**CRASH DATA RESEARCH CENTER**

Calspan Corporation
Buffalo, NY 14225

# NOT-IN-TRAFFIC SURVEILLANCE

# CALSPAN ON-SITE BACK OVER INCIDENT INVESTIGATION

**SCI CASE NO.: CA08043**

**VEHICLE: 1999 TOYOTA SIENNA**

**LOCATION: ILLINOIS**

**DATE OF INCIDENT: JULY 2008**

Contract No. DTNH22-07-C-00043

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

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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 are 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 STANDARD TITLE PAGE

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## BACKGROUND

This on-site investigation focused on the circumstances of a non-fatal back over incident and the rear visibility study of the involved 1999 Toyota Sienna minivan **(Figure 1)**. This incident occurred on the driveway of a private residence in a residential area as the driver of the Toyota was backing from the roadway into the driveway. The Toyota was not equipped with a backing/parking aid. The non-motorist was a 4-year-old female and the daughter of the driver. At the time of the incident, the non-motorist was seated on the driveway. The driver entered the vehicle that was parked across the street from the residence and began a backing maneuver to park the Toyota in the driveway. The child was located within the blind zone and was subsequently struck by the rear bumper and was knocked to the ground. The non-motorist was wedged between the spare tire and the concrete surface. The incident was observed by an older sibling who alerted the driver. The driver immediately stopped the backing maneuver and pulled the vehicle forward. She exited the vehicle and observed the lying child on the driveway. The child was transported to a local hospital where she was treated for multiple injuries including a right pneumothorax. She was admitted for treatment and was released four days post-crash.

**Figure 1. 1999 Toyota Sienna.**

This incident was identified by the Crash Investigation Division (CID) of the National Highway Traffic Safety Administration (NHTSA) through a review of Police Accident Reports (PARs). The PAR was forwarded to the Calspan Special Crash Investigations (SCI) team on August 22, 2008 for follow-up investigation. The SCI team established cooperation with the driver of the Toyota on September 10, 2008 to facilitate the inspection of the vehicle, incident site, and consent to conduct an interview. Due to the Agency's interests in Not-In-Traffic incidents, the case was assigned as an on-site investigation on September 11, 2008. The inspection of the vehicle, incident site, and driver interview was conducted on September 17, 2008.

## SUMMARY

### *Incident Site*

**Figure 2. Overall view of the front of the residence.**

This back over incident occurred during daylight hours in July 2008 in a residential area. The Toyota was parked against the north curb across the street from the residence. This roadway was approximately 8 meters (26 feet) in width and was surfaced with asphalt. The residence was located on the southwest corner of a four-leg intersection. The driveway to the house was 5 meters (16.4 feet) in width and had a grade of less than one percent. The concrete surfaced driveway ended at the roadway and was intersected by a concrete sidewalk. The front of the residence was landscaped with multiple shrubs and small trees. The landscaping extended approximately 4 meters (13 feet) north of the house. Beyond the landscaping, the property contained a concrete walkway that led to the front door and a lawn that was intersected by a concrete sidewalk. The landscaped area was not considered a sight obstruction as the incident occurred near the mouth of the driveway.

A mailbox mounted on a wooden post that was approximately 150 cm (60”) in height was located at the end of the property near the south curb, west of the driveway. The mailbox did not pose as a sight obstruction to the driver. The driver stated during the SCI interview that her attention was on the mailbox as she did not want to strike it during her backing maneuver. Additionally, at the time of the incident a trash receptacle was located on the east end of the driveway near the curb. This also was not a sight obstruction as the driver was focusing on not striking this object during her backing maneuver. **Figure 2** is an overall view of the residence. The Incident Schematic is included as **Figure 16** of this report.

### *Vehicle Data*

**Figure 3. Case vehicle, 1999 Toyota Sienna.**

The case vehicle in this back over investigation was a 1999 Toyota Sienna XLE minivan **(Figure 3)**. The Toyota was manufactured on November 1998 and was identified by Vehicle Identification Number (VIN): 4T32F13C0XU (production number deleted). The Toyota was powered by a 3.0 liter V-6 engine linked to a four-speed automatic transmission with a column mounted shifter. The front-wheel drive Sienna was equipped with radial tires, size P215/65R15 mounted on OEM alloy wheels. The Toyota was not equipped with a backup system.

The window glazing was AS1 for the laminated windshield, AS2 for the front doors, and AS3 OEM deep tint for the rear doors, rear side windows, backlight, and sun roof. The driver stated that all windows were closed during the incident. The clarity of the glass was clear at the time of the investigation. There were no obstructions to the side or back glazing.

**Figure 4. Overall view of the undercarriage components.**

The interior of the Toyota was configured with box-mounted type seats for the first row and second row, and a bench seat for the third row. The outboard seats in all three rows were equipped with adjustable head restraints. The front left and second row right head restraints were adjusted 3 cm (1") above the top of the seat backs. The remainder of the head restraints were in the full-down positions.

**Figure 4** is an overall view of the rear undercarriage components. The vertical clearance heights of the rear components of the Toyota were measured from the paved surface of the roadway in front of the residence and are listed in the following table:

| Component | Clearance Height |
|---|---|
| Beltline | 111 cm (43.7") |
| Bottom of backlight | 118 cm (46.4") |
| Base of wiper blade | 122 cm (48.0") |
| Top of backlight | 158 cm (62.2") |
| Top of lift gate | 163 cm 64.2") |
| Bottom of bumper | 35 cm (13.8") |
| Spare tire sidewall | 24 cm (9.4") |
| Spare tire center of rim | 27.5 cm (10.8") |
| Trunk floor | 51.5 cm (20.2" |
| Trunk support rails | 42 cm (16.5") |
| Tail pipe | 28 cm (11.0") |
| Muffler | 23 cm (9.1) |
| Left shock mount | 16 cm (6.3") |
| Right shock mount | 16 cm (6.3") |
| Left coil spring bracket | 15.5 cm (6.1") |
| Right coil spring bracket | 15.5 (6.1") |
| Center of axle | 30.5 cm (12.0") |
| Axle ends | 25.5 cm (10.0") |
| Left transport hook | 30 cm (11.8") |
| Right transport hook | 31 cm (12.2") |
| Fuel filler neck | 36 cm (14.2") |

### *Driver Data*

The driver of the Toyota was a 48-year old female with a stated height of 170 cm (67") and a weight of 54 kg (120 lb). The driver has near and far sighted vision deficiencies and wore contact lenses for corrective measures. She stated during the interview that as she entered the vehicle, all windows were closed and the radio was in the off-position. She also noted that she looks over her right shoulder when backing. The driver is familiar with backing in and out of the driveway from her residence.

### *Non-Motorist Data*

The non-motorist was a 4-year-old female. The driver/mother stated that her demographics were 110 cm (43.3") and 15 kg (34 lbs). At the time of the incident, the non-motorist was wearing a multicolored sun dress without shoes. The child has no known sight or hearing impairments. The non-motorist sustained abrasions to her left face, inner right leg, tension pneumothorax of the right lung, and a green stick fracture of the left clavicle. She was hospitalized for four days and released.

### *Incident Sequence*

### *Pre-Incident*

Prior to the incident, the Toyota was parked across the street from the residence against the north curb. The driver had just completed mowing the lawn and had placed the trash receptacle on the east end of the driveway. The non-motorist and three of her siblings were playing on the property as the driver completed her task. The specific activity of the non-motorist consisted of her playing on the lawn and running through the lawn sprinklers.

Upon completing her task, the driver proceeded to cross the street and enter the Toyota. Her intentions were to back the vehicle into the driveway and park the Sienna on the west side of the driveway. An older sibling stated to the driver post-incident, that as the driver entered the vehicle, the non-motorist picked up a bug catcher that was on the lawn and proceeded into the driveway. The non-motorist reached the intersection of the west driveway and the sidewalk. She proceeded to sit on the driveway and began playing with the insects that were captured in the bug catcher. The SCI investigator determined that the non-motorist was seated facing west, perpendicular to the rear plane of the Toyota with her right side exposed to the back of the Toyota. This was determined by the subsequent injuries sustained by the non-motorist and the contact evidence on the vehicle. This determination is described in detail in the ***Vehicle Contact Damage/Evidence*** section of this report. The driver was unaware of the non-motorist on the driveway as she entered the vehicle.

### *Incident*

The driver began a backing maneuver from the north curb traveling in a southeast trajectory. The driver was looking over her right shoulder during the backing trajectory. As she entered the driveway, her attention was focused on the mailbox located on the west side of the driveway. She stated that she did not believe that she was close enough to the west end of the driveway and stopped the vehicle. At this point, she placed the vehicle in drive and began a forward movement traveling in a northeast direction. She

stopped the vehicle on the roadway, placed the transmission selector in reverse and attempted to back into the driveway. During this attempt, her attention was on the trash receptacle that was located on the east side of the driveway.

As she entered the driveway, the vehicle was facing in a northeast direction. The driver continued into the driveway approximately 6 meters (20 feet), unaware of the non-motorists presence and struck her with the rear bumper, left of the centerline. The driver did not feel the impact and continued backing.

During the continuation of the backing maneuver, a sibling of the non-motorist approached the left front door and alerted the driver that she had struck the 4-year-old female.

The driver immediately applied the brakes, stopped the vehicle placed the transmission selector in drive and pulled forward approximately 0.9-1.5 meters (3-5 feet) where she stopped the Toyota. **Figures 5-12** is an image sequence of the vehicle's movement from pre-incident to final rest.

**Figure 5. Pre-incident parked position against the north curb.**

**Figure 6. Initial backing maneuver.**

**Figure 7. Driver stops and begins to pull forward to reposition the vehicle and to reattempt the backing manuver.**

**Figure 8. Forward motion of the Toyota.**

**Figure 9. Driver stops near the corner and begins backing.**

**Figure 10. Rearward trajectory of the Toyota.**

**Figure 11. Area where the vehicle struck the child.**

**Figure 12. Driver pulls forward post-contact.**

***Post-Incident***

The driver exited the Toyota through the left front door and observed the 4-year-old lying on the driveway. She picked up the child and held her in her arms. Initially the non-motorist was unresponsive to the driver as she spoke to her. The driver stated that the non-motorist suddenly responded and began flailing her arms and screaming.

The 9-1-1 emergency response number was called and police and ambulance assistance was requested. Ambulance personnel arrived on-scene and transported the child to a local hospital. Upon arrival, hospital personnel began treatment of the child. Diagnostic testing was completed to determine the extent of injury. It was determined that the non-motorist sustained abrasions to her left face, inner right leg, tension pneumothorax of the right lung, and a green stick fracture of the left clavicle. She was hospitalized for four days and released.

***Vehicle Contact Damage/Evidence***

The Toyota was inspected by the SCI investigator at the residence where the incident occurred 53 days post-incident. The vehicle had been used on numerous occasions since the incident. The SCI investigator inspected the rear bumper and undercarriage of the vehicle for contact evidence. Upon inspecting the undercarriage of the vehicle, two areas of wipe marks were observed on the sidewall of the undercarriage mounted spare tire

**(Figures 13 and 14)**. These wipe marks consisted of dirt/road film being cleaned away from the rubber surface of the spare tire. These suspected areas of contacts measured 9 cm (3.5") and 34 cm (13.4") respectively and were located on the rear and left aspects of the tire. Additionally, these contact areas extended 38-89 cm (15"- 35") forward of the bumper fascia. Based on the injuries sustained by the non-motorist and the suspected area of contact, the SCI investigator concluded that the child was seated perpendicular to the rear of the Toyota. The Toyota's rear bumper contacted the right shoulder area of the child knocking her to the ground where the left side of her face contacted the concrete surface. As the vehicle continued backing, the spare tire contacted the child's right upper body area. She was compressed between the spare tire and the concrete surface resulting in a green stick fracture of the left clavicle and tension pneumothorax of the right lung. Additionally, as she was compressed, she was displaced rearward resulting in the abrasions to the left face and inner right leg.

**Figure 13. Contact to the rear aspect of the spare tire.**

**Figure 14. Area of contact to the left side of the spare tire.**

***Rear Visibility***

During the on-site investigation, a rear visibly study was conducted with the driver positioned in the Toyota. The Toyota was parked against the south curb on level ground to conduct the study. Seated within the left front seat in a driving posture, the driver's eye height measured 140 cm (55") above the ground. At the time of the SCI inspection, the seat track was adjusted to a rear third track position and the head restraint was located 3 cm (1") above the seat back. The second row right head restraint was positioned 3 cm (1") above the seat back and the remainder of the head restraints were located in the full-down position.

The driver stated that she was looking over her right shoulder as she was backing; therefore the visibility study was conducted with the driver looking over her right shoulder.

The rear visibility was determined using an 8 cm (3") diameter reflective red marker that was positioned in a stand and set 71 cm (28") above the ground. The driver was asked to locate the reflective marker looking over her shoulder as it cleared the backlight at the centerline.

The driver detected the reflective marker in the rear view mirror 6.5 m (21.3 feet) aft of the back bumper. The driver continued a straight line of sight that intersected the ground at a point that was 12.5 m (41 feet) from the rear bumper. Lateral cones of visibility were established with driver looking over her right shoulder. Due to her positioning, a left lateral cone (left of the vehicle) could not be determined as she could not see left of the centerline. The right cone was began at the centerline and extended 2.2 meters (7.2 feet) to the right. Although the driver noted that there were no interior sight line obstructions, the third row head restraints and the D-pillars may have obstructed the driver's vision. At the onset of the final backing trajectory into the driveway, the non-motorist was positioned within the blind zone based on the visibility study.

In addition to rear visibility study with the driver looking over her shoulder, a visibility study was conducted with her using the mirrors. These results are included in this report as **Figure 15. Attachment A** of this report is the Not In Traffic Surveillance Forms.

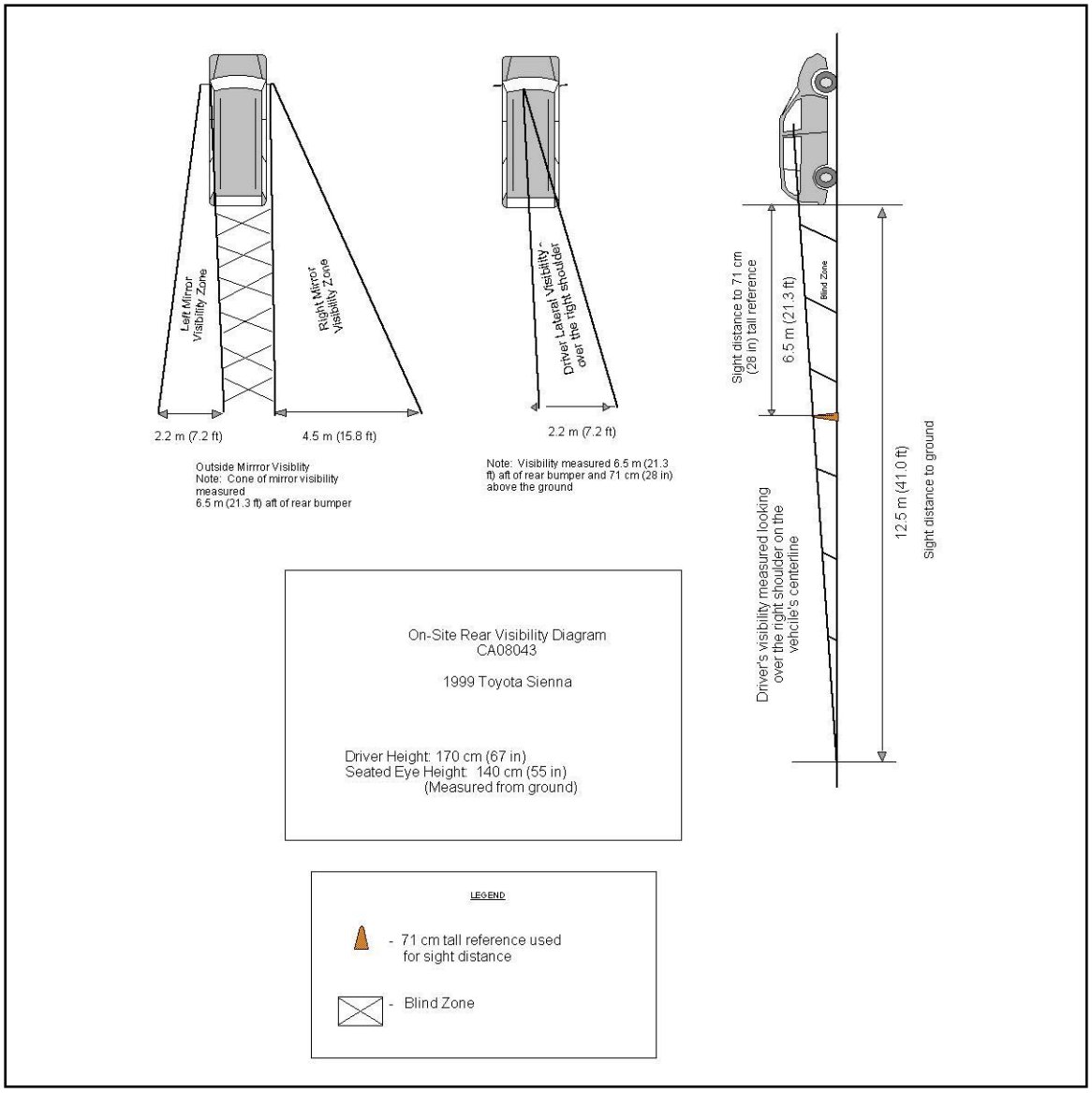


***Figure 15. Rear Visibility Diagram***

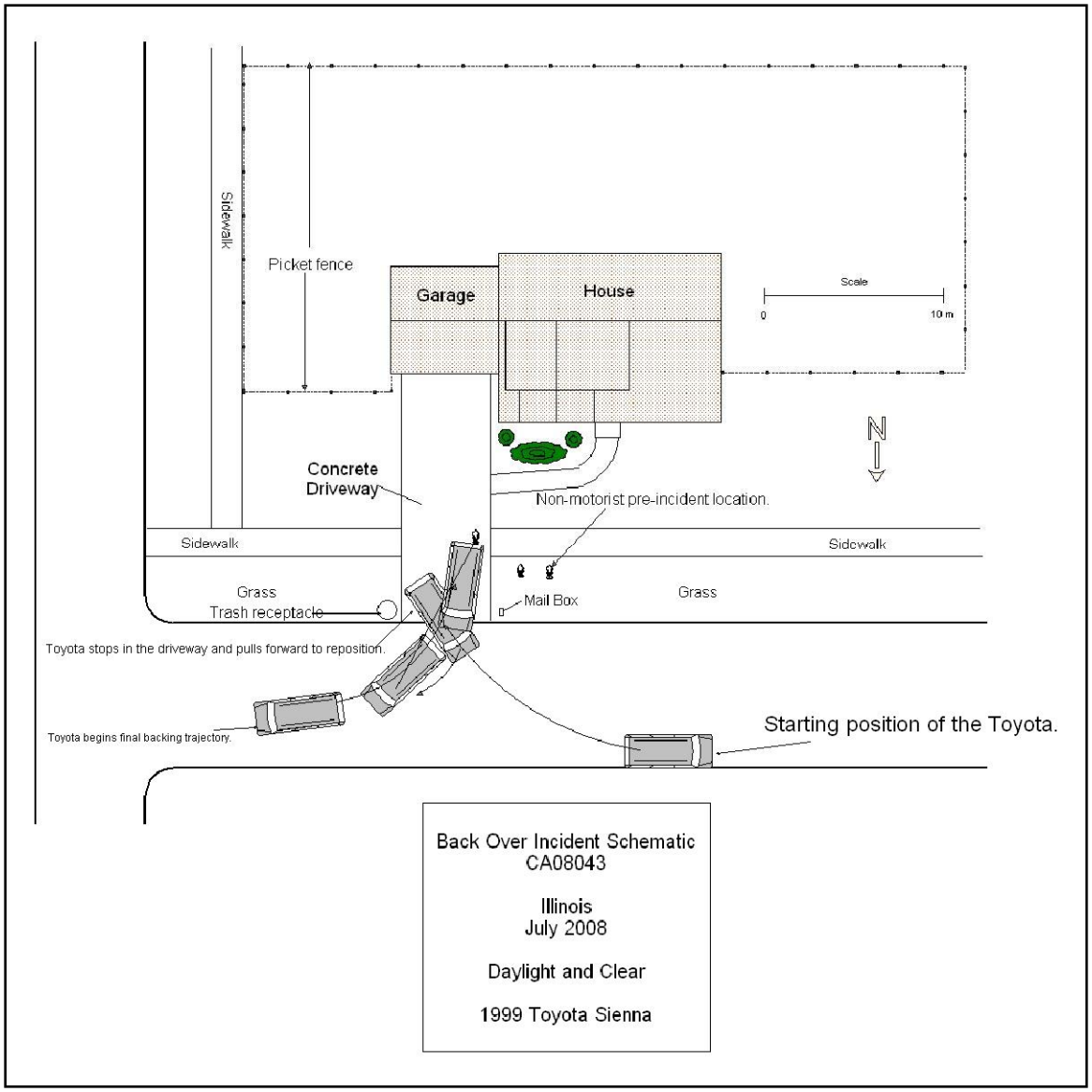


***Figure 16. Incident Schematic***

***Attachment A: Not-In-Traffic Surveillance Forms***

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

C A 0 8 0 4 3

## IDENTIFICATION

2. Date of Crash 0 7 / X X / 0 8

3. Time of Crash 2 0 3 9

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 1 0 . 0 m

13. Estimated speed at impact 0 0 2 kmph

14. Grade at impact (+/ -) + 0 1 %

15. Estimated distance from impact to vehicle final rest

0 0 2 . 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 C A 0 8 0 4 3

## VEHICLE IDENTIFICATION

2. VIN 4 T 3 Z F 1 3 C 0 X U X X X X X X

3. Model Year 1 9 9 9

4. Vehicle Make (specify): Toyota

5. Vehicle Model (specify): Sienna XLE

## 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 P215/65R15

7. LF Tire Size P215/65R15

8. LR Tire Size P215/65R15

9. RF Tire Size P215/65R15

10. RR Tire Size P215/65R15

## Seats / Head Restraint Data

| Seat Position | Seat Type (Select from below ) | Head Restraint (Check if available) | Head Restraint Adjustment (select) | NOTES: |
|---|---|---|---|---|
| Front Left | 9 | ☑ | ☐ ☑ ☐ Full Down / Mid / Full Up | |
| Front Middle | 0 | ☐ | ☐ ☐ ☐ Full Down / Mid / Full Up | |
| Front Right | 9 | ☑ | ☑ ☐ ☐ Full Down / Mid / Full Up | |
| 2nd Left | 9 | ☑ | ☑ ☐ ☐ Full Down / Mid / Full Up | |
| 2nd Middle | 0 | ☐ | ☐ ☐ ☐ Full Down / Mid / Full Up | |
| 2nd Right | 9 | ☑ | ☐ ☑ ☐ Full Down / Mid / Full Up | |
| 3rd Left | 6 | ☑ | ☑ ☐ ☐ Full Down / Mid / Full Up | |
| 3rd Middle | 6 | ☐ | ☐ ☐ ☐ Full Down / Mid / Full Up | |
| 3rd Right | 6 | ☑ | ☑ ☐ ☐ 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 | | 111 | See technical report for additional components not listed here. |
| Top of trunk/tailgate | | 163 | |
| Bottom of bumper | | 35 | |
| Trailer hitch (if applicable) | | N/A | |
| Undercarriage | | | |
| | Sway bar | N/A | |
| | Axle | 31 | |
| | Differential | N/A | |
| | Other (specify): N/A | N/A | |
| 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

C A 0 8 0 4 3

## 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

C A 0 8 0 4 3

## DRIVER PROFILE

2. Driver's Age 4 8
99 = Unknown

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

4. Driver's Height 1 7 0 cm
999 = Unknown

5. Driver's Weight 0 5 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): _____
- ☐ N/A
- ☐ Unknown

12. Where was driver going
Description:

Moving vehicle from road to park it in the driveway.

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): M-box&trash

***Internal***

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

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

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

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

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

20. Est time between start of backing and impact

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

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

- ☑ Pillar
- ☑ Headrest
- ☐ Cargo
- ☐ Other occupant
- ☐ Other (specify) _____
- ☐ Unknown
- ☑ None

22. Recent experience driving this vehicle

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

23. Frequency of driving in this parking lot/driveway

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

24. Driver Impairment
*(Select all that apply)*

- ☑ No drugs or alcohol present
- ☐ Alcohol present (specify BAC): _____
- ☐ Drugs present (specify):_____
- ☐ Unknown

25. Source of alcohol/drug results

- ☑ Police reported
- ☐ Medical record
- ☐ Other (specify)_____
- ☐ Not Tested
- ☐ Unknown if tested

Not Applicable ☐

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

# Non Motorist Form

Reset Values

Special Crash Investigations
Not In Traffic Surveillance

1. Case Number
C A 0 8 0 4 3

## NON-MOTORIST PROFILE

2. Non-motorist's Age
99 = Unknown
0 4 ☐ Months ☉ Years

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

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

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

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 | None | | | |
| | Helmet | None | | | |
| | Hood | None | | | |
| | Other (specify): _____ | None | | | |
| | Unknown | None | | | |
| **UPPER BODY** | Short Sleeve | None | | | |
| | Long Sleeve | None | | | |
| | Light Jacket | None | | | |
| | Heavy Jacket | None | | | |
| | Other (Specify): Sun dress | Multi colored | Natural | Soft | Light |
| | Unknown | None | | | |
| **LOWER BODY** | Shorts | None | | | |
| | Pants | None | | | |
| | Shoes | None | | | |
| | Other (specify): _____ | None | | | |
| | Unknown | None | | | |