SURVIVAL FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

Palm Springs, CA

HWY17MH005

(26 pages)

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

SURVIVAL FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

A. CRASH INFORMATION

Location:	Westbound Interstate 10 (I-10) in the vicinity of post mile marker 32.5, Palm Springs, Riverside County, California
Vehicle #1:	1996 MCI Motorcoach
Operator #1:	USA Holiday Inc.
Vehicle #2:	2015 International Prostar Truck in combination with a 2013 Utility 3000 R Trailer
Operator #2:	TSC, Tri-State Collision, LLC
Date:	October 23, 2016
Time:	Approximately 05:16 a.m. Pacific Daylight Time (PDT)
Fatalities:	12 Motorcoach Passengers, 1 Motorcoach Driver
NTSB #:	HWY17MH005

B. SURVIAL FACTORS GROUP

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C. CRASH SUMMARY

The crash involved a 1996 MCI Motorcoach that struck a 2015 Prostar truck tractor in combination with a 2013 Utility 3000 R semitrailer. The truck had been slowing and stopping on the Interstate 10 (I-10) freeway due to utility work in the area. The motorcoach struck the rear of the semitrailer with a high speed differential, causing significant intrusion of the semitrailer into the motorcoach. For a summary of the crash, refer to the *Crash Summary Report* (or *Factual Report of the Investigation*, depending on investigation type) in the docket for this investigation.

D. DETAILS OF THE SURVIVAL FACTORS INVESTIGATION

The Survival Factors Group investigation collected evidence pertaining to the vehicles, the occupants, and the emergency response. The MCI motorcoach, International truck, and Utility trailer were inspected between the dates of October 24 and 30, 2016 at the Mohica Towing vehicle lot, located in Desert Hot Springs, California.

1. MCI Motorcoach

The MCI Motorcoach was a 102D3 series. General information about this motorcoach series was obtained in the MCI 102D Series Maintenance Manual and Coach Specifications; and specific information about the build of this unit was obtained in the MCI Final Vehicle Record.[1] The motorcoach sustained damage primarily to the front end and front half above the passenger floor level, due to intrusion from the semi-trailer.[2] A detailed exterior inspection of the motorcoach is documented in the Vehicle Factors Group Chairman's report, available in the accident docket. The motorcoach had 47 total passenger seats, with 12 rows of two-person seats on the driver side and 11 rows of two-person seats on the passenger side. The last row of seats on the driver side had 3 seats, and the aft corner of the passenger side had a lavatory.

1.1. Driver Seat, Loading Door and Entry Area

Externally, the front of the motorcoach was destroyed, with the dashboard and components forward of the firewall displaced. Various front end components and the loading door were found in the debris pile. The loading area and driver seat floor area were crushed and displaced. The area in front of the driver seat, extending from about the middle of the driver seat inboard was missing. The driver side window consisted of a large upper pane with two smaller panes below. The upper pane had glass that was still in the frame but shattered, and was held in place by the laminate. The two lower driver window panes were intact.

The driver seat was manufactured by National, model 93-B. It was extensively deformed from impact, as documented in photos.[3] The base was deformed about 4 inches aft on the right front corner, and about 2 inches to the left. The front edge of the seat base was dented inward at a location about 5 inches from the inboard edge and 7.5 inches from the outboard edge. The driver seatback was 22 inches high, 20 inches wide, and the headrest was missing. The seat cushion was 16 inches deep and 18 inches wide. The driver seat pan was deformed upward, aft, and into the

[1] Survival Factors Attachment 1: MCI Motorcoach Information
[2] Survival Factors Photos 1, 2, 3, and 4, available in the accident docket.
[3] Survival Factors Photos 5 and 6, in the accident docket.

seatback. There was a dent on the front edge of the seatpan, located 5 inches from the outboard edge. There was blood on the inboard seat frame below the seatpan. The seatback was deformed inward slightly with the frame buckled at locations about 4 inches below the top and at the middle.

The driver seat had a three point restraint manufactured by AmSafe with the upper attachment located on the motorcoach sidewall and the lower attachments on the base of the driver seat. The restraint was found with extensive damage and partially connected the attachment points.[4] The steering wheel was found in the debris pile with extensive deformation from impact.[5]

1.2. Passenger Windows and Emergency Exits

The motorcoach had 7 passenger windows on each side (aft of the driver window on the driver side and aft of the loading door on the passenger side). All of the passenger windows were emergency exits with the exception of the most aft windows on the passenger side. The exit windows were opened by lifting an aluminum bar at the base of the window frame. There were black labels at the bottom of the windows, one near the forward edge and another near the aft edge that read "EMERGENCY EXIT, LIFT THIS BAR, PUSH WINDOW OPEN".

Portions of the motorcoach sidewalls were cut away, which included portions of the window frames. The first two window frames and a section of the sidewall below these windows on the driver side were cut away. It measured approximately 96 inches wide, and was in the vicinity of passenger row 4. The latch for the third window was broken and sections of the frame were cut. The glass for the remaining 4 windows on the driver side was broken away, but the frames and latches were intact and in the closed position.

The first two window frames on the passenger side were cut away. The emergency exit window latches on the third and fourth windows of the passenger side were broken off. The fourth window on the passenger side was intact and partially open. The fifth window frame on the passenger side was cut away. The sixth window glass was broken away, the latch was in place, and the frame was closed. The seventh (last) window on the passenger side, which was next to the lavatory, was not an emergency exit, and was intact.

The passenger side sidewall at the front of the motorcoach was cut away from the front extending to a location just in front of row 3. There were also cuts located below the third passenger window, but with the sidewall panel remaining in place. The cuts below window 3 consisted of horizontal cuts with the top cut approximately 20 inches long and the bottom cut approximately 24 inches long, joined by a vertical cut just forward of the aft window frame of passenger window 3. An additional section of the passenger side sidewall was cut away in a location below passenger window 5 and just forward of the rear wheels. It measured 46 inches wide and 19 inches high from the base of the sidewall panel to the bottom edge of the window. The base of the sidewall floor panel, which had the heating system, was about 10 inches high from the bottom of the floor.

There were two roof hatches. The forward hatch was positioned above and slightly aft of the front axle, and adjacent to the first passenger window. The aft hatch was positioned above axles 2 and 3, adjacent to the 6th passenger window (accurate measurements along the roof were

[4] Survival Factors Photos 7, 8, 9, available in the accident docket.
[5] Survival Factors Photo 10, available in the accident docket.

not possible due to extensive roof deformation and missing sections). A large section of the roof, extending from the front of the motorcoach to the aft of the second passenger windows was cut away and displaced and hanging on the passenger side. This section of roof included the front hatch. The hatch cover was displaced and found in the debris pile. The rear hatch cover was in place and closed.

1.3. Passenger Seats

The front half of the passenger cabin was extensively damaged, with the privacy panels and seats displaced or cut away, and found in the debris pile.[6] The bottom of the luggage racks were 62 inches from the floor and the roof was about 78 inches high. The aisle was 14 inches wide. The seat row pitch (distance from seat to seat) was 32 inches.

The passenger seats were manufactured by National, model 4210-A. Nominal dimensions of the passenger seats were as follows: Cushion Reference Point (CRP) was about 16 inches from the floor; the top of the seatback was about 36 inches from the floor, and the top of the head rest about 42 inches from the floor.[7] The motorcoach passenger seat labels indicated that "the material in this seat as originally manufactured conforms to the recommend the requirements of FMV SS 302 and PQ S – one – 200". A typical seat was measured and provided the following dimensions: the seat cushion was 18 inches wide and 18 inches deep; the seatback was 21.5 inches high and 17.5 inches wide at the widest point and 15 inches wide at the top. There was an adjustable headrest about 10.5 inches wide and 6 inches tall. The passenger seats had folding armrests. The outboard seat attachments were located on the sidewall and under the seat with a floor attachment positioned slightly towards the inboard side of the seat. The floor attachment leg was 17 inches outboard from the inboard edge of the seat and 22 inches inboard from the sidewall attachment. The seat cushion frame was 11 inches from the floor.

The total number of seats parts found inside the motorcoach were as follows: 21 seat cushions, 22 seatbacks, and 19 headrests. The motorcoach had three seats at the back mounted to a wood panel. The seat pan cushions were displaced and missing. The seat position in the last row and next to the lavatory was labeled as seat number 47. There were six rows of seats remaining in the motorcoach on the driver side and two rows of seats in place on the passenger side, with two more rows that were cut and loose in the passenger compartment.

Row 11 on the driver side was disconnected from the aft sidewall attachment, and the nut was missing from the attachment bolt. The driver side row 10 seat was deformed forward on the inboard edge. The seatbacks of rows 8, 9, 10 and 11 on the driver side were all deformed forward. On the passenger side, the outboard seatback of row 11 was deformed forward.[8]

The debris pile outside the motorcoach contained 26 seat cushions, 28 seatbacks, and 22 headrests. There were 13 1/2 full seat frame assemblies found outside motorcoach, The seats found outside the motorcoach had several passenger seat backs that were deformed forward relative to the base of the seat.[9] Five of the seatbacks found on the outside of the motorcoach had local

[6] Survival Factors Photos 11, 12, 13, available in the accident docket.
[7] Cushion Reference Point refers to the point of intersection of the seat back cushion and the seat pan cushion.
[8] Survival Factors Photos 14, 15, available in the accident docket.
[9] Survival Factors Photo 16, available in the accident docket.

deformation that appeared consistent with occupant impact.[10] One of the passenger side seats was found to be crushed aft and inward on the forward and right side of the seat pan. One seat pair had windshield glass and decals from the windshield stuck in between the two seat positions. A pair of seats was found still attached to a cut-away section of the sidewall from the passenger side.[11] There was blood and tissue on the inboard sidewall attachment of this seat.

1.4. Luggage Bins, Passenger Control Units, Video Monitors

The luggage bins were displaced with the mounting frames fractured aft to approximately row 6 on the driver side and row 7 on the passenger side. There were seat labels located on the passenger control units (PCUs). The driver side PCUs were displaced up until the PCU above seats 13 and 14. The next row on the driver side was labeled with seat numbers 17 and 18, which indicated that the seats were numbered from left to right across the full row. The PCUs on the driver side were displaced or partially dislodged up through row 4, and were intact aft of row 4. The forward video monitors on both the driver and passenger sides had been mounted overhead between rows 3 and 4. The forward video monitors were missing. On the driver side there was a video monitor mounted overhead between rows 8 to 9, which is just behind seats 29 and 30, and a similar monitor on the passenger side.

2. 2015 Prostar Truck and 2013 Utility 3000 R Semitrailer

The Vehicle Factors Group Chairman's Factual Report contains a detailed exterior inspection of the 2015 Prostar truck and 2013 Utility 3000 R semitrailer, contained in the accident docket. The exterior of the Prostar truck did not exhibit significant damage. The Utility trailer was extensively damaged at the back.

2.1. Interior

The truck driver area, including dashboard, footwell, and steering wheel did not exhibit obvious crash damage.[12] The truck driver seat was found in the fully aft adjustment position. It was manufactured by National Seating.[13] There was a three-point restraint with the upper mounting point attached to the B-pillar, and the lower mounting points attached to the base of the seat. The seatbelt webbing was labeled Amsafe, part number 80290502, lot 201615, and "conforms to FM VSS 209 and 302". There were no webbing marks found. The inertia reel was functional; the buckle was functional. There were no obvious impact marks on the dashboard, knee bolster, or steering wheel.

The truck driver seatpan was 21 inches wide and 18 inches deep. The seatback had an integrated headrest; it was 29 inches tall and 20 inches wide at the widest point. The head rest portion was about 18 inches above the CRP, and the headrest portion was about 12 inches wide at the top. The seat had folding armrests. The seatback cover had a label indicating "made Max SP 05 21 2013".

[10] Survival Factors Photo 17, available in the accident docket.
[11] Survival Factors Photo 18, available in the accident docket.
[12] Survival Factors Photo 19, available in the accident docket.
[13] National Seating is a division of the Commercial Vehicle Group, Inc.

The seatback was deformed aft to an angle of about 80 degrees from vertical.[14] The seatback was deformed with a fracture point on the right side about 8 inches above the CRP. The seatback frame was fractured on the left side at the Pivot bolt.[15] The portion of the seatback frame that remained attached to the pivot on the right side was upright.

3. Occupant Information

The crash involved the driver of the motorcoach, 42 passengers, and the truck driver. The following sections provide information about the driver and passengers based on autopsy reports or medical records obtained by subpoena. Table 1 summarizes the injury severity for those involved.

Table 1. Injury Table

Injuries[16]	Drivers	Passengers	Total
Fatal	1	12	13
Serious	0	11	11
Minor	1	19*	20
None	0	0	0
Total	2	42	44

*Medical Records for one passenger could not be located. The injury severity for this passenger was classified as minor based on self reported injuries.

3.1. Truck Driver Information

The truck driver was a 50 year old male, and sustained minor injuries. During an interview with NTSB investigators, he indicated that he suffered back strain and contusions from the seat belt. He was treated and released from Eisenhower Medical Center.

3.2. Motorcoach Driver Information

The motorcoach driver was a 59 year old male, who was fatally injured. The Coroner's Case report number 2016-11443 was obtained from the Riverside County Coroner's Office, 800 S. Redlands Ave, Perris, CA 95340. The autopsy indicated that the decedent had a height of 5 foot 8 inches and weight of 230 pounds. The cause of death was multiple blunt force impact injuries.

[14] Survival Factors Photo 20, available in the accident docket.
[15] Survival Factors Photo 21, available in the accident docket.
[16] Title 49 CFR 830.2 defines a fatal injury as: any injury that results in death within 30 days of the accident. A serious injury as: an injury which requires hospitalization for more than 48 hours commencing within seven days from the date the injury was received; results in a fracture of any bone (except simple fractures of the fingers, toes, or nose); causes severe hemorrhages, nerve, muscle, or tendon damage; involves any internal organ; or involves second or third degree burns, or any burns affecting more than 5 percent of the body surface.

A summary of the post mortem examination included multiple abrasions, contusions and lacerations; subdural and subarachnoid hemorrhage; multiple fractures of the calvarium and base of skull; multiple anterior and posterior bilateral rib fractures; fracture of thoracic vertebrae 4; dislocation and fracture of lumbar vertebrae 5; transection of the thoracic aorta; rupture of the pericardial sac; bilateral hemothoraces; bilateral lung and testes contusions; fractures of the right femur, right tibia, right fibula.

The torso included abrasions at the left side of the neck and top of shoulder, and the lower quadrant of the right lower abdomen, consistent with use of the 3 point restraint.

3.3. Motorcoach Passenger Information

The following sections list the passengers according to injury severity. The passenger's age, gender, height and weight, and a summary of the injuries are given. Information about the Emergency Medical Services (EMS) prehospital care is included when available.

3.3.1. Fatal

Passenger 1 was a 66 year old female. The Coroner's Case report number 2016-11430 identified the cause of death as multiple blunt impact injuries. The victim was reported as having been ejected and laying on the ground near the driver's side of the motorcoach. The height was recorded as 64 inches and the weight 178 lbs. A summary of the injuries included blunt impact injuries to the head with multiple abrasions and lacerations, fractures of the mandible and maxilla, subgaleal hemorrhage, atlanto-occipital dislocation, pontomedullary laceration, subdural hemorrhage, subarachnoid hemorrhage; blunt impact injuries to the torso with multiple contusions, fractured sternum, laceration of the heart, multiple rib fractures, laceration of the descending thoracic aorta, right hemothorax; blunt injuries to the extremities with multiple abrasions, open right tibia and fibula fractures, open left 2nd metacarpal fracture, laceration of the left antecubital fossa, mid shaft fracture of the right ulna.

Passenger 2 was a 53 year old female. The Coroner's Case report number 2016-11433 identified the cause of death as multiple blunt impact injuries. The height was recorded as 63 inches and the weight 211 lbs. A summary of the injuries included blunt impact injuries to the torso with multiple contusions, lacerations of the liver and spleen, multiple rib fractures (bilateral 1-11), with puncture of right lung, right hemopneumothorax, T5 thoracic vertebra fracture, an abrasion of the right eyebrow and subgaleal hemorrhage.

Passenger 3 was a 50 year old male. The Coroner's Case report number 2016-11436 identified the cause of death as multiple blunt impact injuries. The height was recorded as 67 inches and the weight 158 lbs. A summary of the injuries included multiple blunt impact injuries to the head, torso, and extremities. There was a frontal bone skull fracture, subgaleal, subdural and subarachnoid hemorrhage; left hemothorax and hemoperitoneum, intimal tears of the thoracic aorta, ruptured pericardial sac and contusion of the heart, contusions and lacerations of the bilateral lungs, lacerations of the liver, multiple fractures including multiple bilateral anterior and posterior ribs, multiple pelvis, the left and right femurs, right tibia and fibula, right humerus.

Passenger 4 was a 62 year old male. The Coroner's Case report number 2016-11438 identified the cause of death as multiple blunt impact injuries. The height was recorded as 66 inches

and the weight 182 lbs. A summary of the injuries included multiple blunt impact injuries with multiple contusions, lacerations, and abrasions; basilar skull fracture; multiple cerebral fractures; fracture of thoracic vertebrae 9 and 10, multiple bilateral anterior and posterior rib fractures; right hemothorax; multiple contusions of the tongue; contusion of the left atrium of the heart; bilateral lung contusions; liver and spleen laceration.

Passenger 5 was a 72 year old female. The Coroner's Case report number 2016-11442 identified the cause of death as multiple blunt impact injuries. The height was recorded as 60 inches and the weight 150 lbs. A summary of the injuries included multiple blunt impact injuries to the head with multiple abrasions, lacerations of the scalp, subgaleal hemorrhage, atlanto-occipital dislocation, subdural hemorrhage, subarachnoid hemorrhage; blunt impact injuries to the torso with multiple contusions, abrasion of the right hip, fractures of the sternum, rib fractures (bilateral 1-11), laceration of the descending thoracic aorta, laceration of the pericardium, lacerations of the heart, fracture of the 11th thoracic vertebral body with transection of the thoracic spinal cord at this level, fractures of the pelvis, lacerations of the liver; blunt impact injuries to extremities with multiple abrasions, laceration of the right hand, laceration of the left thigh, fracture of the right and left femurs, fracture of the left radius and ulna, fracture of the left humerus.

Passenger 6 was a 72 year old female. The Coroner's Case report number 2016-11444 identified the cause of death as multiple blunt impact injuries. The height was recorded as 58 inches and the weight 131 lbs. A summary of the injuries included multiple blunt impact injuries with multiple comminuted skull fractures with avulsed brain matter, thoracic aortic laceration, contusions of the heart and lungs, factures of all bilateral ribs, fractures of the pelvis, dislocation of the right and left clavicles, fracture of the left humerus, fractures of the right and left femurs, and fractures of the left patella, tibia and fibula.

Passenger 7 was a 57 year old female. The Coroner's Case report number 2016-11445 identified the cause of death as multiple blunt force injuries. The height was recorded as 64 inches and the weight 136 lbs. A summary of the injuries included multiple blunt force injuries to the head and neck with abrasions, contusions, lacerations to the left face, open fractures of the maxilla and mandible, subgaleal and subarachnoid hemorrhage, fracture of the hyoid bone; blunt force injuries to the torso with abrasions and contusions to the chest, bilateral hemothoraces, bilateral rib fractures (left 2-12 and right 2-10), sternum fracture, transection of the spinal cord and fracture/dislocation of the thoracic 5th and 6th vertebrae with transection of the underlying spinal cord, fractures of the right pubic and ischial bones, fracture/dislocation of the left sacro-iliac joint, laceration of the left lung, lacerations of the liver, pulpifaction of the spleen; blunt force injuries to the extremities with abrasions and contusions to the right shoulder, right and left forearm and hand and right and left lower legs, fractures to the right radius and ulna.

Passenger 8 was a 63 year old female. The Coroner's Case report number 2016-11446 identified the cause of death as multiple blunt force injuries. The height was not recorded and the weight was 219 lbs. A summary of the injuries included multiple blunt force injuries to the head and neck with laceration and hematoma at the right temple, lateral left tongue contusion; blunt force injuries to the trunk with bilateral pelvis fractures, left retroperitoneal soft tissue hemorrhage, multiple bilateral rib fractures (all left and right 1-10); injuries of the extremities with compound fracture of the right distal tibia and fibula, multiple abrasions and contusions of the legs.

Passenger 9 was a 68 year old female. The Coroner's Case report number 2016-11447 identified the cause of death as multiple blunt impact injuries. The height was recorded as 58 inches and the weight 172 lbs. A blood toxicology analysis was negative. A summary of the injuries included multiple blunt impact injuries with multiple cutaneous abrasions, contusions and lacerations, fractures of the bilateral tibia and fibula, fracture of the left femur and left and right humerus and left ulna and radius.; bilateral subdural and subarachnoid hemorrhage, tear of the mid brain-pontine junction, traumatic separation of the cervical vertebra 2 -3, fracture of thoracic vertebrae 10, bilateral contusions and lacerations of the lungs, contusion and laceration of the heart, multiple lacerations of the spleen, multiple bilateral anterior and posterior fractures of the ribs, sternal fractures.

Passenger 10 was a 69 year old female. The Coroner's Case report number 2016-11448 identified the cause of death as multiple blunt force injuries. The height was recorded as 58 inches and the weight 126 lbs. A summary of the injuries included multiple blunt force injuries to the head and neck with right eye lacerations, contusion and abrasions to the left orbit and left eye, abrasions to the lower right jaw and left chin, avulsion of the right ear, subgaleal and subarachnoid hemorrhage, atlanto-occipital dislocation; blunt force injuries to the torso with abrasions and contusions to the central and right chest, bilateral hemothoraces and hemoperitoneum, fracture of the right clavicle, bilateral rib fractures, fracture/dislocation of the thoracic vertebral column with transection of the spinal cord, bilateral pubic bone fractures and fracture/dislocations of the sacro-iliac joints, lacerations of the heart, transection of the aorta, pulpifaction of the liver, rupture of the bladder; blunt force injuries of the extremities with abrasions to the right arm, fractures of the right humerus and ulna, fracture of the left humerus, contusion abrasions and lacerations to the right hip and leg, open fractures of the right tibia and fibula and femur, open fracture/dislocation of the left talar-tibial joint and open fractures of the left tibia and fibula.

Passenger 11 was a 52 year old female. The Coroner's Case report number 2016-11449 identified the cause of death as multiple blunt force injuries. The height was recorded as 60 inches and the weight 159 lbs. A summary of the injuries included multiple blunt force injuries with transection of the pons-mid brain, thoracic vertebral fracture with visible spinal cord, multiple bilateral rib fractures, pubic symphysis diastasis pulmonary and liver lacerations, fractures of the left clavicle, right ulna and left radius, multiple abrasions on the right side of the body.

Passenger 12 was a 71 year old female. The Coroner's Case report number 2016-11450 identified the cause of death as multiple blunt force injuries. The height was recorded as 64 inches and the weight 180 lbs. A summary of the injuries included multiple blunt force injuries to the head and neck with contusions and abrasions of the face, subgaleal and subarachnoid hemorrhage; injuries to the torso with contusions to the chest, bilateral hemothoraces and hemoperitoneum, fracture of the right clavicle, bilateral rib fractures (left 1-12 and right 3-10), fracture of the sternum, fracture/dislocation of the thoracic 3rd and 4th vertebrae with transection of the underlying spinal cord, fracture of the pubic symphysis, multiple lacerations of the heart, transection of the descending aorta at the arch, pulpification of the liver; injuries to the extremities with contusion to the right hand, fracture of the right humerus, contusions and abrasions to the left forearm and hand and right and left legs, open fractures of the right tibia and fibula, open fractures of the left tibia and fibula.

3.3.2. Serious

Passenger 13 was a 49 year old female and suffered serious injuries. No height or weight was noted in the medical records. A summary description of the injuries provided by the medical records includes a fracture of the medial wall of the right orbit, a nondisplaced fracture af the base of the right nasal bone. She also had contusions to the right and left anterior knees.

Passenger 14 was a 39-year-old female. Her weight was recorded as 175 pounds, and her height was 5 feet 5 inches. A summary description of the injuries provided by the medical records included lacerations of central forehead (5 cm), right upper eyelid (3 cm), and right lower eyelid (3 cm). Her injuries also included concussion, complex facial laceration to the nasal bridge (nasal dorsum, 16 cm, left nasal mucosal laceration, 6 cm) and frontal aspect of the head, acute traumatic comminuted fracture of the bilateral nasal bone fractures, acute traumatic fracture of the nasal spine, acute traumatic fracture of the anterior nasal septum.

Passenger 15 was a 37 year old male and suffered serious injuries. Height and weight were not found in the medical records. A summary description of the injuries provided by the medical records included a right frontal scalp laceration, fractures of the left fourth and fifth lumbar spine transverse processes, contusions of the midline back and left lower lumbar spine, contusions and abrasions to the face and right shoulder.

Passenger 16 was a 56 year old female. Her weight was recorded as 155 pounds, and her height was 5 feet. A summary description of the injuries provided by the medical records included multiple left rib fractures, acute fractures involving the right and left thyroid cartilage with the posterior portion of the right thyroid cartilage displaced and depressed medially. Additionally, there is a depressed fracture of the posterior aspect of the right hyoid bone and a nondisplaced fracture in the posterior aspect of the left hyoid bone and a lower leg abrasion.

Passenger 17 was a 60 year old female and suffered serious injuries. No height or weight was noted in the medical records. A summary description of the injuries provided by the medical records included a fracture of the medial tibial plateau on the right proximal tibia, a scalp laceration at the hairline of the forehead, and forearm contusions.

Passenger 18 was a 57 year old male and suffered serious injuries. His weight was recorded as 190 pounds, and his height was not found in the medical records. A summary description of the injuries provided by the medical records included rib fractures of the right number 1 rib, right anterior 10^{th} rib, posterolateral 11^{th} rib. His injuries also included sternal manubrium fracture, acute fracture of the right transverse process of the L1, L2, and L3 vertebra, and acute fracture of the tibial spine and lateral aspect of medial tibial plateau.

Passenger 19 was a 44 year old male and suffered serious injuries. The medical records noted his height as 5 feet 7 inches and weight was 180 pounds. A summary description of the injuries provided by the medical records included fractures of anterior arch of C1, fractures of C5 and C6 and endplate of T1; subarachnoid hemorrhage; extensive maxillofacial and left orbital injury; respiratory failure.

Passenger 20 was a 53 year old female. Her weight was recorded as 154 pounds, and her height was 5 feet 2 inches. A summary description of injuries provided by the medical records included blunt craniofacial trauma, left frontal scalp laceration, blunt thoracoabdominal trauma, multiple rib fractures on the left 5-8, a grade III splenic injury. In addition, left transverse process fracture at L3, L4, L5, nondisplaced fracture, anterior, inferior vertebral body, right distal anterior humerus laceration, as well as bilateral upper extremity fractures to the right radius and a minimally displaced fracture of the left radial diaphysis, mid distal third aspect.

Passenger 21 was a 56 year old female and suffered serious injuries. Medical records noted a height of 5 feet 3 inches and a weight of 179 pounds. It was noted that she was seated in the middle of the bus and was pinned in her seat from the seat in front of her. A summary description of the injuries provided by the medical records includes left posterior fractures of ribs 10, 11, and 12, right posterior ribs 1, 2, 3, 4, and fractures of the left L1, L2, and L3 transverse process. She also had abrasions and contusions to the right shoulder and right hip.

Passenger 22 was a 60 year old female and suffered serious injuries. The medical records noted her height as 5 feet 3 inches and weight was 142 pounds. A summary description of the injuries provided by the medical records included an acute superior T12 endplate compression fracture with anterior cortical buckle noted, left shoulder strain, right ankle strain.

Passenger 23 was a 65 year old female and suffered serious injuries. The medical records noted her height as 5 feet 3 inch and weight was 140 pounds. A summary description of the injuries provided by the medical records included a left mandibular parasymphysis fracture, a right mandibular ramus fracture, left mandibular subcondylar fracture and submental laceration. She also had abrasions and contusions on both knees, left hand, and right elbow.

3.3.1. Minor and No Injuries

Passenger 24 was a 41 year old female and suffered minor injuries. Height and weight were not found in the medical records. The medical records noted that she was seated on the 4th seat from the front on the driver side of the motorcoach. A summary description of the injuries provided by the medical records included an abrasion with erythema of the right forehead and lateral aspect of orbit, and contusions of the right knee.

Passenger 25 was a 53 year old female and suffered minor injuries. The medical records noted her height as 5 feet 1 inch and weight was 181 pounds. A summary description of the injuries provided by the medical records included a laceration to the tongue and abrasion to the right lower leg, and strain to the right shoulder.

Passenger 26 was a 57-year-old female and suffered minor injuries. The medical records noted her height as 5 feet 2 inches and weight was 120 pounds. A summary description of the injuries provided by the medical records included a contusion of the right ribs, left hip and upper thigh.

Passenger 27 was a 63 year old male and suffered minor injuries. Medical records noted his height as 5 feet 6 inches and weight was 145 pounds. A summary description of the injuries

provided by the medical records included cervical sprain, fractured nose, contusions of the chest, right hip, left arm.

Passenger 28 was a 58 year old male and suffered minor injuries. Medical records noted a height 5 feet 4 inches of and a weight of 130 pounds. A summary description of the injuries provided by the medical records included a right nasal bone fracture, right wrist abrasions and contusions. His medical records indicated that he arrived at 8:05 am and was discharged the same day at 3:58 pm. He denied head trauma and had no loss of consciousness.

Passenger 29 was a 56 year old female and suffered minor injuries. The medical records noted her height as 4 feet 9 inches and weight was 265 pounds. A summary description of the injuries provided by the medical records included contusions of the lower back, pelvis, right lower leg, right upper arm.

Passenger 30 was a 54 year old female and suffered minor injuries. Medical records noted a height of 5 feet 6 inches and a weight of 234 pounds. A summary description of the injuries provided by the medical records included contusions to the right lower leg, right upper abdomen and right arm.

Passenger 31 was a 60 year old female and suffered minor injuries. The medical records noted her height as 5 feet 3 inches and weight was 159 pounds. A summary description of the injuries provided by the medical records included a strain and contusion of the right shoulder.

Passenger 32 was a 76 year old female and suffered minor injuries. Medical records noted a height of 5 feet 4 inches and a weight of 198 pounds. A summary description of the injuries provided by the medical records included a head injury with a left posterior scalp laceration and soft tissue swelling. She also suffered abrasions to the left shoulder and left knee..

Passenger 33 was a 56 year old male. Desert Regional Medical Center reported that there were no medical records for this individual found. The passenger described being injured, treated and released at the medical center.

Passenger 34 was a 45 year old male and suffered minor injuries. The medical records noted his height as 5 feet 9 inches and weight was 220 pounds. A summary description of the injuries provided by the medical records includes abrasions and contusions of the left knee and left elbow.

Passenger 35 was a 26 year old male and suffered minor injuries. The medical records noted his height as 6 feet 1 inches and weight was 203 pounds. A summary description of the injuries provided by the medical records included abrasion of the lip and abrasion of he left upper knee. He was reported to have been sitting in the rear of the motorcoach.

Passenger 36 was a 65 year old male and suffered minor injuries. Medical records noted a height of 5 feet 9 inches and a weight of 185 pounds. A summary description of the injuries provided by the medical records included multiple abrasions over the left and right shins. He complained of headache but had no loss of consciousness.

Passenger 37 was a 38 year old female and suffered minor injuries. Medical records noted a height of 5 feet 5 inches and a weight of 260 pounds. A summary description of the injuries provided by the medical records included a laceration on the left shin, soft tissue injury to the posterior left shoulder. She stated that she struck her head but did not suffer loss of consciousness or headache.

Passenger 38 was a 61 year old female and suffered minor injuries. Medical records noted a height of 4 feet 7 inches and a weight of 139 pounds. A summary description of the injuries provided by the medical records includes She was noted to have arrived into the emergency department at 8:08 am and was discharged at 10:39 the same day. The ED notes indicated that she was seated in the back of the bus. A summary description of the injuries provided by the medical records included multiple superficial abrasions over the following areas: posterior neck and posterior chest was and thoracic spine.

Passenger 39 was a 69 year old male and suffered minor injuries. Height and weight were not found in the medical records. A summary description of the injuries provided by the medical records included contusions on the left arm and abrasions and tenderness to the left shoulder, middle of upper back, and both knees. His medical records indicated that he arrived at 7:36 am and was discharged the same day at 10:36 am. He denied head trauma and had no loss of consciousness.

Passenger 40 was a 74 year old female and suffered minor injuries. Medical records noted a height of 5 feet 1 inch and a weight of 137 pounds. A summary description of the injuries provided by the medical records included a head injury with an abrasion over the right side of forehead and over the right anterior knee.

Passenger 41 was a 62-year-old female and suffered minor injuries. Medical records noted her height as 5 feet 3 inches weight was 115 pounds. A summary description of the injuries provided by the medical records included right leg pain and right forehead abrasion.

Passenger 42 was a 50 year old male and suffered minor injuries. Medical records noted his height was 5 feet 6 inches and weight was 245 pounds. A summary description of the injuries provided by the medical records included an abrasion to forehead, lacerations to calves, and right wrist and shoulder pain.

3.4. Passenger Seating Location

The motorcoach did not have assigned seats. The CHP collected witness statements from passengers.[17] A seating chart was developed based on the available information. Some passengers did not provide specific information regarding the seat, or in some cases there was conflicting information. The seat chart given in Figure 1 represents an estimate of the seating positions given these limitations. The seat chart includes a passenger ID number, which corresponds with the passenger reference numbers given in section 3.2.

[17] Survival Factors Attachment 2: CHP Witness Statements.

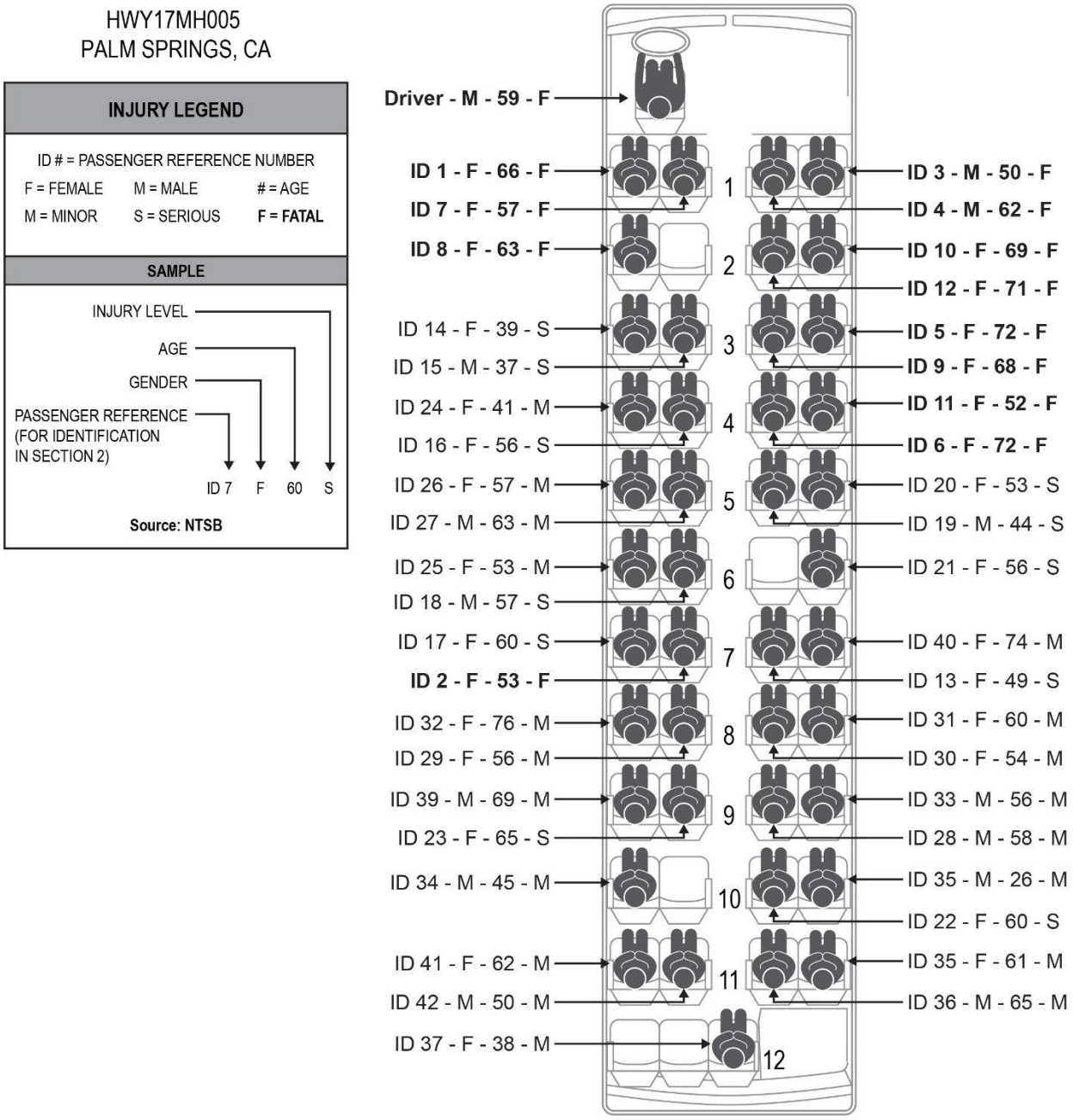

Figure 1: Motorcoach Interior Configuration

4. Federal, State, and County Response Information

4.1. California Highway Patrol (CHP)

The California Highway Patrol (CHP) has primary jurisdiction for the crash. The Dispatch logs were obtained from the CHP Communications Center incident number 161023IC00069.[18] The call was initiated at 5:16:45 am. The first unit was assigned and enroute at 5:18 am, and the first unit arrived onscene at 5:22 am. It was indicated that a truck was involved with a tour bus, and that a fire/rescue response was needed at 5:19 am. All west bound lanes were shut down at 5:29 am, and the request for a coroner response was at 5:31 am. A hard closure of the freeway was requested at 5:34 am. It was noted that extrication operations continued at 6:20 am. Evaluations of the accident vehicles and requests for equipment to remove accident vehicles began at 6:50 am. Operations to remove highway closure started at 3:50 pm. CHP had 36 units assigned.

4.2. Riverside County Sheriff and Coroner's Office

The deceased were taken to the Riverside County Coroner's Office and autopsies were performed at 800 S. Redlands Ave, Perris, CA 95340.

5. Fire/Rescue Information

5.1. Riverside County Office of Emergency Services

The Emergency Services Coordinator provided information to NTSB investigators regarding the response to the crash. He noted the Emergency Operations Center (EOC), located in Indio CA was not used for support of the response because it was not needed.

5.2. Palm Springs Fire Department (PSFD)

The Palm Springs Fire Department (PSFD) had jurisdiction for the crash. The PSFD jurisdiction include a 2 mile stretch of I-10, from N. Indian Canyon Rd on the east extending to Diablo Rd on the west, in which the crash occurred. Most of the region in this area was under the jurisdiction of Riverside County Fire Department, who contracts fire services from Cal Fire. However, some cities in the area had their own fire departments, including Palm Springs and Cathedral City.

The event call came through the Palm Springs Police Department, and was copied at the Fire Department base station.[19] The call was received at 5:20:01 am, units were dispatched at 5:22 am, and first arrived at 5:34 am. The event log noted that two mutual aid engines from Riverside County Fire Department (Cal Fire) were enroute at 5:21 am (refer to section 5.4 for more information). A full response was noted at 5:30 am. The contracted EMS service, American Medical Response (AMR), noted that they were short on units at 5:32 am, and was followed immediately with a request for medic support from Cathedral City, also at 5:32 am (refer to sections 5.3 and 6 for more information). A request for additional resources from Cal

[18] Survival Factors Attachment 4: CHP Incident Report
[19] Survival Factors Attachment 5: Palm Springs PD Event Record.

Fire occurred at 5:34 am. EMS units responding and a request for fire backup coverage for Palm Springs occurred by 5:36 am. AMR noted that they dispatched 3 additional units at 3:36 am. The Incident Commander (IC) was able to view the scene while enroute (from the other side of the highway), and requested additional extrication resources and the availability of air EMS at 5:40 am (refer to section 6.3 for additional air EMS information). The IC arrived on scene and indicated a face to face command at 5:42 am. Extrication operations were occurring at 6:41 am. Communications regarding EMS were occurring between 6:41 am and 8:43 am, at which time all patients were noted as transported. See section 6 for more information regarding EMS operations.

The PSFD response consisted of the Battalion Chief (unit 4430), the Deputy Chief (Unit 4401), 4 Engines (E1, E3, E4, and E5), a truck (T2), and an incident support unit (BS442). All units were staffed with paramedics except the two Chiefs.

The PSFD Chief who was the IC and the Captains of other responding units were interviewed by the NTSB.[20] The Captain of the first arriving Engine, number 443, assumed initial IC, and assigned a Fire Fighter (FF) to estimate the number of injured, and declared a Mass Casualty Incident (MCI). The FF entered the bus and estimated the casualties. The initial IC assigned another FF to Medic Communications. The initial IC directed ambulance parking, and transferred IC to the Chief about 10 minutes after arriving on scene. It was noted that the incident log recorded the transfer at a later time.

The fire fighters used ladders to access the passenger windows of the motorcoach. It was noted that by this time, there were about 2 windows broken out by bystanders. Estimates of how many victims self evacuated ranged from 8 to 20. They noted that it was difficult to break the windows, and that use the emergency egress windows was difficult due to the windows swinging shut. The windows also needed to remain open for ventilation, which was another reason they broke out the glass. They noted that there were about 20 people remaining in the motorcoach, with several who required assistance to evacuate and others who needed extrication. It was noted that space was a problem due to the intrusion of the semi trailer, luggage, and the number of people inside the motorcoach.

It was decided to cut larger access holes in the side of the motorcoach due to the difficulty in lifting walking wounded up to the window level, and having them climb down the ladders. They noted difficulties with cutting the sidewalls. First they tried general purpose saws, which required repositioning trucks for electrical cord access, but these saws were inadequate. They also tried hydraulic cutters, which also did not work well, and resorted to gas powered rotary cutters. These created issues with sparks and smoke. They cut access points down to the floor level of the motorcoach, and this greatly assisted evacuation. They estimated that about 8 or 9 victims climbed down the ladders and about 10 were extricated and lifted out on backboards. There was 1 victim thought to have been ejected, as noted by a CHP officer that described approaching the scene and seeing a victim outside the motorcoach, laying near the driver side front wheel. This victim was triaged as not viable, and was noted as possibly the motorcoach driver.

[20] Survival Factors Attachment 3: NTSB Interviews.

Inside the motorcoach, it was noted that there was no room to manipulate back boards, so victims were handed out the side and onto backboards held outside. Evacuating the motorcoach of walking wounded was necessary to create the space needed for extricating trapped vicitims. Fire fighter fatigue was an issue, with extrication operations going for more than 2 hours. Regarding operations inside the motorcoach, difficulty in cutting the seats out the way was also noted. Various methods were attempted, including cutting the seat mounting point from outside the bus through the sidewall. The PSFD had recently upgraded hydraulic cutting tools from the Hurst MOC[21] to the Hurst JL500[22]. They felt that the older cutter would not have been able to cut the seat attachments. A system was established in which they cut and removed seats and debris out the driver side, while most of the passengers were evacuated from the passenger side.

There were concerns with structural support of the entangled vehicles. They considered trying to separate the semi trailer from the motorcoach to better access victims, but the risks were considered too high for injuring trapped victims. They decided to transport less critical patients while working to extricate the more immediate but trapped patients. This decision was made despite the protocol of transporting the more severely injured first, based on the extended duration required to extricate the severely injured, and the sufficient resources available at that time. They brought in a heavy wrecker and placed straps around the semi-trailer to support it prior to extricating the last 2 viable victims. They noted that the triage area was set up on the north side.

They noted that the medical communications officer was in contact with Desert Regional Medical Center (DRMC), and that they discussed sending some patients to outlaying trauma centers with concerns of overwhelming the DRMC. However, the other trauma centers were a long distance and they ended up with less immediate patients than anticipated, so they were able to send these initial patients DRMC. This kept the ambulances nearby so that they could quickly return to the scene.

The PSFD Battalion Chief was contacted on April 20th, 2016 for an update on communications between the responding agencies following the crash. He indicated that the difficulties and use of the tools for extrication had been discussed, and that they were looking for ways to communicate lessons learned to the responder community. Regarding the air EMS (details provided in section 6.3 of this report), he noted that after the crash he followed up with Riverside County Emergency Command Center regarding the policies for staging air EMS in a crash. He noted that the Riverside EMS Agency (REMSA) Policy Manual does not require patients to be extricated prior to staging air EMS resources. The IC indicated that this issue had been discussed between agencies, and an MCI After Action meeting involving the fire chiefs of the Riverside County agencies was planned.

The current version of the REMSA Policy Manual was found on the Riverside County website.[23] The policy for MCI Scene Management, 3304, Section 5, Patient Transportation, subparagraph h. states in part:

[21] http://www.jawsoflife.com/en/product/5000-psi-moc-combi
[22] http://www.jawsoflife.com/en/product/5000-psi-jl-500-cutter
[23] http://www.remsa.us/policy/

> "During extreme circumstances where ambulance resources are exhausted or where alternative transportation resources, such as buses, will provide the most expedient transport or enhance patient safety, use of those resources are authorized as determined by the IC."

The policy for air EMS, Section 5201, EMS Aircraft Operations, Equipment, and Personnel, EMS Aircraft Operations, Section 8 allows for either EMS or Rescue aircraft to be used depending on the circumstances. Dispatch of EMS Aircraft, Section 1, designates RCFD as the coordinating agency for dispatch of aircraft. No policy was found related to status of patient extrication.

5.3. Cathedral City Fire Department (CCFD)

Cathedral City Fire Department responded via mutual aid. The Cathedral City Police Department Event Record for Event No. 1610C-5266 was obtained.[24] The call was received at 5:33:06 am, the first unit was dispatched at 5:41 am, and arrived at 5:55 am. A request for any available medical units was received at 5:35 am. CCFD engine E411C and medic unit M413C responded to the crash. Medic unit M413C arrived at 5:55 am, and engine 413C was staged at 5:55 am.

The fire crew assisted in rescue operations. The medic unit, M413 was an ALS unit and transported 2 patients to DRMC. The unit was called back to the scene and the FF/Paramedics from the unit assisted with further extrication of survivors, and then helped extricate the deceased.

5.4. Riverside County Fire Department (RCFD) and Emergency Command Center (ECC)

Riverside County Fire Department, contracts to Cal Fire, and provided assistance via mutual aid. They were dispatched by Riverside County Command which operates from the Emergency Command Center located in Perris, CA. The Interagency Report of Incident and Dispatch Action number 16-CARRU 127956 was obtained.[25] The call was received at 5:20:00 am, units were dispatched at 5:21 am, and onscene at 5:57 am. Cal Fire supported the response by providing significant resources through mutual aid.

6. EMS

There were 31 people transported from the scene, 30 of these were motorcoach patients, and 1 was the driver from the truck. Primary EMS services for Palm Springs were contracted to AMR. The operations supervisor for the private EMS company AMR was the triage coordinator. NTSB investigators spoke with the triage coordinator and he noted that all of the AMR units were Advanced Life Support (ALS).[26] The EMS system in Palm Springs used Ready Net system to coordinate local hospitals capability with the EMS transport coordinator. AMR transported 29

[24] Survival Factors Attachment 6: Cathedral City Police Department Event Record.
[25] Survival Factors Attachment 7: Cal Fire Interagency Report.
[26] Survival Factors Attachment 3: NTSB Interviews.

patients and 2 additional patients were transported via mutual aid by Cathedral City EMS. More details of the AMR and Cathedral City EMS response are provided in the sections below.

6.1. AMR

The EMS Incident Detail Report was obtained.[27] The call was received at 5:20:31 am, the first unit was assigned at 5:20 am, enroute at 5:23 am, and arrived at 5:34 am. There were 9 ALS units from AMR that responded, these were 8 from AMR in Palm Springs and 1 from AMR in Hemet. Two of the units made double runs. Information about most of the AMR transports are given in the table 2 below.

Table 2: AMR EMS Response

AMR Case	Unit	Dest.	Patient (Passenger Ref.)	At Scene	Transport	At Dest.
1996 725	5516	JFK	Passenger 26 Standing on scene, green, seated	7:28	7:48	8:18
			Passenger 27 Backboard to Gurney			
1996 679	8101	JFK	Passenger 42 Green, airway seat	5:34	6:11	6:41
			Passenger 29 Green, gurney			
			Passenger 41 Green bench			
1996 728	8109	EMC	Passenger 15 immediate	7:33	7:58	8:23
			Passenger 38 Yellow, jump seat			
			Passenger 28			
1996 685	8110	EMC	Passenger 32 Gurney, yellow	5:41	6:19	6:45
			Passenger 33 Bench, green			
			Passenger 36 Green, jump			
			Passenger 21 Green, bench			
1996 727	8110	DRMC	Passenger 14 yellow, gurney	7:25	7:35	7:43
			Passenger 23 Green, jump seat			
			Passenger 39 Green, bench			
1996 686	8111	na	na	Cancelled		
1996 703	8301	EMC	Passenger 40 Seated in back sleeping	6:53	7:05	7:29
			Passenger 13 Seated in back sleeping standing in triage area			
			Passenger 37 Seated in back, sleeping backboard			
1996 719	8303	EMC	Truck driver Denies LOC, self extricated Captains seat	7:25	7:50	8:07
			Passenger 16 gurney			
1996 709	8432	DRMC	Passenger 30 Bench, yellow	6:53	7:15	7:23
			Passenger 34 Bench, green			

[27] Survival Factors Attachment 8: EMS Incident Detail Report.

			Passenger 24 Bench, green			
			Pasenger 31 Jump seat, green			
			Passenger 19			
1996 711	8437	DRMC	(unknown) female, Code 3	6:50	7:20	7:30
			(unknown) male, Code 3			
1996 686	8111	NA	NA	5:40:11	cancelled	NA
1996 688	8109	DRMC	(unknown) male, gurney, yellow	5:41	6:25	6:36
			Passenger 17 jump seat, green			
			Passenger 35 front seat, green			

6.2. Cathedral City EMS

Cathedral City EMS was contained within the CCFD. They transported 2 people to DRMC in unit Medic 413. The NFIRS report for Medic 413 (without patient information) was provided.[28]

6.3. Air EMS

Information regarding air transport was obtained from PSFD IC and others, as described in this section. An interview with the PSFD Battalion Chief/IC was conducted. He indicated that the PSFD coordinates mountain rescue operations using air support typically from the CHP or the Riverside Sheriff's Office (RSO). EMS transport services, as opposed to air support for mountain rescue, are coordinated through the RCFD. The PSFD does not typically use air EMS transport services due to the small section of highway that is within their jurisdiction, and the close proximity to the trauma center.

Due to the scale of this event, as a precaution, the IC contacted CHP and RSO to check on air support availability. This was done early in the event, prior to having the patients extricated or triaged. The IC noted that he decided to check with CHP and RSO first, even though they are not the regular EMS transport services because: this process was quicker and more simple; the regular air EMS resources were further away, and the EMS process was more complex due to the different types of helicopters available, which included both mountain rescue and EMS.

The CHP and RSO did not have units immediately available. In parallel, the EMS transport coordinator was focused on triage and ground transport. Due to the difficult extrications, they were not able to do a normal triage process, and it was difficult to assess the EMS transport needs. The IC checked availability from CHP and RSO a second time, and found that the estimated time of arrival was long enough that he then pursued the regular EMS air support through RCFD. He noted that he was initially told that they would not send a helicopter until patients were extricated. He felt that they should stage a helicopter on scene as extrication of patients was imminent. Soon after (as shown in the event report below), the IC indicated that

[28] Survival Factors Attachment 9: Cathedral City Medic 413 NFIRS Report.

patients were ready for transport and coordination with RCFD resulted in Mercy Air, a private air EMS company, to dispatch Mercy 5.

The EMS transport coordinator from AMR was interviewed by the NTSB. He noted that air EMS was requested and that a helicopter was dispatched and hovered over site in case it was needed. The helicopter was cancelled by the EMS transportation coordinator due to: delays in extrication of patients, knowledge of which patients were viable, and proximity of the trauma center. The initial triage and identification of patients that needed transport was a challenge due to difficulty of extrication and rescue. There was confusion determining which patients were viable, and which needed to be transported. They found that there were fewer severely injured patients than anticipated, and they tended to be either deceased or without immediate transport criticality. By the time that they were identifying the transport needs, there were ground ambulances available, and the transport time to the trauma center did not warrant the need for air transport.

The log entries related to air support were extracted from the PSFD event report, and consisted of the following:

Time	Entry
5:40:55	request air ship availability
5:51:18	CHP will check
6:02:01	CHP negative for air ship
6:31:47	2nd Request for air ship
6:32:56	CHP air ship not available
6:34:19	I10C advise that if RSO not avail, use Perris
6:34:23	RSO negative airship until 07:00
6:36:30	Negative RSO airship
6:41:35	I10C – start 1 airship to stage, extrication going on
6:46:54	I10C – made contact with medcom, need airship, we have patient
6:49:21	CDF will call back for air ship ETA
6:51:25	Airship will be Mercy5 ETA 39 min, will be using CalCord
7:08:15	Mercy5 – 25 min ETA
7:24:35	Mercy8 updated ETA 8 mins
7:36:21	Confirm request for Mercy, they are overhead and not communicating
7:37:40	Mercy on Calcord and contacting the 10LZ on Calcord
7:39:22	Cancel airship
7:39:55	Calfire advised
7:41:08	Calfire advised cancel Mercy air

Notes:

1. I10C refers communications from the PSFD IC to dispatch.
2. Perris refers to the Riverside County ECC located in Perris CA.
3. CDF is the California Department of Forestry, which is the old designation for Riverside County ECC.
4. CalCord refers to a radio communications channel available to all agencies.
5. 10 LZ refers to the helicopter landing zone established on I-10.

The CHP supervisor for air support was contacted by phone on November 3, 2016. He stated that the CHP was not the normal coordination point for air EMS. He noted that the CHP air EMS group was not staffed from about 2am to 5:45 am, when the aircraft staff started to arrive. That particular morning there was no EMS staff until about 6:30 am, and there was no phone call requesting air EMS support prior to staff arrival. The CHP supervisor noted that he contacted CHP dispatch to determine how the system works, and what happened in this case. He reported that he was told that Cal Fire was the normal dispatch service for air EMS. The CHP dispatcher said that an air EMS request was not typical for the CHP. Their process would be to call the CHP air services, and if no staff answered, they would then for the request to Cal Fire. He noted that the typical request for CHP air support was for support other than EMS, such surveillance. He noted that if a call for these services came in when there was no staff on duty, they would contact staff cell phones.

The CHP supervisor further noted that a crash in that area would not normally use air EMS due to the close proximity of the trauma center, and that a ground ambulance would be quicker. He said that air EMS might be requested to transport patients to outlying hospitals or if they was a shortage of ground ambulances. He was asked about the PSFD request for RSO support, responded that RSO did not provide EMS services, only rescue. He noted that SFO did not have ALS capability, and that other than the CHP air EMS, only private companies offered medical air resources, which were dispatched through Cal Fire. He noted that the pre-hospital oversight was done by Riverside County REMS Authority, and that their protocols were available on their website.[29]

The log entries related to air support were extracted from the CHP event report, and consisted of the following:

Time	Entry
5:51:43	PSFD Bat. Ch. Requests airship
5:52:57	1039 PSFD (request received)
7:36:18	76-S5 Mercy air req to land WB JWO scene / roll san G to west end // 206 FM WB WO HL
7:40:40	A61: WB JWO scene is clear to land
7:46:24	BD-A61 Mercy Air landing on frontage JWO scene
7:46:52	76-S5 Mercy air cancelled and cal fire is handling

A Cal Fire Chief was contacted by phone on November 3, 2016 and asked about air EMS services in the area. He stated that the CHP was the only government agency in Riverside County that had air EMS capability, and all others were private. He noted that the Riverside Sheriff's Office had air capability for rescue operations, but no medical capability. He also noted that RCFD (Cal Fire) also had rescue helicopters and would only transport a patient as a last resort, that they had some medical capability, but were not an air EMS operation. He said that they coordinated the air EMS services for the county; and noted that there used to be 2 private air EMS companies, but now there was only Mercy. Mercy had recently changed their name to Aircom. He said that Cal Fire dispatch coordinated by determining how many patients needed

[29] The Riverside County EMS Agency 2016 Policy Manual is available at http://www.remsa.us/policy/.

transport and what air EMS capabilities were available, then would transfer the response to the appropriate air EMS dispatch.

7. Hospital Information

Patients were transported to 3 area hospitals. The nearest trauma center was Desert Regional Medical Center (DRMC), a level 2 trauma center located in Palm Springs. Patients were also transported to JFK Memorial Hospital (North) located in Indio, and Eisenhower Medical Center located in Rancho Mirage.

7.1. Desert Regional Medical Center (DRMC)

Desert Regional Medical Center received 15 patients. The prehospital triage nurse at DRMC was contacted, and noted that the bed availability was not a problem due to the time of the crash in the morning. She noted that they had 2 beds in the trauma bay as well as 2 others in a designated area. They had 1 patient intubated, and did not require a lot of emergent surgery cases, so all patients were admitted into beds outside the emergency department. They did not see penetrating wounds, but mostly blunt force trauma, orthopedic injuries and some lacerations. One patient had a severe laceration.

The crash occurred before the shift change, and had a tiered system. So they were able to have a few of the off-going staff stay long. The 7am shift was coming in, and they called in the 9am tiered shift early. She noted that they arrived around 7:30 to 8 am. She said the ambulance transport from the scene started about 6:20 am and it was about a 10 minute trip. All the more severely injured patients were transported to DRMC except 2 that initially went to Eisenhower. Of those 2, one was admitted at Eisenhower, and the other was transferred to DRMC.

She noted that Eisenhower was not a trauma center but had good capability including intervention for stroke. JFK was also not a trauma center and lacked capability for stroke, but was able to treat heart attack and was also quite capable. She noted that there were other fatal car crashes that day, but the times of those crashes were different enough that it did not affect their care for this crash. She said that the typical helicopter land and offload time target at the hospital was 5 to 10 minutes, and that flight time to their facility from the crash would have been about 10 min.

She was asked about what went good or bad, she said it went well. She said they did learn about a deficiency with an internal process intended to streamline an MCI event. The process had a special patient ID and an associated folder with blank forms that was intended to allow them to bypass the electronic system if it went down. When they tried this system, they found that the registration side of the hospital could not pull up the special trauma numbers, and so they had to revert back to the regular trauma numbering system. At the time of the interview, they had already performed an after action meeting and addressed lessons learned from the event.

7.2. JFK Memorial Hospital (JFKMH)

John F. Kennedy Memorial Hospital, located at 47111 Monroe St., Indio, CA 92201, received 5 patients. Most were minor injuries but included a few more seriously injured.

7.3. Eisenhower Medical Center (EMC)

Eisenhower Medical Center, located at 39000 Bob Hope Dr., Rancho Mirage, CA 92270, received 11 patients. All 11 patients had minor injuries and were treated and released.

E. DOCKET MATERIAL

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

LIST OF ATTACHMENTS

Survival Factors Attachment 1: MCI Motorcoach Information

Survival Factors Attachment 2: CHP Witness Statements

Survival Factors Attachment 3: NTSB Interviews

Survival Factors Attachment 4: CHP Incident Report

Survival Factors Attachment 5: Palm Springs PD Event Record

Survival Factors Attachment 6: Cathedral City Police Department Event Record

Survival Factors Attachment 7: Cal Fire Interagency Report

Survival Factors Attachment 8: EMS Incident Detail Report

Survival Factors Attachment 9: Cathedral City Medic 413 NFIRS Report

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Survival Factors Photograph 2 – Motorcoach Front and Driver Side

Survival Factors Photograph 3 – Motorcoach Forward Portion of Passenger Side

Survival Factors Photograph 4 – Motorcoach Aft Portion of Passenger Side

Survival Factors Photograph 5 – Motorcoach Driver Seat, Front

Survival Factors Photograph 6 – Motorcoach Driver Seat, Side

Survival Factors Photograph 7 – Motorcoach Driver Restraint Buckle

Survival Factors Photograph 8 – Motorcoach Driver Restraint Upper Attachment

Survival Factors Photograph 9 – Motorcoach Driver Restraint Overview

Survival Factors Photograph 10 – Motorcoach Steering Wheel

Survival Factors Photograph 11 – Motorcoach Privacy Panel Front

Survival Factors Photograph 12 – Motorcoach Privacy Panel Back

Survival Factors Photograph 13 – Motorcoach Interior Front Portion

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Survival Factors Photograph 16 – Motorcoach Deformed Passenger Seat

Survival Factors Photograph 17 – Motorcoach Passenger Seat with Impact

Survival Factors Photograph 18 – Motorcoach Passenger Seat Attached to Sidewall

Survival Factors Photograph 19 – Truck Driver Area

Survival Factors Photograph 20 – Truck Driver Seat

Survival Factors Photograph 21 – Truck Driver Seatback

END OF REPORT

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