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ON-SITE NOT IN TRAFFIC SURVEILLANCE BACK OVER INVESTIGATION

CASE NUMBER - IN08001
LOCATION - ARKANSAS
VEHICLE - 2007 HYUNDAI ELANTRA
CRASH DATE - November 2007

Submitted:

April 24, 2008
Revised: June 2, 2008

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

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15. *Supplementary Notes* On-site not in traffic surveillance back over investigation involving a 2007 Hyundai Elantra and a nonmotorist.			
16. *Abstract* This report covers an on-site not in traffic surveillance back over investigation involving a 2007 Hyundai Elantra and a nonmotorist, who was backed over in front of the driver's residence. The Hyundai was parked just off the edge of the roadway in the driver's front yard. The driver was in his residence with his family and decided to back the Hyundai into his driveway. The driver hurried out the front door so his 2-year-old son (i.e., the nonmotorist) would not follow him and ran to the Hyundai. However, unknown to the driver, the nonmotorist subsequently exited the front door and headed (i.e., the type of motion is unknown) toward the back of the Hyundai. Meanwhile, the driver had entered the Hyundai and was preparing to back up. He stated that he looked at both side view mirrors and the rearview mirror, saw nothing behind him, and began to back up while looking through the rearview mirror. The driver indicated that as he backed up, he felt a "bump" from under the vehicle, but thought he had backed over some tree roots on the roadside. He stopped the Hyundai and pulled forward. The driver stated he felt another bump and immediately stopped the vehicle, got out and discovered the nonmotorist on the ground near the Hyundai's right rear tire. The Hyundai's back bumper had impacted the nonmotorist, knocked him down, and the right rear tire ran over his head as the driver backed up and then pulled forward. The nonmotorist sustained skull fractures, a traumatic brain injury, a lacerated right ear and contusions to his head and face as a result of being run over by the Hyundai's right rear tire. He survived his injuries. There was insufficient information to determine the nonmotorist's location relative to the Hyundai when the driver looked through his side view mirrors and rearview mirror and began to back up.			
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BACKGROUND

IN08001

This incident was brought to the NHTSA's attention on or before November 16, 2007 by an on-line article from an Arkansas newspaper. This incident involved a 2007 Hyundai Elantra and a nonmotorist. The incident occurred in November, 2007, at 4:16 p.m., in Arkansas and was investigated by the applicable city police department. An incident report and Arkansas Motor Vehicle Crash Report were completed by the police agency, but neither were sent to any state agency. This contractor obtained a copy of the report from the police department. This incident is of special interest because the Hyundai's driver backed over a nonmotorist (2-year-old, male) who sustained moderate injuries. This contractor inspected the scene and Hyundai, and interviewed the Hyundai's driver on January 15, 2008. This report is based on the police incident report, Arkansas Motor Vehicle Crash Report, scene inspection, Hyundai inspection, and an interview with the Hyundai's driver.

SUMMARY

The Hyundai was parked just off the edge of the roadway in the driver's front yard. The driver was in his residence with his family and decided to back the Hyundai into his driveway. The driver hurried out the front door so his 2-year-old son (i.e., the nonmotorist) would not follow him and ran to the Hyundai. However, unknown to the driver, the nonmotorist subsequently exited the front door and headed (i.e., the type of motion is unknown) toward the back of the Hyundai. Meanwhile, the driver had entered the Hyundai and was preparing to back up. He stated that he looked at both side view mirrors and the rearview mirror, saw nothing behind him, and began to back up while looking through the rearview mirror. The driver indicated that as he backed up, he felt a "bump" from under the vehicle, but thought he had backed over some tree roots on the roadside. He stopped the Hyundai and pulled forward. The driver stated he felt another bump and immediately stopped the vehicle, got out and discovered the nonmotorist on the ground near the Hyundai's right rear tire. The Hyundai's back bumper had impacted the nonmotorist, knocked him down, and the right rear tire ran over his head as the driver backed up and then pulled forward. The nonmotorist sustained skull fractures, a traumatic brain injury, a lacerated right ear and contusions to his head and face as a result of being run over by the Hyundai's right rear tire. He survived his injuries. There was insufficient information to determine the nonmotorist's location relative to the Hyundai when the driver looked through his side view mirrors and rearview mirror and began to back up.

Figure 1: View south with Hyundai parked in same location as at time of incident; red reflector on tripod shows driver reported final rest location of nonmotorist

CRASH CIRCUMSTANCES

Crash Environment: The Hyundai Elantra was parked facing south (**Figure 1**) in the driver's front yard just off the west edge of a roadway that traversed north/south in front of the driver's residence. At the time of the incident, the light condition was daylight, the atmospheric condition

was clear, and the roadside was dry, level, dirt/gravel. The driveway the driver was intending to back into was dry concrete and had a negative grade of 10.3%. The site of the incident was located in a rural residential area. The Hyundai's driver met the SCI investigator at the scene of the incident and pointed out the parked and final rest positions of the Hyundai as well as the final rest position of the nonmotorist. See the Scene Diagram at the end of this report.

Figure 2: Overview of parked position of Hyundai, driveway and driver's residence

Pre-Crash: The Hyundai Elantra's driver was with his family inside their residence. His wife was in the shower and his three children [a 3-year-old female, a 2-year-old male (i.e., the nonmotorist) and an approximate 9-month-old (unknown sex)] were playing. The driver stated during the interview that he instructed the children to go into a bedroom and play while he went outside to back the Hyundai into the driveway of the residence (**Figure 2**). The police incident report indicated that the driver stated he "hurried outside so his son would not follow him". The driver closed the front door behind him as he exited the residence and ran from the door to the Hyundai. Unknown to the driver, the nonmotorist subsequently followed him outside. The driver approached the Hyundai, which was approximately 17 meters (56 feet) from the door of his residence, from the right. He ran across the back of the vehicle to the driver's side and entered the Hyundai through the left front door. Once inside the vehicle, the driver started the engine, then looked at both side view mirrors and the rearview mirror. He then began to back up while looking through the rearview mirror. The driver estimated the elapsed time between entering the Hyundai and beginning the backing maneuver was 10 seconds. At some point after the driver left the residence, the nonmotorist also exited the residence through the front door. The nonmotorist approached the Hyundai from the right. However, his specific path and motion as he approached the Hyundai is not known. The driver did not see the nonmotorist and thought he was still inside the residence. The driver's intention was to back the vehicle toward the driveway and then turn counterclockwise to back into the driveway. The incident occurred on the roadside, near the south edge of the driveway as the driver backed up.

Crash: The Hyundai's driver began backing up while looking through the rearview mirror. The driver wasn't sure if he simply let his foot off the brake to allow the Hyundai to idle backward or if he accelerated backward. As he backed up, he felt a "bump" from under the vehicle, but thought he had backed over some tree roots on the roadside. The driver estimated that he had backed up between 2 and 5 seconds before the "bump" occurred. He stopped the Hyundai, shifted the transmission into "Drive" and then pulled forward. He felt another bump and immediately stopped the vehicle. Based on the police incident report, the right portion of the Hyundai's back bumper (**Figure 3** below) initially impacted the nonmotorist. The Hyundai's right rear tire then ran over the nonmotorist's head as the driver backed up, and again when he pulled forward. Based on the driver's indicated position of the nonmotorist at final rest and the parked location of the Hyundai, the distance that the Hyundai traveled backward from its parked position to the initial

impact was estimated to be 1.7 meters (6 feet). The Hyundai then traveled backward from impact 1.7 meters (6 feet) where the driver indicated he initially stopped. The driver then pulled forward 2.3 meters (7 feet) to the location where the driver stopped the vehicle. The total travel distance from the initial impact to final rest of 4 meters (13 feet). The driver stated he thought he was traveling approximately 5 km.p.h. (~3 m.p.h.) when the incident occurred. There was insufficient information to support an independent speed analysis. In addition, there was insufficient information to determine the nonmotorist's specific path and motion as he approached the Hyundai and his location relative to the Hyundai when the driver looked through his rearview and side view mirrors and began to back up.

Figure 3: Overview of back of Hyundai, scratches on bumper are not related to this incident, vertical scale in 10th of meter

Post-Crash: The Hyundai's driver got out of the vehicle and saw the nonmotorist laying on his left side with his head toward the street (**Figure 4**) bleeding heavily from his head. The driver picked up the nonmotorist and ran into the house yelling for help from his wife. The driver's wife took the nonmotorist and ran outside and began yelling for a neighbor to call 911. The driver ran to a second neighbor's house and told them to call 911. The nonmotorist was transported by ambulance to a local hospital and subsequently airlifted to an urban children's medical center. The nonmotorist survived and was hospitalized for five days and discharged. He sustained skull fractures, a traumatic brain injury, a lacerated right ear and contusions to his head and face.

Figure 4: Overview of scene of incident from front yard of driver's residence; arrows indicate from left to right: 1 driver reported back of Hyundai at initial stop; 2 driver reported final rest position of nonmotorist; 3 approximate location of nonmotorist at impact with bumper; 4 driver reported position of back of Hyundai at final rest; Hyundai in driver reported initial parked position

CASE VEHICLE

The 2007 Hyundai Elantra (**Figures 5** and **6** below) was a front wheel drive, four-door sedan (VIN: KMHDU46D57U------) equipped with a 2.0L, I-4 engine and automatic transmission. Its back bumper was covered with a plastic bumper fascia with energy absorbing material between the bumper fascia and bumper bar. None of the Hyundai's glazing was tinted. The Hyundai was not equipped with any after market equipment and was not equipped with a back up/parking aid. The Hyundai's specified wheelbase was 265 centimeters (104.3 inches), the specified rear overhang was 99 centimeters (38.9 inches), and the specified overall length was 451 centimeters (177.4 inches). The measured distance from the ground to the bottom of the back bumper fascia

was 27 centimeters (10.6 inches). The measured distance from the ground to the rear axle was 13 centimeters (33 inches). The measured distance from the ground to the top of the trunk was 105 centimeters (41.3 inches). The measured distance from the ground to the beltline was 96 centimeters (37.8 inches).

Figure 5: Front right view of subject Hyundai Elantra

Figure 6: Back right view of subject Hyundai Elantra, scratches on back bumper are not related to this incident

CASE VEHICLE DAMAGE

Inspection of the Hyundai Elantra revealed no damage or evidence of contact with the nonmotorist. Some heavy scratches to the back bumper fascia were located to the right of the vehicle's centerline. The driver indicated that the damage was from a previous incident. Based on the police incident report, which indicated the area on the back bumper where the initial impact occurred, the reported contact to the right rear tire, and the Collision Deformation Classification (CDC) guidelines for pedestrian impacts, the CDCs were determined to be: **06-BRLN-1** (**180** degrees) and **12-FRWN-9** (**0** degrees).

CASE VEHICLE DRIVER

The Hyundai's driver was a 22-year-old, White (non-Hispanic) male. He was 175 centimeters (69 inches) tall and weighed 104 kilograms (230 pounds). He drove the Hyundai every day and had owned the vehicle for eight or nine months. He did not have a vision deficiency and was not wearing sunglasses at the time of the incident. The police incident report indicated that the driver displayed no signs of alcohol or drug usage; however, the driver was given a blood test. Numerous attempts were made to obtain the test results, but they were never forwarded to this contractor.

CASE VEHICLE VISIBILITY STUDY

A visibility study was conducted during the inspection of the Hyundai Elantra in order to determine the nominal blind zone behind the vehicle as well as the nominal blind zone of both side view mirrors and the rearview mirror. The standard 71 centimeters (28 inches) high target was used for the observations. The Hyundai driver assisted the SCI investigator in making the visibility observations and the Hyundai was placed in the same parked location as at the time of the incident. The driver's eye height was measured as he sat in the driver seat with the seat adjusted to the approximate middle track position, which was his normal seat track position. The driver's eye height was measured as 116 centimeters (45.7 inches) above the ground. Please refer

to the Nominal Visibility Diagram at the end of this report when reading the following description.

Figure 7: View out of Hyundai's backlight from driver's seat; arrow shows target in location where driver could first see it

The initial set of observations was made with the driver looking over his right shoulder out of the backlight (**Figure 7**). The target was moved rearward from the back bumper along the Hyundai's approximate centerline until it came into the driver's view (**Figure 7**). The target had to be moved rearward from the back bumper 7.1 meters (23.3 feet) before the top of target came into the driver's view. The target was then moved to the right 0.8 meter (2.6 feet) where it became obstructed by the Center High Mounted Stop Lamp (CHMSL). The target became visible again when moved 1.3 meters (4.3 feet) further to the right. When the target was moved 1.9 meters (6.2 feet) further to the right, it dropped out of the driver's sight. This is because the location of the target placed it on the negatively sloped (-10.3 %) driveway. The target was moved further to the right and became visible to the driver through the right rearmost window when moved right an additional 3.6 meters (11.8 feet). The target was then placed back to its initial position at the approximate centerline. When moved 0.3 meter (0.7 foot) to the left of the approximate centerline, it became obstructed by the back left head restraint. From this point, the target was not visible to the driver because it was not normal for the driver to turn his head any further to the right.

Figure 8: Close view through Hyundai's rearview mirror from driver's seat

The Hyundai's driver was then asked to view behind the vehicle through the rearview mirror (**Figure 8**), which he indicated he had not adjusted prior to this contractor's on-site investigation. It was in the same position as at the time of the incident. The target was moved rearward from the back bumper as the driver viewed through the rearview mirror. The target did not become visible to the driver until it was moved rearward 7.3 meters (23.9 feet). The target became obstructed by the (CHMSL) when moved to the right 0.2 meter (0.7 foot) and became visible again when moved right an additional 0.5 meter (1.6 feet). When moved 0.6 meter (2 feet) further to the right, the target became obstructed by the back right head restraint. The target did not become visible again when moved further to the right because it went out of the rearview mirror's field of view. The target was returned to the initial location at the approximate centerline and when moved left, was immediately obstructed by the back left head restraint and was not visible again when moved further to the left.

The target was then placed at the back left bumper corner as the driver viewed through the left side view mirror (**Figure 9**). The driver did not adjust his side view mirrors often and could not recall the last time he had adjusted the side view mirrors. When the target was placed at the back left bumper corner, it was necessary to move the target 0.9 meter (3 feet) to the left before it went out of the mirror's view. The target was repositioned at the back left bumper corner and moved forward, toward the left side view mirror. The target went out of the mirror's field of view when moved forward 0.7 meter (2.3 feet) from the bumper corner. The target was then positioned at the back right bumper corner and the same process was repeated for the right side view mirror (**Figure 10**). When moved laterally to the right 0.9 meter (3 feet), the target went out of the mirror's field of view. The target was then placed back at the back right bumper corner, and moved 0.9 meter (3 feet) forward where it went out of the mirror's field of view and the driver could no longer see it.

Figure 9: Close view through Hyundai's left side view mirror; arrow shows target at location it began to go out of driver's view as it was moved forward from back left bumper corner

Figure 10: Close view through Hyundai's right side view mirror from driver's seat, arrow shows target at location it began to go out of driver's view as it was moved forward from the back right bumper corner

NONMOTORIST

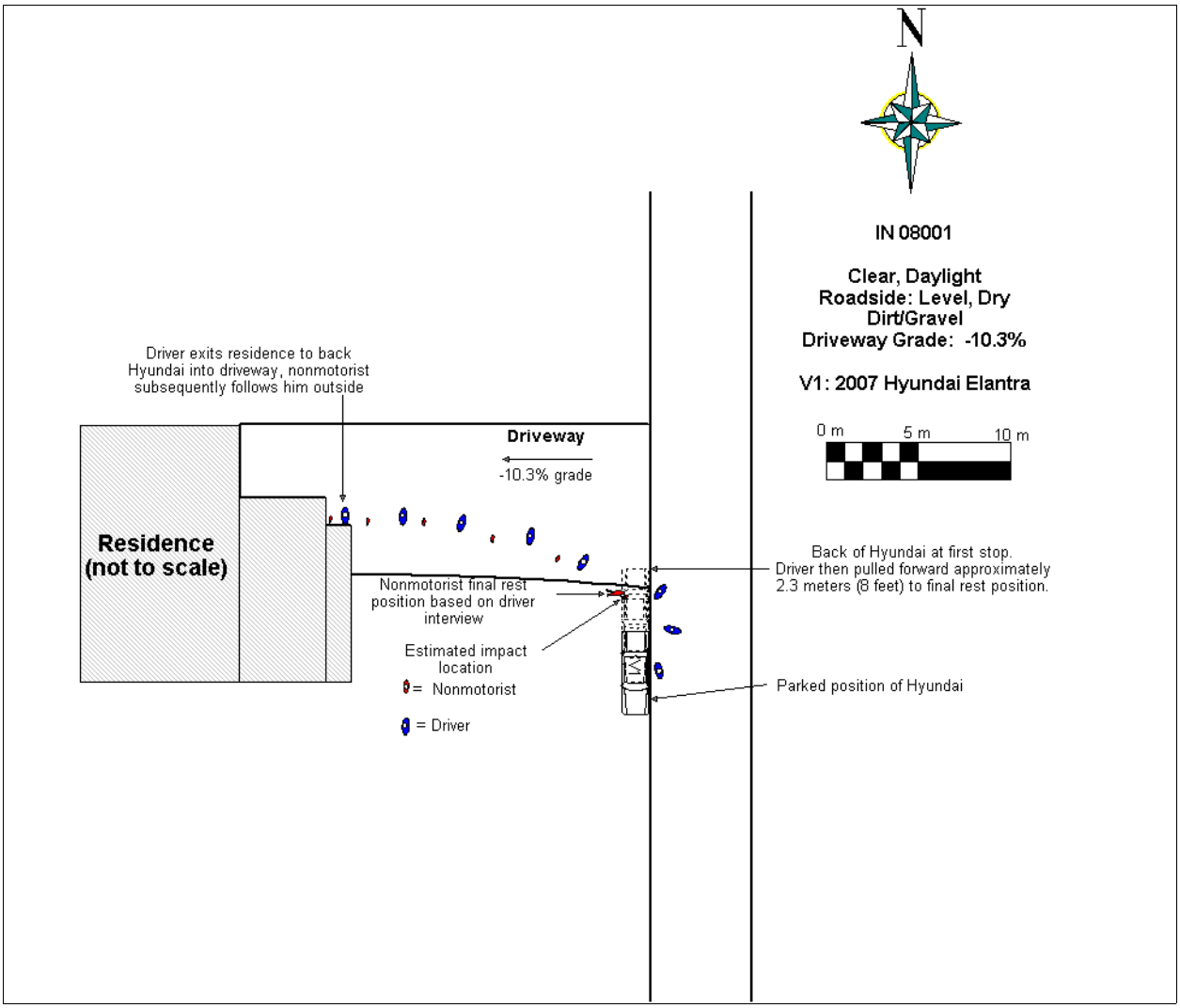
The nonmotorist was a 2-year-old, White (non-Hispanic) male. He was 97 centimeters (38 inches) tall and weighed 13 kilograms (29 pounds). According to the driver, he was wearing camouflage shorts, a yellow t-shirt, and blue "crocs" shoes.

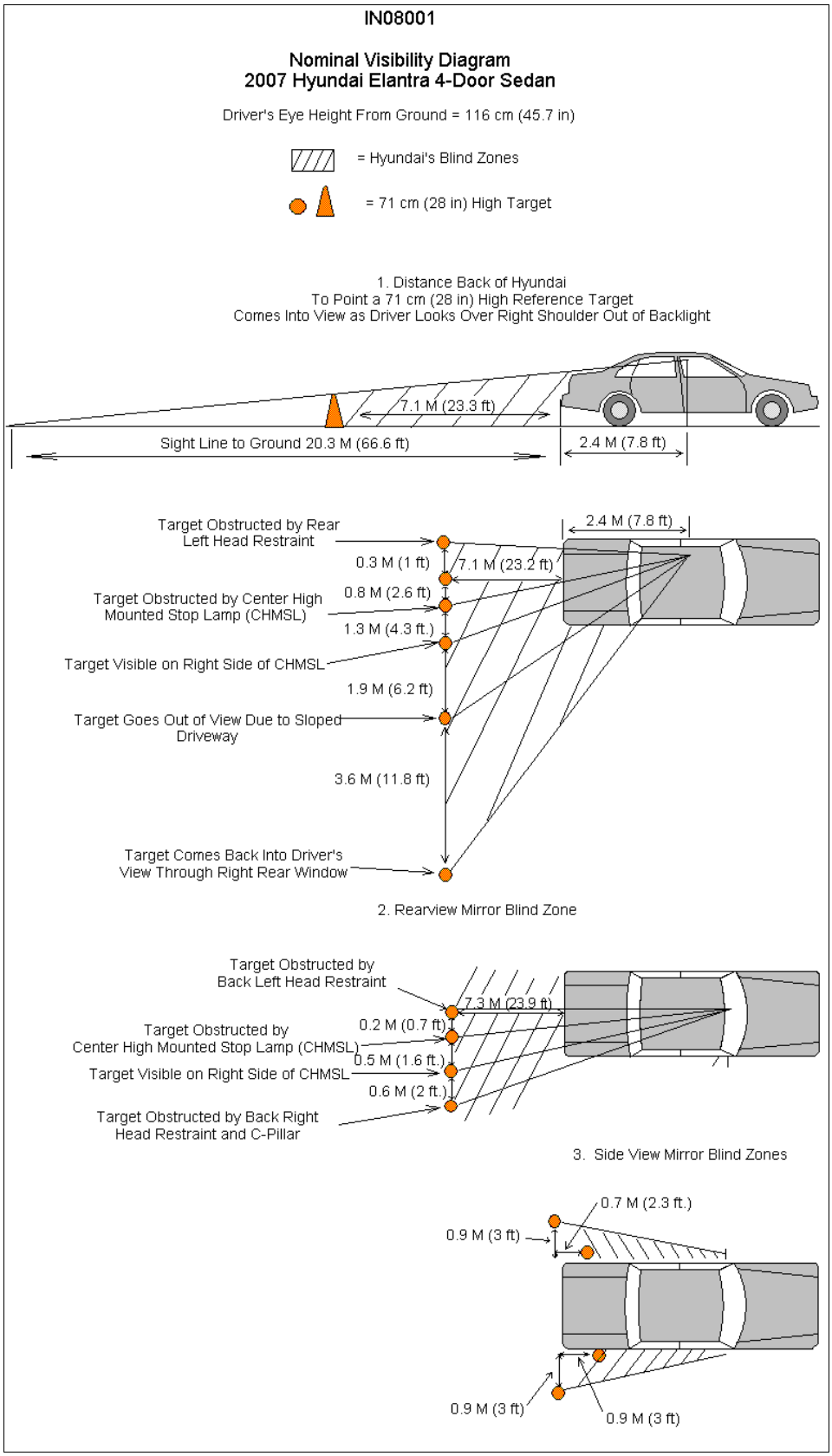
NONMOTORIST INJURIES

The nonmotorist sustained moderate injuries. The table below shows the nonmotorist's injuries and injury mechanisms.

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
1 2	Fracture right skull behind ear; Fracture left skull behind ear	moderate 150400.2,1 150400.2,2	Tire, right rear	Certain	Interviewee (driver)

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
3	Traumatic brain injury, not further specified	unknown 115099.7,0	Tire, right rear	Certain	Police Accident Report
4	Laceration, severe, to right ear, not further specified	minor 290600.1,1	Tire, right rear	Certain	Interviewee (driver)
5	Contusion {bruises}, multiple, head, not further specified	minor 190402.1,9	Tire, right rear	Certain	Interviewee (driver)
6	Contusion {bruise}, multiple, face, not further specified	minor 290402.1,9	Tire, right rear	Certain	Interviewee (driver)


N
IN 08001
Clear, Daylight
Roadside: Level, Dry
Dirt/Gravel
Driveway Grade: -10.3%
V1: 2007 Hyundai Elantra
0 m
5 m
10 m
Driver exits residence to back Hyundai into driveway, nonmotorist subsequently follows him outside
Driveway
-10.3% grade
Residence (not to scale)
Nonmotorist final rest position based on driver interview
Estimated impact location
= Nonmotorist
= Driver
Back of Hyundai at first stop. Driver then pulled forward approximately 2.3 meters (8 feet) to final rest position.
Parked position of Hyundai


IN08001
Nominal Visibility Diagram
2007 Hyundai Elantra 4-Door Sedan
Driver's Eye Height From Ground = 116 cm (45.7 in)
= Hyundai's Blind Zones
= 71 cm (28 in) High Target
1. Distance Back of Hyundai
To Point a 71 cm (28 in) High Reference Target
Comes Into View as Driver Looks Over Right Shoulder Out of Backlight
7.1 M (23.3 ft)
Sight Line to Ground 20.3 M (66.6 ft)
2.4 M (7.8 ft)
Target Obstructed by Rear
Left Head Restraint
0.3 M (1 ft)
7.1 M (23.2 ft)
Target Obstructed by Center High
Mounted Stop Lamp (CHMSL)
0.8 M (2.6 ft)
1.3 M (4.3 ft.)
Target Visible on Right Side of CHMSL
1.9 M (6.2 ft)
Target Goes Out of View Due to Sloped
Driveway
3.6 M (11.8 ft)
Target Comes Back Into Driver's
View Through Right Rear Window
2. Rearview Mirror Blind Zone
Target Obstructed by
Back Left Head Restraint
7.3 M (23.9 ft)
Target Obstructed by
Center High Mounted Stop Lamp (CHMSL)
0.2 M (0.7 ft)
Target Visible on Right Side of CHMSL
0.5 M (1.6 ft.)
Target Obstructed by Back Right
Head Restraint and C-Pillar
0.6 M (2 ft.)
3. Side View Mirror Blind Zones
0.7 M (2.3 ft.)
0.9 M (3 ft)
0.9 M (3 ft)
0.9 M (3 ft)

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 8 0 0 1

IDENTIFICATION

2. Date of Crash 1 1 / x x / 0 7

3. Time of Crash 1 6 1 6

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 1 . 7 m

13. Estimated speed at impact 0 0 5 kmph

14. Grade at impact +/ - 0 0 0 %

15. Estimated distance from impact to vehicle final rest

0 0 4 . 0 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 8 0 0 1

VEHICLE IDENTIFICATION

2. VIN K M H D U 4 6 D 5 7 U X X X X X X

3. Model Year 2 0 0 7

4. Vehicle Make (specify): Hyundai

5. Vehicle Model (specify): Elantra

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	☐	
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 P195/65R15

7. LF Tire Size P195/65R15

8. LR Tire Size P195/65R15

9. RF Tire Size P195/65R15

10. RR Tire Size P195/65R15

Seats / Head Restraint Data

Seat Position	Seat Type (Select from below)	Head Restraint (Check if available)	Head Restraint Adjustment (select)	NOTES:
Front Left	1	☑	☑ Full Down / ☐ Mid / ☐ Full Up	
Front Middle	0	☐	☐ Full Down / ☐ Mid / ☐ Full Up	
Front Right	1	☑	☑ Full Down / ☐ Mid / ☐ Full Up	
2nd Left	4	☑	☑ Full Down / ☐ Mid / ☐ Full Up	
2nd Middle	4	☑	☑ Full Down / ☐ Mid / ☐ Full Up	
2nd Right	4	☑	☑ Full Down / ☐ Mid / ☐ Full Up	
3rd Left	0	☐	☐ Full Down / ☐ Mid / ☐ Full Up	
3rd Middle	0	☐	☐ Full Down / ☐ Mid / ☐ Full Up	
3rd Right	0	☐	☐ 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		96	
Top of trunk/tailgate		105	
Bottom of bumper		27	
Trailer hitch (if applicable)		N/A	
Undercarriage			
	Sway bar	N/A	
	Axle	13	
	Differential	N/A	
	Other (specify): Tailpipe	24	Also tow hook: 21
Sensor Height (if equipped)		N/A	
Camera Height (if equipped)		N/A	

Not Applicable ✔

Undo 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 8 0 0 1

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

Not Applicable

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 8 0 0 1

DRIVER PROFILE

2. Driver's Age 2 2
99 = Unknown

3. Driver's Sex
- ☉ Male
- ☐ Female
- ☐ Unknown

4. Driver's Height 1 7 5 cm
999 = Unknown

5. Driver's Weight 1 0 4 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): Roadside into driveway
- ☐ N/A
- ☐ Unknown

12. Where was driver going
Description:

Back vehicle into driveway and park

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) CHMSL
- ☐ 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 8 0 0 1

NON-MOTORIST PROFILE

2. Non-motorist's Age 0 2 ☐ Months ◉ Years
99 = Unknown

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

4. Non-motorist's Height 0 9 7 cm
999 = Unknown

5. Non-motorist's Weight 0 1 3 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)			
Pink				

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