



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**



DOT HS 813 517

October 2023

**Special Crash Investigations:
Remote Move-Over-Law Crash
Investigation;
Vehicle: 2004 Jeep Grand Cherokee;
Location: Pennsylvania;
Crash Date: July 2021**

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Suggested APA Format Citation:

Crash Research & Analysis, Inc. (2023, October). *Special Crash Investigations: Remote move-over-law crash investigation; Vehicle: 2004 Jeep Grand Cherokee; Location: Pennsylvania; Crash Date: July 2021* (Report No. DOT HS 813 517). National Highway Traffic Safety Administration.

Technical Report Documentation Page

1. Report No. DOT HS 813 517	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Special Crash Investigations: Remote Move-Over-Law Crash Investigation; Vehicle: 2004 Jeep Grand Cherokee; Location: Pennsylvania; Crash Date: July 2021	5. Report Date October 2023		6. Performing Organization Code
	7. Author Crash Research & Analysis, Inc.		8. Performing Organization Report No. CR21019
9. Performing Organization Name and Address Crash Research & Analysis, Inc. PO Box 302 Elma, NY 14059	10. Work Unit No. (TRAIS)		11. Contract or Grant No. 693JJ919C000004
	12. Sponsoring Agency Name and Address National Highway Traffic Safety Administration 1200 New Jersey Avenue SE Washington, DC 20590		13. Type of Report and Period Covered Technical Report
14. Sponsoring Agency Code			
15. Supplementary Notes Each crash represents a unique sequence of events, and generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicles or their safety systems. This report and associated case data are based on information available to the Special Crash Investigation team on the date this report was submitted.			
16. Abstract This report documents a Move-Over-Law crash that involved a 2004 Jeep Grand Cherokee that drove onto the shoulder of a highway and struck three firefighters and a 2017 Nissan Altima disabled from a previous crash. A State Police officer was struck by one of the firefighters. A large fire truck and a marked police vehicle were on scene with the emergency lights activated at night. A 48-year-old male firefighter was fatally injured, while the other two firefighters and the State Police officer sustained incapacitating (A-level) injuries. The 63-year-old Jeep driver was not injured.			
17. Key Words Move-over law, firefighter, fatality, non-motorist		18. Distribution Statement This document is available to the public from the USDOT, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, crashstats.nhtsa.dot.gov .	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 23	22. Price

Table of Contents

Background	1
Move-Over Law	2
Summary.....	3
Crash Site	3
Pre-Crash.....	3
Crash	5
Post-Crash.....	6
2004 Jeep Grand Cherokee	7
Description	7
Exterior Damage	7
Interior.....	8
2004 Jeep Cherokee Safety Inspection	8
2017 Ford Explorer.....	10
Exterior Damage	10
2017 Nissan Altima	11
Non-Motorist Data	12
Firefighter #1 Demographics	12
Injuries	12
Kinematics	13
Firefighter #2 Demographics	14
Injuries	14
Kinematics	14
Firefighter #3 Demographics	15
Injuries	15
Kinematics	15
Police Officer Demographics.....	16
Injuries	16
Kinematics	16
Pre-Crash Diagram.....	17
Crash Diagram: Post-Crash.....	18

Special Crash Investigations
Remote Move-Over-Law Crash Investigation
Case Number: CR21019
Vehicle: 2004 Jeep Grand Cherokee
Location: Pennsylvania
Crash Date: July 2021

Background

This remote investigation documents a Move-Over-Law crash of a 2004 Jeep Grand Cherokee that drove onto the shoulder of a highway at night and struck three firefighters and a 2017 Nissan Altima disabled from a previous crash. A police officer was subsequently struck by one of the firefighters. A large fire truck and a marked police vehicle were on scene with the emergency lights activated. A 48-year-old male firefighter, identified as Fighter # 1 in this report, was fatally injured, while the other two firefighters, identified as Firefighter #2 and Firefighter #3 in this report, and the police officer sustained incapacitating (A-level) injuries. The 63-year-old female Jeep driver was not injured. She was initially charged with a driving under the influence violation; however, that was changed to third-degree homicide by vehicle, four counts of aggravated assault by vehicle, nine counts of recklessly endangering another person, reckless driving, and related charges. She was jailed, awaiting trial at the time of the SCI investigation.

The National Highway Traffic Safety Administration became aware of the incident via news media reports. NHTSA's Crash Investigation Division assigned this crash as a remote investigation to the Special Crash Investigations (SCI) team at Crash Research & Analysis, Inc., in July 2021. The criminal complaint and an in-car dash cam video from the police vehicle were obtained by NHTSA. The SCI team contacted the police reconstructionist for data pertaining to this crash; however, due to the ongoing criminal aspects of this case on-scene images and additional police reports were not available at the time of the investigation. The SCI team analyzed the dash cam video and criminal complaint which provided the basis for this technical report. Additionally, the SCI investigator was able to photograph the Jeep and the Nissan.

Move-Over Law

Pennsylvania's Move-Over Law requires a motorist approaching an emergency response area to move over at least one lane farther away. Motorists unable to safely merge into a lane farther away from the emergency response area are required to slow to a travel speed no more than 20 mph below the posted speed limit. An emergency response area is where an emergency vehicle has its lights flashing, or where road crews or emergency responders have emergency lighting, lighted flares or posted signs in place to try to warn approaching traffic. The law was first enacted in 2010 and has been revised several times. Fines and a point system for violations were added in 2020 with an effective date of April 2021.

Summary

Crash Site

The crash occurred at night on a four-lane, divided interstate highway. At the time of the crash, the National Weather Service reported the temperature at 21.1°C (70°F) with 65 percent humidity and no wind. The interstate had two lanes in both eastbound and westbound travel directions divided by a concrete median barrier. This crash occurred in the westbound lanes. Both travel lanes were approximately 3.6 m (12 ft) in width and were bordered by paved shoulders. The left (south) shoulder was approximately 0.5 m (1.5 ft) wide while the right (north) shoulder was approximately 3.6 m (12 ft) wide. A rumble strip was cut into the right shoulder at the edge of the travel lane. The lanes were delineated by a broken white lane line with a yellow edge line denoting the edge of the left travel lane and a white edge line marking the edge of the right travel lane. All paved surfaces were bituminous. At the location of the crash and the immediate approach to the crash site, the travel lanes were straight and level. The distant approach consisted of a right curve for westbound traffic that ended approximately 1.3 km (0.8 mi) east of the crash location. The posted speed limit was 89 km/h (55 mph).

Located at the crash site due to a previous crash were two fire trucks, one parked diagonally, blocking the right shoulder and the right travel lane, with the second parked forward, blocking the right travel lane. Both units had their emergency lights activated. A disabled 2017 Nissan Altima was parked on the right shoulder forward of the second fire truck. The other vehicle from the previous crash, a 2017 Chevrolet Malibu was parked on the right shoulder approximately 30 m (100 ft) ahead of the Nissan. A marked police 2017 Ford Explorer was parked in the right lane adjacent to the Nissan with its overhead emergency lights activated. Eight firefighters were present at the scene in various locations and both police officers were outside the vehicle conducting the investigation of the previous crash.

Pre-Crash

The 63-year-old female Jeep driver was claimed to be lost as she attempted to return to her residence in New Jersey. She stated to the investigating officer that she had an appointment during the afternoon hours prior to this nighttime crash. The police investigation determined she was stopped by officers from three different police agencies during a 2.5-hour period prior to the crash. The first traffic stop was for driving without headlights. She told the officer she was lost. He gave her directions and a warning. The driver was again stopped for an inoperable brake light. She again told the officer she was lost and was given directions and a warning. The driver was stopped for the third time for no license plate light; two of the three brake lights were inoperative in addition to traveling 16 km/h (10 mph) over the speed limit. She again complained to the officer about being lost; she was given directions and a warning.

The driver also told police she knew the brakes on the Jeep were faulty and she stated in a subsequent police interview that she drove accordingly to compensate for poor brakes. She further stated that since she was lost, she tried to get a hotel room, but was unsuccessful. In lieu of a hotel, she stated to the police that she stopped and purchased a soft drink and a bottle of liquor. The driver poured some of the liquor in the soft drink container and continued to drive, police said.

The previous front-to-rear crash occurred in the westbound lanes of the interstate. Both drivers stopped their vehicles on the right shoulder. The 2017 Chevrolet Malibu with likely frontal damage stopped approximately 30 m (100 ft) ahead of a 2017 Nissan Altima that had sustained damage to the back of the vehicle. The emergency response network was notified and responded to this prior crash.

Large fire trucks from two local volunteer fire departments arrived on scene, a 2017 Pierce Velocity fire truck and a 2008 Seagrave Marauder firetruck. The Pierce fire truck pulled up and stopped in the right lane approximately 6 m (20 feet) behind the disabled Nissan parked on the right shoulder. The Seagrave fire truck pulled up approximately 9 m (30 feet) behind the Pierce at an angled protective position to the scene with the rear blocking the right shoulder and the front blocking the right lane. Three orange traffic cones were placed approximately 3 m (10 feet) apart between the front of the Seagrave and the left back corner of the Pierce. The back of the Pierce fire truck was marked with red and yellow conspicuity tape on each side of a rear roll-up door that was open. The back had seven separate lights on each side of the door consisting of red, yellow, and white. The red lights were in flashing mode at the time of this crash. Overhead emergency lights were also activated. Figures 1 and 2 are approach views of the fire trucks at the scene prior to this crash as viewed by the police in-car camera. Crash diagrams showing the overall crash site and sequence of events are included at the end of this report.



Figure 1. Westerly view of the fire truck blocking the right lane and shoulder of the interstate. Image obtained from the police in-car dash cam.



Figure 2. Westerly view of the positions of the fire truck, traffic cones, and the firefighters. Image obtained from the police in-car dash cam.

A marked 2017 Ford Explorer police vehicle with two officers responded to the call, arriving with active emergency lighting. The State Police trooper who drove the vehicle stated that the emergency lights on the fire trucks were visible for over 1.2 km (0.75 mi). As they arrived on scene, the officer parked the Ford in the right travel lane adjacent to the position of the Nissan and forward of the Pierce fire truck. With the officers present on scene, the Seagrave fire truck was released from the scene and the vehicle departed westbound. The two officers, carrying flashlights, exited the Ford and walked along the shoulder to the Chevrolet Malibu. The police were wearing standard uniforms but not reflective vests. The female officer walked to the driver side as the male officer walked with the Nissan driver back to his vehicle. The Nissan driver then entered his vehicle and the police officer was positioned adjacent to the Nissan's left B-pillar area. Firefighters #2 and #3 walked back from the Chevrolet toward their fire truck. Both were wearing firefighter turnout pants with reflective bands around the ankles and reflective safety vests. Firefighter #2 was wearing a helmet. Other firefighters, including Firefighter #1, were positioned in and around the Pierce fire truck on the right shoulder.

At some point, the Jeep driver entered the westbound lanes traveling in the opposite direction of her intended destination. Prior to the Jeep's approach to the previous crash site, some firefighters returned to the Seagrave fire truck and departed the scene, leaving the Pierce fire truck blocking the right lane. Based on the police in-car camera, the Seagrave truck departed approximately 48 seconds prior to this crash. The firefighters assigned to the Pierce fire truck were standing on the right shoulder between the truck and the concrete barrier. The Nissan remained parked and disabled on the right shoulder.

The Jeep driver told the police that as she approached the previous crash site, she thought the roadway split; therefore, she drove over the rumble strips and onto the right shoulder to keep right. She estimated her speed at 64 km/h (40 mph).

Crash

The front of the Jeep struck three firefighters on the right shoulder. Firefighter #1 was struck presumably by the center front area of the Jeep (Event 1) and was carried and thrown forward as the Jeep continued forward on the shoulder. Firefighter #2 was struck presumably by the front left aspect of the Jeep (Event 2) and thrown forward into the back of the parked police Ford Explorer (Event 3). Contact with the Ford caused damage to the trunk deck and the rear bumper fascia. Firefighter #3 was presumably struck by the front right aspect of the Jeep (Event 4) and was displaced to the right. As the Jeep continued forward, the full front area struck the full width of the back of the disabled Nissan in a 12/6 o'clock impact configuration (Event 5). The impact locked the front wheels of the Jeep as it skidded a police-reported distance of 9.1 m (30 ft) to final rest, pushing the Nissan forward and into the view of the police dash cam.

The struck Firefighter #1 was thrown into the police officer who was standing adjacent to the Nissan. This occurred as the Jeep displaced the Nissan forward along the right shoulder. The police officer was displaced forward and knocked to the pavement before coming to rest on his back at the edge of the right westbound travel lane. The firefighter tumbled to final rest in a face-down position, straddling the right white edge line. This was captured by the police dash-cam as the Jeep remained fully engaged with the Nissan to final rest.

Post-Crash

The dash cam also captured the following sequence of actions. The female police officer ran back along the right lane to check the status of her fellow officer. A male firefighter ran to check the status of the struck firefighters. The police officer radioed for additional assistance and medical support.

The Jeep driver exited her vehicle. She was observed wearing a cast on her left forearm from a previous injury. It was stated in the police investigation that she poured the soft drink container on the ground to dispose of the alcoholic mixture. She was not injured.

2004 Jeep Grand Cherokee

Description

The 2004 Jeep Grand Cherokee Laredo was identified by the Vehicle Identification No. (VIN) 1J4GW48S34Cxxxxxx. It was a 4-door SUV with unibody construction. Power was provided by a 4.0-liter, 6-cylinder gasoline engine linked to a 4-wheel drivetrain with a 4-speed automatic transmission. The service brakes were 4-wheel disc with ABS and electronic brakeforce distribution. Originally, the Jeep was manufacturer-equipped with P225/75R16 tires mounted on alloy wheels. At the time of the crash, the Jeep had mismatched tires. The vehicle's odometer at the time of the crash was 295,205 km (183,437 mi).

The interior seated five occupants with front bucket seats and a three-passenger second row seat. All seating surfaces were cloth. The front and second row outboard positions had adjustable head restraints. Safety systems included manual 3-point lap and shoulder seat belts for the four outboard positions and a center rear lap belt. The front belt systems had retractor pretensioners. Supplemental restraint was provided by dual-stage frontal air bags for the driver and right-front passenger. Both air bags deployed in this crash.

Exterior Damage

The front of the Jeep sustained damage from impacts with three people (Events 1, 2, and 4) and the back of the Nissan (Event 5). The three impact events with the firefighters involved the front of the Jeep and probably the front bumper and hood. Although not supported by residual damage due to the subsequent Event 5 impact, these impacts were probably distributed across the front with the following estimated Collision Deformation Classifications (CDC):

	Object Struck
Event 1 – 12FCEN1	Firefighter #1 (48 years old)
Event 2 – 12FLEN1	Firefighter #2 (22 years old)
Event 4 – 12FREN1	Firefighter #3 (17 years old)

The Event 5 impact masked the damage that resulted from the first three events (Figures 3 and 4). The Jeep struck the back of the parked and disabled Nissan on the right shoulder of the interstate. The damage was distributed across the full width of the Jeep's front and involved the bumper, grill, headlight assemblies, hood, and the left front fender. The bumper beam was crushed rearward approximately 15 cm (6 in) and the hood face was displaced 15–20 cm (6–8 in) rearward. The 12 o'clock direction of force impact from Event 5 resulted in a CDC of 12FDEW1.



Figure 3. Frontal damage to the 2004 Jeep Grand Cherokee



Figure 4. Front right oblique view of the frontal damage to the 2004 Jeep Grand Cherokee

Interior

The interior was not damaged by exterior deformation or occupant contact. There was no intrusion of interior components. The driver seat belt system displayed historical usage that included wear marks on the latch plate and edge fraying of the webbing. Both the driver and passenger frontal air bag deployed, the driver's from the steering-wheel-mounted module and the passenger's from a mid-mount module. There was no damage or evidence on the driver's frontal air bag.

2004 Jeep Cherokee Safety Inspection

A certified auto mechanic conducted a post-crash inspection at the request of the investigating police officer. The mechanic's overall assessment of the vehicle was that it was in poor condition. According to the reports, these were some of the findings.

- The body and undercarriage were rusted.
- Several rust holes were present in the vehicle's hood.
- The undercarriage was rusted with additional areas of rust-through of the unibody frame.
- His inspection found the Jeep's brakes to be defective.
- The master cylinder reservoir was nearly empty of brake fluid. There was no resistance when depressing the brake pedal.

- The front brake line had burst due to rust and corrosion.
- He stated the front brake pads were worn unevenly, indicating caliper piston issues. The inner pads were glazed from overheating and the inner pad at the right front had separated from the backer plate.
- The left rear outer disc brake pad was completely worn away.
- The caliper bracket was rubbing on the rotor that measured 2.5 mm (.099 in) in thickness.
- The piston in the left rear caliper was dislodged from the bore within the caliper. This alone caused the brake fluid for the rear brakes to completely leak out.

The mechanic's overall assessment was that the Jeep had minimal braking long before this crash. Only the front brakes provided a limited braking force due to their poor condition.

In her statements to the police, the driver reported that she was aware that the brakes were in poor condition. She added that she adjusted how she drove the vehicle so she could stop.

2017 Ford Explorer

The 2017 Ford Explorer was a marked Pennsylvania State Police vehicle. It was not inspected, and images of this vehicle were not made available. The vehicle was a gray 4-door SUV, with an emergency light bar mounted to the roof at the location of the B-pillars. The light bar was activated at the time of this crash with laterally alternating blue and red LED lights. In addition to the overhead lights, a laterally alternating light bar was mounted at the backlight of the rear lift gate. Reflective tape markings were present on the sides and back. Due to its parked position in front of the fire truck, its emergency lights were not directly visible to approaching westbound traffic.

Exterior Damage

Although the Ford was parked on the right travel lane forward of the fire truck, its back was struck by Firefighter #2 (Event 3) as he was thrown forward following impact by the Jeep. The damage was minor in severity and included a dent to the rear lift gate, bending of the license plate, and an abrasion to the rear bumper fascia. The estimated CDC for this Event 3 impact was 06BCEN1.

2017 Nissan Altima

The Nissan Altima disabled from a previous crash was parked on the right shoulder at the time of this crash. The back of the Nissan sustained an unknown extent of damage. The Jeep subsequently struck the back of the Nissan (Event 5, Figures 5 and 6) following its impacts with the three firefighters. The Nissan sustained additional damage of a greater severity than its previous crash. This impact crushed the bumper beam approximately 15 cm (6 in), separated the bumper fascia, crushed both quarter panels forward with induced damage extending into the upper D-pillars, jamming the rear doors closed. The trunk lid, that was previously opened, was crushed further forward into the backlight, disintegrating the glazing. The estimated CDC for this Event 5 damage was 06BDEW4.

The Nissan driver was seated at the time of the crash. He responded to the 6 o'clock direction of force, loading and deforming the seatback rearward. He was not injured in this crash.



Figure 5. Back damage to the Nissan Altima following the Event 5 crash with the Jeep



Figure 6. Back right view of the Event 5 damage to the Nissan

Non-Motorist Data

Firefighter #1 Demographics

Age/sex: 48 years/male
 Height: 188 cm (74 in)
 Weight: 132 kg (291 lb)
 Alcohol/drug involvement: Negative for alcohol or drugs
 Transport from scene: Ambulance to level 1 trauma center
 Medical treatment: Died 3 hours after crash

Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Components (IPC)	IPC Confidence Level
1	Subarachnoid hemorrhage to base of brain, NFS	140210.5	Isolated IPC Exterior of Other Motor Vehicle – Front bumper	Possible
2	Subarachnoid hemorrhage, NFS	140693.2	Isolated IPC Exterior of Other Motor Vehicle – Front bumper	Possible
3	Tear along the attachment of the thoracic aorta, NFS	420202.4	Isolated IPC Exterior of Other Motor Vehicle – Hood	Probable
4	Tear along attachment of abdominal aorta that extends to the left peri-renal tissue and adrenal gland, NFS	520202.4	Isolated IPC Exterior of Other Motor Vehicle – Hood	Probable
5	Rib fractures: left posterior 5-10, left lateral 3-6, right posterior 1-6	450203.3	Isolated IPC Exterior of Other Motor Vehicle – Hood	Probable
6	Bilateral lung contusions, NFS	441410.3	Caused by other injury (rib fractures)	Probable
7	C6 spine has gaping fracture with injury to spinal cord, NFS	610200.3	Isolated IPC Exterior of Other Motor Vehicle – Front bumper	Possible
8	C6 vertebra has gaping fracture, NFS	650230.2	Isolated IPC Exterior of Other Motor Vehicle – Front bumper	Possible
9	T10 vertebra has gaping fracture, NFS	640430.2	Isolated IPC Exterior of Other Motor Vehicle – Hood	Probable
10	Contusion to descending colon, NFS	540810.2	Isolated IPC Exterior of Other Motor Vehicle – Hood	Probable

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Components (IPC)	IPC Confidence Level
11	Left kidney hemorrhage, NFS	541610.2	Isolated IPC Exterior of Other Motor Vehicle – Hood	Probable
12	Left adrenal gland hemorrhage, NFS	540210.1	Isolated IPC Exterior of Other Motor Vehicle – Hood	Probable
13	3-inch stapled laceration to lateral surface of left hip	810602.1	Isolated IPC Exterior of Other Motor Vehicle – Front bumper	Probable

Source: Autopsy report (internal)

Kinematics

The 48-year-old firefighter was standing or moving about near the right side of the fire truck. He was dressed in shorts, a tee-shirt, and shoes and socks. His orientation to the approaching Jeep is unknown. The following discussion is based on the location, nature, and severity of his injuries. His contact damage to the Jeep was masked by the subsequent impact damage with the Nissan. It should be noted that the injuries are incomplete as organ and tissue donations were performed prior to the autopsy.

The front of the Jeep struck Firefighter #1. The bumper fascia would have contacted his lower extremities as the hood face and grille area engaged his pelvic and abdominal region. The contact resulted in the laceration of the left hip, contusion of the descending colon, and hemorrhages of the left kidney and the left adrenal gland. Due to the speed of the Jeep at impact, he began to wrap onto the hood of the vehicle as he was accelerated forward. The contact and subsequent acceleration further resulted in a tear along the attachment of the thoracic and abdominal aorta that extended to the left peri-renal tissue and adrenal gland and a gaping fracture of the T-10 vertebrae. The probable hood contact resulted in posterior and lateral fractures of the ribs and bilateral pulmonary contusions.

The acceleration of his body by the Jeep resulted in a probable hyperflexion of the neck that caused a gaping fracture of the C6 vertebrae with an unspecified spinal cord injury and subarachnoid hemorrhage of the base of the brain.

Firefighter #1 was probably momentarily carried forward by the Jeep then thrown forward prior to its impact with the Nissan. Based on the dash-cam video of the police Ford Explorer, Firefighter #1 was thrown into the police officer who was standing adjacent to the left B-pillar area of the disabled Nissan. This contact knocked the police officer forward as he tumbled along the road surface to final rest. Firefighter #1 tumbled along the road surface before coming to final rest in a face-down position nearly perpendicular to the right travel lane with his head facing in a northerly direction. At final rest, his abdomen was positioned on the white edge line separating the travel lane from the right shoulder.

Immediately following this multiple event crash, a non-involved firefighter rushed to check the condition of the struck firefighter. He rolled him onto his back, found he was unresponsive and used his radio to request additional medical assistance. Firefighter #1 was transported by

ambulance to a level 1 trauma center where he was pronounced deceased and transferred to the medical examiner’s office for autopsy.

Firefighter #2 Demographics

Age/sex: 22 years/male
 Height: Unknown
 Weight: Unknown
 Transport from scene: Helicopter to a level 1 trauma center
 Medical treatment: Admitted for treatment

Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Components (IPC)	IPC Confidence Level
1	Closed head injury w/loss of conscious	100099.9	Isolated IPC Exterior of Other Motor Vehicle – Rear surface	Possible
2	Fractured femur, NFS	853000.3	Isolated IPC Exterior of Other Motor Vehicle – Bumper, Alternate – Hood edge/grille	Possible
3	Additional unspecified injuries	Unknown	Unknown	Unknown

Source: Affidavit

Kinematics

Firefighter #2 was standing or walking adjacent to the fire truck. It was stated in the police investigation that he was wearing firefighter turnout pants, a firefighter helmet, and a high-visibility vest with reflective material. His orientation in relation to the approaching Jeep and that of the two other firefighters struck is unknown.

As the Jeep traveled on the shoulder between the fire apparatus and the concrete barrier, the front of the Jeep struck Firefighter #2 (Event 2). Based on his reported injuries, the front bumper and/or hood/grille struck his lower extremities and pelvic regions, resulting in an unspecified femur fracture. He was accelerated and thrown forward and left of the Jeep into the back plane of the parked police Ford Explorer (Event 3). His helmet separated from his head and was thrown forward along the concrete barrier. The rear lift gate of the police vehicle was dented, the license plate was bent, and the bumper fascia was abraded from contact by Firefighter #2. His head injury with loss of consciousness possibly occurred from contact with the lift gate. The affidavit listed additional unspecified injures from the crash.

Firefighter #2 was found lying on the pavement at the back of the Ford unconscious. He was treated at the scene and transported by helicopter to a level 1 trauma center where he was admitted for treatment of his injuries. The medical facility refused to release his medical records without a signed medical authorization.

Firefighter #3 Demographics

Age/sex: 17 years/male
 Height: Unknown
 Weight: Unknown
 Transport from scene: Helicopter to a level 1 trauma center
 Medical treatment: Admitted for treatment

Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Components (IPC)	IPC Confidence Level
1	Brain bleed, NFS	140629.3	Isolated IPC Other Vehicle or Object – Ground	Possible
2	Right* orbital fracture, NFS	251200.2	Isolated IPC Other Vehicle or Object – Ground	Possible
3	Impact injury to head, NFS	100099.9	Isolated IPC Other Vehicle or Object – Ground	Possible

Source: Affidavit; *firehouse web site

Kinematics

Firefighter #3 was initially walking eastbound on the right (north) shoulder next to Firefighter #2, closest to the concrete barrier. His position with respect to the approaching Jeep is unknown. It was stated in the police investigation that he was wearing firefighter turnout pants, boots, a high-visibility safety vest with reflective material and was carrying a tool in his right hand, possibly a flashlight. Firefighter #3 was not wearing a helmet.

The front of the Jeep struck Firefighter #3 and displaced him forward and to the right of the vehicle (Event 4). He struck the ground and possibly the concrete barrier. He sustained a brain bleed, a right orbital fracture, and an unspecified impact injury of the head.

Firefighter #3 was transported by helicopter to a Level 1 trauma center where he was admitted for treatment of his injuries. Due to insufficient data pertaining to this person's identity, his medical records could not be obtained.

Police Officer Demographics

Age/sex: Unknown years/male
 Height: Unknown
 Weight: Unknown
 Transport from scene: Ambulance to level 1 trauma center
 Medical treatment: Unknown if admitted

Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Components (IPC)	IPC Confidence Level
1	Concussion	161000.2	Isolated IPC Other Vehicle or Object – Ground	Probable
2	Scalp contusion, NFS	110402.1	Isolated IPC Other Vehicle or Object – Ground	Probable
3	Contusion to back, NFS	410402.1	Isolated IPC Other Vehicle or Object – Ground	Probable
4	Contusion to neck, NFS	310402.1	Isolated IPC Other Vehicle or Object – Ground	Probable

Source: Affidavit

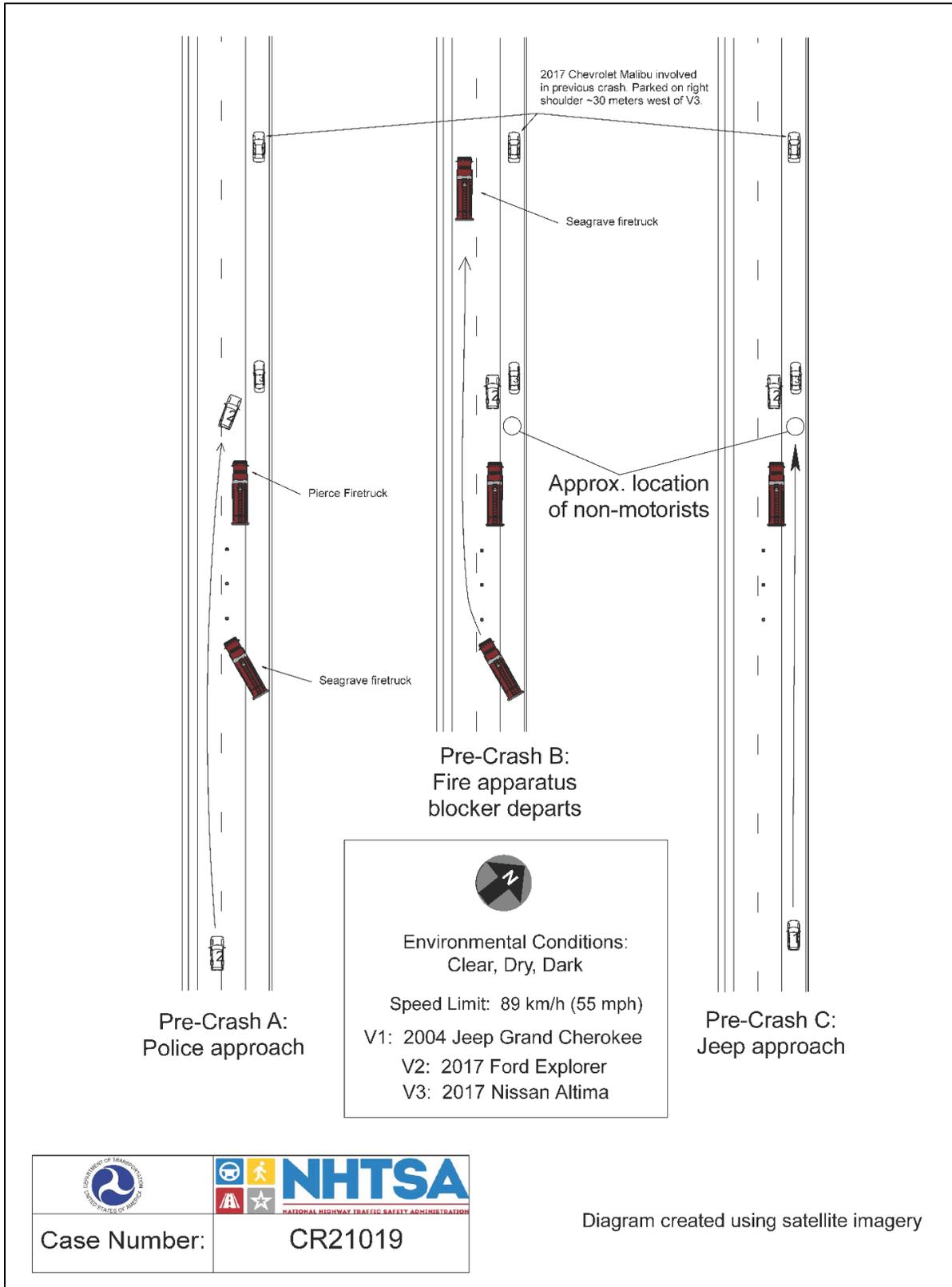
Kinematics

The police officer, a State Police trooper, was standing adjacent to the left B-pillar of the disabled Nissan that was parked on the right shoulder. His marked Ford Explorer was parked in the right lane forward of the fire truck and left and slightly forward of the Nissan.

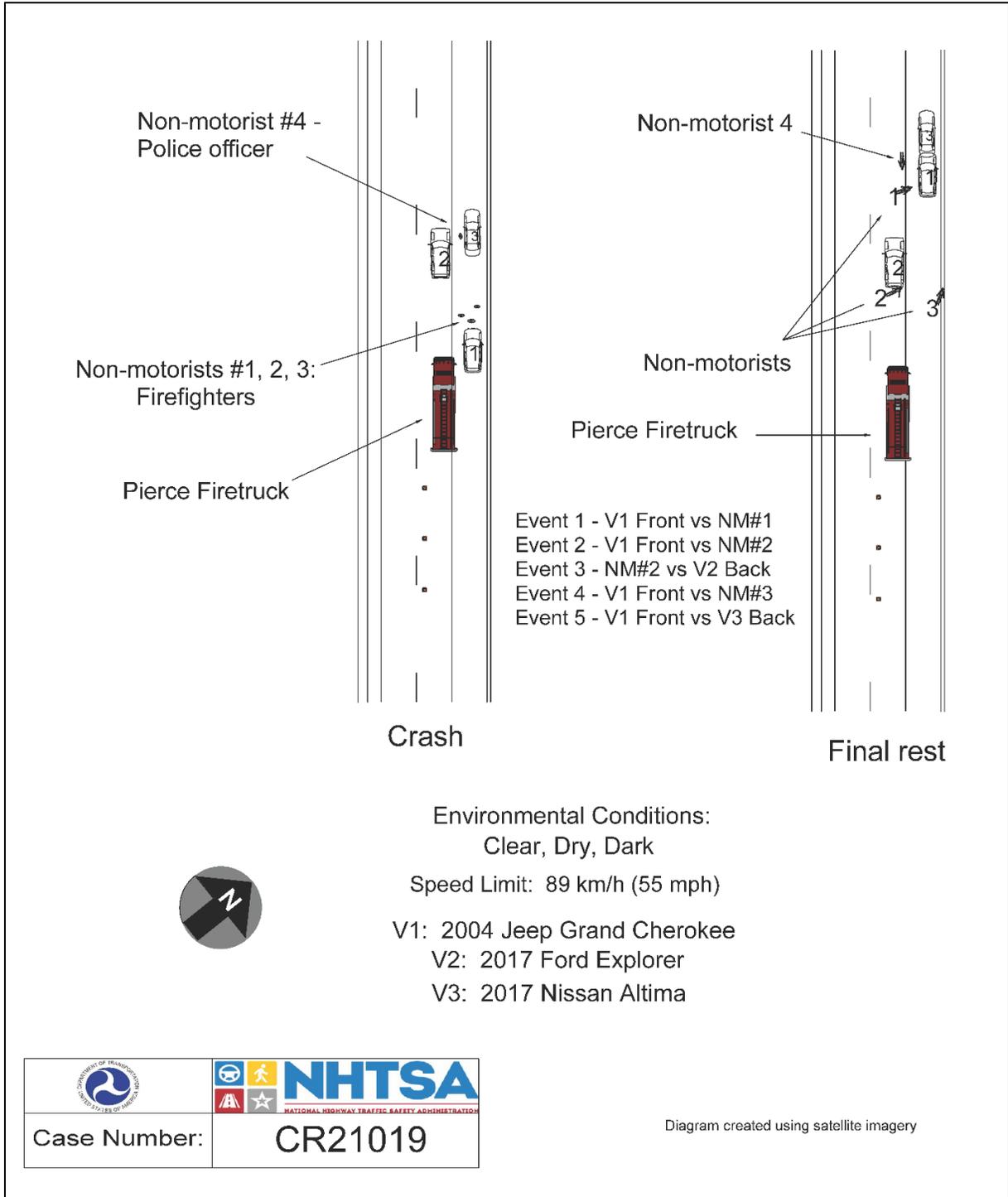
The Jeep entered the shoulder maintaining its speed and traveled between the concrete barrier and the fire truck, initially striking the three firefighters. Firefighter #1 was struck by the front of the Jeep and thrown forward of his at-impact position into the State Police trooper, displacing the officer forward and knocking him to the pavement where he landed on his back then tumbled to final rest. He sustained a concussion and soft tissue contusions of the scalp, back, and neck. He came to final rest on his back with his legs facing west in the right travel lane adjacent to the lane line.

He was transported by ambulance to a level 1 trauma center where he was treated for his injuries.

Pre-Crash Diagram



Crash Diagram: Post-Crash



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16055-100523-v2a