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Missouri State Highway Patrol

Reconstruction Report

[redacted]

[redacted]

Missouri State Highway Patrol
Reconstruction Report

[redacted]

Appendices

Attachments

VIN Assist, 2004 Grand Caravan
AutoStats, 2004 Grand Caravan
Weather Service Data
Rental agreement
Written statement from Nicole G. Keding

[redacted]

Missouri State Highway Patrol
Reconstruction Report

[redacted]

[redacted]

Original Investigating Officer: Trooper A. M. Harrison, #1217

Troop Reconstructionist: N/A

Assisting Officers:
Sergeant C. M. Heath, #777
Sergeant B. L. Adams, #119
Trooper S. L. Price, #1220
Sergeant Richard L. Sanders, #877
Trooper D. K. Heppe, #686
Trooper G. N. Williams, #706

Assisting Agencies:
Scott County Sheriff's Department
North Scott County Ambulance
Scott City Fire and Rescue
NBC Fire and Rescue
Cape Girardeau Fire and Rescue
Air EVAC Helicopter
Scott County Coroner, Scott Amick

Level IV Reconstruction:
Sergeant K. W. Malugen, #707
Major Crash Investigation Unit
Team Four, Troop E
Jackson, Missouri

Date of Report: October 7, 2004

[redacted]

Synopsis

On [redacted], at approximately 1140 hours, a single motor vehicle crash occurred on Interstate 55, in Scott County, that resulted in six deaths, and one injury. The seven people involved in the crash were all in a southbound Dodge Grand Caravan. [redacted] The vehicle struck the dirt embankment on the south side of the creek, and overturned. This crash met the Missouri State Highway Patrol criteria for a level IV reconstruction. I, Sergeant Kevin W. Malugen, #707, was assigned to complete the reconstruction.

At approximately 1215 hours, [redacted] I was contacted by Sergeant C. M. Heath, #777, the team leader and supervisor of our crash team. Sergeant Heath informed me he was en route to a fatal motor vehicle crash on Interstate 55, south of Scott City, Missouri, and he requested I respond. I left my residence and arrived at the scene of the crash at approximately 1315 hours. Sergeant Heath was already on the scene, and I later learned he arrived at approximately 1230 hours. I met with Sergeant B. L. Adams, #119, who was assisting Trooper A. M. Harrison, #1217 with the initial investigation. Sergeant Adams told me the crash involved one vehicle, and five fatalities.

Vehicle #1

Vehicle #1 was a silver, 2005 Dodge Grand Caravan minivan, traveling southbound on Interstate 55. [redacted]e. Vehicle #1 was being driven by [redacted]

[redacted]

Sergeant Heath had already taken some initial photographs, and while he was assisting in the extrication and removal of the occupants, I began to obtain grade, super-elevation, and drag factor measurements for the crash scene. Sergeant Heath marked the final resting position of vehicle #1 and the final resting positions of the ejected occupants. After the extrication of the occupants, and the removal of the vehicle, I set up our Sokkia total station and prepared to document the scene physical evidence. I entered the data into the evidence recorder, while Sergeant Heath held the prism pole. The data collected with the electronic total station was used to create a scale map of the crash scene. The scale map of the crash scene and a log of the photographs taken during this investigation are included as appendices of this report.

After completing the documentation of the crash scene evidence with the total station, Sergeant Heath and I responded to Carnell's Towing to complete the vehicle examination. The vehicle examination was completed, and we left Carnell's Towing.

Trooper Harrison completed an initial investigation report concerning the facts of his investigation. In that report, Trooper Harrison stated, "The accident occurred as vehicle #1 was southbound on Interstate 55 in Scott County. Vehicle #1 was traveling in the left lane and ran off the left side of the roadway into the median. Vehicle #1 impacted the end of a guardrail and continued southbound between the north and southbou[redacted]Vehicle #1 became airborne and impacted the south dirt embankment head-on. Vehicle #1 then overturned onto its top."

The following pages contain the details of my investigation.

[redacted]

Environmental Factors

Roadway

This crash occurred on [redacted] roadway is maintained by the Missouri Department of Transportation. Southbound Interstate 55 is designed with two southbound travel lanes. The lane to the right is commonly referred to as the driving lane, while the lane to the left is commonly referred to as the passing lane. The southbound travel lanes are separated from one another by a dashed white line painted on the surface of the road, and near the middle. The right lane is separated from the outside shoulder by a solid white fog line, and the left lane is separated from the inside shoulder by a solid yellow fog line. The travel lanes combined, measured approximately 23.61 feet in width. The outside shoulder measured approximately 9.71 feet in width and the inside shoulder measured approximately 3.04 feet in width.

The crash scene was located in a straight portion of the road, with a slight downhill grade for southbound traffic. I measured the grade with a four-foot smart level and found the grade to be 0.8 degrees. The roadway has a super-elevation perpendicular to the flow of traffic. This is to allow for water to drain from the traveled portion of the roadway. The roadway is crowned near the middle, and the roadway slopes down from the crown in both directions. The outside shoulder has a super-elevation of 2.0 degrees. The right lane has a super-elevation of 1.5 degrees. The left lane has a super-elevation of 0.2 degrees. The inside shoulder has a super-elevation of 0.7 degrees.

[redacted] shortly after my arrival at the crash scene, I collected the data used to calculate the drag factors for the roadway and grass median. The roadway was dry at the time of the crash, and dry during the time I obtained the drag factor data. The data collected resulted in the following calculated drag factors. The drag factor for the southbound outside shoulder was .76. The drag factor for the southbound right lane was .71. The drag factor for the southbound passing lane was .70. The drag factor for the southbound inside shoulder was .61. The drag factor for the grass median was .68.[1]

[1] For further information concerning grade, super-elevation, and drag factor see Appendix II, Math Calculations.

[redacted]

The following photos are of the crash scene taken during the on-scene investigation.

First, looking northbound.

Secondly, looking southbound.

[redacted]

And thirdly, looking down at the final resting position on the creek bank.

Traffic Control

The posted speed limit for Interstate 55 is 70 miles per hour. As I described in the roadway description, Interstate 55 has painted lines on the roadway surface to indicate traffic lanes. There were no other traffic controls.

Vision Obstructions

This crash occurred during daylight hours on [redacted] at approximately 1140 hours Central Daylight Savings Time. Visibility is in excess of a mile in both directions. There were no permanent vision obstructions, and no known temporary vision obstructions that contributed to this crash.

[redacted]

Light Conditions

This crash occurred on [redacted] approximately 1140 hours Central daylight Savings Time. It was overcast and the sun, at an altitude of 56.7 degrees and an azimuth of 142.7 degrees, would have provided adequate lighting.

Weather

Weather information obtained from the Internet and recorded by the National Weather Service at the Cape Girardeau Regional Airport, Cape Girardeau, Missouri indicated the following conditions existed in the area at 1153 hours Central Daylight Savings Time. The temperature was 68 degrees Fahrenheit, and the dew point was 65 degrees Fahrenheit. The barometric pressure was 30.02 inches of mercury, and the winds were out of the north at 10 miles per hour. The sky was cloudy, and the weather was reported as overcast.

[redacted]

Mechanical Factors

Vehicle #1

[redacted] The mileage on vehicle #1 was unreadable because the digital display was damaged, and there was no power to the vehicle during my examination. At final rest, vehicle #1 was on its top, upside down facing south, on the south creek bank approximately twenty-five feet down the embankment. Carnell's Towing arrived to lift vehicle #1 up from the creek bank, and tow it from the crash scene.

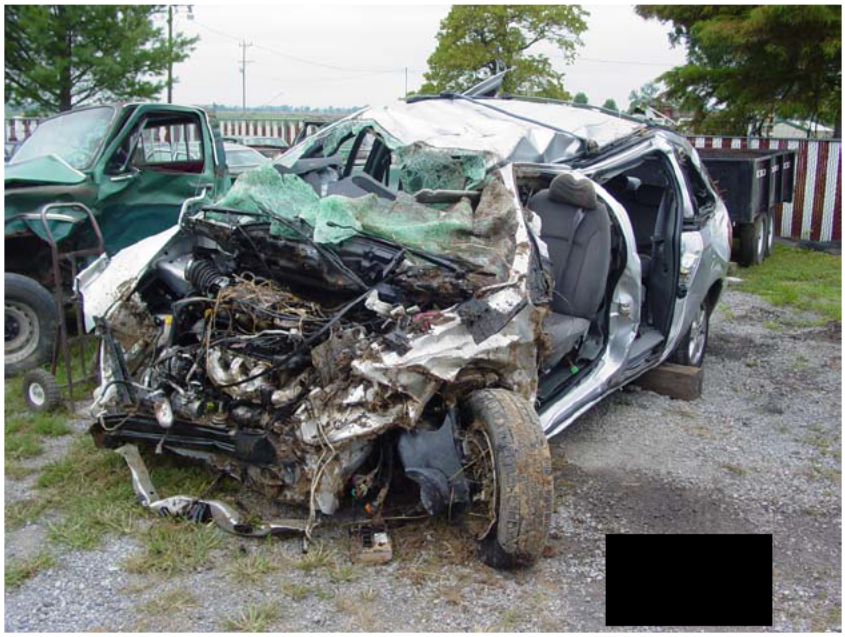
While still at final rest, Sergeant Heath briefly examined vehicle #1. After Carnell's Towing lifted the vehicle up from the creek bank, Sergeant Heath and I continued our brief examination. During the brief examination I observed that the driver's seat belt had been cut by rescue personnel and had been worn by the driver. I also observed that both the driver and front seat passenger air bags were deployed, and a third air bag had deployed at the knee bolster area for the driver. Carnell's Towing towed vehicle #1 from the scene and took it to their storage facility on Highway 74.

[redacted], after we completed our scene investigation, Sergeant Heath and I responded to Carnell's Towing to complete a more thorough examination of vehicle #1. During the examination the following information was noted: The damage to vehicle #1 was consistent with the crash sequence initially reported by Trooper Harrison. The front bumper was torn from the vehicle and the grill was destroyed. Both headlight / parking light assemblies were destroyed. The hood was torn off of the vehicle, and the engine was forced rearward and shifted to the driver's side. The entire front end was forced downward and the windshield was busted out. The middle of the busted windshield had blood evidence on the inside indicating occupant contact. The front left fender was pushed inward and down. The driver's front door and driver's side sliding door had been cut off by the responding fire and rescue squad. The front left rocker panel was bent downward. The driver's

[redacted]

side "A" pillar was bent in and down, and the roof on the driver's side was crushed back and down. The back hatch was sprung open and the glass was broken out. All glass on the driver's side of the vehicle was busted out. The passenger's side sliding door was sprung open and bent up. The passenger's side front door was sprung open, and the passenger's side fender was forced rearward. The glass on the passenger's side of the vehicle was still intact.

The photo below is a photograph of vehicle #1 taken at the tow company storage lot on A[redacted] and represents the damage sustained in the crash.


[redacted]

The interior of vehicle #1 was examined and the following information was noted: The driver's seat belt was cut by rescue personnel and had been used by the driver. The driver's front air bag and knee bolster air bag were deployed. The right front passenger's seat was rotated clockwise, and the passenger's side air bag was deployed. The right front seat belt was hanging in the unused position, and it had no signs of use during the crash. Both second row bucket seat backs were bent forward. The second row seat belts were hanging in the unused position and they had no signs of use. The driver's side second row seat belt was locked in the unused position. The driver's seat was forced forward and twisted counter-clockwise. The passenger's side third row seat back was bent forward,

and the seat belts for the third row were hanging in the unused position. They had no signs of use during the crash. There was hair on the broken glass of the driver's side, third row window.

I examined the tires on vehicle #1 and recorded the following information:

	Left	Right
Axle #1	Bridgestone TURANZA EL 42 215 / 65R 16 98T Tread (o)7/32(m)8/32(i)8/32 – Air (flat)	Bridgestone TURANZA EL 42 215 / 65R 16 98T Tread (o)7/32(m)8/32(i)8/32 – Air (flat)
Axle #2	Bridgestone TURANZA EL 42 215 / 65R 16 98T Tread (o)8/32(m)9/32(i)9/32 – Air (30 psi)	Bridgestone TURANZA EL 42 215 / 65R 16 98T Tread (o)8/32(m)9/32(i)9/32 – Air (30 psi)

The left front tire had a cut on the sidewall and it was pulled from the rim. The right front tire was pulled from the rim, and the wheel was broken from impact with the guardrail. The right rear wheel was dented from contact with the guardrail.

There was no evidence of an equipment or tire failure that would have contributed to this crash.

During this investigation, photographs of vehicle #1 were taken. The photographs, and a photograph log, are included with this report.

[redacted]

Human Factors

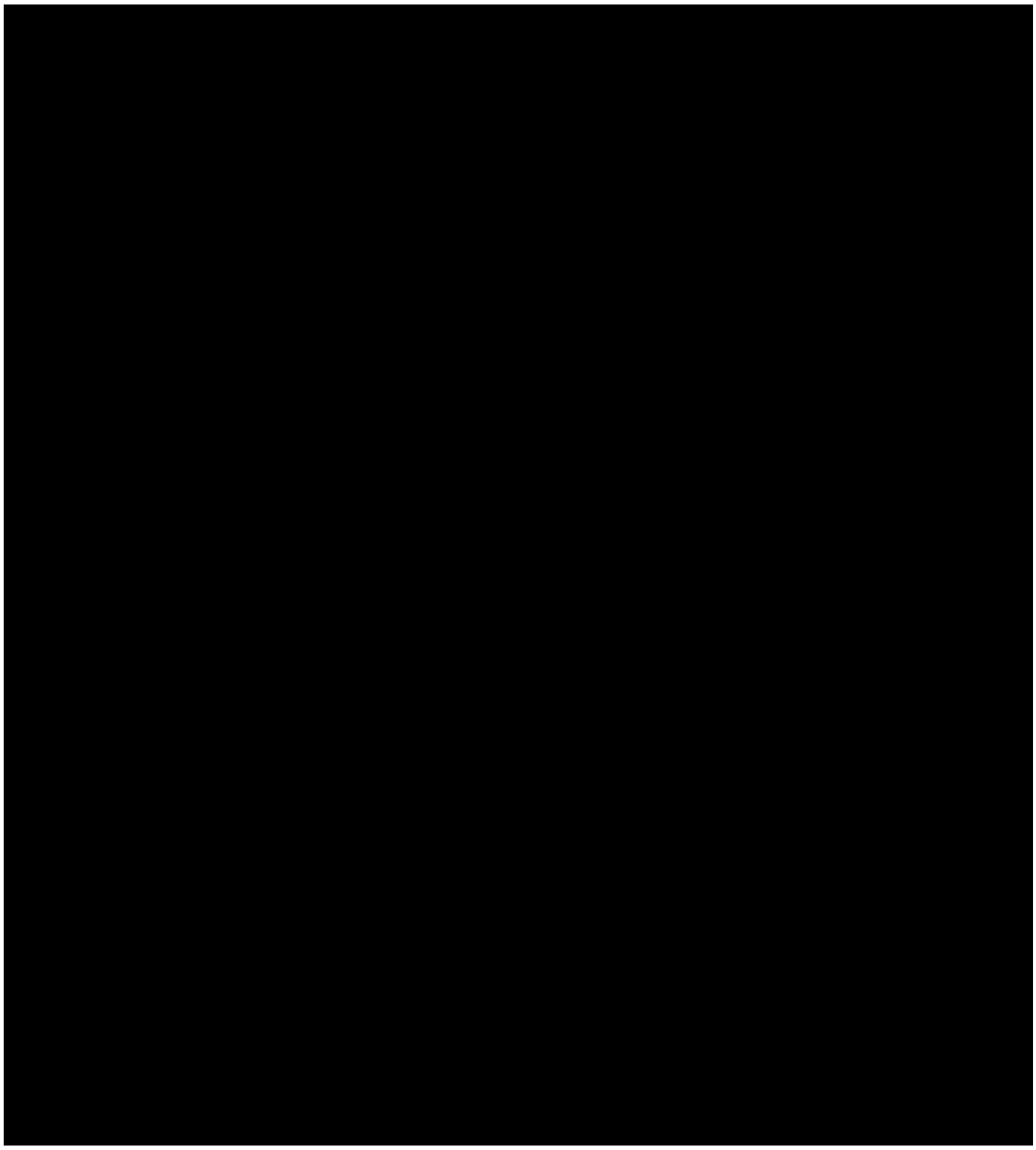
Driver #1

Upon arrival of the responding rescue personnel and Trooper Harrison, the driver of vehicle #1 was still seat belted in the driver's seat. [redacted]. Below is a digital photograph of driver #1's driver's license.

Driver #1, [redacted] was seriously injured in the crash and after extrication, he was transported from the crash scene by helicopter, to St. Francis Hospital in Cape Girardeau, Missouri, then later to Barnes - Jewish Hospital in St. Louis, Missouri. O[redacted] of the injuries he sustained in the crash. He was pronounced dead at 1324 hours, [redacted], by Dr. Ruybalid at Barnes - Jewish Hospital.

Passenger (s)

There were six passengers in vehicle #1 at the time of the crash. The six passengers and their seating positions were initially identified by Trooper Harrison. The passengers were as follows:



[redacted]

[redacted]

Witness (es)

There were three listed witnesses on page one of Trooper Harrison's initial report. The witnesses were as follows:

[redacted]

[redacted]

Trooper Harrison spoke to all three witnesses at the scene of the crash. All three provided the same information. They said the vehicle was southbound in the left lane traveling approximately 75 to 80 miles per hour when it suddenly veered into the median and went airborne off the embankment.

A written statement from [redacted] was obtained, and a copy of that statement is included with this report.

[redacted]

Scene Investigation

At approximately 1215 hours, [redacted]4, I was contacted by Sergeant C. M. Heath, #777, the team leader and supervisor of our crash team. Sergeant Heath informed me he was en route to a fatal motor [redacted], south [redacted], and he requested I respond. I left my residence and arrived at the scene of the crash at approximately 1315 hours. Sergeant Heath was already on the scene, and I later learned he arrived at approximately 1230 hours. I met with Sergeant B. L. Adams, #119, who was assisting Trooper A. M. Harrison, #1217 with the initial investigation.

When I arrived at the crash scene I observed a silver van on its top, below [redacted]nt. There were southbound tire tracks in the grass median indicating the path of travel of the silver van as it traveled off of the roadway and off of the embankment. Sergeant Heath was assisting in the extrication and removal of the occupants, and he told me he had already taken some initial photographs. Trooper Harrison was interviewing the listed witnesses and family members of the occupants in vehicle #1, who were traveling with them in separate vehicles. After the occupants were removed, and while Sergeant Heath was assisting in the removal of vehicle #1 from the creek bank, I obtained grade, super-elevation, and drag factor measurements for the crash scene. Sergeant Heath had already marked the final resting position of vehicle #1 and the final resting positions of the ejected occupants before the vehicle and occupants were removed. After I completed gathering the measurement data, I set up our Sokkia total station and prepared to document the scene physical evidence. That evidence consisted of the final rest of vehicle #1, the final rest of the ejected occupants, the tire marks in the grass median, and the impact gouge in the south side dirt embankment. I entered the data into the evidence recorder, while Sergeant Heath held the prism pole. The data collected with the electronic total station was used to create a scale map of the crash scene. The scale map of the crash scene and a log of the photographs taken during this investigation are included as appendices of this report.

[redacted]

From the examination of the physical evidence, and after Trooper Harrison spoke to the witnesses and family members, the following information was revealed: This crash occurred, as vehicle #1 was southbound on Interstate 55 in [redacted] #1 was traveling in the left lane of Interstate 55 and traveled off of the roadway, into the median at an approximate 3-degree angle. The first visible tire marks, appeared as tire tracks where the grass was just pushed down from the rolling tires. These tire tracks continued for approximately 197.97 feet. At that point the right side tires struck the end of the guardrail at the point where the guardrail slopes down to the ground. This caused the right side of the vehicle to slightly lift, damaging both wheels on the passenger side of the vehicle. The right side tire tracks also disappeared for a distance of 15.6 feet. At that point, the tire tracks changed from the pushed down grass to the pulling of the grass, which is commonly seen during braking on a grassy surface. The braking tire marks continued for approximately 104.11 feet to the point of vault for vehicle #1 at the [redacted]mbankment. The grade of the grassy median was consistent at 0.8 degrees downhill, however at the edge of the embankment the grade was up at approximately 2.5 degrees. Vehicle #1 vaulted and traveled airborne approximately 126.17 feet horizontally, and fell approximately 21.7 feet vertically. Vehicle #1 struck the dirt embankment on the south side of the creek with its front end, as the front end was pitching downward. The vehicle left a large gouge in the dirt, and overturned onto its top.

The measurements referred to in this report were obtained from the electronic total station data, and physical measurements made at the crash scene. The total station data was used to create a scale map of the crash scene, and that scale map is included as appendix IV of this report. Photographs were also taken during this investigation. Those photographs are included with this report, and a log of those photographs is included as appendix I.

[redacted]

Findings

The position of vehicle #1, the visible and photographed roadway evidence, and the roadway and the surrounding areas were mapped by utilizing computer graphics and the data collected by the use of the electronic total station. Measurements referred to in the scene investigation section of this report were taken from the scale map of the crash scene, as well as physical measurements made during my scene investigation. From the analysis of the evidence I was able to estimate the speed of vehicle #1.

Vehicle #1 was southbound in the left lane of Interstate 55 when the vehicle left the east side of the roadway and traveled into the median. Vehicle #1 continued in the median, struck the end of the guardrail, and went airborne off of the embankment at [redacted]. Vehicle #1 struck the dirt embankment on the south side of [redacted] and overturned. Vehicle #1 came to rest on its top, facing south. I analyzed the vault and airborne measurements, and the minimum speed from the evidence of vehicle #1 braking. That analysis resulted in a calculated speed of 80 miles per hour when vehicle #1 traveled off of the roadway and into the grass median. The evidence of braking resulted in a deceleration to 66 miles per hour at the point of vault. As vehicle #1 traveled airborne 126.17 feet horizontally and 21.7 feet vertically, no further decrease in speed would occur. Vehicle #1 would have struck the dirt embankment at approximately 66 miles per hour.

Trooper Harrison spoke to family members of those involved in the crash. Apparently, the family members were traveling with vehicle #1 in separate vehicles, and were in front of vehicle #1 when the crash occurred. The family members indicated to Trooper Harrison that Hearn began driving at the rest area in Ste. Genevieve County, approximately 80 miles north of the crash scene. The family members told Trooper Harrison that Hearn had been up all night, and they believed he must have fallen asleep. That would be consistent with the small angle of roadway departure, and the evidence of braking, only after striking the guardrail.

For detailed math calculations see appendix II.

[redacted]

Event Analysis

According to the analysis of the evidence, the conclusions described and illustrated in this report indicate that this collision was a result of [redacted] who was unlicensed, and driving in a careless and imprudent manner by traveling off of the road, going airborne off of a creek embankment, and striking the dirt embankment on the south side of the creek. My mathematical conclusions indicate driver #1 was speeding, traveling 80 miles per hour when limited to 70 miles per hour. The evidence indicates that driver #1 most likely fell asleep while operating vehicle #1. This crash resulted in the death of six occupants, and the serious injuries to one occupant.

The driver of vehicle #1 was the only occupant wearing a seat belt. Although he was killed as a result of his injuries, if the other occupants would have been properly restrained their chances of survival and / or reduced injuries would have increased.

K W Malugen 707

Sgt. K. W. Malugen, #707, E-SS
Reconstructionist, ACTAR 1056

C.M. Hoot

Reviewed By

[redacted]

Appendices

Appendix I - Photograph Log
Appendix II- Math Calculations
Appendix III – Astronomical Data
Appendix IV – Forensic Map

Attachments

VIN Assist, 2004 Grand Caravan
AutoStats, 2004 Grand Caravan
Weather Service Data
Rental agreement
Written statement from [redacted]

[redacted]

Appendix I - Photo Log

[redacted]

Photographer(s): Sergeant C. M. Heath, #777
Sergeant K. W. Malugen, #707

Photograph Log: Sergeant K. W. Malugen, #707

The following is a log of photographs taken. The images on CD-ROM are stored at Missouri State Highway Patrol, General Headquarters, Traffic Division, Accident Records, 1510 East Elm, P.O. Box 568, Jefferson City, Missouri.

Sergeant Heath arrived at the crash [redacted] at approximately 1230 hours. The crash had occurred at approximately 1140 hours, and upon his arrival fire and rescue personnel were in the process of extricating the severely injured occupants. The scene had not been disturbed and he photographed the scene as it was on his arrival. After I arrived, the crash scene was cleared, and additional photographs were taken at the scene and at the tow company storage lot. There was one digital disc of photographs taken during this crash investigation. Photographs 1 - 84 were taken at the scene of the crash by Sergeant Heath, and photographs 85 - 103 were taken at the tow company storage lot by me. The following is a log of the photographs taken.

Disc #1

Picture #	Description
DSC00001	Crash scene tire marks in grass median, looking south, north of Bridge A0914
DSC00002	Tire marks in the grass median, looking north
DSC00003	Tire marks in the median, looking north
DSC00004	Crash scene tire marks in grass median, looking south, north of Bridge A0914
DSC00005	Crash scene tire marks in grass median, looking south, north of Bridge A0914
DSC00006	Crash scene tire marks in grass median, looking south, north of Bridge A0914
DSC00007	Final rest of vehicle #1 down on the creek bank
DSC00008	Final rest of vehicle #1 down on the creek bank
DSC00009	Tire marks in the median, looking north
DSC00010	Final rest of vehicle #1 down on the creek bank
DSC00011	Final rest of vehicle #1 down on the creek bank
DSC00012	Rear license plate, vehicle #1 on its top
DSC00013	Rear license plate, vehicle #1 on its top
DSC00014	Point of take-off for vehicle #1, looking up from final rest of vehicle #1

DSC00015 Point of take-off for vehicle #1, looking up from final rest of vehicle #1
DSC00016 Gouge in dirt creek bank, location of first touch, vehicle #1
DSC00017 Final rest of vehicle #1, driver's side
DSC00018 Final rest of vehicle #1, front
DSC00019 Final rest of vehicle #1, front
DSC00020 Final rest of vehicle #1, front
DSC00021 Vehicle #1, after being lifted from creek bank below
DSC00022 Vehicle #1, after being lifted from creek bank below
DSC00023 Top edge of rear window, vehicle #1
DSC00024 Third row, passenger side seat belt, vehicle #1
DSC00025 Third row, driver's side window, upper edge
DSC00026 Second row seats, looking from opening at driver's side
DSC00027 Driver's seat belt strap after it was cut by rescue personnel
DSC00028 Driver's seated area
DSC00029 Front seat passenger's seated area
DSC00030 Front seat passenger's seated area
DSC00031 Looking forward from the rear window
DSC00032 Passenger's side of vehicle #1
DSC00033 Passenger's side of vehicle #1
DSC00034 Passenger's side of vehicle #1
DSC00035 Passenger's side front tire and wheel, vehicle #1
DSC00036 Passenger's side rear tire and wheel, vehicle #1
DSC00037 Driver's side front tire and wheel, vehicle #1
DSC00038 Driver's side rear tire and wheel, vehicle #1
DSC00039 Driver's side front of vehicle #1
DSC00040 Front of vehicle #1
DSC00041 Front of vehicle #1
DSC00042 Passenger's side front of vehicle #1
DSC00043 Driver's side rear of vehicle #1
DSC00044 Lower creek bank where vehicle #1 came to rest
DSC00045 Lower creek bank where vehicle #1 came to rest
DSC00046 Lower creek bank where vehicle #1 came to rest and point of first touch
DSC00047 Tire marks in grass median, looking north
DSC00048 Tire marks in grass median, looking north
DSC00049 Tire marks in grass median, looking north from end of guardrail
DSC00050 End of guardrail struck by vehicle #1
DSC00051 Tire marks in grass median, looking south
DSC00052 Tire marks in grass median, looking south
DSC00053 Tire marks in grass median, looking north
DSC00054 Tire marks in grass median, looking north
DSC00055 Tire marks in grass median, looking south
DSC00056 Tire marks in grass median, looking north
DSC00057 Grass median, north of where tire marks are first visible, looking north
DSC00058 Grass median, north of where tire marks are first visible, looking north
DSC00059 Grass median, where tire marks are first visible, looking south
DSC00060 Grass median, where tire marks are first visible, looking south

[redacted]

DSC00061 Tire marks in grass median, looking south
DSC00062 Tire marks in grass median, looking south
DSC00063 Tire marks in grass median, looking south
DSC00064 Tire marks in grass median, looking south
DSC00065 Point of take-off, and point of first touch
DSC00066 Tire marks in grass median, looking north
DSC00067 Driver's license for TR passenger
DSC00068 Driver's license for TR passenger
DSC00069 Driver's license for SR passenger
DSC00070 Driver's license for SR passenger
DSC00071 Social Security Card and Health Network ID card for TL passenger
DSC00072 Social Security Card and Health Network ID card for TL passenger
DSC00073 Social Security Card and Health Network ID card for TC passenger
DSC00074 Social Security Card and Health Network ID card for TC passenger
DSC00075 Driver's license and social Security card for S
DSC00076 Driver's license and social Security card for S
DSC00077 Driver's license for the driver
DSC00078 Driver's license for the driver
DSC00079 Rear of vehicle #1
DSC00080 Driver's side of vehicle #1
DSC00081 Driver's side of vehicle #1
DSC00082 Front of vehicle #1
DSC00083 Underside of vehicle #1, dirt and grass from gouge in median
DSC00084 Driver's side front wheel suspension components

DSC00085 Front of vehicle #1
DSC00086 Passenger's side front of vehicle #1
DSC00087 Driver's side front of vehicle #1
DSC00088 Driver's side rear of vehicle #1
DSC00089 Rear of vehicle #1
DSC00090 Passenger's side rear of vehicle #1
DSC00091 Looking forward at interior from rear window
DSC00092 Looking forward at interior from rear window
DSC00093 Looking forward at interior from rear window
DSC00094 Second row seats, looking from passenger side door opening
DSC00095 Third row seats, looking from passenger side door opening
DSC00096 Back of first row seats, driver's and front seat passenger's, looking from passenger side door opening
DSC00097 Front seats, looking from passenger side front door opening
DSC00098 Front seats, looking from passenger side front door opening
DSC00099 Vehicle identification number plate
DSC00100 Front driver's seat, looking from driver's side
DSC00101 Center dash area, between the front seats
DSC00102 Driver's side rear of vehicle #1
DSC00103 Driver's side front of vehicle #1

Appendix II - Math Calculations

Drag Factor

I responded to the scene of the crash and arrived on [redacted] at approximately 1315 hours. This crash occurred on Interstate 55, a concrete, four-lane roadway, divided by a grassy median. I collected the drag factor data shortly after my arrival. I collected the data by using my 34-pound drag tire attached to a spring scale to measure how many pounds of force were required to slide the drag tire and maintain steady movement across the tested surface. Five surfaces were tested.

The first test was conducted by pulling the drag tire southbound on the outside (west) shoulder of southbound Interstate 55. I pulled the tire three times.

Pull #1 = 27 pounds Pull #2 = 25 pounds Pull #3 = 26 pounds
So the average force to pull the drag tire was 27 + 25 + 26 = 78/ 3 = 26 pounds of force.

26 pounds of force will be used in the commonly accepted drag factor formula, Force/Weight,

$$f = \frac{F}{W}$$
$$f = \frac{26}{34}$$
$$f = .76$$

The second test was conducted by pulling the drag tire southbound on the driving lane (right) of southbound interstate 55. I pulled the tire three times.

Pull #1 = 24 pounds Pull #2 = 24 pounds Pull #3 = 25 pounds
The average force needed to pull the tire was 24 + 24 + 25 = 73 / 3 = 24.33 pounds of force.

So 24.33 pounds of force will be used in the commonly accepted drag factor formula, Force/Weight,

$$f = \frac{F}{W}$$
$$f = \frac{24.33}{34}$$
$$f = .71$$

The third test was conducted by pulling the drag tire southbound on the passing lane (left) of southbound Interstate 55. I pulled the tire three times.

Pull #1 = 23 pounds Pull #2 = 24 pounds Pull #3 = 25 pounds
So the average force to pull the drag tire was 23 + 24 + 25 = 72 / 3 = 24 pounds of force.

24 pounds of force will be used in the commonly accepted drag factor formula, Force/Weight,

$$f = \frac{F}{W}$$
$$f = \frac{24}{34}$$
$$f = .70$$

The fourth test was conducted by pulling the drag tire southbound on the inside shoulder (east) of southbound Interstate 55. I pulled the tire three times.

Pull #1 = 21 pounds Pull #2 = 21 pounds Pull #3 = 21 pounds
The average force needed to pull the tire was, 21 pounds of force.

So 21 pounds of force will be used in the commonly accepted drag factor formula, Force/Weight,

$$f = \frac{F}{W}$$
$$f = \frac{21}{34}$$
$$f = .61$$

The fifth test was conducted by pulling the drag tire southbound on the grassy median of Interstate 55. I pulled the tire three times.

Pull #1 = 23 pounds Pull #2 = 23 pounds Pull #3 = 24 pounds
The average force needed to pull the tire was, 23 + 23 + 24 = 70 / 3 = 23.33 pounds of force.

So 23.33 pounds of force will be used in the commonly accepted drag factor formula, Force/Weight,

$$f = \frac{F}{W}$$
$$f = \frac{23.33}{34}$$
$$f = .68$$

[redacted]

Grade

This crash occurred on Interstate 55, a concrete roadway maintained by the Missouri Department of Transportation. In the area of this crash, the roadway has a slight down grade to the south for southbound traffic. The grade was measured with a four-foot smart level, and measured 0.8 degrees for the roadway, and 0.8 degrees for the grassy median. 0.8 degrees *converted to %,* 0.8 (TAN) = 1.3%.

Super-elevation

Interstate 55 has a measurable super-elevation across the road surface to allow water to drain. The super-elevation was measured with a four-foot smart level. The outside shoulder has a super-elevation of 2.0 degrees, or *converted to %, 2*.0 (TAN) = 3.4%. The driving lane of Interstate 55 has a super-elevation of 1.5 degrees, or *converted to %, 1.5* (TAN) = 2.6%. The passing lane of Interstate 55 has a super-elevation of 0.2 degrees, or *converted to %, 0.2* (TAN) = 0.3%. The inside shoulder of southbound Interstate 55 has a super-elevation of 0.7 degrees, or *converted to %, 0.7* (TAN) = 1.2%. The roadway in crowned near the middle to allow water to run off in both directions from the higher middle portion of the road. The grassy median slopes down from the inside shoulder edge at 9.0 degrees, or *converted to %, 9.0* (TAN) = 15.8%.

Speed

This crash occurred as vehicle #1 was traveling southbound on Interstate 55. Driver #1 traveled into the grass median at an approximate angle of 3.0 degrees. Vehicle #1 traveled through the grass for 197.97 feet before the right side tires struck the end of a guardrail. At that point, the grass appeared pulled, as if driver #1 began braking. Vehicle #1 continued to travel in the median 104.11 feet before vaulting off of a 2.5-degree grassy ramp. Vehicle #1 traveled 126.17 feet horizontally, and fell 21.7 feet vertically. Vehicle #1 struck the dirt embankment and overturned, totally ejecting four occupants, and partially ejecting one occupant.

From the above information and measurements, a speed for vehicle #1 can be calculated. First a speed will be calculated from the vault data.

The following commonly accepted reconstruction formula will be used;

$$S = \frac{2.73xD}{\sqrt{DxSIN\theta xCOS\theta + hx(COS\theta^2)}}$$

The following measurements taken from the scene investigation, and the scale forensic map created from the data collected with the electronic total station will be used.

S = Speed
2.73 = math constant
D = horizontal distance (126.17 feet)
SIN of the angle of take-off , 2.5 degrees = .043
COS of the angle of take-off, 2.5 degrees = .999
h = vertical distance (21.7 feet)
COS of the take-off angle, squared, 2.5 degrees = .998

$$S = \frac{2.73xD}{\sqrt{DxSIN\theta xCOS\theta + hx(COS\theta^2)}}$$

$$S = \frac{2.73x126.17}{\sqrt{126.17x.043x.999 + 21.7x(.998)}}$$

$$S = \frac{344.4441}{\sqrt{5.41988469 + 21.6566}}$$

$$S = \frac{344.4441}{\sqrt{27.07648469}}$$

$$S = \frac{344.4441}{5.203506961}$$

$$S = 66.19460733$$

Therefore, the speed from the vault calculation is approximately 66 miles per hour.

Now I will combine the 66.19460733 speed with the speed loss from the deceleration in the grass after vehicle #1 struck the guardrail.

Using the following commonly accepted reconstruction formula;

$$S = \sqrt{So^2 + 30xDxf}$$

The following variables will be used.

S = speed
So = speed original of the calculated 66.19460733 miles per hour speed
30 = math constant
D = braking distance (104.11 feet)
f = drag factor in grass of .68

$$S = \sqrt{So^2 + 30xDxf}$$
$$S = \sqrt{66.19460733^2 + 30x104.11x.68}$$
$$S = \sqrt{4381.726039 + 2123.844}$$
$$S = \sqrt{6505.570039}$$
$$S = 80.657114$$

Therefore, the speed estimate calculated for vehicle #1 was approximately 80 miles per hour in the grass, when driver #1 began braking.

A witness traveling southbound behind vehicle #1 estimated its speed between 75 and 80 miles per hour.

[redacted]

Appendix III - Astronomical Data

Astronomical Applications Dept.
U.S. Naval Observatory
Washington, DC 20392-5420

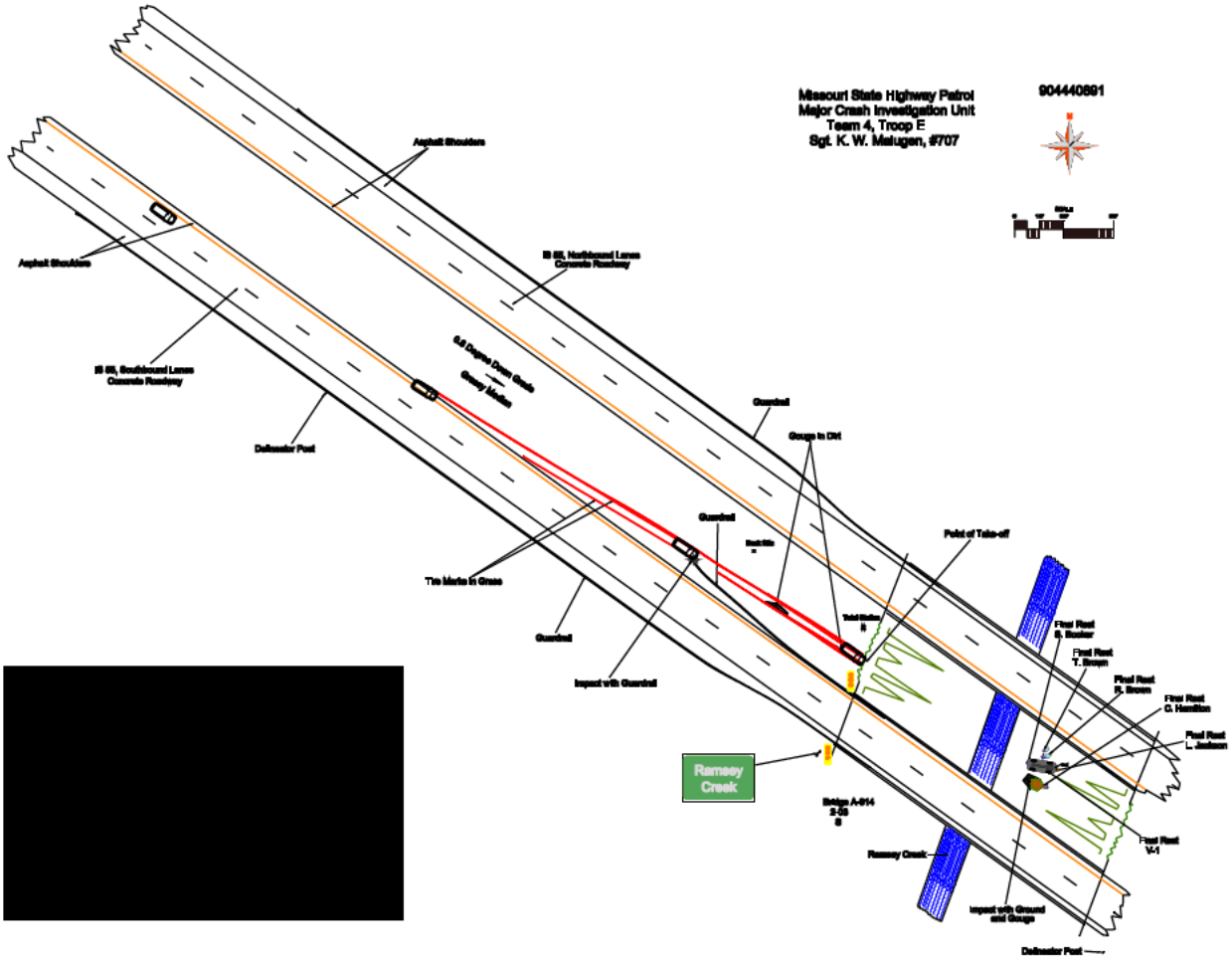
SCOTT CITY, MISSOURI
o , o ,
W 89 31, N37 13

Altitude and Azimuth of the Sun

[redacted]

h m	Altitude o	Azimuth (E of N) o
09:00	40.9	113.3
09:10	42.7	115.5
09:20	44.5	117.9
09:30	46.2	120.4
09:40	47.9	123.0
09:50	49.5	125.8
10:00	51.1	128.8
10:10	52.6	131.9
10:20	54.1	135.3
10:30	55.4	138.9
10:40	56.7	142.7
10:50	57.8	146.7
11:00	58.9	151.0
11:10	59.8	155.5
11:20	60.5	160.2
11:30	61.1	165.2
11:40	61.5	170.2
11:50	61.8	175.4
12:00	61.8	180.6
12:10	61.7	185.8
12:20	61.4	191.0
12:30	61.0	196.0
12:40	60.3	200.9
12:50	59.5	205.6
13:00	58.6	210.0
13:10	57.5	214.2
13:20	56.4	218.2
13:30	55.1	222.0
13:40	53.7	225.5
13:50	52.2	228.8
14:00	50.7	231.9
14:10	49.1	234.8
14:20	47.5	237.6
14:30	45.7	240.2
14:40	44.0	242.6
14:50	42.2	245.0
15:00	40.4	247.2

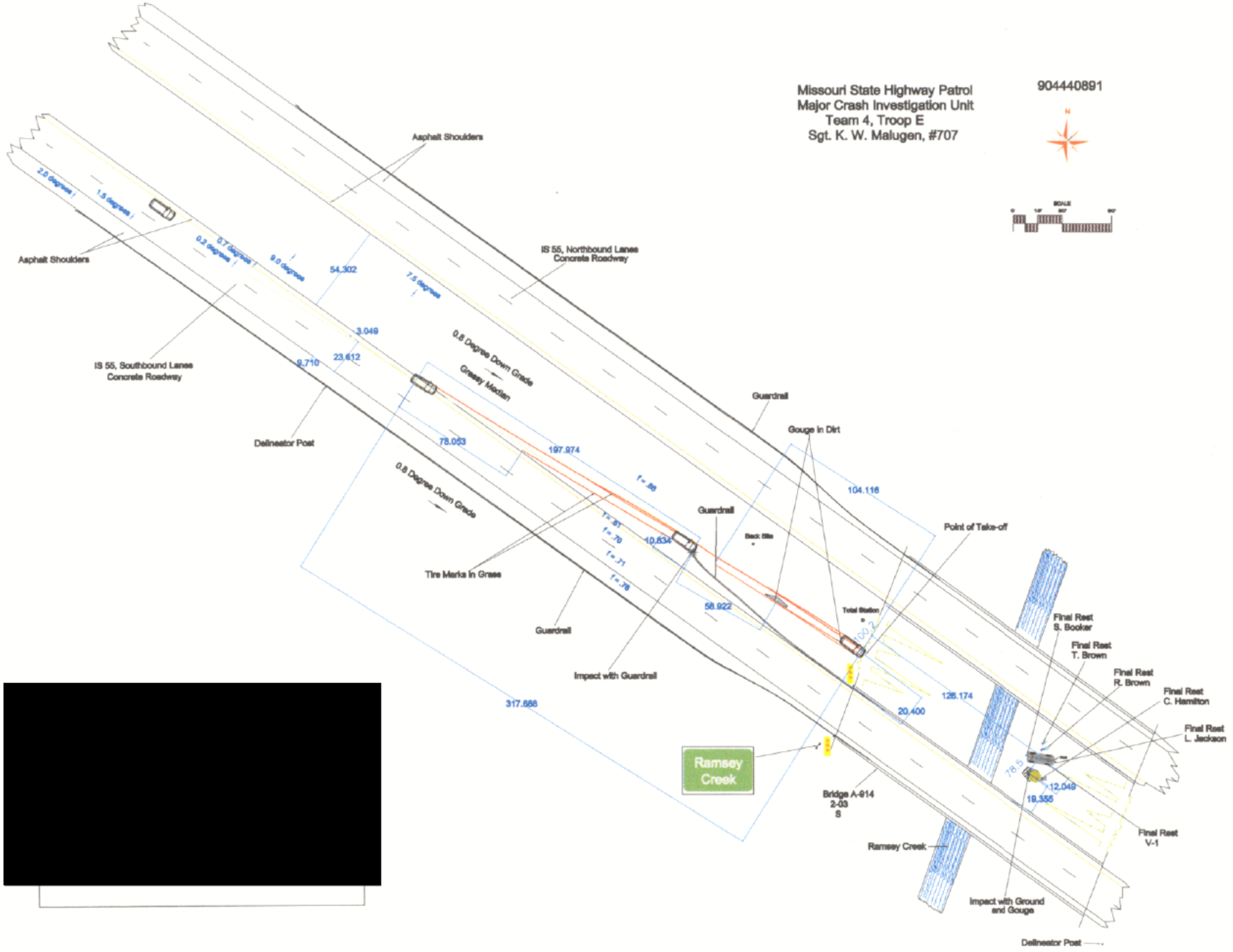
Appendix IV - Forensic Map



[redacted]

Missouri State Highway Patrol
Major Crash Investigation Unit
Team 4, Troop E
Sgt. K. W. Malugen, #707

904440891

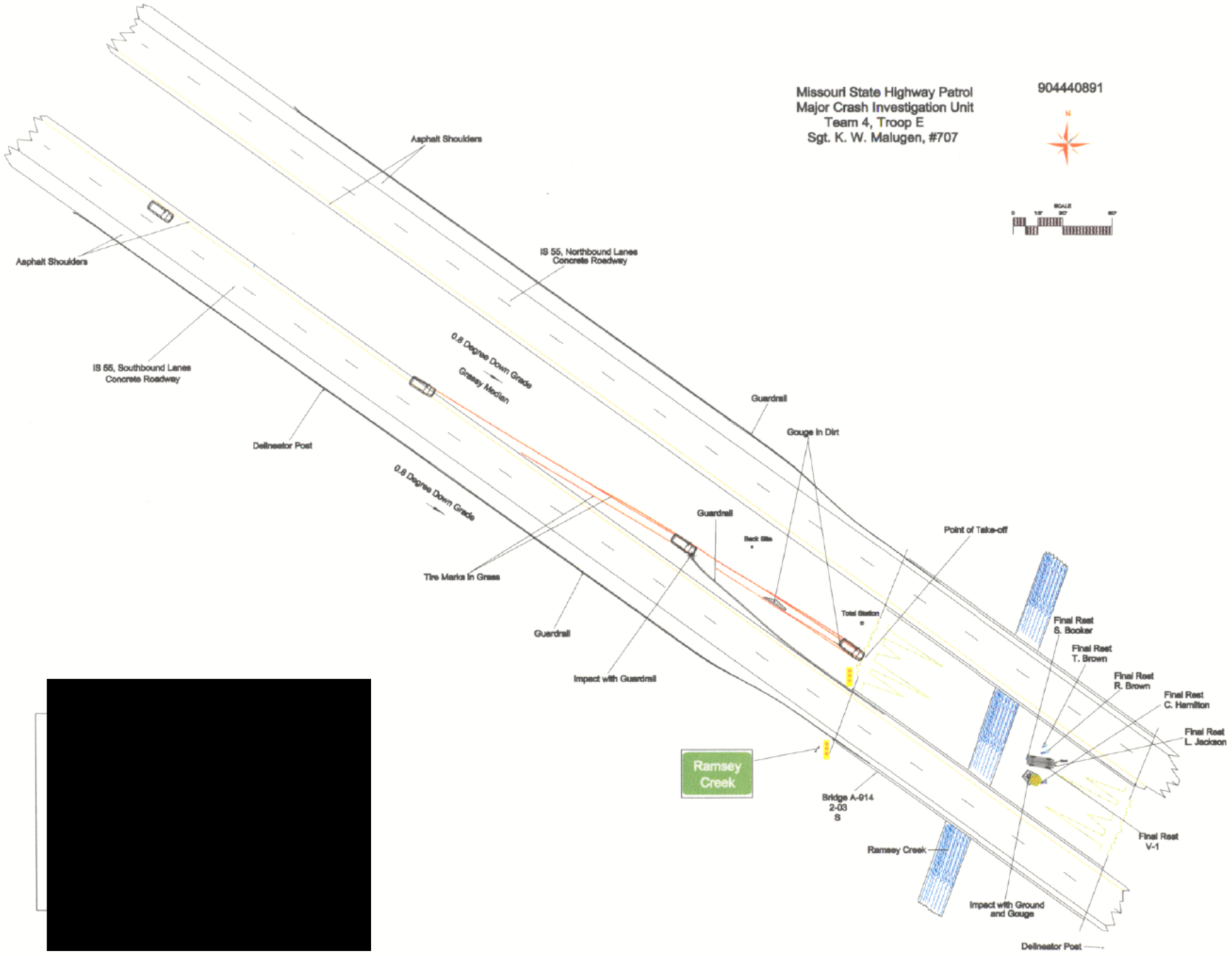


[redacted]

[redacted]

Missouri State Highway Patrol
Major Crash Investigation Unit
Team 4, Troop E
Sgt. K. W. Malugen, #707

904440891



[redacted]

11:04 [redacted]

VINassist(R) Version 1.27

(c) by NICB 1991

Law Enforcement Edition

[redacted]

DIGIT	DESCRIPTION	MEANING
2	Country of Origin	CANADA
D	Manufacturer	DODG DODGE
4	Vehicle Type	MPV LESS SIDE AIR BAGS
G	Gross Vehicle Weight	5001 - 6000 GVWR & HYD BRAKES
P	Line	CVN,GRD CVN,CVN C/V,GRD CVN C/V-FWD
4	Series	DURANGO SLT/CVN,GRD CVN SXT
4	Body Style	EXTENDED WAGON
L	Engine	3.8L V6 CYL SMPI
1	Check Digit	* Calculated as - 3
4	Year	2004
R	Assembly Plant	WINDSOR, ON (CANADA)
148406	Sequence Number	* OUT OF RANGE

--VIN Failed Test-- * Invalid Digit

VIN indicates a 2004 DODGE EXTENDED WAGON

[redacted]

MISSOURI STATE HIGHWAY PATROL - TROOP A
1510 EAST ELM
JEFFERSON CITY MO 65101

[redacted]

2004 DODGE GRAND CARAVAN 4DR MINI VAN

CURB WEIGHT:	4219 lbs.	1914 kg.
Curb Weight Distribution -	Front: 58 %	Rear: 42 %
Gross Vehicle Weight Rating:	5600 lbs.	2540 kg.
Number of Tires on Vehicle:	4	
Drive Wheels:	FRONT	

HORIZONTAL DIMENSIONS

	Inches	Feet	Meters
Total Length	201	16.75	5.11
Wheelbase:	119	9.92	3.02
Front Bumper to Front Axle	38	3.17	0.97
Front Bumper to Front of Front Well	22	1.83	0.56
Front Bumper to Front of Hood	6	0.50	0.15
Front Bumper to Base of Windshield	38	3.17	0.97
Front Bumper to Top of Windshield	74	6.17	1.88
Rear Bumper to Rear Axle	44	3.67	1.12
Rear Bumper to Rear of Rear Well	26	2.17	0.66
Rear Bumper to Rear of Trunk	5	0.42	0.13
Rear Bumper to Base of Rear Window	6	0.50	0.15

WIDTH DIMENSIONS

Maximum Width	79	6.58	2.01
Front Track	63	5.25	1.60
Rear Track	64	5.33	1.63

VERTICAL DIMENSIONS

	Inches	Feet	Meters
Height	69	5.75	1.75
Ground to:			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	28	2.33	0.71
Hood - top front	31	2.58	0.79
Base of windshield	43	3.58	1.09
Rear Bumper - top	22	1.83	0.56
Trunk - top rear	44	3.67	1.12
Base of rear window	47	3.92	1.19

[redacted]

[redacted]

2004 DODGE GRAND CARAVAN 4DR MINI VAN

INTERIOR DIMENSIONS

	Inches	Feet	Meters
Front Seat Shoulder Width	63	5.25	1.60
Front Seat to Headliner	40	3.33	1.02
Front Leg - seatback to floor (max)	41	3.42	1.04
Rear Seat Shoulder Width	65	5.42	1.65
Rear Seat to Headliner	39	3.25	0.99
Rear Leg - seatback to floor (min)	40	3.33	1.02

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS + OPTIONAL SIDE AIRBAGS

STEERING DATA

Turning Circle (Diameter)	468	39.00	11.89
Steering Ratio:	__.__:1		
Wheel Radius:	12	1.00	0.30
Tire Size (OEM):	P215/65R16		

ACCELERATION & BRAKING INFORMATION

Brake Type: ALL DISC
ABS System: ALL WHEEL ABS

Braking, 60 mph -> 0 (Hard pedal, no skid, dry pavement):
d = 130 ft t = 3.0 sec. a =-29.7 ft/sec/sec G-force = -0.92

ACCELERATION:

0->30 mph	t = 3.7 sec.	a = 11.9 ft/sec/sec	G-force = 0.37
0->60 mph	t = 9.7 sec.	a = 9.1 ft/sec/sec	G-force = 0.28
45->65 mph	t = __._ sec.	a = __._ ft/sec/sec	G-force = _.__

Transmission Type: AUTOMATIC

NOTES:

Federal Bumper Standard Requirements = NO REQUIREMENT

[redacted]

2004 DODGE GRAND CARAVAN 4DR MINI VAN

OTHER INFORMATION

TIP-OVER STABILITY RATIO = 1.17 REASONABLY STABLE
NHTSA Star Rating (calculated) ***

CENTER OF GRAVITY (No Load):

Inches behind front axle	= 49.98
Inches in front of rear axle	= 69.02
Inches from side of vehicle	= 39.50
Inches from ground	= 27.01
Inches from front corner	= 96.44
Inches from rear corner	= 119.72
Inches from front bumper	= 87.98
Inches from rear bumper	= 113.02

MOMENTS OF INERTIA APPROXIMATIONS (No Load):

YAW MOMENT OF INERTIA	= 3002.57	lb-ft-sec^2
PITCH MOMENT OF INERTIA	= 3068.28	lb-ft-sec^2
ROLL MOMENT OF INERTIA	= 693.18	lb-ft-sec^2

FRONT PROFILE INFORMATION

ANGLE FRONT BUMPER TO HOOD FRONT	= 56.3	deg
ANGLE FRONT OF HOOD TO WINDSHIELD BASE	= 20.6	deg
ANGLE FRONT OF HOOD TO WINDSHIELD TOP	= 27.9	deg
ANGLE OF WINDSHIELD	= 33.7	deg
ANGLE OF STEERING TIRES AT MAX TURN	= 29.1	deg

FIRST APPROXIMATION CRUSH FACTORS:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush or indentation may be evaluated using the following formula, the appropriate Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

V(mph) = Sqr root of (30 * CF * MID)

KE Equivalent Speed (Front/Rear/Side) = 21 CF

Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY = 27 CF
(Tested for Rear/Side Impact only)

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The Rear Impact data with more than 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, esp. GM, your estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

[redacted]

Date	Time (cdt)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Temperature (°F)				Pressure		Precipitation		
						Air	Dwpt	6 hour Max.	6 hour Min.	altimeter (in)	sea level (mb)	1 hr	3 hr	6 hr
30	09:53	N 10	10.00	A Few Clouds	FEW036	71	61			30.12	1019.7			
30	08:53	N 10	10.00	Overcast	OVC036	67	61			30.12	1019.8			
30	07:53	N 7	10.00	Overcast	OVC036	65	62			30.11	1019.2			
30	06:53	N 6	9.00	Overcast	OVC038	64	62	66	63	30.09	1018.7			
30	05:53	N 6	9.00	Overcast	OVC038	65	62			30.08	1018.3			
30	04:53	N 3	7.00	Overcast	OVC036	65	62			30.06	1017.7			
30	03:53	Calm	5.00	Fog/Mist	OVC036	63	63			30.06	1017.6			
30	02:53	Calm	7.00	Overcast	OVC036	65	63			30.06	1017.6			
30	01:53	Calm	7.00	Overcast	OVC034	65	63			30.05	1017.3			
30	00:53	N 5	8.00	Overcast	OVC032	66	63	67	66	30.04	1017.1			
29	23:53	N 3	7.00	Overcast	FEW016 OVC028	66	63			30.04	1017.1			
29	22:53	N 6	8.00	Overcast	OVC030	66	63			30.04	1017.1			
29	21:53	N 8	8.00	Overcast	OVC026	67	63			30.05	1017.2			
29	20:53	N 7	9.00	Overcast	OVC019	67	63			30.04	1017.1			
29	19:53	N 9	10.00	Overcast	OVC015	67	62			30.02	1016.4			
29	18:53	N 10	10.00	Overcast	OVC015	67	62	70	67	30.00	1015.7			
29	17:53	N 10	10.00	Overcast	OVC015	68	62			30.00	1015.6			
29	16:53	N 12	10.00	Overcast	OVC015	68	63			30.00	1015.7			
29	15:53	N 10	10.00	Overcast	OVC017	69	63			30.01	1016.0			
29	14:53	N 10	10.00	Overcast	OVC015	69	64			30.01	1016.1			
29	13:53	N 10	10.00	Overcast	OVC015	69	64			30.02	1016.3			
29	12:53	NW 9	10.00	Overcast	OVC013	69	64	71	67	30.02	1016.3			0.01
29	11:53	N 10	10.00	Overcast	BKN007 OVC011	68	65			30.02	1016.2			
29	10:53	N 10	7.00	Overcast	OVC007	68	65			30.01	1016.0			
29	09:53	N 9	5.00	Fog/Mist	OVC007	67	65			30.00	1015.7		0.01	
29	08:53	N 9	10.00	Light Rain	OVC009	69	67			29.99	1015.2	0.01		
29	07:53	NW 9	10.00	Overcast	OVC009	69	68			29.97	1014.5			
29	06:53	N 3	9.00	Overcast	OVC005	70	69	70	67	29.94	1013.7			
29	05:53	Calm	9.00	Overcast	OVC007	70	69			29.92	1013.0			
29	04:53	Calm	6.00	Fog/Mist	OVC055	68	68			29.91	1012.5			
29	03:53	Calm	8.00	A Few Clouds	FEW070	69	68			29.92	1012.8			
29	02:53	Calm	8.00	A Few Clouds	FEW090	69	69			29.93	1013.1			
29	01:53	Calm	5.00	Fog/Mist	FEW001	68	68			29.94	1013.4			

[redacted]

Date	Time (cdt)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Air	Dwpt	Max.	Min.	altimeter (in)	sea level (mb)	1 hr	3 hr	6 hr
								6 hour						
						Temperature (°F)				Pressure		Precipitation		
28	23:53	W 3	7.00	A Few Clouds	FEW006	69	69			29.95	1013.7			
28	22:53	SW 8	10.00	Mostly Cloudy	BKN006	71	70			29.96	1014.1			
28	21:53	S 3	7.00	Fair	CLR	69	69			29.93	1013.3			
28	20:53	SW 3	9.00	Fair	CLR	70	69			29.93	1013.2			
28	19:53	W 5	10.00	A Few Clouds	FEW110	71	70			29.92	1012.7			
28	18:53	E 3	10.00	Fair	CLR	72	70	90	71	29.92	1012.7			0.13
28	17:53	Calm	10.00	Light Rain	FEW046 SCT100 SCT120	71	70			29.95	1013.9	0.06		
28	16:53	W 3	5.00	Light Thunderstorm Rain Fog/Mist	BKN031 OVC065	71	69			29.97	1014.3	0.07		
28	15:53	SW 18 G 32	10.00	Thunderstorm in Vicinity	FEW021 SCT048 SCT055	75	69			29.92	1012.9			
28	14:53	SE 26 G 32	10.00	Fair and Windy	CLR	85	73			29.88	1011.3			
28	13:53	S 12	10.00	Mostly Cloudy	SCT040 BKN050	89	75			29.89	1011.8			
28	12:53	S 12	10.00	Partly Cloudy	SCT032	89	77	89	75	29.92	1012.7			
28	11:53	S 6	10.00	Partly Cloudy	SCT025	86	77			29.95	1013.7			
28	10:53	SW 3	10.00	Partly Cloudy	SCT023	84	77			29.96	1014.2			
28	09:53	Vrbl 5	10.00	A Few Clouds	FEW016	82	77			29.97	1014.6			

[redacted]

[redacted]

[redacted]

WRITTEN STATEMENT

ALL CORRECTIONS SHOULD BE INITIALED BY THE PERSON GIVING THE STATEMENT. ATTACH AND NUMBER ADDITIONAL PAGES IF NECESSARY. PAGE _____ OF _____

I was traveling on 55 South. There was a Van ahead of me (one car) We were all in the left lane. The Van all of a sudden just veered off the roadway hitting (clipping) the guardrail. We were going approx. 75-80 mph They didn't stop or were able to slow down at all. I seen them go airborn and hit the dirt wall - Causing a cloud of dust.

[redacted]

Enterprise

CUSTOMER COPY

[redacted]

OWNER OF VE

BRANCH ADD

DATE IN / DATE OUT

RENTAL TYPE | SOURCE # | I.D. #

RENTAL AGREEMENT NO. D

RENTER

START CHARGES IF DIFFERENT

[redacted]

ORIGINAL VEHICLE

COLOR	LICENSE NO.
MODEL	ECAR#

MILE-AGE	
	IN
	OUT
DRIVEN	

CONDITION AGREED TO: X RENTER

NO DAMAGE

X= DENT — = SCRATCH O= MISSING

FUEL OUT E 1/8 1/4 3/8 1/2 5/8 3/4 7/8 F

FUEL IN E 1/8 1/4 3/8 1/2 5/8 3/4 7/8 F

BILL TO ☐ COMPANY

ATTN: PHONE EXT.

REFERENCE NUMBER:

ADDITIONAL AUTHORIZED DRIVER - EXCEPT AS REQUIRED BY LAW, NONE PERMITTED WITHOUT OWNER'S WRITTEN APPROVAL.

I request Owner's permission to allow [redacted] who is under my control and direction to drive Vehicle for me and on my behalf. I am responsible for their acts while they are driving, and for fulfilling Terms and Conditions of this Agreement. Use of Vehicle by an unauthorized driver will affect my liability and rights under this agreement.

RENTER: X

PERMISSION GRANTED TO OPERATE VEHICLE ONLY IN THE STATE OF RENTAL AND THE FOLLOWING STATE(S):

Operation in any other State or Country will affect your liability and rights under this agreement.

OPTIONAL PRODUCTS NOTICE: Our contract offers, for an additional charge, optional products including Collision Damage Waiver (referenced below), Personal Accident Insurance and Supplemental Liability Protection. Before deciding whether to purchase any of these optional products, you may wish to determine whether your personal insurance or credit card provides you coverage during the Rental Period. The purchase of any of these optional products is not required to rent Vehicle.

RENTER DECLINES OPTIONAL COLLISION DAMAGE WAIVER (CDW) AND ASSUMES DAMAGE RESPONSIBILITY. SEE PAGE 2, PARAGRAPH 5. RENTER: X	RENTER **ACCEPTS OPTIONAL COLLISION DAMAGE WAIVER** (CDW) AT DAILY FEE SHOWN IN COLUMN TO RIGHT. SEE OPTIONAL PRODUCTS NOTICE TO LEFT, "NOTICE" BELOW AND PAGE 3, PARAGRAPH 15. COLLISION DAMAGE WAIVER IS NOT INSURANCE. RENTER:
RENTER DECLINES OPTIONAL PERSONAL ACCIDENT INSURANCE (PAI). RENTER: X	RENTER **ACCEPTS OPTIONAL PERSONAL ACCIDENT INSURANCE (PAI)** AT DAILY FEE SHOWN IN COLUMN TO RIGHT. SEE OPTIONAL PRODUCTS NOTICE TO LEFT AND PAGE 3, PARAGRAPH 17. RENTER:
RENTER DECLINES OPTIONAL SUPPLEMENTAL LIABILITY PROTECTION (SLP). RENTER: X	RENTER **ACCEPTS OPTIONAL SUPPLEMENTAL LIABILITY PROTECTION (SLP)** AT DAILY FEE SHOWN IN COLUMN TO RIGHT. SEE OPTIONAL PRODUCTS NOTICE TO LEFT AND PAGE 3, PARAGRAPH 18. RENTER:

ACKNOWLEDGMENT OF THE ENTIRE AGREEMENT, WHICH CONSISTS OF PAGES 1 THROUGH 4

I HAVE READ AND AGREE TO THE TERMS AND CONDITIONS ON PAGES 1 THROUGH 4 OF THIS RENTAL AGREEMENT AND BY MY SIGNATURE BELOW I AM THE "RENTER" UNDER THIS AGREEMENT. I ALSO AUTHORIZE OWNER TO PROCESS CHARGES ON MY CREDIT CARD(S) FOR ANY ADVANCE DEPOSITS, INCREMENTAL AUTHORIZATIONS/DEPOSITS AND/OR CHARGES INCURRED, AS WELL AS PAYMENTS REFUNDED BY A THIRD PARTY TO RENTER.

RENTER X DATE

OWNER REP X EMPL. #

I will return car by:		Deposit(s):		
Date	Time	Amount	Paid By	Date Paid

REPLACEMENT VEHICLE

DATE OUT

COLOR	LICENSE NO.
MODEL	ECAR#

MILE-AGE	
	IN
	OUT
DRIVEN	

CONDITION AGREED TO: X RENTER

NO DAMAGE

X= DENT — = SCRATCH O= MISSING

OUT E 1/8 1/4 3/8 1/2 5/8 3/4 7/8 F

IN E 1/8 1/4 3/8 1/2 5/8 3/4 7/8 F

NOTICE: IF YOU HAVE COLLISION COVERAGE UNDER YOUR OWN AUTOMOBILE INSURANCE POLICY WRITTEN IN LOUISIANA, YOUR COLLISION COVERAGE AUTOMATICALLY EXTENDS TO RENTAL MOTOR VEHICLES PURSUANT TO LA R.S.22:1406(F). EVEN IF YOU ARE NOT A LOUISIANA INSURED, THE PURCHASE OF COLLISION DAMAGE WAIVER IS NOT MANDATORY AND MAY BE WAIVED. THIS CONTRACT OFFERS, FOR AN ADDITIONAL CHARGE, A COLLISION DAMAGE WAIVER TO COVER YOUR RESPONSIBILITY FOR DAMAGE TO THE VEHICLE. BEFORE DECIDING WHETHER TO PURCHASE THE COLLISION DAMAGE WAIVER, YOU MAY WISH TO DETERMINE WHETHER YOUR OWN AUTOMOBILE INSURANCE AFFORDS YOU COVERAGE FOR DAMAGE TO THE RENTAL VEHICLE AND THE AMOUNT OF THE DEDUCTIBLE UNDER SUCH COVERAGE.

RENTER'S SIGNATURE: DATE:

FUEL CHARGE

TOTAL CHARGES	
DEPOSITS	
REFUNDS	
AMOUNT DUE	

CLOSED BY

Paid By	Cash	Check	Charge
Receipt Of Cash Refund	Date	Amount	Received by

wner is an affiliate of Enterprise Rent-A-Car Company, which owns all rights to Enterprise names and marks.