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ON-SITE NOT IN TRAFFIC SURVEILLANCE BACK OVER INVESTIGATION

CASE NUMBER - IN-07-014
LOCATION - MICHIGAN
VEHICLE - 1989 CHEVROLET CAMARO
INCIDENT DATE - April 2007

Submitted:

June 11, 2007
Revised November 19, 2007

Contract Number: DTNH22-07-C-00044

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
National Center for Statistics and Analysis
Washington, D.C. 20590-0003

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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.

Technical Report Documentation Page

1. *Report No.* IN-07-014	2. *Government Accession No.*	3. *Recipient's Catalog No.*	
4. *Title and Subtitle* On-Site Not-In-Traffic Surveillance Back Over Investigation Vehicle - 1989 Chevrolet Camaro Location - Michigan		5. *Report Date:* June 11, 2007 6. *Performing Organization Code*	
7. *Author(s)* Special Crash Investigations Team #2		8. *Performing Organization Report No.*	
9. *Performing Organization Name and Address* Transportation Research Center Indiana University 222 West Second Street Bloomington, Indiana 47403-1501		10. *Work Unit No. (TRAIS)* 11. *Contract or Grant No.* DTNH22-07-C-00044	
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15. *Supplementary Notes* On-site not in traffic surveillance back over investigation involving a 1989 Chevrolet Camaro and a pedestrian.			
16. *Abstract* This report covers an on-site not in traffic surveillance back over investigation involving a 1989 Chevrolet Camaro and a pedestrian. This incident is of special interest because the Chevrolet's driver backed over a pedestrian (4-year-old, female), who sustained police reported "B" (non-incapacitating-evident) injuries as a result of the crash The Chevrolet was parked heading north in a driveway near the entrance to a residence. The driver (17-year-old, male) and his two passengers (16-year-old, female and 10 year-old, male) came out of the residence, entered the vehicle, and the driver immediately began to back out of the driveway. The driver was looking through his left side view mirror as he backed up. He did not see the pedestrian behind him and backed over her. A visibility study of the Chevrolet indicated that the left side view mirror gave the driver a limited field of view as he backed up, and the pedestrian was most likely outside of the mirror's field of view. In addition, it is possible a speaker in the cargo area of the vehicle could have blocked the driver's view of the pedestrian when he checked his rearview mirror prior to backing up. The pedestrian was trapped under the vehicle near the left front wheel. The pedestrian was transported to a hospital and admitted.			
17. *Key Words* Back Over Child Injury Motor Vehicle Traffic Crash Injury Severity		18. *Distribution Statement* General Public	
19 *Security Classif. (of this report)* Unclassified	20. *Security Classif. (of this page)* Unclassified	21. *No. of Pages* 18	22. *Price* $6,100

Form DOT 1700.7 (8-72) Reproduction of completed page authorized

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BACKGROUND

IN-07-014

This incident was brought to NHTSA's attention on or before May 1, 2007 by a story in a Michigan on-line news service. This incident involved a 1989 Chevrolet Camaro and a pedestrian. The incident occurred in April, 2007 at 5:00 p.m., in Michigan and was investigated by the applicable county sheriff's department. A standard "State of Michigan Traffic Crash Report" (i.e., UD-10) was completed by the county sheriff's department and submitted to the state. This incident is of special interest because the Chevrolet's driver backed over a pedestrian [4-year-old, White (non-Hispanic) female], who sustained police reported "B" (non-incapacitating-evident) injuries as a result of the incident. This contractor inspected the scene and Chevrolet, and interviewed the driver and front right passenger on May 16, 2007. A second interview was conducted with the driver on June 5, 2007. This report is based on the sheriff's department crash report, interviews with the Chevrolet's driver and front right passenger, scene and vehicle inspections, and this contractor's evaluation of the evidence.

SUMMARY

The Chevrolet Camaro was parked heading north in a driveway near the entrance to a residence. The pedestrian was located south of the Chevrolet, but it is not known if she was directly in the path of the vehicle or entered the path of the vehicle as it was backing. The pedestrian was being baby-sat at the residence, but was not being closely supervised. The driver (17-year-old, male) and his two passengers (16-year-old, female and 10 year-old, male) came out of the residence and entered the vehicle. The driver immediately checked his mirrors and began to back out of the driveway. The driver was looking through his left side view mirror as he backed up. He did not see the pedestrian and backed over her. She was trapped under the vehicle near the left front wheel. The pedestrian was transported to a hospital and admitted. A visibility study of the Chevrolet indicated that the left side view mirror gave the driver a limited field of view as he backed up, and the pedestrian was most likely outside of the mirror's field of view. In addition, it is possible a speaker in the cargo area of the vehicle could have blocked the driver's view of the pedestrian when he checked his rearview mirror prior to backing up. At the time of the incident, the atmospheric condition was clear, the light condition was daylight and the driveway surface was a combination of dry gravel and dirt.

CRASH CIRCUMSTANCES

Crash Environment: The Chevrolet Camaro was parked in a one-lane, unpaved, driveway, which traversed in a nominal north-south direction, but curved toward the southwest as it approached the street. The driveway had a slightly negative grade (i.e., -0.4%)in the area where the Chevrolet was parked. The grade then progressed to 1.6% negative in the area where the impact occurred. The driver's residence was located on the west side of the driveway. The Chevrolet was parked adjacent to the residence. At least three teenagers (14-year-old, female; 15-year-old, female; and 17-year-old male) were playing basketball on the east side of the driveway in a parking area. An adult male was behind the residence doing yard work. A 16-year-old female was inside the residence. The police crash report indicated that the pedestrian was being baby-sat at the residence. The pedestrian was located south of the Chevrolet in an unknown location just prior to the incident. At the time of the incident, the atmospheric condition was clear, the light

condition was daylight and the driveway surface was a combination of dry gravel and dirt. There was no other traffic present. The site of the incident was rural residential. See the Scene Diagram at the end of this report.

Figure 1: View south, red arrow shows parked location of Chevrolet, green arrow shows approximate area of impact (Note: tire marks are not incident related)

Pre-Crash: The Chevrolet Camaro was parked headed north on the east side of the residence near the entrance to the residence [**Figure 1**, (Note: The field investigation was conduced several weeks post-crash, and it had rained since the incident. The tire marks visible in the area where the vehicle was parked were relatively "fresh" and therefore, not related to this incident)]. The driver and his two passengers exited the residence and approached the Chevrolet from it's left side. Neither the driver or his passengers saw the pedestrian as they exited the residence. The driver and male passenger entered the vehicle through the left front door after taking only a few paces from the steps to the deck of the residence. The male passenger got into the back left seat. The female passenger walked around the front of the vehicle to the right side and got into the front right seat. According to the driver, he did not look directly out of the backlight prior to backing up. He stated he only checked his right side view mirror, rearview mirror, and left side view mirror, in that order, prior to backing. The driver indicated that the estimated time range from entering the vehicle to beginning to back up was 10 seconds or less. The driver stated that when he backed up, he used only the left side view mirror. He did not turn his head to the right to look out of the backlight or check his other mirrors. The driver stated that as he backed up, he was engaged in a conversation with one of the passengers. The driver indicated that as he backed, he kept the vehicle close to the west edge of the driveway to avoid the kids playing basketball in the eastern portion of the driveway/parking area. The driver's intention was to back out of the driveway and into the street, which was approximately 34 meters (~112 feet) from his parked location. Meanwhile, the pedestrian was at an unknown location behind the Chevrolet. It is not known if the pedestrian was directly in the path of the vehicle, or approached the path of the vehicle from the left or right side as the driver began backing up. There were no view obstructions in the environment behind or to either side of the vehicle as it backed up. Lastly, the sheriff's department crash report indicated that the driver was not under the influence of alcohol or drugs.

Crash: The Chevrolet Camaro's driver began backing while looking through his left side view mirror. He turned the steering wheel slightly to the left to follow the curve of the driveway as he backed up. The driver stated that he felt the impact and then stopped the vehicle. The driver was also alerted to the impact by his front right passenger, who told the investigating sheriff's deputy that she felt a "thud" and yelled at the driver to stop. In addition, the 17-year-old male who was playing basketball near the Chevrolet told the investigating sheriff's deputy that he saw the child under the Chevrolet and ran toward the vehicle yelling at the driver to stop. He did not see the impact, nor did the other two teens who were playing with him. The specific area of the impact

in the driveway and location of the impact on the back of the vehicle could not be identified by the driver or the front right passenger. It was also not addressed on the sheriff's department crash report. However, the driver and front right passenger showed the SCI investigator the approximate parked location of the vehicle, the approximate location of the vehicle at final rest, and the approximate final rest location of the pedestrian. This information indicated that the Chevrolet had traveled approximately 12.3 meters (~40 feet) from its parked position to its final rest position. In addition, the driver estimated the range of elapsed time from beginning to back up to impact was 2-3 seconds. Considering this information, other data acquired during the investigation and several reconstruction scenarios, it was determined that the best approximation of the Chevrolet's travel distance to impact (**Figure 1** above) was 7 meters (23 feet), and the impact speed was approximately 15 km.p.h. (~9 m.p.h.). It is also this contractor's opinion that the pedestrian was struck by the Chevrolet's back bumper (**Figure 2**) and knocked down. However, the pedestrian's attitude (i.e., standing, sitting etc.), motion and approach relative to the vehicle just prior to the impact are not known.

Figure 2: Overview of back of Chevrolet

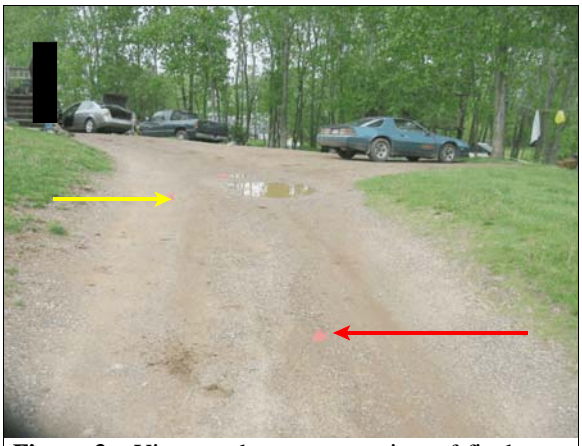


Figure 3: View northeast to overview of final rest position as reported by driver and front right passenger, red arrow shows reported location of back end of Chevrolet and yellow arrow shows reported location of pedestrian

Post-Crash: The Chevrolet Camaro and pedestrian came to rest in the driveway (**Figure 3**). It was determined that the Chevrolet had traveled backward approximately 5.3 meters(17.4 feet) from impact to final rest. In the process, the Chevrolet had passed over the pedestrian and she had become lodged between the undercarriage and the ground. It was determined that the pedestrian was most likely dragged approximately 1 to 1.5 meters (3.2 to 4.9 feet) as the vehicle passed over her. The pedestrian's rest position was described by a witness (i.e., the adult who had been working in the back yard) as facing towards the front of the vehicle with her left shoulder partly pinched between the left front tire and the ground. The Chevrolet's driver, the passengers, the adult male and some other people managed to lift the left front of the vehicle enough for the pedestrian to be pulled out from under the vehicle. The pedestrian was conscious and being held by the adult male when the investigating sheriff's deputy arrived. The pedestrian was subsequently transported by ambulance to a hospital and admitted for treatment of her injuries.

The1989 Chevrolet Camaro was a rear wheel drive, two-door coupe (VIN: 1G1FP21S1KL------) equipped an a 2.8L, V6 engine and automatic transmission. The vehicle's engine had been modified to some extent and the hood had been removed. In addition, the driver had installed a speaker in the cargo area of the vehicle. The speaker extended 19 centimeters (7.4 inches) above the top of the back seat. The top of the back seat was 89 centimeters (35 inches) above the ground. The vehicle's recommended tire size was P215/65R15; however, the vehicle was equipped with P195/60R15 tires on the front and P255/60R15 size tires on the rear. The tires on the vehicle at the time of the incident would have raised the vehicle less than 2.5 centimeters (1 inch) higher that the stock tires. The Chevrolet was not equipped with any back up/parking aid. The Chevrolet's wheelbase was measured as 256 centimeters (100.8 inches). The specified rear overhang was 112 centimeters (44.1 inches) and the specified overall length was 488 centimeters (192.1 inches). The distance from the ground to the bottom of the back bumper was measured as 37 centimeters (14.6 inches). The distance from the ground to the top of the hatch at the back end was measured as 92 centimeters (36.2 inches). At the time of the incident, both the right front and left front windows were fully open.

CASE VEHICLE DAMAGE

There was no evidence of pedestrian contact to the Chevrolet Camaro's back bumper or undercarriage. It was not possible to thoroughly inspect the undercarriage due to the restricted space under the vehicle. A partial CDC was estimated as follows: **06-B9LU-1** (**180** degrees). The Chevrolet was not damaged.

CASE VEHICLE DRIVER

The Chevrolet Camaro's driver was a White, (non-Hispanic) 17-year-old, male. He was 178 centimeters (70 inches) tall and weighed 75 kilograms (165 pounds). The driver was not wearing sunglasses or corrective lenses at the time of the incident. He indicated he drives the Chevrolet daily and parks it in the subject driveway daily as well. The driver indicated that he, his girlfriend and her brother were leaving the residence to go pick up a friend when the incident occurred.

CASE VEHICLE FRONT RIGHT PASSENGER

The Chevrolet Camaro's front right passenger was a White, (non-Hispanic) 16-year-old, female. She was 168 centimeters (66 inches) tall and weighed 59 kilograms (130 pounds).

CASE VEHICLE BACK LEFT PASSENGER

The Chevrolet Camaro's back left passenger was a White (non-Hispanic) 10-year-old, male. He was 142 centimeters (56 inches) tall and weighed 54 kilograms (120 pounds).

A visibility study was conducted during the Chevrolet Camaro inspection in order to determine the approximate field of view through both side view mirrors and the rearview mirror. In addition, for completeness, the nominal blind zone behind the Chevrolet and the right "B"-pillar blind zone (i.e., the Chevrolet did not have a "C"-pillar) were also assessed. The driver did not look directly out of the backlight either prior to backing up or while backing up, so these blind zones were not a factor in this incident. Lastly, the rearview mirror's field of view and the blind zone behind the vehicle were assessed with the speaker both in place in the cargo area as well as removed from the cargo area.

The Chevrolet driver's eye height was 104 centimeters (41 inches) above the ground as he sat in the driver's seat. The driver's seat was adjusted to between the middle and full rear position. The standard target, 71 centimeters (28 inches) in height, was used for the visibility observations. Please refer to the nominal visibility diagram at the end of this report when reading the following discussion.

The driver was asked to sit in the driver's seat and view through the right and left side view mirrors and indicate when the target went out of each mirror's field of view. The target was first placed at the back left corner of the Chevrolet. It had to be moved only 0.5 meters (1.6 feet) to the left before going out of the left side view mirror's field of view. The target was then placed at the back right corner of the vehicle and moved to the right 1.8 meters (5.9 feet) before going out of the right side view mirror's field of view.

Figure 4: View through Chevrolet's rearview mirror

Figure 5: View out of Chevrolet's backlight from driver's seat with the speaker removed from the cargo area

The driver was also asked to view behind the Chevrolet through the rearview mirror (**Figure 4**) with the speaker removed from the cargo area. The target was then moved rearward from the back of the vehicle until it came into the driver's view. The target had to be moved rearward approximately 2 meters (6.6 feet) before the driver could see it. The target was then placed in this position at the vehicle's approximate centerline and was moved 1.8 meters (5.9 feet) to the right before going out of the rearview mirror's field of view. When the target was moved to the left from the centerline, it was visible for 1.2 meters (3.9 feet) before being obstructed by the image of the driver's head in the rearview mirror. In summary, the depth of the rearview mirror blind zone with the speaker removed was determined to be 2 meters (6.6 feet). The total width of the beginning of the visibility zone at this

point was 3 meters (9.8 feet). With the speaker in place in the cargo area, it was necessary to move the target rearward from the back of the vehicle 4.3 meters (14.1 feet) before the driver could see it over the top of the speaker.

Figure 6: Arrow shows location target first came into driver's view as he looked over right shoulder out of backlight (speaker removed from cargo area)

With the speaker removed from the cargo area, the driver was asked to look over his right shoulder out of the backlight (**Figure 5** above) and indicate when the target came into view as it was moved rearward from the back of the vehicle. It was necessary to move the target rearward 2.1 meters (6.9 feet) before the driver could see it (**Figure 6**). The target was then moved to the right from this position at the vehicle's approximate centerline 5 meters (16.4 feet) where it became obstructed by the right B-pillar. It was necessary to move the target an additional 3.2 meters (10.4 feet) to the right before the driver could see it again on the right side of the B-pillar. When the target was moved 2 meters (6.6 feet) to the left from the vehicle's centerline, it became obstructed by the left B-pillar. With the speaker in the cargo area (**Figure 7**), it was necessary to move the target rearward from the back of the vehicle 5.1 meters (16.7 feet) before the driver could see it over the top of the speaker. The target had to be moved 1.1 meters (3.6 feet) to the right from the centerline to position out of the driver's view behind the speaker prior to determining the depth of the blind zone behind the speaker.

Figure 7: View out backlight from driver's seat with speaker in cargo area

The visibility study indicated that the left side view mirror gave the driver a limited field of view as he backed up, and the pedestrian was most likely outside of the mirror's field of view. In addition, it is possible that the speaker in the cargo area blocked the driver's view of the pedestrian when he checked his rearview mirror prior to backing up.

PEDESTRIAN

The pedestrian [4-year-old, White (non-Hispanic) female; 91 centimeters and 16 kilograms (36 inches, 35 pounds)] was reportedly wearing an red tee-shirt, blue jeans, and sandals. She was transported from the scene by ambulance to a hospital and admitted for treatment of her injuries.

The pedestrian's injuries were reported in the police crash report based on the investigating officer's interview with the pedestrian's treating physician. The table below shows the pedestrian's injuries based on the police reported information. The injury mechanisms are based on this contractor's interpretation of the injury descriptions and the available information

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
1	Contusion {bruise} left lung, not further specified	serious 441406.3,2	Tire, left front	Probable	Police Crash Report
2	Fracture left ribs: 1st and 2nd, not further specified	moderate 450220.2,2	Tire, left front	Probable	Police Crash Report
3	Fracture neck left humerus, not further specified	moderate 752600.2,2	Tire, left front	Probable	Police Crash Report
4	Abrasions and friction burns on body, not further specified	minor 990200.1,9	Unknown contact mechanism	Unknown	Police Crash Report
5	Contusions {bruises} on body, not further specified	minor 990400.1,9	Unknown contact mechanism	Unknown	Police Crash Report

IN-07-014

Nominal Visibilty Diagram
Case Vehicle = 1989 Chevrolet Camaro

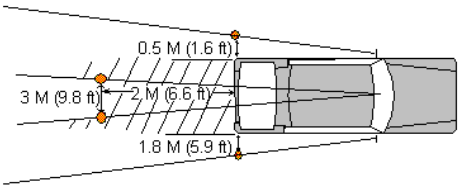
Chevrolet Driver's Eye Height From Ground = 104 cm (40.9 in)

= Chevrolet Blind Zones

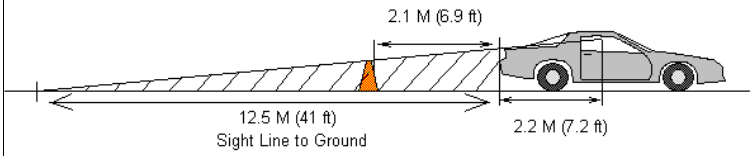
= Side View Mirror and Rearview Mirror Visibility Zone

= 71 cm (28 in) High Target

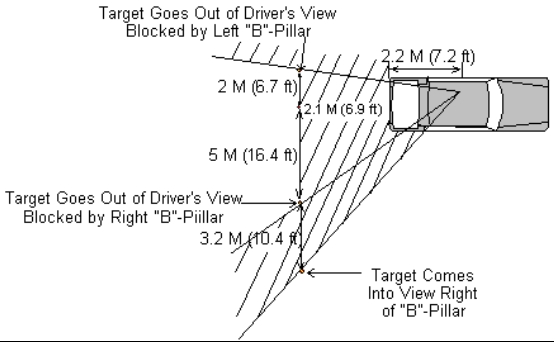
1. Side View Mirror and Rearview Mirror Visibility Zones
(Note: rearview mirror visibility zone as shown is without speaker in cargo area; depth of blind zone behind speaker with driver looking through rearview mirror was 4.3 Meters (14.2 feet); width of speaker blind zone was not determined)

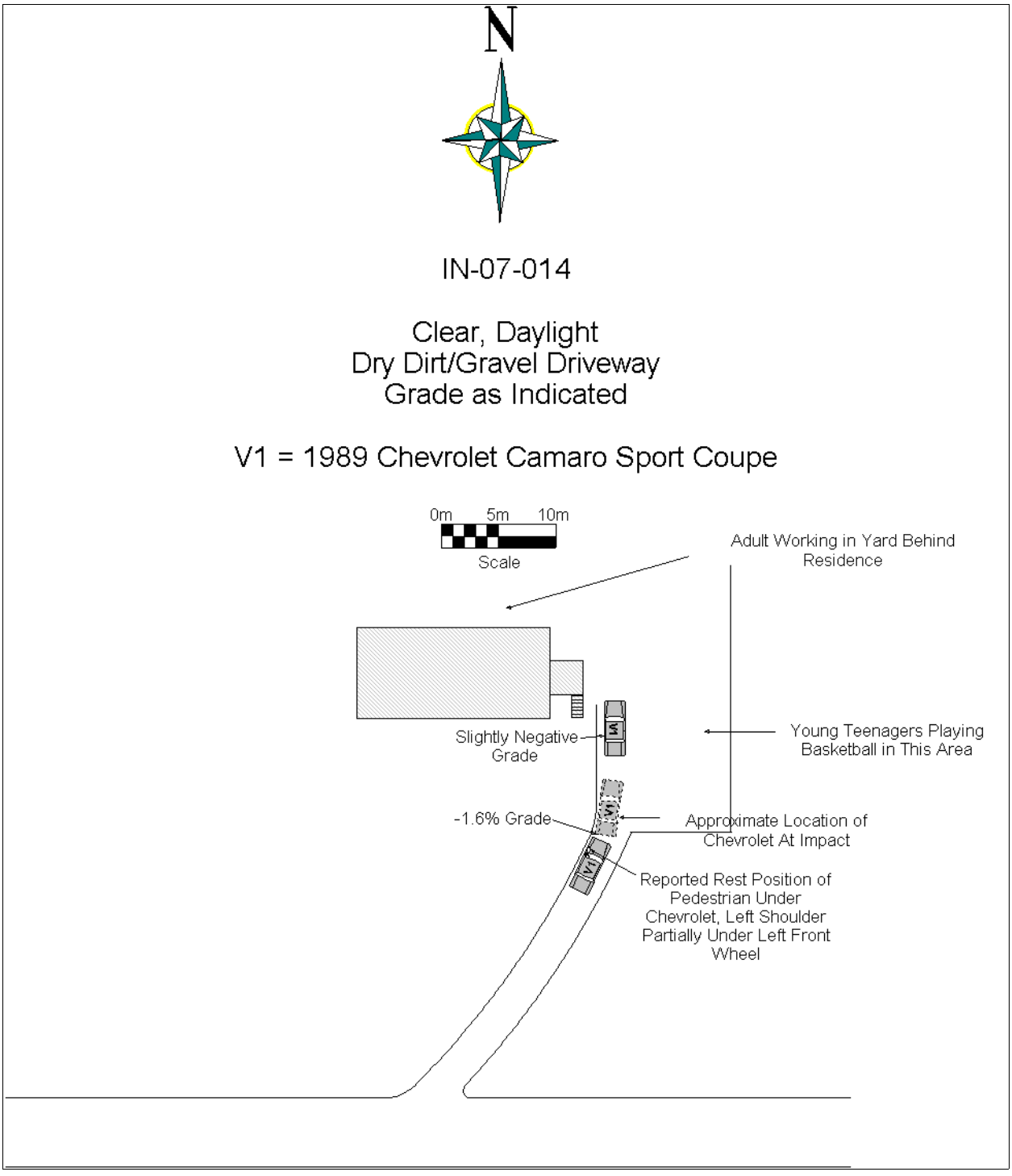


2. Distance Back of Chevrolet To Point a 71 cm (28 in) High Reference Target Comes Into Driver's View as He Looks Over Right Shoulder
(Note: blind zone as shown is without speaker in cargo area; depth of blind zone behind speaker with driver looking over right shoulder was 5.1 Meters (16.7 feet); width of speaker blind zone was not determined)



3. Blind Zone Behind Chevrolet, Driver Looking Over Right Shoulder
(Note: blind zone as shown is without speaker in cargo area; depth of blind zone behind speaker with driver looking over right shoulder was 5.1 Meters (16.7 feet); width of speaker blind zone was not determined)




N
IN-07-014
Clear, Daylight
Dry Dirt/Gravel Driveway
Grade as Indicated
V1 = 1989 Chevrolet Camaro Sport Coupe
0m 5m 10m
Scale
Adult Working in Yard Behind Residence
Slightly Negative Grade
Young Teenagers Playing Basketball in This Area
-1.6% Grade
Approximate Location of Chevrolet At Impact
Reported Rest Position of Pedestrian Under Chevrolet, Left Shoulder Partially Under Left Front Wheel

Not Applicable ☐

Reset Values

Print Forms

U.S. Department of Transportation
National Highway Traffic Safety Administration

SCENE FORM

Special Crash Investigations
Not In Traffic Surveillance

1. Case Number

I N 0 7 0 1 4

IDENTIFICATION

2. Date of Crash 0 4 / x x / 0 7

3. Time of Crash 1 7 0 0

Code reported military time of crash.

NOTE: Midnight = 2400
Unknown = 9999

AMBIENT CONDITIONS

4. Light Conditions

- (•) Daylight
- ( ) Dark
- ( ) Dark but lighted
- ( ) Dawn
- ( ) Dusk
- ( ) Unknown

5. Atmospheric Conditions
(*Select all that apply)*

- (•) Clear-No adverse conditions
- ( ) Cloudy
- ( ) Rain
- ( ) Snow
- ( ) Fog, Smog, Smoke
- ( ) Sleet, Hail (freezing rain or drizzle)
- ( ) Blowing Snow
- ( ) Severe Crosswinds
- ( ) Blowing Sand, Soil, Dirt
- ( ) Other (specify):_____
- ( ) Unknown

6. Temperature

- ( ) Below 0 degrees Celsius (Below 32 F)
- ( ) 1-10 degrees Celsius (33-50 F)
- (•) >10-24 degrees Celsius (51-75 F)
- ( ) Over 24 degrees Celsius (Over 75 F)
- ( ) Unknown

SCENE INFORMATION

7. Type of area in which crash occurred
(*Select all that apply)*

- (•) Single family residential
- ( ) Row houses/townhouses
- ( ) Multi family housing
- ( ) Commercial
- ( ) Industrial
- ( ) Rural
- ( ) Unknown

8. Driver exterior sightline obstructions
(*Select all that apply)*

- (•) None
- ( ) Other vehicles
- ( ) Building
- ( ) Trees
- ( ) Shrubbery
- ( ) Other (specify)_____
- ( ) Utility poles
- ( ) Signs
- ( ) Glare
- ( ) Unknown
- ( ) No driver present

9. Crash location

- (•) Driveway
- ( ) Parking Lot
- ( ) Sidewalk
- ( ) Alley
- ( ) Intersection of driveway and sidewalk
- ( ) Road / street
- ( ) Roadside / shoulder
- ( ) Other (specify)_____
- ( ) Unknown

10. Non motorist sightline obstructions
(*Select all that apply)*

- (•) None
- ( ) Other vehicles
- ( ) Building
- ( ) Trees
- ( ) Shrubbery
- ( ) Utility poles
- ( ) Signs
- ( ) Glare
- ( ) Other (specify) _____
- ( ) Unknown

11. Grade at parked position + / - 0 0 0 %

12. Estimated distance from parked position to impact

0 0 7 . 0 m

13. Estimated speed at impact 0 1 5 kmph

14. Grade at impact +/(-) - 0 2 %

15. Estimated distance from impact to vehicle final rest

0 0 5 . 3 m

Unknown = 999 Reference Items 11,12, 13, 14, 15

Not Applicable ☐

Reset Values

U.S. Department of Transportation
National Highway Traffic Safety Administration

VEHICLE FORM

Special Crash Investigations
Not In Traffic Surveillance

1. Case Number I N 0 7 0 1 4

VEHICLE IDENTIFICATION

2. VIN 1 G 1 F P 2 1 S 1 K L X X X X X X

3. Model Year 1 9 8 9

4. Vehicle Make (specify): Chevrolet

5. Vehicle Model (specify): Camaro Sport Coupe

GLAZING

Location	Presence (check)	Status (select)	Clarity (select)	Tint (check)	Glazing Obstructions (specify if present)
Windshield	☑	☑ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☑ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
LF	☑	☐ Fixed / ☐ Closed / ☑ Open / ☐ Partially Open / ☐ Unknown	☑ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
RF	☑	☐ Fixed / ☐ Closed / ☑ Open / ☐ Partially Open / ☐ Unknown	☑ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
2nd Left	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
2nd Right	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
3rd Left	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
3rd Right	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
Backlight	☑	☑ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☑ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	Speaker
Left Backlight	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
Right Backlight	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
Roof	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	
Other (specify)	☐	☐ Fixed / ☐ Closed / ☐ Open / ☐ Partially Open / ☐ Unknown	☐ Clear / ☐ Hazy / ☐ Very Dirty / ☐ Unknown	☐	

TIRE DATA

6. Vehicle Manufacturer Recommended Tire Size P215/65R15

7. LF Tire Size P195/60R15

9. RF Tire Size P195/60R15

8. LR Tire Size P255/60R15

10. RR Tire Size P255/60R15

Seats / Head Restraint Data

Seat Position	Seat Type (Select from below)	Head Restraint (Check if available)	Head Restraint Adjustment (select)	NOTES:
Front Left	2	☑	☐ ☐ ☑ Full Down / Mid / Full Up	Integral head restraint
Front Middle	0	☐	☐ ☐ ☐ Full Down / Mid / Full Up	
Front Right	2	☑	☐ ☐ ☑ Full Down / Mid / Full Up	Integral head restraint
2nd Left	1	☐	☐ ☐ ☐ Full Down / Mid / Full Up	
2nd Middle	0	☐	☐ ☐ ☐ Full Down / Mid / Full Up	
2nd Right	1	☐	☐ ☐ ☐ Full Down / Mid / Full Up	
3rd Left		☐	☐ ☐ ☐ Full Down / Mid / Full Up	
3rd Middle		☐	☐ ☐ ☐ Full Down / Mid / Full Up	
3rd Right		☐	☐ ☐ ☐ Full Down / Mid / Full Up	

Seat Type codes:

0 = No seat or seat folded down
1 = Bucket
2 = Bucket w/ folding back
3 = Bench
4 = Bench with folding back cushions
5 = Bench w/ folding back
6 = Split bench w/ separate back cushions
7 = Split bench w/ separate folding back
8 = Pedestal (i.e. column supported)
9 = Box mounted (i.e. van type)
10= Other seat type (specify)
99= Unknown seat type

VEHICLE MEASUREMENTS

Clearance Heights		Measurements (all from ground, and in centimeters	NOTES
Beltline		86	Speaker in cargo area extends 19 above back seat. Ground to top of back seat = 89
Top of trunk/tailgate		92	
Bottom of bumper		37	
Trailer hitch (if applicable)		N/A	
Undercarriage			
	Sway bar		Sway bar = 18 at differential, 23 at axle
	Axle	27	
	Differential	19	
	Other (specify): Ex pipe	15	Tail pipe = 27
Sensor Height (if equipped)		N/A	
Camera Height (if equipped)		N/A	

Not Applicable ☑

Reset Values

U.S. Department of Transportation
National Highway Traffic Safety Administration

Back Up / Parking Aid Form

Special Crash Investigations
Not In Traffic Surveillance

1. Case Number

I N 0 7 0 1 4

PARKING AID PRESENCE

2. Type of backing/parking aid present

- ○ OEM camera
- ○ OEM ultrasonic/radar sensor
- ○ OEM combination camera-ultrasonic/radar sensor
- ○ OEM Fresnel lens
- ○ OEM interior mirrors
- ○ Aftermarket camera
- ○ Aftermarket ultrasonic/radar sensor
- ○ Aftermarket combination camera-ultrasonic radar sensor
- ○ Aftermarket Fresnel lens
- ○ Aftermarket interior mirrors
- ○ Other (specify): _____

CAMERA INFORMATION

Specify field of view measurements on diagram

3. System make/model

_____

4. Video monitor type

- ○ None present
- ○ LCD (color)
- ○ CRT (black & white)
- ○ Unknown

5. Video display size _____ cm
(Diagonal)

6. Camera location

- ○ None present
- ○ Bumper
- ○ License plate
- ○ Tailgate/Hatch/Trunk
- ○ Other (specify): _____

7. Video image quality under scene lighting conditions

- ○ None present
- ○ Good
- ○ Average
- ○ Poor (specify): _____
- ○ Unknown

8. Was the camera functioning properly

- ○ None present
- ○ Yes
- ○ No, poor image quality due to glare
- ○ No, poor image quality due to atmospheric conditions
- ○ No, camera turned off
- ○ No, camera inoperable
- ○ Unknown

ULTRASONIC/RADAR SENSOR

Specify object detection range on diagram

9. System make/model

_____

10. Auditory warning illumination

- ○ No sensor present
- ○ Yes
- ○ No
- ○ Unknown

11. Number of sensors ____

12. Sensor locations
(Select all that apply)

- ○ No sensor present
- ○ Left bumper
- ○ Center bumper
- ○ Right bumper
- ○ License plate area
- ○ Tailgate/Hatch/Trunk

13. Was warning system functioning properly

- ○ No sensor present
- ○ Yes, system alerted driver
- ○ No, system did not alert driver
- ○ No, system turned off
- ○ No, system inoperable
- ○ Unknown

14. Did driver react to warning

- ○ No sensor present
- ○ Yes
- ○ No
- ○ Unknown

15. Did driver report common false warnings

- ○ No sensor present
- ○ Yes
- ○ No
- ○ Unknown

No Driver Present ☐

Reset Values

U.S. Department of Transportation
National Highway Traffic Safety Administration

DRIVER FORM

Special Crash Investigations
Not In Traffic Surveillance

1. Case Number

I N 0 7 0 1 4

DRIVER PROFILE

2. Driver's Age 17
99 = Unknown

3. Driver's Sex
- (•) Male
- ( ) Female
- ( ) Unknown

4. Driver's Height 178 cm
999 = Unknown

5. Driver's Weight 075 kg
999 = Unknown

6. Driver eyewear worn
(Select all that apply)
- (•) None
- ( ) Eyeglasses
- ( ) Sunglasses
- ( ) Contacts
- ( ) Unknown

7. Driver vision deficiency condition
(Select all that apply)
- (•) None
- ( ) Near sighted
- ( ) Far sighted
- ( ) Astigmatism
- ( ) Other (specify) _____
- ( ) Unknown

8. Non motorist's relationship to driver
- (•) No relationship
- ( ) Child
- ( ) Grandchild
- ( ) Sibling
- ( ) Neighbor
- ( ) Friend
- ( ) Other (specify): _____
- ( ) Unknown

DRIVER ACTIONS

9. Driver approach to vehicle for entry
- ( ) From left front
- (•) From left
- ( ) From left rear
- ( ) From right rear
- ( ) From right front
- ( ) Circled vehicle
- ( ) Return trip (backing into driveway/lot)
- ( ) Other (specify): _____
- ( ) N/A
- ( ) Unknown

10. Driver entry interruption
(Select all that apply)
- (•) Direct trip from building to vehicle
- ( ) Loaded items into vehicle
- ( ) Spoke with family
- ( ) Spoke with neighbors
- ( ) Spoke with contacted nonmotorist
- ( ) Return trip (backing into driveway/lot)
- ( ) Other (specify): _____
- ( ) N/A
- ( ) Unknown

11. Purpose of backing
- ( ) Leaving parking space in parking lot
- (•) Backing onto roadway from driveway
- ( ) Entering parking space in parking lot
- ( ) Backing into driveway from roadway
- ( ) Other (specify): _____
- ( ) N/A
- ( ) Unknown

12. Where was driver going
Description:

Leaving to go to friend's house

13. Driver in a hurry
- ( ) Yes
- (•) No
- ( ) N/A
- ( ) Unknown

14. How did driver check behind (rear area of vehicle) after vehicle entry
(Select all that apply)
- ( ) Did not look
- (•) Checked mirrors
- ( ) Turned right and looked back
- ( ) Turned left and looked back
- ( ) Viewed Camera
- ( ) Listened for auditory/visual warning from system
- ( ) Other (specify): _____
- ( ) N/A
- ( ) Unknown

15. Estimated time between vehicle entry and start of backing
- (•) 0-10 Seconds
- ( ) 11-30 Seconds
- ( ) 31-60 Seconds
- ( ) Over 60 Seconds
- ( ) N/A
- ( ) Unknown

16. What direction was the driver looking during backing maneuver
(Select all that apply)

- ○ Straight ahead
- ○ Right
- ○ Left
- ○ Rearward
- ○ At object inside the car
- ◉ At mirrors
- ○ Other (specify): _____
- ○ N/A
- ○ Unknown

17. Was the driver distracted during back up maneuver
(Select all that apply)

- ○ No non-driving activities

External

- ○ Looking at other vehicles
- ○ Looking at other non motorist
- ○ Looking at intended turn destination
- ○ External focus, not specified
- ○ Other external focus (specify): _____

Internal

- ○ Looking at other occupant
- ◉ Talking to passenger
- ○ Dialing phone
- ○ Talking on phone
- ○ Listening to radio/cd/portable playback device
- ○ Adjusting radio/cd player
- ○ Adjusting climate controls
- ○ Using a device/controls integral to vehicle (specify): _____
- ○ Reading/adjusting navigation system
- ○ Eating or drinking
- ○ Smoking related
- ○ Retrieving fallen object (specify): _____
- ○ Internal focus, not specified
- ○ Focused on other internal object (specify): _____
- ○ N/A
- ○ Unknown

18. Driver avoidance actions prior to impact
(Select all that apply)

- ◉ None
- ○ Braking
- ○ Steering left
- ○ Steering right
- ○ Accelerating
- ○ Other (specify): _____
- ○ N/A
- ○ Unknown

19. Did driver see struck non motorist prior to impact
(Select all that apply)

- ◉ No, never saw non motorist
- ○ Saw non motorist prior to entering vehicle
- ○ Saw non motorist after entering vehicle
- ○ Other (specify): _____
- ○ N/A ○ Unknown

20. Est time between start of backing and impact

- ○ <2 or = 1 second
- ◉ 2-5 seconds
- ○ 6-10 seconds
- ○ > 10 seconds
- ○ N/A ○ Unknown

21. Driver interior sightline obstructions
(Select all that apply)

- ○ Pillar
- ○ Headrest
- ○ Cargo
- ○ Other occupant
- ○ Other (specify) _____
- ◉ Unknown
- ○ None

22. Recent experience driving this vehicle

- ◉ More than 10 times the last three months
- ○ 6-10 times the last three months
- ○ 2-5 times the last three months
- ○ Less than 2 times the last three months
- ○ First time driving this vehicle
- ○ N/A
- ○ Unknown

23. Frequency of driving in this parking lot/driveway

- ◉ Daily
- ○ Weekly
- ○ Several times a month
- ○ Monthly
- ○ Rarely
- ○ First time in lot/driveway
- ○ N/A ○ Unknown

24. Driver Impairment
(Select all that apply)

- ◉ No drugs or alcohol present
- ○ Alcohol present (specify BAC): _____
- ○ Drugs present (specify):_____
- ○ Unknown

25. Source of alcohol/drug results

- ○ Police reported
- ○ Medical record
- ○ Other (specify)_____
- ◉ Not Tested
- ○ Unknown if tested

Not Applicable ☐

U.S. Department of Transportation
National Highway Traffic Safety Administration

Non Motorist Form

Reset Values

Special Crash Investigations
Not In Traffic Surveillance

1. Case Number
I N 0 7 0 1 4

NON-MOTORIST PROFILE

2. Non-motorist's Age — 0 4 ○ Months ◉ Years
99 = Unknown

3. Non-motorist's Sex
○ Male
◉ Female
○ Unknown

4. Non-motorist's Height — 0 9 1 cm
999 = Unknown

5. Non-motorist's Weight — 0 1 6 kg
999 = Unknown

6. Medical outcome
○ Not injured
○ ER only
◉ Hospitalized 1-4 days
○ Hospitalized 5 days or more
○ Treatment later
○ Fatal
○ Unknown

7. Source of most severe injury
○ Bumper
◉ Tire
○ Undercarriage
○ Other Specify:_____
○ Ground
○ N/A
○ Unknown

8. Non-motorist impairment
(Select all that apply)
◉ No drugs or alcohol present
○ Positive for alcohol (specify BAC): _____
○ Positive for drugs (specify): _____
○ Unknown

9. Source of alcohol/drug results
○ Police reported
○ Medical Report
○ Other (specify) _____
◉ Not Tested
○ Unknown if tested

NON-MOTORIST ACTIONS

10. Non-motorist attitude
○ Standing
○ Bending at waist
○ Sitting
○ Crouching
○ Kneeling
○ On skates/skateboard
○ On bike/scooter
○ Other (specify)_____
◉ Unknown

11. Non-motorist motion
○ Not moving
○ Walking slowly
○ Walking rapidly
○ Running or jogging
○ Skipping/Hopping/Jumping
○ Falling/Stumbling/Rising
○ On skates/skateboard
○ On bike/scooter
○ Other (specify): _____
◉ Unknown

12. Non-motorist approach relative to rear of vehicle
○ Stationary
○ From left
○ From right
○ From behind
○ Other (specify): _____
◉ Unknown

13. Non-motorist first avoidance action
○ No avoidance actions
○ Stopped
○ Accelerated pace
○ Ran away (along vehicle path)
○ Jumped
○ Turned away from vehicle
○ Turned toward vehicle and braced
○ Dove or fell away from vehicle
○ Other (specify): _____
◉ Unknown

14. Non-motorist primary focus of attention
○ Striking vehicle
○ Play object
○ Person
○ Surrounding traffic
○ Animal
○ Handheld electronic (phone, MP3 player, etc.)
○ Other Object (specify) _____
◉ Unknown

15. Were any other Non-motorists present?
(*Select all that apply)*
○ Alone
◉ One adult present
○ One other child present
○ Multiple adults present
◉ Multiple children present
○ Unknown

NON MOTORIST CLOTHING

NOTES:

- Specify Color, Fabric and Texture/Weight for outermost layer only
- Indicate "*NONE*" if applicable
- Available codes:

Colors		***Fabrics***	***Textures***	***Weights***
Black	Charcoal gray	Natural	Soft	Heavy
Lt gray/silver	Brown	Synthetic	Slick	Medium
Gold/tan	Purple	Blend	Coarse	Light
Dark blue	Light blue			
Dark green	Light green			
Maroon	Red			
Orange	Yellow			
White	Other (specify)			

	Clothing	Color	Fabric	Texture	Weight
HEADWEAR	Hat				
	Helmet				
	Hood				
	Other (specify): _____				
UPPER BODY	Short Sleeve	Red	Natural	Soft	Light
	Long Sleeve				
	Light Jacket				
	Heavy Jacket				
	Other (Specify): _____				
LOWER BODY	Shorts				
	Pants	Light blue	Natural	Soft	Medium
	Shoes	Unknown	Unknown	Unknown	Unknown
	Other (specify): _____				