

INDIANA UNIVERSITY

TRANSPORTATION RESEARCH CENTER

School of Public and Environmental Affairs
222 West Second Street Suite A
Bloomington, Indiana 47403-1501
(812) 855-3908 Fax: (812) 855-3537

ON-SITE NOT IN TRAFFIC SURVEILLANCE BACK OVER INVESTIGATION

CASE NUMBER - IN07027
LOCATION - MICHIGAN
VEHICLE - 1994 FORD ECONOLINE VAN
CRASH DATE - June 2007

Submitted:

January 22, 2008
Revised: February 25, 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

DISCLAIMERS

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no responsibility for the contents or use thereof.

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the National Highway Traffic Safety Administration.

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.

1. <i>Report No.</i> IN07027		2. <i>Government Accession No.</i>		3. <i>Recipient's Catalog No.</i>	
4. <i>Title and Subtitle</i> On-Site Not In Traffic Surveillance Back Over Investigation Vehicle - 1994 Ford Econoline Van Location - Michigan				5. <i>Report Date:</i> January 22, 2008	
				6. <i>Performing Organization Code</i>	
7. <i>Author(s)</i> Special Crash Investigations Team #2				8. <i>Performing Organization Report No.</i>	
9. <i>Performing Organization Name and Address</i> Transportation Research Center Indiana University 222 West Second Street Bloomington, Indiana 47403-1501				10. <i>Work Unit No. (TRAIS)</i>	
				11. <i>Contract or Grant No.</i> DTNH22-07-C-00044	
12. <i>Sponsoring Agency Name and Address</i> U.S. Department of Transportation (NVS-411) National Highway Traffic Safety Administration National Center for Statistics and Analysis Washington, D.C. 20590-0003				13. <i>Type of Report and Period Covered</i> Technical Report Incident Date: June 2007	
				14. <i>Sponsoring Agency Code</i>	
15. <i>Supplementary Notes</i> On-site not in traffic surveillance back over investigation involving a 1994 Ford E150 Econoline van and a pedalcyclist.					
16. <i>Abstract</i> This report covers an on-site not in traffic surveillance back over investigation involving a 1994 Ford E-150 Econoline van and a pedalcyclist, who was backed over in a driveway. This incident is of special interest because the Ford's driver backed over a pedalcyclist (3-year-old, male), who sustained critical injuries resulting in his death. The Ford Econoline van was parked in the back yard/driveway of a residence facing northwest. The back of the Ford was near a sidewalk that ran east/west. There were trees and bushes on each side of the driveway near the sidewalk. Multiple adults and children were in the back yard at the time of the incident. The Ford's driver and front right passenger exited the residence, entered the Ford and the driver began to back up into the street. Meanwhile, the pedalcyclist was riding his tricycle westbound on the sidewalk and rode into the path of the backing Ford from the right. The Ford's back bumper impacted the pedalcyclist. The back of the Ford passed over him, and he and his tricycle were dragged into the street. The pedalcyclist was transported by private conveyance to a hospital where he expired due to a fractured skull and brain injuries. A visibility study showed that the pedalcyclist was well within the Fords's rear blind zone and could not be seen by the driver when she backed up. In addition, when the driver got in the vehicle, the pedalcyclist's westbound path of approach on the sidewalk would have been obstructed not only by the trees and bushes adjacent to the sidewalk on the southeast corner of the driveway, but also by the Ford's right rear window shade, which the driver indicated was down at the time of the incident.					
17. <i>Key Words</i> Back Over Child Fatality Injury Severity				18. <i>Distribution Statement</i> General Public	
19. <i>Security Classif. (of this report)</i> Unclassified		20. <i>Security Classif. (of this page)</i> Unclassified		21. <i>No. of Pages</i> 19	
				22. <i>Price</i> \$7,000	

TABLE OF CONTENTS

IN07027

	<u>Page No.</u>
BACKGROUND	1
SUMMARY	1
CRASH CIRCUMSTANCES	1
CASE VEHICLE: 1994 FORD E-150 ECONOLINE	4
CASE VEHICLE DAMAGE	4
CASE VEHICLE DRIVER	4
CASE VEHICLE VISIBILITY STUDY	4
PEDALCYCLIST	6
PEDALCYCLIST INJURIES	6
NOMINAL VISIBILITY DIAGRAM	9
SCENE DIAGRAM	10
ATTACHMENTS: NOT IN TRAFFIC SURVEILLANCE BACK OVER DATA FORMS	

This crash was brought to NHTSA's attention on or before June 22, 2007 by an on-line news article. This incident involved a 1994 Ford E150 Econoline van and a pedalcyclist. The incident occurred in June, 2007 at 12:15 p.m., in Michigan and was investigated by the applicable city police department. The police completed a standard "State of Michigan Traffic Crash Report" and submitted a copy of the report to the state. This incident is of special interest because the Ford's driver backed over a pedalcyclist (3-year-old, male), who sustained critical injuries resulting in his death. Attempts to obtain cooperation and set up the inspection of the Ford began on June 26, 2007. However, cooperation and inspection arrangements could not be finalized until the week of August 6, 2007 due to complications related to pending legal action against the driver and impoundment of the Ford by the police department. This contractor inspected the scene and Ford on August 14, 2007. This contractor also interviewed the Ford's driver on August 14, 2007 and a witness on September 5, 2007. This report is based on the police crash report, interviews with the Ford's driver and witness, discussions with the investigating police office, scene and vehicle inspections, the pedalcyclist's medical records and autopsy reports and this contractor's evaluation of the evidence.

SUMMARY

The Ford Econoline van was parked facing northwest in the back yard/driveway of a residence. The back of the Ford was near a sidewalk that ran east/west. There were trees and bushes on each side of the driveway near the sidewalk. Multiple adults and children were in the back yard at the time of the incident. The Ford's driver and front right passenger exited the residence, entered the Ford and the driver began to back up into the street. Meanwhile, the pedalcyclist (3-year-old, male) was riding his tricycle westbound on the sidewalk and rode into the path of the backing Ford from the right. The Ford's back bumper impacted the pedalcyclist. The back of the Ford passed over him, and he and his tricycle were dragged into the street. The pedalcyclist was transported by private conveyance to a hospital where he expired due to skull fractures and brain injuries. The Ford's driver stated that she checked her rearview and side view mirrors prior to backing up as well as checking with adults in the back yard to make sure the way was clear prior to backing up. The driver did not recall if she was looking out of the backlight or through the rearview or side view mirrors as she backed up. A visibility study showed that the pedalcyclist was well within the Ford's rear blind zone and could not be seen by the driver when she backed up. In addition, when the driver got in the vehicle, the pedalcyclist's westbound path of approach on the sidewalk would have been obstructed not only by the trees and bushes adjacent to the sidewalk on the southeast corner of the driveway, but also by the Ford's right rear window shade, which the driver indicated was down at the time of the incident.

CRASH CIRCUMSTANCES

Crash Environment: The Ford Econoline van was parked facing northwest on the east side of the pedalcyclist's residence in the back yard/driveway, which intersected an east/west sidewalk and street (**Figure 1** below). The back of the Ford was approximately 0.3 meter (1 foot) north of the sidewalk. The sidewalk was 1.6 meters (5.2 feet) in width. The mouth of the driveway at the sidewalk was 3.5 meters (11.5 feet) in width. The driveway was essentially just a non-uniform

area of the back yard of the residence. The driveway was level and its surface was a combination of dry dirt and grass and there was significant vegetation on the east and west sides of the driveway entrance (**Figure 1**). In addition, the driveway was lower than the sidewalk, ranging from 5-10 centimeters (2-4 inches). However, the sidewalk was also level. There was one other vehicle in the driveway at the time of the incident, but it was in front of the Ford. At the time of the incident the light condition was daylight, the atmospheric condition was clear and the driveway, sidewalk and street surfaces were dry. See the Scene Diagram at the end of this report.

Pre-Crash: The pedalcyclist, multiple children, and adults were outside the residence. The driver and her fiancé (i.e., the front right passenger) were both inside the residence visiting. The driver and the front right passenger exited the south side of the residence and encountered the victim near the entrance. The driver stated she stopped for approximately 30 seconds to tie the victim's shoes. The victim then went on his way and subsequently got on his tricycle (**Figure 2**). The driver and passenger then walked approximately 12 meters (39.4 feet) to the Ford, both approaching from the left. The driver went straight to the driver's door and the passenger walked around the front of the Ford to the right front door. After entering, the driver stated she checked her rearview and side view mirrors. The driver stated she then asked the other adults, who were in the yard, whether the children playing about the yard were clear of the back of the Ford. When the driver received assurance that the area behind the Ford was clear, she began to back up. The driver estimated that the time between vehicle entry and the start of the backing maneuver was approximately 60 seconds. Her intention was to back counterclockwise (i.e., east) into the street, then proceed westbound. Meanwhile, the pedalcyclist was east of the driveway on the sidewalk, riding his tricycle westbound across the path of the backing Ford (**Figure 3**).



Figure 1: Overview of incident site, red arrow shows pedalcyclist's westbound travel path toward right side of backing case vehicle (Note: neither vehicle in driveway is the subject vehicle)



Figure 2: Left side of tricycle, arrows show pavement abrasions



Figure 3: Yellow arrow shows backing travel path of case vehicle, red arrow shows pedalcyclist's travel path (Note: vehicle in driveway is not case vehicle)

Crash: The Ford's driver began to back the Ford southbound toward the street, but couldn't remember whether she was looking through the backlight or any of her mirrors as she backed up. The driver indicated she tapped the accelerator lightly as she backed to get over the lip of the sidewalk. She also turned the steering wheel slightly to the right. According to a witness, almost immediately after the Ford began to back up, the center area of the Ford's back bumper (**Figure 4**) impacted the pedalcyclist, who was behind the Ford after approaching from the right. The impact knocked the pedalcyclist and his tricycle over onto their left side. The adults in the yard immediately yelled at the driver to stop. By the time the driver stopped backing, the Ford had dragged the pedalcyclist and his tricycle from the sidewalk, past the mouth of the driveway, and into the street, a total distance of approximately 2.3 meters (7.5 feet). Based on an interview with a witness and the available information, as the pedalcyclist was dragged, he remained under the back of the Ford and no tire passed over him. The pedalcyclist sustained skull fractures, brain injuries and multiple contusions and abrasions. His head injuries most likely occurred after he was knocked over to the left by the Ford's back bumper. As the back of the Ford passed over him, the right side of his head most likely contacted the undercarriage, possibly the trailer hitch, and his head was pressed between the undercarriage and the pavement when the back of the van traveled down the slope of the driveway apron.



Figure 4: Overview of back of Ford, witness stated impact to pedalcyclist was to center portion of back bumper

Based on the scene inspection, police crash report, and witness accounts, it was determined that the Ford traveled backward to impact approximately 0.8 meter (~3 feet) and traveled 2.8 meters (~9 feet) from impact to final rest (**Figure 5**). Based on the driver interview, the distance backed to impact, and reasonable acceleration values to calculate a range of speeds, the Ford's impact speed was estimated to be approximately 3 km.p.h. (~2 m.p.h.). The time to impact was calculated to be approximately 2.2 seconds.

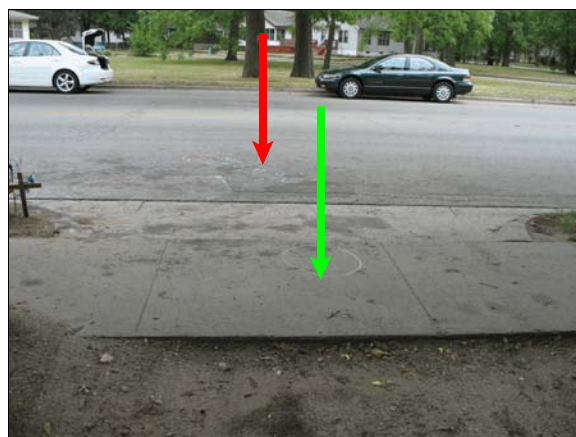


Figure 5: Overview of impact area in sidewalk indicated by green arrow, red arrow shows reported location of back of case vehicle at final rest

Post-Crash: The driver stated she exited the Ford and walked to the back of the vehicle but by that time, the pedalcyclist's mother had pulled him out from under the Ford and was holding the child. The pedalcyclist was then transported by private conveyance to the hospital and was pronounced dead 43 minutes after the incident.

The 1994 Ford E150 Econoline was a rear wheel drive, three-door van, (VIN: 1FEDD14N6RH-----), equipped with a 5.0L, V8 engine and automatic transmission. The Ford was not equipped with tinted glass but did have adjustable shades on both rear side windows and the backlights. According to the driver, at the time of the incident, only the right side window shade was down. The Ford was not equipped with any backup/parking aid. A small, circular wide view mirror was attached to each side view mirror's lower outer corner. The Ford's recommended tire size was P235/75R15 and the vehicle was equipped with tires of this size. The distance from the ground to the Ford's beltline was 129 centimeters (51 inches). The distance from the ground to the bottom of the bumper was 39 centimeters (15.4 inches). The distance from the ground to the bottom of the trailer hitch was 30 centimeters (12 inches). The distance from the ground to the bottom of the axle was 28 centimeters (11 inches). The Ford's specified wheelbase was 351 centimeters (138 inches). The specified rear overhang was 111 centimeters (43.8 inches) and the specified overall length was 538 centimeters (212 inches).

CASE VEHICLE DAMAGE

There was no evidence of pedestrian contact to the Ford's back bumper, undercarriage or tires. Based on the available information and Collision Deformation Classification (CDC) guidelines for pedestrian impacts, a CDC was determined to be: **06-BCLN-1 (180 degrees)**. The Ford was not damaged in the incident and was not towed. The Ford was, however, subsequently impounded by the police.

CASE VEHICLE DRIVER

The Ford's driver was a Black (non-Hispanic) 20-year-old female. She was 168 centimeters (66 inches) tall and weighed 71 kilograms (156 pounds). She indicated she drove the Ford daily. The driver had no vision deficiency and was not wearing sunglasses at the time of the incident. The police crash report indicated that a blood sample was taken. The driver tested negative for alcohol, however; the results of the drug test were not available.

CASE VEHICLE VISIBILITY STUDY

A visibility study was conducted during the inspection of the Ford in order to determine the nominal blind zone behind the Ford as well as the right "D"pillar blind zone. In addition, the blind zone of the rearview and side view mirrors were also assessed. The Ford's driver was not available for the visibility study. Instead, a sheriff's deputy assisted this contractor in the study and acted as a surrogate driver. The deputy was approximately 175 centimeters (~69 inches) tall. The deputy's eye height as he sat in the driver's seat was measured as 162 centimeters (64 inches) above the ground. The surrogate driver adjusted the driver's seat to the approximate middle track position, which was his normal seat adjustment. The standard 71 centimeters (28 inches) high target was used for the visibility observations. Please refer to the Nominal Visibility Diagram at the end of this report when reading the following discussion.

For the assessment of the blind zone behind the Ford, the surrogate driver was asked to look over his right shoulder out of the backlight (Figure 6). The target was positioned behind the Ford and moved rearward until it came into the driver's view. It was necessary to move the target rearward from the back of the Ford 13.4 meters (44 feet) before the surrogate driver could see it over the top of the third row seat back (Figures 6 and 7). At this point, the target was moved to the right from the vehicle's approximate centerline 4.9 meters (16 feet) where it became obstructed by the right "D"-pillar. The target was then moved an additional 2.7 meters (8.9 feet) to the right where it became visible again through the right rear window. The target was then returned to the centerline and moved to the left. The target was moved 1.6 meters (5.2 feet) from the centerline where it became obstructed by the left "D"-pillar. The surrogate driver was not able to see the target if moved further to the left because it was unnatural to turn his head any further to the right.

The surrogate driver was then asked to view behind the Ford through the rearview mirror (Figure 8). It was necessary to move the target rearward from the back of the vehicle 17 meters (55.8 feet) before the driver could see it over the top of the third row seat back (Figure 6). When moved 2.9 meters (9.5 feet) to the right of the vehicle's approximate centerline, the target became obstructed by the second row right seat back. The target was then moved 2.3 meters (7.5 feet) to the left of the centerline where it became obstructed by the left "D"-pillar. It was not visible to the surrogate driver if moved further left. When viewing through the rearview mirror as well as through the backlight, an area of the surrogate driver's view was obstructed by the center frame of the double back doors (Figure 6). The width of this area was not determined.

The surrogate driver was then asked to view the target down each side of the vehicle through the respective side view mirror. The target was



Figure 6: View out backlight from driver's seat; driver stated only the right rear window shade was down at time of the incident



Figure 7: Measuring wheel shows location where target came into surrogate driver's view when looking over right shoulder through backlight

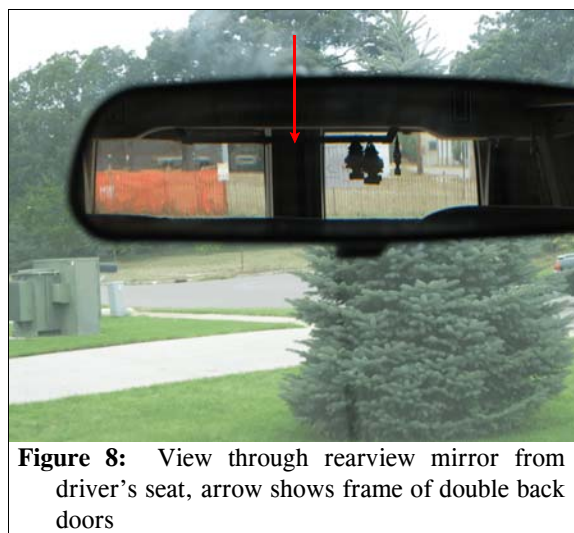


Figure 8: View through rearview mirror from driver's seat, arrow shows frame of double back doors

placed at the back left corner of the Ford and had to be moved rearward 2.6 meters (8.5 feet) before it came into left side view mirror's field of view. The target was then moved to the Ford's back right corner, where it was visible to the surrogate driver through the right side view mirror. The target was then moved 1.1 meters (3.6 feet) toward the front of the Ford where it passed out of the mirror's field of view.

The witness interview indicated that the pedalcyclist was behind the Ford when the driver began to back up, and the on-site investigation indicated the Ford's driver backed up only 0.8 meter (2.6 feet) to impact. The visibility study showed that based on this information, the pedalcyclist was well within the Ford's rear blind zone and could not be seen by the driver when she backed up. In addition, when the driver got in the vehicle, the pedalcyclist's westbound path of approach on the sidewalk would have been obstructed not only by the trees and bushes adjacent to the sidewalk on the southeast corner of the driveway (see **Figure 1** above), but also by the Ford's right rear window shade, which the driver indicated was down at the time of the incident.

PEDALCYCLIST

The pedalcyclist was a 3-year-old, Black (non-Hispanic) male. He was 97 centimeters tall and weighed 18 kilograms (38 inches, 39 pounds). The pedalcyclist was reportedly wearing a dark t-shirt, black shorts, and black aqua socks at the time of the incident.

PEDALCYCLIST INJURIES

The pedalcyclist was transported from the scene by private conveyance to a hospital and expired 43 minutes later. The table below shows the pedalcyclist'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
	Nonanatomic brain injury with loss of consciousness, unresponsive, pupils fixed, dilated, and non-reactive, no gag reflex, GCS = 3	not coded	Exterior of other motor vehicle: undercarriage	Probable	Emergency room records
1	Lacerations of brainstem including pons and pontomedullary junction	maximum 140212.6,8	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
2	Lacerations of cerebellum, not further specified	severe 140474.4,6	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
3	Hemorrhage, subdural, scant, over occipital pole	severe 140652.4,9	Exterior of other motor vehicle: undercarriage	Probable	Autopsy

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
4 5	Hemorrhage, subarachnoid, over basilar skull and cerebral surfaces	serious 140684.3,1 140684.3,2	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
6	Hemothorax ¹ , 10 ml, right pleural cavity	serious 442202.3,1	Exterior of other motor vehicle: rear bumper	Probable	Autopsy
7	Fracture, hinge, gaping, extending from middle fossa to middle fossa passing just posterior to sella turcica; cerebrospinal fluid present in both ears	severe 150206.4,8	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
8	Fracture involving right temporal and parietal bones, extending posteriorly and blending with lambdoidal suture on right with three additional fractures in right temporal bone ²	serious 150404.3,1	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
9 10	Fracture left parietal bone extending across coronal suture into left frontal bone and downward toward left temporal bone; a loop-shaped fracture occurred in left temporal bone	serious 150404.3,2 moderate 150402.2,5	Ground	Probable	Autopsy
11	Fractured {chipped} tooth, upper right side	minor 251404.1,8	Ground	Probable	Emergency room records
12 13 14	Contusions, subgaleal, deep, right temporal scalp and left temporal parietal scalp; contusions x 2, anterior right scalp	minor 190402.1,1 190402.1,2 190402.1,5	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
15	Abrasion, 3.0 x 2.0 (1.2 x 0.8 in) above left ear	minor 190202.1,2	Ground	Probable	Autopsy
16	Abrasion, 2.5 x 0.6 cm (1.0 x 0.2 in) left forehead	minor 290202.1,7	Ground	Probable	Autopsy

¹ Lesion was described in the autopsy as blood-tinged serous fluid. The following term is defined in Dorland's Illustrated Medical Dictionary as follows:

serum (ser' em): 1. the clear portion of any body fluid; the clear fluid moistening serous membranes. 2. blood serum; the clear liquid that separates from blood on clotting.

² Deformity was noted to the posterior right side of head. No obvious lacerations were present, but the occiput was "boggy" to palpation. According to the RANDOM HOUSE WEBSTER'S UNABRIDGED DICTIONARY, this term is defined as follows:

boggy (bog'é): wet and spongy.

Pedalcyclist Injuries (Continued)


IN07027


Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
17	Contusion right eyebrow	minor 290402.1,7	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
18	Abrasion, 10 x 4 cm (3.9 x 1.6 in) beginning on left forehead and extending to left cheek	minor 290202.1,2	Ground	Probable	Autopsy
19	Abrasion pinna left ear, both anterior and posterior	minor 290202.1,2	Ground	Probable	Autopsy
20	Contusion beneath right eye	minor 297402.1,1	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
21	Contusion {hematoma} left eye, not further specified	minor 297402.1,2	Exterior of other motor vehicle: undercarriage	Probable	Emergency room records
22	Contusion, 2.0 x 0.5 cm (1.6 x 0.2 in) right lateral cheek	minor 290402.1,1	Exterior of other motor vehicle: undercarriage	Probable	Autopsy
23	Abrasion, 4.0 x 2.0 cm (1.6 x 0.8 in) left upper chest	minor 490202.1,2	Ground	Probable	Autopsy
24	Abrasion, 2.0 x 2.0 cm (0.8 x 0.8 in) left lower quadrant of abdomen	minor 590202.1,2	Ground	Probable	Autopsy
25	Abrasion right abdomen, not further specified	minor 590202.1,1	Ground	Probable	Autopsy
26	Abrasions, faint, middle of back	minor 690202.1,4	Ground	Probable	Autopsy
27	Abrasions, cluster, 4.5 x 0.5 cm (1.8 x 0.2 in) left lower back	minor 690202.1,8	Ground	Probable	Autopsy
28	Abrasion, 2.5 x 1.5 cm (1.0 x 0.6 in) left lateral-most shoulder	790202.1,2	Ground	Probable	Autopsy
29	Abrasion, linear, right wrist and abrasions x 3 base right thumb	790202.1,1	Ground	Probable	Autopsy
30	Abrasions x 2 posterior left wrist and abrasion anterior left wrist	790202.1,2	Ground	Probable	Autopsy
31	Abrasions x 2 left knee and to left lower leg, not further specified	minor 890202.1,2	Ground	Probable	Autopsy

IN07027

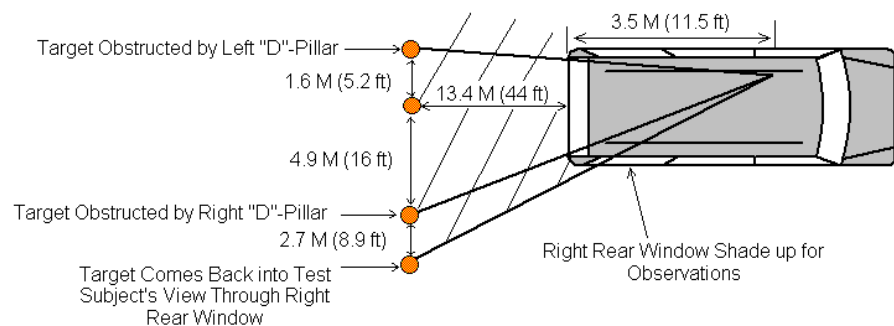
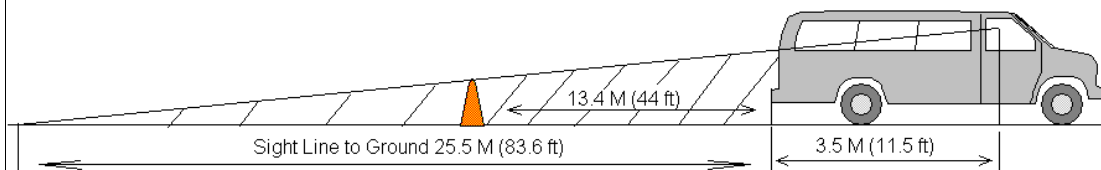
Nominal Visibility Diagram
Case Vehicle = 1994 Ford E150 Econoline Van

Surrogate Driver's Eye Height From Ground = 162 cm (63.8 in)

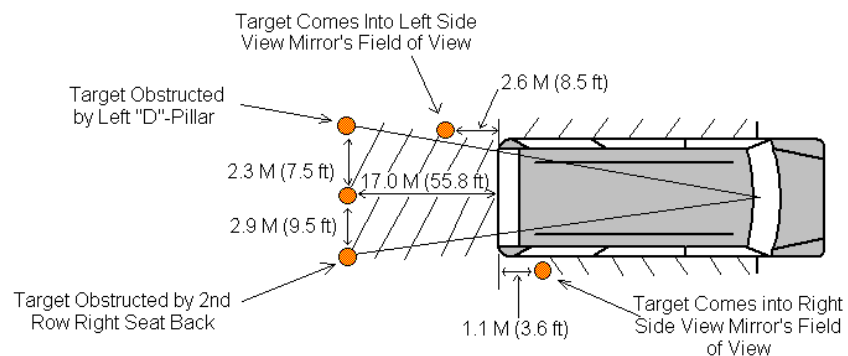
 = Ford's Blind Zones

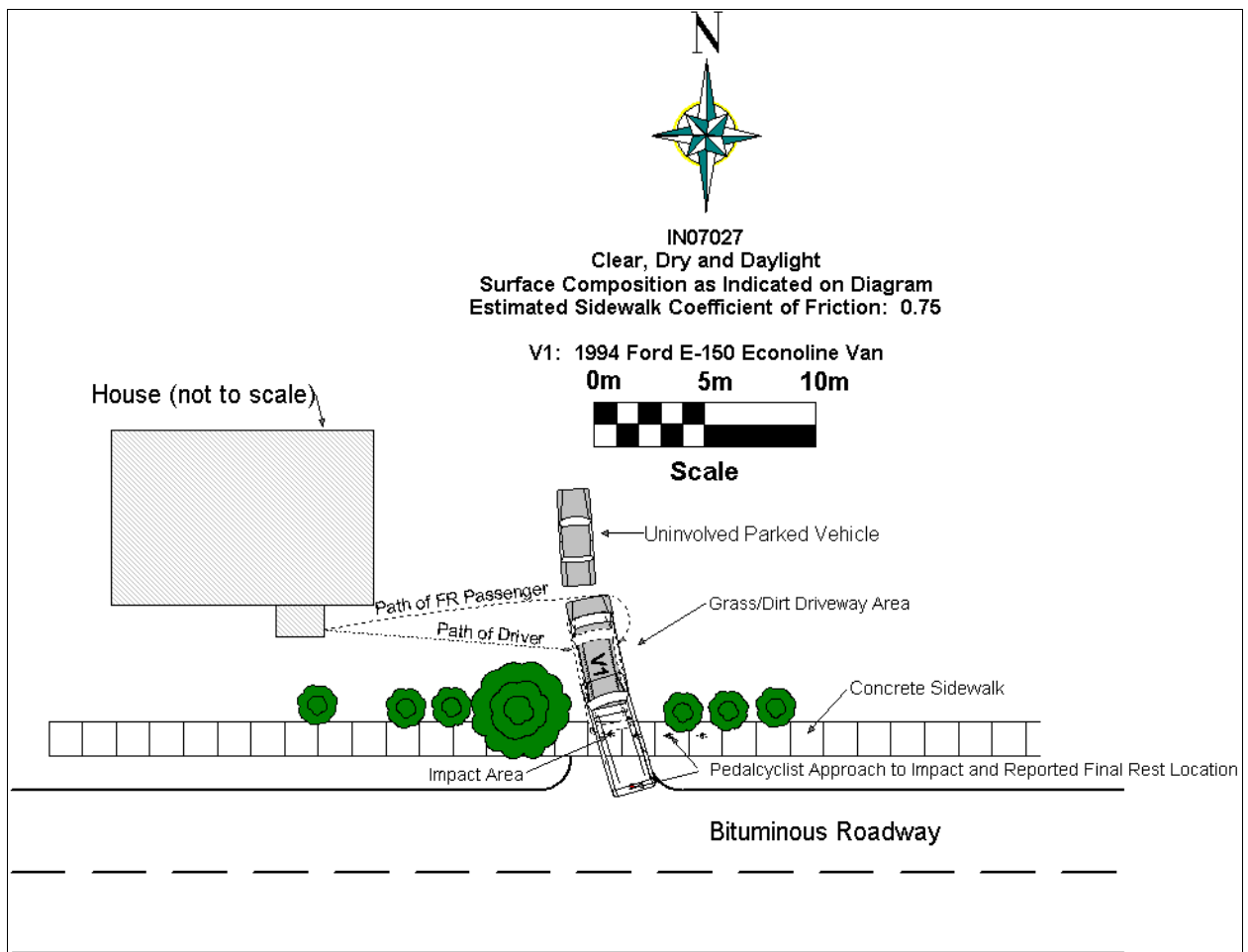
 = 71 cm (28 in) High Target

1. Distance Back of Ford
To Point a 71 cm (28 in) High Reference Target
Comes Into Surrogate Driver's View as He Looks Over Right Shoulder Out of Backlight



2. Rearview Mirror Blind Zone and Side View Mirrors' Blind Zone
Down Side of Vehicle







SCENE FORM

1. Case Number

IDENTIFICATION

2. Date of Crash ____ / ____ / ____

3. Time of Crash ____

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
- ☐ Shrubby
- ☐ 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
- ☐ Shrubby
- ☐ Utility poles
- ☐ Signs
- ☐ Glare
- ☐ Other (specify) _____
- ☐ Unknown

+ / -

11. Grade at parked position ____ %

12. Estimated distance from parked position to impact

_____ m

13. Estimated speed at impact ____ kmph
+ / -

14. Grade at impact ____ %

15. Estimated distance from impact to vehicle final rest

_____ m

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



VEHICLE FORM

1. Case Number _____

VEHICLE IDENTIFICATION

2. VIN _____

3. Model Year _____

4. Vehicle Make (specify): _____

5. Vehicle Model (specify): _____

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		
2 nd Left		Fixed / Closed / Open / Partially Open / Unknown	Clear / Hazy / Very Dirty / Unknown		
2 nd Right		Fixed / Closed / Open / Partially Open / Unknown	Clear / Hazy / Very Dirty / Unknown		
3 rd Left		Fixed / Closed / Open / Partially Open / Unknown	Clear / Hazy / Very Dirty / Unknown		
3 rd 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 _____

7. LF Tire Size _____

9. RF Tire Size _____

8. LR Tire Size _____

10. RR Tire Size _____

Seats / Head Restraint Data

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

Seat Type codes:

- | | |
|---|--------------------------------------|
| 0 = No seat or seat folded down | 8 = Pedestal (i.e. column supported) |
| 1 = Bucket | 9 = Box mounted (i.e. van type) |
| 2 = Bucket w/ folding back | 10= Other seat type (specify) |
| 3 = Bench | 99= Unknown seat type |
| 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 | |

VEHICLE MEASUREMENTS

Clearance Heights	Measurements (all from ground, and in centimeters)	NOTES
Beltline		
Top of trunk/tailgate		
Bottom of bumper		
Trailer hitch (if applicable)		
Undercarriage		
Sway bar		
Axle		
Differential		
Other (specify):		
Sensor Height (if equipped)		
Camera Height (if equipped)		



Back Up / Parking Aid Form

1. Case Number

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



DRIVER FORM

1. Case Number

DRIVER PROFILE

2. Driver's Age

99 = Unknown

3. Driver's Sex

- ☐ Male
☐ Female
☐ Unknown

4. Driver's Height

999 = Unknown

_____ cm

5. Driver's Weight

999 = Unknown

_____ kg

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:

13. Driver in a hurry

- ☐ Yes N/A
☐ No Unknown
☐ 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 ☐ Over 60 Seconds
☐ 11-30 Seconds ☐ N/A
☐ 31-60 Seconds Unknown

<p>16. What direction was the driver looking during backing maneuver (Select all that apply)</p> <p><input type="radio"/> Straight ahead</p> <p><input type="radio"/> Right</p> <p><input type="radio"/> Left</p> <p><input type="radio"/> Rearward</p> <p><input type="radio"/> At object inside the car</p> <p><input type="radio"/> At mirrors</p> <p><input type="radio"/> Other (specify): _____</p> <p><input type="radio"/> N/A</p> <p>Unknown</p> <p>17. Was the driver distracted during back up maneuver (Select all that apply)</p> <p><input type="radio"/> No non-driving activities</p> <p>External</p> <p><input type="radio"/> Looking at other vehicles</p> <p><input type="radio"/> Looking at other non motorist</p> <p><input type="radio"/> Looking at intended turn destination</p> <p><input type="radio"/> External focus, not specified</p> <p><input type="radio"/> Other external focus (specify): _____</p> <p>Internal</p> <p><input type="radio"/> Looking at other occupant</p> <p><input type="radio"/> Talking to passenger</p> <p><input type="radio"/> Dialing phone</p> <p><input type="radio"/> Talking on phone</p> <p><input type="radio"/> Listening to radio/cd/portable playback device</p> <p><input type="radio"/> Adjusting radio/cd player</p> <p><input type="radio"/> Adjusting climate controls</p> <p><input type="radio"/> Using a device/controls integral to vehicle (specify): _____</p> <p><input type="radio"/> Reading/adjusting navigation system</p> <p><input type="radio"/> Eating or drinking</p> <p><input type="radio"/> Smoking related</p> <p><input type="radio"/> Retrieving fallen object (specify): _____</p> <p><input type="radio"/> Internal focus, not specified</p> <p><input type="radio"/> Focused on other internal object (specify): _____</p> <p><input type="radio"/> N/A</p> <p>Unknown</p> <p>18. Driver avoidance actions prior to impact (Select all that apply)</p> <p><input type="radio"/> None</p> <p><input type="radio"/> Braking</p> <p><input type="radio"/> Steering left</p> <p><input type="radio"/> Steering right</p> <p><input type="radio"/> Accelerating</p> <p><input type="radio"/> Other (specify): _____</p> <p><input type="radio"/> N/A</p> <p>Unknown</p>	<p>19. Did driver see struck non motorist prior to impact (Select all that apply)</p> <p><input type="radio"/> No, never saw non motorist</p> <p><input type="radio"/> Saw non motorist prior to entering vehicle</p> <p><input type="radio"/> Saw non motorist after entering vehicle</p> <p><input type="radio"/> Other (specify): _____</p> <p><input type="radio"/> N/A</p> <p>Unknown</p> <p>20. Est time between start of backing and impact</p> <p><input type="radio"/> <2 or = 1 second</p> <p><input type="radio"/> 2-5 seconds</p> <p><input type="radio"/> 6-10 seconds</p> <p><input type="radio"/> > 10 seconds</p> <p><input type="radio"/> N/A</p> <p>Unknown</p> <p>21. Driver interior sightline obstructions (Select all that apply)</p> <p><input type="radio"/> Pillar</p> <p><input type="radio"/> Headrest</p> <p><input type="radio"/> Cargo</p> <p><input type="radio"/> Other occupant</p> <p><input type="radio"/> Other (specify) _____</p> <p><input type="radio"/> Unknown</p> <p>None</p> <p>22. Recent experience driving this vehicle</p> <p><input type="radio"/> More than 10 times the last three months</p> <p><input type="radio"/> 6-10 times the last three months</p> <p><input type="radio"/> 2-5 times the last three months</p> <p><input type="radio"/> Less than 2 times the last three months</p> <p><input type="radio"/> First time driving this vehicle</p> <p><input type="radio"/> N/A</p> <p>Unknown</p> <p>23. Frequency of driving in this parking lot/driveway</p> <p><input type="radio"/> Daily</p> <p><input type="radio"/> Weekly</p> <p><input type="radio"/> Several times a month</p> <p><input type="radio"/> Monthly</p> <p><input type="radio"/> Rarely</p> <p><input type="radio"/> First time in lot/driveway</p> <p><input type="radio"/> N/A</p> <p>Unknown</p> <p>24. Driver Impairment (Select all that apply)</p> <p><input type="radio"/> No drugs or alcohol present</p> <p><input type="radio"/> Alcohol present (specify BAC): _____</p> <p><input type="radio"/> Drugs present (specify): _____</p> <p><input type="radio"/> Unknown</p> <p>25. Source of alcohol/drug results</p> <p><input type="radio"/> Police reported</p> <p><input type="radio"/> Medical record</p> <p><input type="radio"/> Other (specify) _____</p> <p><input type="radio"/> Not Tested</p> <p>Unknown if tested</p>
---	---



Non Motorist Form

1. Case Number _____

NON-MOTORIST PROFILE

2. Non-motorist's Age _____ Months
99 = Unknown Years

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

4. Non-motorist's Height _____ cm
999 = Unknown

5. Non-motorist's Weight _____ 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

Black	Charcoal gray
Lt gray/silver	Brown
Gold/tan	Purple
Dark blue	Light blue
Dark green	Light green
Maroon	Red
Orange	Yellow
White	Other (specify)

Fabrics

Natural
Synthetic
Blend

Textures

Soft
Slick
Coarse

Weights

Heavy
Medium
Light

	Clothing	Color	Fabric	Texture	Weight
H E A D W E A R	Hat				
	Helmet				
	Hood				
	Other (specify): _____				
U P P E R B O D Y	Short Sleeve				
	Long Sleeve				
	Light Jacket				
	Heavy Jacket				
	Other (Specify): _____				
L O W E R B O D Y	Shorts				
	Pants				
	Shoes				
	Other (specify): _____				