

Remote Not-In-Traffic Surveillance Falling Vehicle Investigation  
Dynamic Science, Inc. (DSI), Case Number DS09015  
1996 Pontiac Grand Am  
Indiana  
November 2008

---

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. Report No. DS09015		2. Government Accession No.		3. Recipient Catalog No.	
4. Title and Subtitle Remote Not-In-Traffic Surveillance Falling Vehicle Investigation				5. Report Date September 15, 2009	
				6. Performing Organization Report No.	
7. Author(s) Dynamic Science, Inc.				8. Performing Organization Report No.	
9. Performing Organization name and Address Dynamic Science, Inc. 299 West Cerritos Avenue Anaheim, California 92805				10. Work Unit No. (TRAIS)	
				11. Contract or Grant no. DTNH22-01-C-27002	
12. Sponsoring Agency Name and Address U.S. Dept. of Transportation (NVS-411) National Highway Traffic Safety Administration 1200 New Jersey Ave, SE Washington, DC 20590				13. Type of report and period Covered [Report Month, Year]	
				14. Sponsoring Agency Code	
15. Supplemental Notes					
16. Abstract This incident occurred in November 2008 at 1300 hours. The subject vehicle was a 1996 Pontiac Grand Am four-door sedan. The vehicle was lifted and supported by a jack. The left front wheel had been removed and a 51-year-old male was under the vehicle working on a hose located at the front end near the engine. For undetermined reasons, the vehicle slipped off the jack and fell onto the victim's chest. The victim was pinned by the left front brake assembly. The wife of the victim called for help and the victim's son heard his mother's calls. The son unsuccessfully attempted to lift the vehicle off the victim. The fire department arrived shortly after the incident and determined that the victim did not have a pulse. Emergency personnel were able to extricate the victim and, after performing CPR for several minutes, were able to establish a pulse. The victim sustained rib and sternum fractures, as well as a collapsed lung. He was transported to a local hospital for treatment. He remained in the hospital for 11 days until succumbing to his injuries.					
17. Key Words Not-In-Traffic Surveillance (NITS), fatality, falling vehicle			18. Distribution Statement		
19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No of pages	22. Price		

**Dynamic Science, Inc.**  
**Crash Investigation**  
**Case Number: DS09015**  
**TABLE OF CONTENTS**

Background .....	1
Summary .....	1
Incident Site .....	1
Pre-Crash .....	1
Incident .....	1
Post-Crash .....	2
Vehicle Information .....	2
Vehicle Damage .....	2
Hoisting Information .....	2
Non-motorist Data .....	3
Injuries .....	3
Attachment 1. Scene Diagram .....	4
Attachment 2. Data Forms .....	5

## BACKGROUND

This incident occurred in November 2008 at 1300 hours. The subject vehicle was a 1996 Pontiac Grand Am four-door sedan (**Figure 1**). The vehicle was lifted and supported on a jack. The left front wheel had been removed and a 51-year-old male was under the vehicle working on a hose located at the front end near the engine. For undetermined reasons, the vehicle slipped off the jack and fell onto the victim's chest. The victim was pinned by the left front brake assembly. The wife of the victim called for help and the victim's son heard his mother's calls. The son unsuccessfully attempted to lift the vehicle off the victim. The fire department arrived shortly after the incident and determined that the victim did not have a pulse. Emergency personnel were able to extricate the victim and, after performing CPR for several minutes, were able to establish a pulse. The victim sustained rib and sternum fractures, as well as a collapsed lung. He was transported to a local hospital for treatment. He remained in the hospital for 11 days until succumbing to his injuries.



**Figure 1.** 1996 Pontiac Grand Am

This Remote Not-In-Traffic Surveillance (NITS) Falling Vehicle Investigation was identified by DSI in an online news article. The article was forwarded to the National Highway Traffic Safety Administration (NHTSA) on February 20, 2009 and the case was assigned on March 11, 2009. The following information was obtained from the online news article, an interview, police photos, and a police incident report.

## SUMMARY

### Incident Site

The incident occurred in a residential garage located in an apartment complex. The vehicle was partially in the garage and partially in the parking area. The floor of the garage was concrete and the parking area was of asphalt composition. The floor of the garage was level; the parking area appeared to have had a slight negative grade of approximately 1 percent. The garage floor and parking area were dry.

The temperature at the nearest reporting station was 6 degrees C (42 degrees F) at 1254 hours. The weather was clear and the wind was out of the southwest at 27 km/h (17 mph)

### Pre-Crash

The Pontiac was parked with the front end partially in the parking area. The vehicle was on a jack and the left front wheel had been removed. The 51-year-old male was on his back under the left front of the vehicle, with his feet oriented towards the east. He was working on a hose that was located at the front of the vehicle near the engine compartment.

## Incident

For undetermined reasons, the vehicle slipped off the jack and fell onto the victim's chest. The victim was pinned by the left front brake assembly.

## Post-Crash

The wife of the victim called for help and the victim's son heard his mother's calls. The son unsuccessfully attempted to lift the vehicle off of the victim. The fire department arrived shortly after the incident and determined that the victim did not have a pulse. Emergency personnel were able to extricate the victim and, after performing CPR for several minutes, were able to establish a pulse. The victim sustained rib and sternum fractures, as well as a collapsed lung. He was transported to a local hospital for treatment. He remained in the hospital for 11 days until succumbing to his injuries.

## Vehicle Information

The subject vehicle in this incident was a 1996 Pontiac Grand Am 4-door sedan. The vehicle was equipped with a 3.1-liter, 6-cylinder engine, automatic transmission, and front-wheel drive.

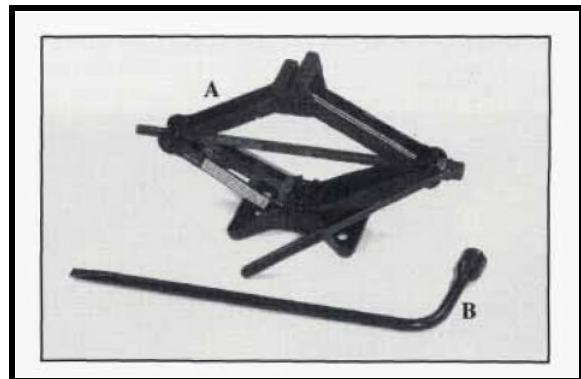
## Vehicle Damage

There was no damage to the Pontiac related to the contact with the non-motorist.

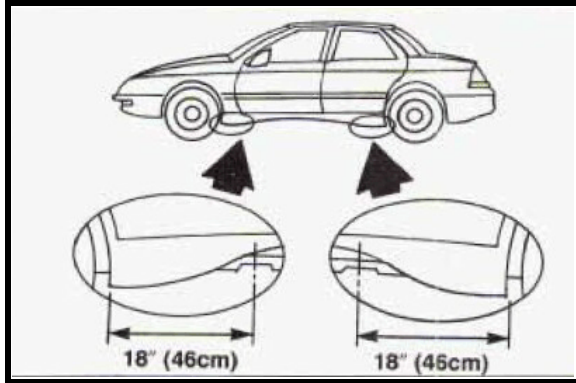
## Hoisting Information

The Pontiac was equipped with a scissors style jack that was stored in the trunk (**Figure 2**). According to one interviewee, the vehicle owner was using the original equipment jack and the vehicle was being hoisted from the left side. The vehicle was designed to be hoisted with the jack head positioned in the frame notch nearest the tire being removed (**Figure 3**). It is not known if the jack had been positioned correctly. In one police photo, it appeared that a block of wood had been used to chock the right rear tire (**Figure 4**).

There was no data available to determine if the vehicle transmission was in PARK or if the parking brake had been engaged. Rescue personnel were contacted but they did not have any additional information.



**Figure 2.** Exemplar view of scissors style jack



**Figure 3.** Frame notch locations



**Figure 4.** Right rear wheel chocked

**Non-motorist Data**

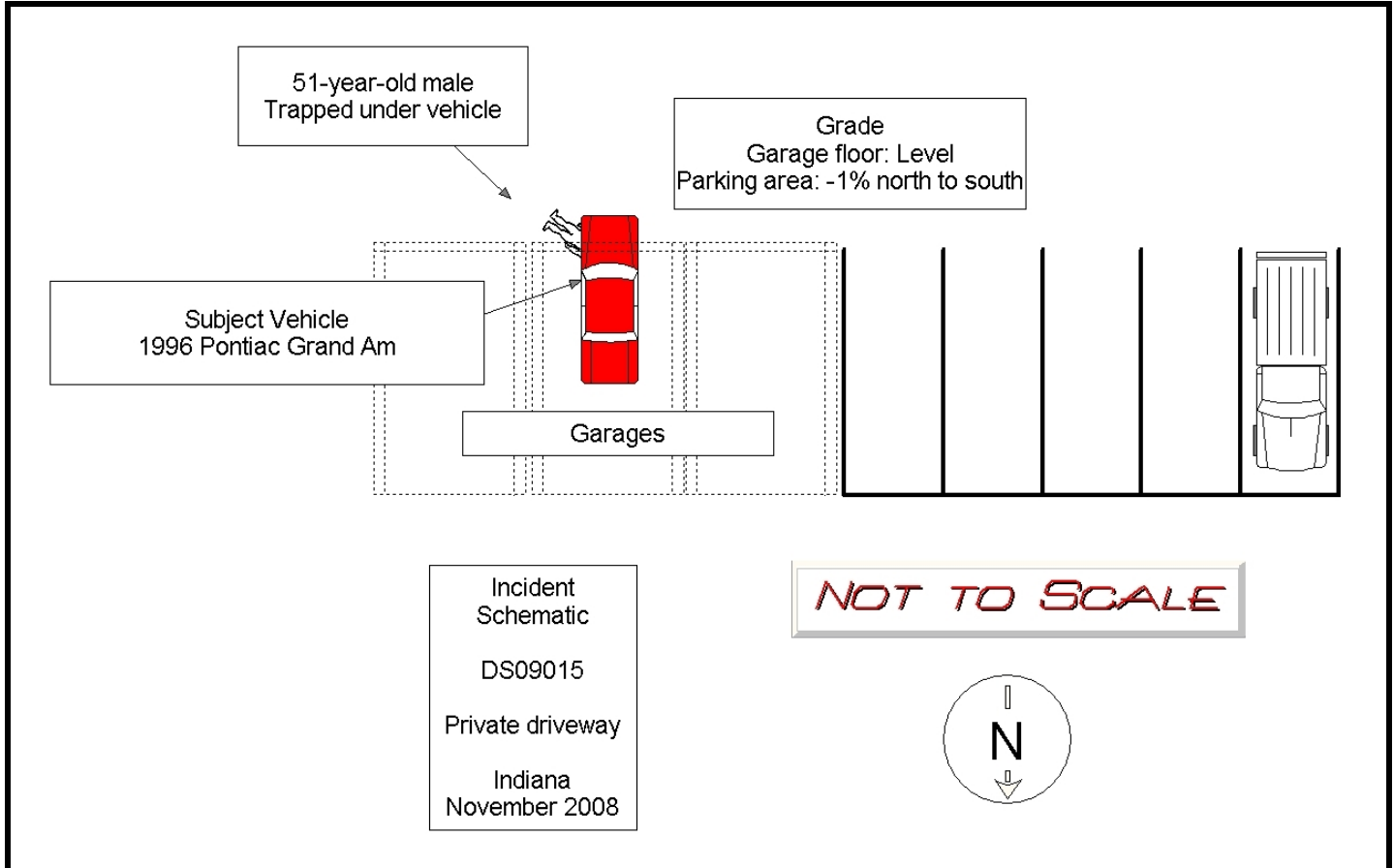
Age/Sex:	51/Male
Height:	Unknown
Weight:	Unknown
Type of medical treatment:	Transported and hospitalized for 11 days.

**Injuries**

Non-motorist: Injuries obtained from interviewee and news articles.

<u>Injury</u>	<u>OIC Code</u>	<u>Injury Mechanism</u>	<u>Confidence Level</u>
Rib fractures	450210.2,9	Front brake assembly	Certain
Sternum fracture	450804.2,4	Front brake assembly	Certain
Collapsed lung	Not codeable		

**Attachment 1. Scene Diagram**





**Attachment 2. Data Forms**



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	Clear / Hazy / Very Dirty		
RF		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
2 <sup>nd</sup> Left		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
2 <sup>nd</sup> Right		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
3 <sup>rd</sup> Left		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
3 <sup>rd</sup> Right		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
Backlight		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
Left Backlight		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
Right Backlight		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
Roof		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		
Other (specify)		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty		

## 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 <sup>nd</sup> Left			Full Down / Mid / Full Up	
2 <sup>nd</sup> Middle			Full Down / Mid / Full Up	
2 <sup>nd</sup> Right			Full Down / Mid / Full Up	
3 <sup>rd</sup> Left			Full Down / Mid / Full Up	
3 <sup>rd</sup> Middle			Full Down / Mid / Full Up	
3 <sup>rd</sup> 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)		



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

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





# Non Motorist Form

1. Case Number \_\_\_\_\_

## NON-MOTORIST PROFILE

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

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  On skates/skateboard  
 Bending at waist  On bike/scooter  
 Sitting  Other (specify) \_\_\_\_\_  
 Crouching  Unknown  
 Kneeling

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:

	<u><b>Colors</b></u>		<u><b>Fabrics</b></u>		<u><b>Textures</b></u>		<u><b>Weights</b></u>
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)						

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