipped with a three-point lap/shoulder belt and a steering wheel airbag for the driver's seat position. The vehicle description refers to the left side (driver-side) and right side (passenger-side). Terrestrial laser scanning was completed on the interior and exterior of the bus jointly by the NYSP and the NTSB.

### **2.1 2013 Chevrolet Express (Micro Bird school bus) Exterior Damage**

The bus sustained extensive damage starting at the front-left bumper corner and extending down the left-side. The contact damage to the front bumper corner was 6

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<sup>1</sup> Per Micro Bird, Inc.

<sup>2</sup> Survival Factors Attachment: Micro Bird FMVSS Test Certifications with Comments



inches wide and the damage extended aft approximately 182 inches. The front-left wheel assembly was completely torn away from the bus and the left-rear dually wheels were both flattened. The contact damage extended vertically to the driver-side A-pillar and above into the fiberglass front fascia attached to the thin sheet metal roof, as shown in **Figures 7-8**. The windshield on the driver's side was shattered and separated from the header and A-pillar. The driver's door panel was peeled aft and exposed the underlying school bus yellow paint. The driver's door window was displaced. Behind the driver's door, starting rearward of the B-pillar, the 2<sup>nd</sup> stage passenger compartment extended outward approximately 10.5 inches.<sup>3</sup> The passenger occupant compartment sustained integrity loss down the left side of the passenger seating compartment. The integrity loss started behind the B-pillar and measured approximately 5 feet high x 7 feet wide. The roof's rail and roof bows were deformed, and the entire roof sustained a combination of contact (left side) and induced damage. The roof line on the right side was buckle inwards. There was a wheelchair lift door located in the rear portion of the bus on the right side, behind seat row three. The exterior handle for the wheelchair lift door was removed from the inside which made it inoperable. The modification was completed precrash by the LBFNY mechanic.



**Figure 7.** Front-left angle view of damage to 2013 Chevrolet Express bus.

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<sup>3</sup> Measurements are based on an exemplar vehicle available at the carrier's place of business.



**Figure 8.** Left-side view of damage showing integrity loss to passenger seating compartment.

The bus was equipped with five passenger windows on the left-side behind the driver's door window. The right-side had a bi-fold loading door, three passenger windows, and two windows on the wheelchair lift door. The forward window of the bi-fold door was displaced and the opening measured 77 inches tall and 13 inches wide. The left-side driver's door window and all five windows along the left side were displaced. Each side window measured 16 inches wide and 28.5 inches tall. The right-side had three windows with the first two being displaced and they also measured 16 inches wide and 28.5 inches tall. The upper window of the rear emergency exit door was displaced. It measured 29.5 inches wide and 22 inches in height. The window adjacent to the rear emergency exit door on the left-side was displaced and measured 18.5 inches wide and 33 inches in height. The two windows on the wheelchair lift door remained intact.

Sidewall and roof construction and measurements:

- Aluminum sidewall outer layer skin measured between 0.03-0.04 inches thick.
- Rear measured fiberglass 0.085 inches thick.
- Roof exterior skin is aluminum ANSI H35.15052-H44 1.02mm.<sup>4</sup>
- Sidewall aluminum skin (H35.1, 5052-H32 1.02mm) side plate with H8600 glue and 3/16-inch rivets and is connected to vertical pillars with rivets.<sup>5</sup>

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<sup>4</sup> Refer to Micro Bird Build sheet in the docket for this investigation.

<sup>5</sup> IBID

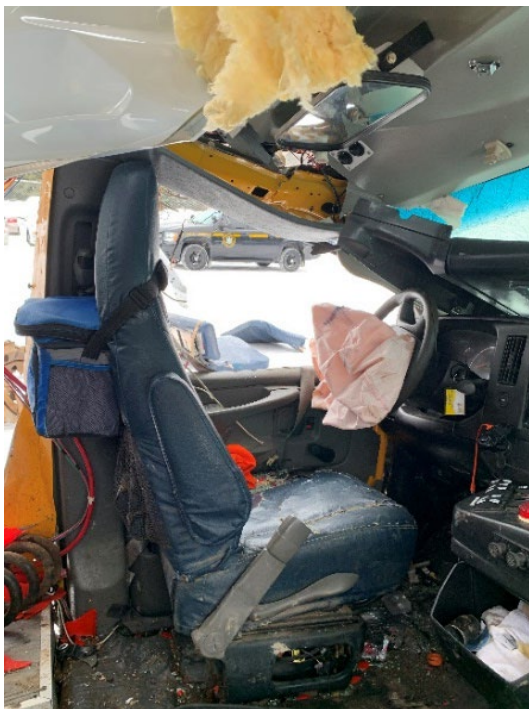
## 2.2 2013 Chevrolet Express (Micro Bird school bus) Interior Damage

The bus interior damage was primarily concentrated to the left-side at the driver door and progressed aft into three of the five rows of passenger seats behind the driver, as shown in **Figure 9**. There were privacy panels behind the driver seat and adjacent to the entry stairs on the right-side in front of the first seat row. At examination, the driver's door was jammed closed and could not open due to vehicle damage. There was minor intrusion of approximately 2 inches, which started at the driver's door and increased aft behind the B-pillar into the left-side seat rows. Subsequently, there was approximately 14 inches of intrusion into the left-side of the passenger compartment which extended aft to row four. Emergency responder cut and removed seat frames and seat backs in row 1-3 on the left side behind the driver. The fourth row on the left-side was shifted laterally to the right as well. The torn sheet metal roof was partially collapsed resulting in vertical intrusion of approximately 30 inches into the passenger seating area directly above rows 2-3 on the left and right side as shown in **Figure 9**.



**Figure 9.** Interior view looking rear to front at intrusion to interior of 2013 Chevrolet Express.



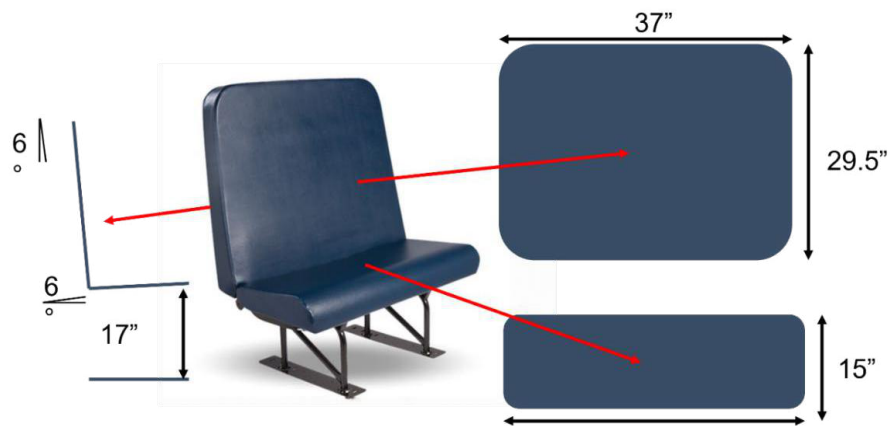


**Figure 10.** View of driver seating area in 2013 Chevrolet Express.

The bus was equipped with an adjustable high-back bucket seat with integral headrest for the driver seat position, as shown in **Figure 10**. Behind the driver seating position were 5 rows of 29.5 inch high-back bench seats on each side. Behind the 5<sup>th</sup> row on the left side the bus was still equipped with the Q'Straint wheelchair tie-downs and lap and shoulder belts which were stored in a bag. The last two rows of seats on the right side were installed by the LBFNY mechanic after the bus was purchased in November 2021. The two seat rows were installed in the area normally left open for the wheelchair lift door operation. The seat manufacturer is unknown. The wheelchair lift mechanism had been removed by the LBFNY mechanic and the wheelchair lift door was secured to the floor with a locking slide bolt and attached to a piece of angle iron that went longitudinally across the door face, forward and aft of the door and made the lift door inoperable. The two seat rows were attached to the piece of angle iron that was spot welded to the exterior side wall and wheelchair lift door. The seat legs were attached to the floor using four tap screws. Post-crash examination showed that both sets of seats remained firmly attached to the floor and sidewall. The three rows of seats forward on the right-side and the five rows of seats on the left-side were original equipment on the bus. Dimensions of the bench seats for the last two right rear seats that were "Add on" seats are shown in **Figure 11** and the original bench seats in **Figure 12**.



**Figure 11.** Dimensions of the "Add-on" passenger seats in the last two rows on the right



**Figure 12.** Dimensions of the originally equipped passenger seats.  
side.

The bus was equipped with emergency window exits that were located on the 2nd window on the left-side and the 3rd window on the right-side. There was an emergency roof exit hatch that was located above the center aisle at row 3. An examination of the roof hatch found it ajar due to induced damage and was not operational. It was labeled as a Specialty Manufacturing Inc. with a 03/11/13 date and part #9247-0300. Examination of the rear emergency exit door showed that it was forcibly pushed open after the crash for occupant egress and was no longer operable.

The driver seat was equipped with a lap and shoulder seat belt attached to the B-pillar. The seat belt was partially retracted, but retained the ability to extend and retract, indicating the vehicle was not equipped with a seat belt pretensioner. The



examination of the D-ring, webbing, and latchplate all showed minor visible evidence of loading. There was some scuffing and a couple small specs of blood or biological matter found on the webbing. The evidence was consistent with previous usage. An examination of the driver's seat belt retractor inertia wheel showed that when pulled forward at a 45-degree angle it would catch only once every 8-10 times. This same test was done on the exemplar bus, and it demonstrated the same results.

The NTSB contacted General Motors (GM) and according to GM, the subject retractor assemblies were validated by Autoliv to meet all FMVSS 209 requirements. GM explained in their response that the subject retractor assembly incorporates an emergency locking retractor (ELR) that is both webbing and vehicle sensitive. FMVSS 209 requires ELRs using vehicle sensing as the primary locking mechanism. The subject retractor assembly incorporated vehicle sensing with a standard ball type feature that automatically locked the seat belt when activated by vehicle acceleration at greater than 0.7 G's.

According to GM, they produced approximately 99,747 2012-2013MY Chevrolet Express HD and GMC Savana HD vehicles with the referenced part numbers between April 11, 2012, and June 18, 2013. A check with the National Highway Traffic Safety Administration's (NHTSA) Office of Defect Investigations (ODI) found no recalls or complaints related to the 2013 Chevrolet Express HD driver seat belt assembly.

The bus was also equipped with three lap belts (maroon, brown, and dark blue) in all seat rows except the two rows on the rear-right (added post manufacturing), as shown in **Figure 13**. Examination of the seat belts found that almost all were pushed between the seat pan and seatback and suspended behind the seats or wrapped around seat legs, as shown in **Figure 14**. There was only one lap belt found to be in use during the collision which was located in the aisle seat of Row 1 behind the driver. The seat belt was found on the seat pan with the webbing of both the latch plate and buckle portions covered in bodily fluids.



**Figure 13.** View of two added seat rows.



**Figure 14.** View of lap belts hanging underneath seats and wrapped around seat legs.

### **2.3 Driver Airbag**

The bus was equipped with an airbag in the steering wheel for only the driver seating position. The crash deployed the driver's airbag. The interior examination showed that the steering wheel was pushed forward into the dash, a measured 4 inches in comparison to the exemplar bus, a clear indication of the driver loading both the airbag and steering wheel. The circular airbag measured about 14 inches in diameter and sustained no damage. There were two 1-inch vent ports on the driver's airbag at the 11 and 1 o'clock position. The airbag examination showed evidence of driver contact to the outside edges of the airbag.

## 2.4 Event Data Recorders

The bus was equipped with an Airbag Control Module (ACM) that had event data recording capabilities. The NYSP removed the driver's seat that was covering the ACM and downloaded the ACM using the direct-to-module methodology. The download was conducted jointly with NYSP and NTSB. The data showed that 2.5 seconds prior to the crash, the bus was traveling at 53-54 mph. The ACM recorded that the Driver's Belt Switch Circuit Status was "buckled", meaning that belt was fastened during impact. For additional information see Docket for this investigation.

## 2.5 New York Seat Belt Law

New York is a "primary enforcement" state. A law enforcement officer can issue a traffic ticket just for failure to wear a seat belt. In the front seat, the driver and each passenger must wear a seat belt, one person per belt. Every occupant, regardless of age or seating position, of a motor vehicle being operated by the holder of a Class-DJ Learner Permit, a Limited Class-DJ, or Class-DJ Driver License must be restrained by a safety restraint. Seat belt usage is not required by passengers in buses other than school buses (seat belt use may be required by the school district).<sup>6</sup> Once the bus was sold from the school district to a private party, it is no longer considered a school bus.<sup>7</sup>

The LBFNY did not have a seat belt use policy, nor did they conduct a pre-trip safety briefing informing their workers to wear their seat belts when being transported in the company bus.

## 2.6 Seating Chart

A seating chart was established based on NTSB investigator interviews of the bus driver and seven passengers. The seating chart is shown below in **Figure 15** gives a schematic of the bus with the seating designations.

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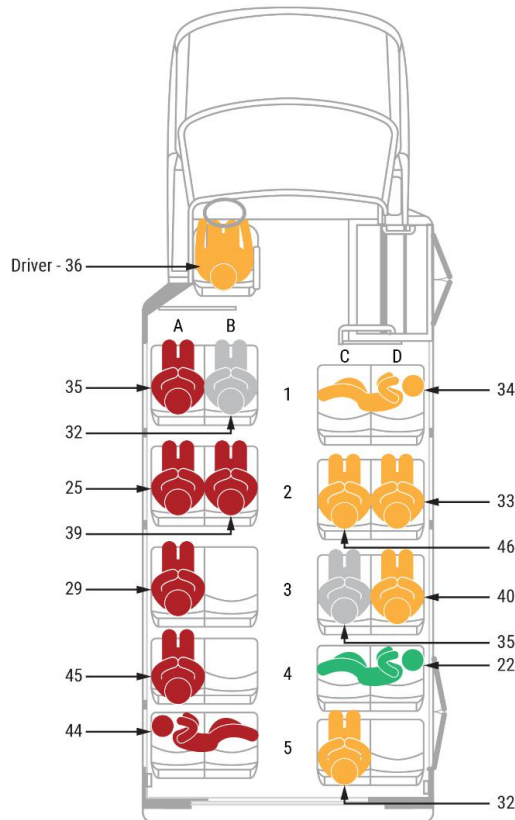
<sup>6</sup> <https://dmv.ny.gov/brochure/new-york-states-occupant-restraint-law>

<sup>7</sup> 49 CFR 390.5 <https://ecfr.io/Title-49/Section-390.5>

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INJURY LEGEND			
■ None	■ Serious		
■ Minor	■ Fatal		
# = Age			

Source: NTSB



**Figure 15:** Schematic of bus seating configuration where Row 1 is the front passenger row (closest to the driver), and Row 5 is the rearmost passenger row by the rear exit door. Seats A and B are on the left-side (driver's side) and C and D are on the right-side. An occupant seated in the center of the seat is designated as either A/B (center left side) or C/D (center right side).

## 2.7 Bus Occupant Injuries

The St Lawrence County Medical Coroner's Office (SLCC) performed a postmortem external examination on the fatally injured bus occupants. Official medical records have been obtained for most of the bus occupants treated at hospitals. A brief description of these injuries is given below and were determined from occupant interviews, patient care reports, and medical records.

Bus Driver - Male, 36-year-old occupant. According to his medical records, he sustained a left wrist sprain, ligament injury to cervical spine with swelling between spinous process at C1-C2, C2-C3, and C3-C4.

Row 1, Seat A - Male, 35-year-old was ejected and fatally injured. The occupant was found supine with the midsagittal plane approximately parallel to the longitudinal axis of the vehicle and pinned underneath the bus's driver-side sill. The superior end of the

torso was under the damaged left front rim of the bus with the super inferior axis towards the rear. External exam demonstrated lacerations to the left arm near the axilla and the left distal forearm. The autopsy revealed that the occupant sustained a complete decapitation and a near amputation of his left distal leg with fractures of the left femur, tibia, and fibula.

Row 1, Seat B - Male, 32-year-old occupant. Fire rescue extricated the patient by removing the entangled seat and cutting the lap belt. Total extrication time was approximately 15-20 minutes. The occupant was unconscious and demonstrated penetrating trauma to the left temporal region of the head. Avulsion of the entire left ear and scalp, small subarachnoid hemorrhage. Seaway Valley Ambulance Unit 843 arrived on-scene at 6:25 a.m. and departed the scene with this patient at 6:40 a.m. arriving at Canton-Postdam Hospital emergency room (ER) at 7:06 a.m. and due to his extensive head injuries, he was later transferred to SUNY Upstate Medical Center in Syracuse.

Row 1, Seat C/D (middle) - Male 34-year-old occupant. According to his interview, he was lying down across the seat prior to the crash.<sup>8</sup> Following the crash, the occupant stated that he was initially pinned to the floor due to the passenger in Row 1 seat B being partially on top of him but was able to self-extricate through the loading door at the front of the bus. The passenger stated he was medically evaluated the next day at SUNY Upstate Medical Center in Syracuse. He reported loss of consciousness, head, neck, and shoulder pain during hospital exam but no other obvious musculoskeletal injuries. Medical records indicate that he was diagnosed with a concussion.

Row 2, Seat A - Male 25-year-old was ejected and fatally injured. Post-crash, the occupant was found supine on the ground with the head near the driver's side B-Pillar. The torso and legs were approximately perpendicular to and directed away from the midline of the vehicle. According to the coroner he sustained cervical fractures, depressed facial fractures, a basilar skull fracture, a left clavicle fracture and comminuted fractures to the left tibia and fibula. He also had a large area of abrasions and lacerations to the right side of his face.

Row 2, Seat B - Male 39-year-old occupant; was fatally injured and on-scene photos show his legs were entrapped between the seatback and the 2<sup>nd</sup> row seat pan. According to the coroner he sustained a nondisplaced left frontal-parietal skull fracture and a large avulsed left scalp laceration. There was no externally visible trauma noted to the torso or extremities.

Row 2, Seat C - Male 46-year-old occupant; Based on his interview, he sustained multiple small glass cuts and had pain and discomfort to his chest and upper back. He

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<sup>8</sup> Refer to Survival Attachment: Passenger Interview Transcripts in Docket for this investigation.



went to SUNY Upstate Medical Center in Syracuse three days post-crash to receive medical evaluation.

Row 2, Seat D - Male 33-year-old occupant; Based on his interview, he was wearing his hardhat at the time of the crash and sustained a small cut to his right hand and had an abrasion to his forehead on the right side. He went to SUNY Upstate Medical Center in Syracuse three days post-crash to receive a medical evaluation.

Row 3, Seat A - Male, 29-year-old occupant; was found entrapped between seatbacks and was fatally injured. According to the coroner he sustained depressed complex fractures of all facial bones and frontal skull with evidence of a basilar skull fracture. Irregular complex abrasions and lacerations to entire face.

Row 3, Seat C - Male, 35-year-old occupant; Based on his interview and medical records, he was initially evaluated in an ambulance at the crash scene and went to the hospital the next day. Medical records indicate he sustained a nondisplaced mid-fibula fracture to left leg and has a swollen left cheek.

Row 3, Seat D - Male 40-year-old occupant; Based on his interview, he sustained a cut to his forehead and chin and complained of pain to his neck. He went to SUNY Upstate Medical Center in Syracuse three days post-crash to receive medical evaluation.

Row 4, Seat A - Male 45-year-old occupant; was found entrapped between seatbacks and was fatally injured. According to the coroner he sustained cervical fractures, multiple mandible fractures, left zygoma (cheek) fracture, left scapula fracture and multiple bilateral rib fractures. Multiple abrasions and lacerations to face and upper left arm.

Row 4, Seat C/D - Male, 22-year-old occupant; According to the occupants interview, prior to the crash he was lying down across the seat. Following the crash, the occupant stated he ended up on the floor and momentarily blacked out and complained of only soreness. This occupant refused treatment on-scene.

Row 5, Seat A/B - Male 44-year-old occupant; was ejected from the bus and was fatally injured. According to the coroner he sustained an extensive craniofacial fracture, a basilar skull fracture, bilateral jaw fractures and brain lacerations. There was no externally visible trauma noted to the torso or extremities.

Row 5, Seat C - Male 32-year-old occupant; Based on his interview, he sustained two large lacerations with stitches to his lower right cheek, and bumps and bruises to his ribs, both shoulders and legs. Seaway Valley Ambulance Unit 845 arrived on-scene at 6:16 a.m. and departed the scene with this patient at 6:35 a.m. arriving at Massena Memorial Hospital ER at 6:52 a.m. and was treated and released.

## **2.8 Occupant Egress**

According to interviews with seven bus passengers, the bus driver and two passengers exited the bus through the bi-fold front-loading doors. Two passengers said they jumped out of the opening along the left-side of the bus. A passenger seated in a window seat in the right 2<sup>nd</sup> row, stated he crawled out of the broken window next to him and he observed two passengers exit using the rear emergency exit door.

## **2.9 Occupant Entrapments**

Interviews with first responders and passengers indicated that four passengers were entrapped and needed to be extricated with one being viable. Entrapped occupants were seated in 1B, 2B, 3A, and 4A. Pre-extrication photographs show the lower limbs of the two deceased being pinned between their seat pan and intruding seatback in front of them and the third stuck partially in the aisle between the 2<sup>nd</sup> row seat pan and the left side seat pan and metal frame that was deformed and shifted from the intrusion, rightward. First responders cut off the three left side seat rows (1, 2, and 3) during the extrication process.

## **2.10 Occupant Ejections**

According to first responders, three passengers were found fully ejected from the bus. One passenger was found deceased near the front-left wheel location (wheel assembly was torn off bus) his torso parallel (head towards front of bus and feet aft) along left-side frame rail. The other ejected passenger was found initially alive, adjacent to the left-side of the bus near the left B-pillar with legs extending away from the midline of the vehicle. The third ejectee was found approximately 8 feet away from the rear emergency exit door in the snow. A good Samaritan pulled the third ejectee to the roadway to administer CPR but realized he was not viable and moved inside the bus to help with survivors.

## **3.0 Crash Notification**

The St. Lawrence County Office of Emergency Services (SLCOES) dispatchers were notified of the crash through the 911 system at 6:02:20 a.m. by an Apple iPhone 14. When the dispatcher answered the call, they wrote in the dispatch logs, *"Accident with no info other than hearing moaning in the background"*.<sup>9</sup> A second call at 6:03:06 was described in the dispatch logs by the dispatcher as coming from "OnStar" (for lack of a better word Dispatcher wrote "OnStar" in dispatch log) with this recorded message, *"the owner of this iPhone was in a severe car crash and is not responding to their phone. Their emergency location is latitude 44. 9015 and longitude -75.0629 with*

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<sup>9</sup> This initial audio call was not included in requested 911 calls.

*an estimated search radius of 5 meters. This message will repeat in 5 seconds”.*<sup>10</sup> During the message you could hear occupants moaning in the background.

The Apple iPhone 14 or Apple Watch Series 8 have feature called, “Crash Detection” and includes the following features:

- an updated gyroscope and accelerometer, which can sense the forces of a severe crash;
- a barometer that can detect pressure changes when airbags deploy;
- a GPS speed sensor that can show rapid deceleration; and
- a microphone that can recognize the sounds typical of a car crash.

The phone will feed all of these inputs into a new crash detection algorithm that’s based on real-world crash data and call 911 if it detects a crash.<sup>11</sup> The iPhone 14 can detect front, side, and rear impacts as well as roll-overs.

When a severe car crash is detected, the iPhone or Apple Watch sounds an alarm and displays an alert for 10 seconds.<sup>12</sup> The iPhone reads the alert in the event that you cannot see the screen. If you have only your phone, the screen displays an Emergency Call slider, and the phone can call emergency services.<sup>13</sup>

If you are able, you can choose to call emergency services or dismiss the alert. In the case of an unresponsive person, once a crash detection is initiated the phone reads the alert out loud, and after 20 seconds if there has not been any response by the individual, the phone will automatically call emergency services.<sup>14</sup>

### **3.1 Emergency Response**

The St. Lawrence County Sheriff’s Office (SLCSO) dispatchers were notified of the crash through the 911 system at 6:02:20 a.m. by an Apple iPhone 14.<sup>15</sup> At 6:03:29 a.m. a 911 caller (former volunteer fireman) reported a “head-on with bus and pick-up truck with 1 male patient ejected and barely breathing”.<sup>16</sup> This was then followed by other 911 callers. At 6:06:47 a caller reported that two other victims appear to be trapped in the bus and were unconscious but were breathing. At 6:07:35 the truck

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<sup>10</sup> The SLCSO dispatcher wrote “OnStar” in the CAD notes however, they later acknowledge that it should have said Apple Notification.

<sup>11</sup> Apple Watch Series 8, Apple Watch SE (2nd generation), and Apple Watch Ultra with the latest version of watchOS.

<sup>12</sup> <https://support.apple.com/en-us/HT213225#:~:text=If%20you%27re%20unable%20to,in%20a%20severe%20car%20crash.>

<sup>13</sup> Emergency calls use a cellular connection or Wi-Fi Calling with an Internet connection from your Apple Watch or iPhone.

<sup>14</sup> <https://support.apple.com/en-us/HT213225>

<sup>15</sup> Refer to Attachment: New York State Police and St. Lawrence County Sheriff’s Department Call Sheet Report.

<sup>16</sup> Refer to Survival Factors Attachment: Witness Interview Transcript in docket for this investigation.

driver called reporting the crash and when asked what type of truck he was in, he stated he was driving a 26-foot box truck. It was at this time that the lead dispatcher dispatched all 8-county fire and rescue agencies initiating a Mass Casualty Incident (MCI) response and contacted the Director of the St. Lawrence County Emergency Management. This declaration dispatched 15 ambulances to the crash scene. Several of the dispatched ambulances were instructed to stage at the Louisville Volunteer Fire (LVFD) station parking lot, which was the designated staging area for this incident.

The first NYSP unit was dispatched at 6:04 a.m. and arrived on scene approximately 19 minutes after being dispatched, followed by a dozen other NYSP units.

**Table 1. Timeline Synopsis**

Dispatch Time	Responding Agency	Apparatus	Arrival Time On-scene
6:02:20 a.m.	Apple iPhone calls into SLCSO dispatch. Sounds from inside the bus.		
6:03:20 a.m.	Apple iPhone calls into SLCSO dispatch with recorded message and location of crash.		
6:03:29	First 911 call into SLCSO dispatch from witness/ good Samaritan		
6:04:28 a.m.	Chief of the Louisville Volunteer Fire Department (LVFD)	Truck used as Command Post (CP)	6:19 a.m.
6:04:28 a.m.	Massena Rescue	Ambulance A212	6:23 a.m.
6:04:34 a.m.	New York State Police	Trooper 2B42	6:23 a.m.
6:04:49 a.m.	Seaway Valley Rescue	Ambulance A844	6:25 a.m.
6:05 a.m.	Waddington Rescue	Ambulance 78WR	6:19 a.m.
6:05 a.m.	Waddington Volunteer Fire Department (WVFD)	Engine 46WF	6:24 a.m.
6:06 a.m.	Madrid Fire Department	Engine 22MF	6:51 a.m.
6:08 a.m.	Massena Rescue	Ambulance A211	6:23 a.m.
6:09 a.m.	Seaway Valley Rescue	Ambulance A845	6:23a.m. Departed to hospital at 6:37 a.m.
6:10 a.m.	Massena Fire Department (MFD)	Engine 71	6:20 a.m.
6:10 a.m.	Norfolk Volunteer Fire Department (NVFD)	Engine 28NF	6:26 a.m.
6:11 a.m.	Seaway Valley Rescue	Ambulance A843	6:25a.m. Departed to hospital at 6:40 a.m.
6:12 a.m.	Norfolk Rescue	Ambulance A141	6:38 a.m.
6:12 a.m.	Madrid Rescue	Ambulance A202	6:38 a.m.
6:12 a.m.	Ogdensburg Rescue	Ambulance 75OR	Staging
6:13 a.m.	Waddington Volunteer Fire Department	Engine	6:46 a.m.
6:14 a.m.	Waddington Rescue	Ambulance	6:46 a.m.
6:16 a.m.	St. Lawrence County Sheriff's Chaplin	Unit 151	6:26 a.m.
6:17 a.m.	St. Lawrence County Sheriff's Deputy	Unit 123	6:48 a.m.

6:20 a.m.	LifeNet Air Ambulance requested	Medivac cancelled	Cancelled due to inclement weather
6:21 a.m.	Potsdam Rescue	Ambulance A262	6:46 a.m.
6:21 a.m.	Waddington Rescue	Ambulance A303	6:38 a.m.
6:22 a.m.	Ogdensburg Rescue	Ambulance A242	6:52 a.m.
6:23 a.m.	LVFD	Rescue Unit	6:52 a.m.
6:31 a.m.	Madrid Rescue	Ambulance A201	6:45 a.m.
6:38 a.m.	Seaway Valley Rescue	Ambulance	6:45 a.m.
6:39 a.m.	Canton Rescue	Ambulance A132	6:45 a.m.
6:46 a.m.	Massena Rescue	Ambulance A214	Staging
7:01 a.m.	St. Lawrence Co Coroner		7:36 a.m.
5:01 p.m.	State highway 37 opened up to traffic in both directions.		

Norfolk Volunteer Fire Department (NVFD) utilized their air lifting bags to stabilize the left side of the bus as first responders extricated the entrapped survivor.<sup>17</sup> Post-crash there were four occupants that were entrapped between seats with only one being viable. Firefighters from LVFD and NVFD extricated the viable occupant. The three remaining entrapped occupants were deceased and extricated upon the completion of the NYS on-scene investigation. Initially, firefighters thought the truck driver was entrapped but were able to remove him through the passenger door and did not use extrication equipment.

The Incident Commander (IC) and the other first responder interviewees indicated that communication between first responders and bus occupants was difficult because of a language barrier.<sup>18</sup> A bilingual occupant on the bus helped translate between the injured occupants and the first responders. A triage area was set-up initially but due to the cold and snowy weather, the injured were quickly moved and evaluated inside of the ambulances that were on scene.

Three Seaway Valley ambulances transported two bus occupants and the Freightliner driver to hospitals in Massena and Potsdam, NY. Due to inclement weather, a medical helicopter that had been requested to respond on-scene was cancelled. One bus occupant was transported to Canton-Potsdam Hospital in Potsdam, NY and was stabilized prior to being transferred to SUNY Upstate University Hospital in Syracuse, NY. The other bus occupant was taken to Massena Hospital in Massena, NY where he was treated and released. The truck driver was also taken to Massena Hospital in Massena, NY and was transferred to SUNY Upstate University Hospital in Syracuse. According to the IC, six bus passengers were evaluated medically and transported in

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<sup>17</sup> Rescue air lifting bags also called rescue air bags are used by fire and emergency rescue personnel to assist vehicle extrication of crash victims and in rescues from small spaces after the collapse of buildings.

<sup>18</sup> Refer to Survival Factors Attachment: First Responder Interview Transcripts in docket for this investigation.



two Waddington Volunteer Rescue ambulances back to the motel the occupants were staying at.

According to the Director of the St. Lawrence County Office of Emergency Services (SLCOES), the morning of the crash they had three people working in dispatch: one call taker, one dispatcher and one law enforcement dispatcher. The supervisor answered the first call. He put the notes up on the big screen that is visible to all dispatchers so they all see the notes and can hear his conversation, so they're dispatching the units simultaneously. Once the exact coordinates of the crash location were obtained, the nearby hospitals were contacted by dispatch to ascertain their availability in accepting injured patients. Some hospitals held-over their midnight shift until it was determined the number of injured occupants being transported to their facility.

The on-scene communication also went well according to the Director of SLCOES. The SLCOES was using an analog conventional system but signed a contract in December 2022 to upgrade the system that went into effect February 2, 2023. The fire operations went to one communication channel and the EMS communications to another. It left their dispatch channel open for communications between the Director, the deputy coordinator, the fire chief and their dispatch. This prevented personnel from speaking over one another and allowed for urgent transmissions to get through.

In total, 15 local and state service agencies responded to the crash scene, including the Director of SLCOES.

**Responding agencies:**

1. New York State Police
2. Louisville Volunteer Fire Department
3. Massena Rescue
4. Massena Volunteer Fire Department
5. Waddington Rescue
4. Waddington Volunteer Fire Department
5. Madrid Rescue
4. Madrid Volunteer Fire Department
6. St. Lawrence County Sheriff's Office
7. Norfolk Volunteer Fire Department
8. Norfolk Rescue
9. Canton Rescue
10. Ogdensburg Rescue
11. St. Lawrence County Office of Emergency Services
12. Seaway Valley Rescue
13. Potsdam Rescue
14. St. Lawrence County Coroner's Office

15. New York State Department of Transportation

According to the Director of the SLCOES, on Monday, January 30, 2023, two days after the crash, they held an After-Action Critical Incident, and stress debriefing which was attended by over 50 first responders from nearly every responding agency from this incident.

Copies of the responding volunteer fire departments Brief Field Incident Reports have been obtained, and the information has been included.

**Treating Hospitals**

Massena Hospital  
1 Hospital Dr.  
Massena, NY 13662  
315-769-4200

Canton-Potsdam Hospital  
50 Leroy St.  
Potsdam, NY 13676  
315-265-3300

SUNY Upstate University Hospital  
750 E. Adams St.  
Syracuse, NY 13210  
315-464-5540

**3.2 St. Lawrence County Office of Emergency Services Mass Casualty Incident Plan**

This crash was elevated to a Mass Casualty Incident (MCI) Level 3 once it was learned that the crash involved a box truck and a bus with injuries and ejections. A copy of the SLCOES MCI and Mutual Aid Plan was obtained.

The SLCOES MCI and Mutual Aid Plan was designed to be used as a tool to help provide an effective rescue and fire service response to an MCI, specifically incorporation of all levels of emergency medical resources including, but not limited to, physicians, nurses, public, and private medical service provider agencies. The plan establishes a systematic organization in order to provide appropriate emergency medical services when a multiple victim incident occurs.

According to the SLCOES MCI and Mutual Aid Plans, an MCI is any medical emergency that overwhelms the normal first response units. It is characterized first by the number of victims and second by a glaring need to streamline all phases of communication during the transport. If the incident is too large or complex to be handled as a multiple casualty incident, the plan can be enlarged to accommodate a mass casualty without any change in the basic structure of the plan.

According to the SLCOES MCI and MAP, mutual aid means the preplanned and organized response of emergency medical services, and other emergency personnel and equipment, to a request for assistance in an emergency when local resources have been expended. The response is predicated upon formal agreements among participating agencies or jurisdictions.

In summary, the SLCOES plan calls for a tiered-response to MCIs such that all mutual aid units, both on stand-by and sent to the scene, are pre-selected and justifiably used. Each rescue district has at least one MCI plan, with some having as many as three. This is a result due to the large districts located in the southern part of the county and numerous units to be utilized in the north. An unconfirmed MCI condition is provided for those incidents that have a potential of large numbers of patients but cannot be confirmed until arrival on scene. This condition puts five to seven units on standby until the responding unit requests an upgrade of the plan.

The MCI first alarm provides for the dispatch of five to seven ambulances to the scene of an MCI, with standby coverage for those units automatically done by the dispatcher. A second alarm request would result in the dispatch of an additional five to seven units to the scene with, again, stand-by automatically done by the dispatcher. Each rescue district has, included in its plan, local hospital information, rescue trucks, and equipment within twenty-five miles.

According to the Director of SLCOES up until the Covid-19 pandemic, they conducted a tabletop disaster or MCI drill every summer. They resumed doing tabletop drills again in 2022.

### **3.2.1 St. Lawrence County Office of Emergency Services**

The St. Lawrence County Office of Emergency Services is located in Canton, NY which is the county seat for St. Lawrence County. St. Lawrence County is the largest county in the state of New York and consists of 42 fire departments and 19 EMS agencies within eight Districts, which are nearly all volunteer departments.

St. Lawrence County Office of Emergency Services consist of four Bureaus.

- 1. Bureau of Communications:** Operates the 911 Public Safety Answering Point (PSAP) and County Communications Center.
- 2. Bureau of Fire:** Provide training opportunities to local responders, support local fire departments, and responding to major incidents involving multiple fire departments within the County.
- 3. Bureau of EMS:** The Bureau of EMS is responsible for assisting in major incidents involving multiple patients and/or fatalities and providing a

smooth flow of information from local hospitals and New York State EMS to local EMS.

**4. Bureau of Emergency Management:** Maintain a high level of preparedness to protect the citizens residing or visiting St. Lawrence County.

#### **4.0 Interviews<sup>19</sup>**

Interviews were obtained from the Chief of the Louisville Volunteer Fire Department (LVFD) and the Incident Commander, who was also the first responder to arrive on-scene. Interviews were also obtained from the two assistant fire chiefs for the LVFD, the Director of the St. Lawrence County Office of Emergency Services and a witness/Good Samaritan that was the first 911 caller. In addition, seven bus passengers were interviewed using an interpreter. All interviews were recorded and transcribed. A copy of all the transcripts can be found in the Docket of this investigation.

#### **E. LIST OF ATTACHMENTS**

- Survival Factors Attachment - Micro Bird FMVSS Test Certifications with Comments
- Survival Factors Attachment - Passenger Interview Transcripts
- Survival Factors Attachment - New York State Police and St. Lawrence County Sheriff's Department Call Sheet Report
- Survival Factors Attachment - Witness Interview Transcript
- Survival Factors Attachment - First Responder Interview Transcripts

Submitted by:

Ronald Kaminski  
Sr. Survival Factors Investigator

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<sup>19</sup> Complete transcripts of all interviews are in the Docket for this investigation.