



U.S. Department  
of Transportation

**National Highway  
Traffic Safety  
Administration**



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DOT HS 813 665

March 2025

# **Special Crash Investigations: On-Site Frontover Investigation; Vehicle: 2022 Chevrolet Tahoe; Location: California; Incident Date: May 2022**

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## Technical Report Documentation Page

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<b>16. Abstract</b> This report documents the on-site investigation of the death of a 14-month-old male due to a 2022 Chevrolet Tahoe SUV front-over incident. The Chevrolet was driven by a belted 24-year-old male with no other passengers. The driver was initially traveling east on a residential street before turning right to enter the driveway. The child was playing in the driveway of a gated private residence and apparently was obscured by four trash cans at the side of the driveway. As the Chevrolet entered the driveway, the child either crawled or walked into the driveway from the area of the trash cans and was run over by the right-side tires. The driver conducted cardiopulmonary resuscitation for an unknown period of time. The child was transported by ambulance to a local trauma hospital where he was pronounced deceased after the incident. The cause of death was reported as severe craniocerebral trauma.			
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**Special Crash Investigations**  
**On-site Frontover Investigation**  
**Case Number DS22025**  
**Vehicle: 2022 Chevrolet Tahoe**  
**Location: California**  
**Incident Date: May 2022**

## **Background**

This report documents the on-site investigation of the death of a 14-month-old male that died during a frontover incident. The investigation was to determine the events leading up to the incident, the actions of the driver, the vehicle characteristics and equipment, the environment/scene conditions and layout, and activities of the involved child. The Special Crash Investigations (SCI) team initiated this investigation in response to a notification sent by the SCI team in December 2022 containing the crash report, the coroner's investigation report, and an online news report. The case was assigned as an on-site investigation in December 2022. The on-scene police photos were obtained in January 2023. The scene inspection took place in January 2023. The Chevrolet Tahoe was sold by the family and was not available for inspection.

The incident occurred in the afternoon hours in May 2022 in California. The incident site was in the driveway entrance of a gated private residence. The driveway was oriented north/south with a chain link fence to the west and a grass yard with a playhouse to the east. There were four trash cans located on the west side of the driveway. Conditions at the time of the incident were clear, daylight, and dry. The vehicle was a 2022 Chevrolet Tahoe SUV that was being driven by a belted 24-year-old male. On the day of the incident the driver was returning home after spending time at his parent's house. The Chevrolet was initially traveling east on a residential street before turning right (south) to enter the residence's driveway. The driver used the remote gate opener to open the gate to the driveway and did not see anyone outside the residence. As the Chevrolet entered the driveway and traveled approximately 9 m (29 ft), the driver said he felt a bump and continued forward and before stopping the vehicle. The driver's wife came out of the residence and asked if he knew where the child was. He told her that he didn't know. She went to the back of the Chevrolet and saw the child on the ground bleeding. It appeared that the child had either crawled or walked into the driveway from the west near the trash cans and was struck by the right-side tires. Emergency services were called, and the 911 operator instructed the driver how to do cardiopulmonary resuscitation (CPR). He began performing CPR and continued for an unknown length of time until EMS arrived. The child was transported by ambulance to a local trauma hospital where he was pronounced deceased approximately 1 hour after the incident. The cause of death was reported as severe craniocerebral trauma.

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## Summary

### Incident Site

The incident site was in the concrete driveway of a gated private residence. The driveway was oriented north/south with a chain link fence to the west and a grass yard with a playhouse to the east. The driveway was separated from the crossing street by a concrete block wall and a metal gate. There were four trash cans located on the west side of the driveway. South of the trash cans was a planter box with three palm trees. Conditions at the time of the incident were clear, daylight, and dry. The weather at the nearest reporting site was 26°C (79°F), 45 percent humidity and winds out of the west at 19 km/h (12 mph). The sun position did not play a role in this incident. An incident diagram and a satellite view (Figure 10) are included at the end of this report.

### Pre-Incident

The driver's wife was at home with her two children, the 14-month-old male and an older female. The two children were outside in the play area. The driver's wife said that when she goes in and out of the house, she can see the front yard from the living room window. Prior to the incident, the daughter went into the house. The 14-month-old male had just started walking but primarily crawled. On occasion the child would play near the trash cans on the west side of the driveway. The neighbors on that side of the driveway had a small dog that the child liked to play with. On the day of the incident the driver was returning home after spending time at his parent's house. The Chevrolet was initially traveling east (Figure 1) on a residential street before turning right (south) to enter the driveway (Figure 2). The driver used the remote gate opener to open the gate to the driveway. The female child saw the gate opening and started heading outside. The wife told the police that she went outside and waved to the driver to stop because the children were outside. The driver stated he did not see anyone outside of the residence. The 14-month-old was near the trash cans and either walked or crawled into the driveway from the right.



*Figure 1. Driveway approach,*



*Figure 2. Eastbound approach, driveway on right*

## Incident

The Chevrolet entered the driveway and traveled approximately 9 m (29 ft). The Chevrolet ran over the child and continued forward (Figure 3). The driver felt a bump and continued forward before stopping the vehicle. The driver's wife came out of the residence and asked if he knew where the child was. He told her that he didn't know. She went to the back of the Chevrolet and saw the child on the ground bleeding. It appeared that the child had either crawled or walked into the driveway from the west near the trash cans and was struck by the right-side tires.



*Figure 3. Area of impact, looking south (police photo)*

## Post-Incident

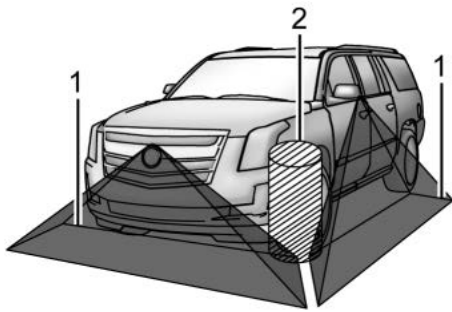
Emergency services were called, and the 911 operator instructed the driver how to do CPR. He performed CPR for an unknown length of time until EMS arrived. The child was transported by ambulance to a local trauma hospital where he was pronounced deceased approximately 1 hour after the incident. The cause of death was reported as severe craniocerebral trauma.

## 2022 Chevrolet Tahoe

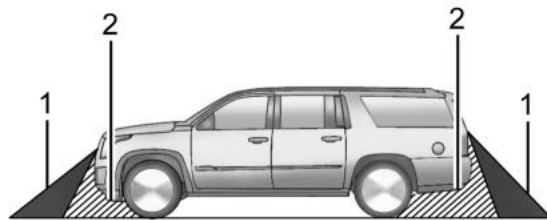
### Vehicle Description

The 2022 Chevrolet Tahoe was a 5-door SUV identified by the Vehicle Identification Number 1GNSKPKD2NRxxxxxx. It had a 5.3-liter, 8-cylinder gasoline engine coupled to a 10-speed automatic transmission, 4-wheel drive, and three rows of seats with seating for eight.

According to the Chevrolet's window sticker, it had assistance systems for parking and backing. One assistance component is called the Surround Vision system. According to the owner's manual the system can display various views (Figures 4 and 5) surrounding the vehicle in the infotainment display. There are several warnings in the manual associated with the feature, including "the surround vision cameras have blind spots and will not display all objects near the corners of the vehicle...the cameras do not display children, pedestrians, bicyclists, crossing traffic, animals, or any other object outside the cameras' field of view, below the bumper, or under the vehicle."



*Figure 4. Camera views, (1) views displayed, (2) area not shown (excerpted from owner's manual)*



*Figure 5. Camera views, (1) views displayed, (2) area*

Views can be accessed in the infotainment display, including front/rear top-down view, front/rear side view, surround view, and several trailer related views. Surround view displays an image of the area surrounding the vehicle and is displayed alongside whatever view has been selected when the vehicle speed is below 12 km/h (8 mph). There were no indications from the police or in the driver's statements that any of the view options were being used during this incident.

The vehicle had a front pedestrian braking (FPB) system as standard equipment. According to the owner's manual, the FPB system may help avoid or reduce the harm caused by front-end crashes with nearby pedestrians when driving in a forward gear. FPB can be set to Off, Alert, or Alert and Brake through vehicle personalization. FPB displays an amber indicator when a nearby pedestrian is detected ahead. When approaching a detected pedestrian too quickly, FPB provides a red flashing alert on the windshield and rapidly beeps or pulses the driver seat. The FPB system can detect and alert to pedestrians when driving in a forward gear at speeds between 8 km/h (5 mph) and 80 km/h (50 mph). During daytime driving, the system detects pedestrians up to approximately 40 m (131 ft). The manual further states that FPB does not provide an alert or automatically brake the vehicle unless it detects a pedestrian. FPB may not detect pedestrians, including children when the pedestrian is not directly ahead, fully visible, or standing upright, or when part of a group. There were no indications that the pedestrian was detected (due to the

location and height of the child) or that the system was in operation prior to the incident (due to the low speed).

It should be noted that the vehicle had been purchased approximately 1 week prior to the incident and the driver may not have been fully aware of the available assistance systems.

### **Exterior Damage**

The Chevrolet did not sustain any residual damage. There were blood transfers on the tread of the right front and right rear tires (Figure 6). The collision deformation classifications (CDCs) for these no residual damage contacts were 12FRWN3 and 12FRWN9, respectively.



*Figure 6. Blood contacts to tires, 2022 Chevrolet Tahoe (police image)*

### **Interior Damage**

The Chevrolet did not sustain any interior damage.

### **Manual Restraint Systems**

The Chevrolet had lap and shoulder belts for all the seating positions and pretensioners for the front outboard seats. According to the police report, the driver was belted.

### **Supplemental Restraint Systems**

The Chevrolet had driver's and passenger's frontal air bags, outboard seat-mounted side-impact air bags for the front-row, and inflatable curtain air bags for the front, second, and third rows. There were no air bag deployments

### **NHTSA Recalls and Investigations**

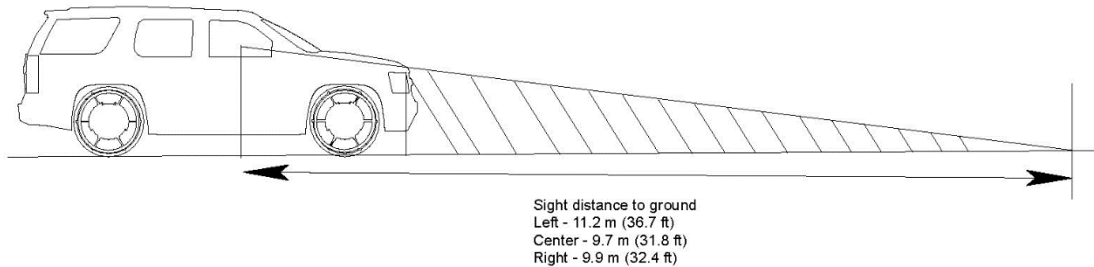
VIN-based searches in January 2023 and October 2024 found no unrepaired recalls associated with this vehicle.

## Front Visibility

An exemplar Chevrolet was examined to obtain general front visibility information. The following baseline items were obtained from the vehicle, vehicle specifications, anthropometric documents,<sup>1</sup> and a New Car Assessment Program report for the 2021 version of this vehicle.

Item	Measurement
Front overhang	97 cm (38.1 in)
Front bumper to base of windshield	131 cm (51.5 in)
Hood line height	110 cm (43.3 in)
Front bumper height (top)	66 m (25.9 in)
Front bumper height (bottom)	36 cm (14.1 in)
Front axle to hood edge (left, right)	64 cm (25.1 in)
Ground to driver's eye height (estimated)	148 cm (58.2 in)
Seat to eye height according to body height	82 cm (32.2 in)
Driver's head to side window (NCAP dummy position)	35 cm (13.7 in)

Based on available data, the sight distance to the ground for the driver looking forward over the left hood, over the center of the hood, and over the right hood was 11.2 m (36.7 ft), 9.7 m (31.8 ft), and 9.9 m (32.4 ft), respectively (Figure 7).



*Figure 7. Sight visibility diagram*

<sup>1</sup> Kovacevic, S., Vučinić, J., Kirin, S., & Pejnović, N. (2010, March). Impact of anthropometric measurements on ergonomic driver posture and safety. *Periodicum Biologorum*, 112(1), 51-54.

## Side Visibility

The right A-pillar was a potential blind spot area as the 14-month-old child came from the right to the left. The lateral width of the A-pillar directly correlates to the projected width of a blind spot. For the Chevrolet, the width dimensions for the A-pillar were 14 cm (5.5 in), 13 cm (5.1 in), 13 cm (5.1 in) for the bottom, middle and top, respectively. One study focused on A-pillar driver obscuration/location and A-pillar passenger obscuration that determines the interaction between the driver and vehicle's pillar, which affects the driver's ability to see external objects, including pedestrians.<sup>2</sup> In the study, vehicle pillars were measured in the all-around view from the driver's monocular eye point 63.5 cm above the seating reference point considering all obstructive elements. For the study, measurements and data were collected from approximately 75 vehicles. The minimum A-pillar obscuration was determined to be 7° and the maximum was reported as 11.5° (Figure 8). The authors noted that there are other interior dimensions that affect obscuration/location, including seating reference point to ground front, seat height, and torso angle.

There was also a blind spot created by the right rear-view mirror. The mirror was 28 cm (11.0 in) wide with an 8 cm (3.1 in) gap between the mirror and the lower A-pillar. The base of the side window was 132 cm (51.9 in) above the ground. It does not appear that the mirror or A-pillar played a role in this incident.

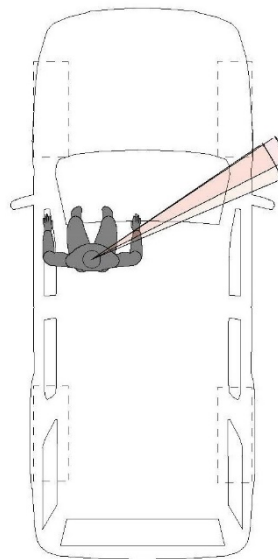


Figure 8. Passenger A-pillar obscuration. Minimum A-pillar obscuration (7°); minimum A-pillar obscuration (11.5°)

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<sup>2</sup> Cardoso Santos, A., Gerez, A., Pádua, A., Genaro, P., Silva, R., & Ferreira, S. (2019, October 14-18). *The influence of A-pillar obscuration/location on driver visibility* (SAE Technical Paper 2019-36-0062). 2019 SAE Brasil Congress & Exhibition, São Paulo, Brazil. <https://doi.org/10.4271/2019-36-0062>

## 2022 Chevrolet Tahoe Driver

### Driver Demographics

Age/sex:	24 years/male
Height:	183 cm (72 in)
Weight:	113 kg (250 lab)
Eyewear:	Unknown
Seat type:	Bucket
Seat track position:	Unknown
Manual restraint usage:	Lap and shoulder belt used
Usage source:	Police report
Air bags:	Frontal, seat-mounted, and IC air bags available; none deployed
Alcohol/drug data:	None
Egress from vehicle:	Exited under own power
Transport from scene:	None
Type of medical treatment:	None at time of incident

### Driver Injuries

The Chevrolet driver was not injured during the incident.

### Driver Kinematics

The driver was belted and there was no movement during the incident. He did feel a bump. He was not treated or transported from the scene.

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## Non-motorist

### Child Demographics

Age/Sex: 14 months/male  
 Height: 76 cm (30 in)  
 Weight: 12 kg (26 lb)  
 Transport from scene: Transported to hospital by EMS ambulance  
 Type of medical treatment: Deceased prior to admission

### Child Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Skull fractures, right frontal, temple, and coronal suture bone (depressed)	150408.4	Tires/ground	Certain
2	Basal skull fractures involving left petrous bone, left greater wing of sphenoid bone, and left occiput bones	150200.3	Tires/ground	Certain
3	Laceration, pituitary gland	140799.3	Tires/ground	Certain
4	Lacerations, left inferior temporal brain lobe	140688.3	Tires/ground	Certain
5	Abrasions, left anterior thigh (pattern of debris grease marks)	810202.1	Tires <sup>3</sup>	Certain
6	Abrasions, left lower leg (black grease marks)	810202.1	Tires	Certain
7	Abrasions, contusions left dorsum foot	810202.1	Tires	Certain
8		810402.1		
9	Cerebrum hematoma – subdural NFS	140650.3	Tires/ground	Certain
10	Cerebrum brain swelling	140660.3	Tires/round	Certain
10	Cerebrum brain swelling	140663.3	Tires/ground	Certain
11	Cervical spine cord injury	610200.3	Tires/ground	Certain

<sup>3</sup> Only one IPC can be used for BioTable short form injury

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
12	Cerebellum laceration, left	140474.3	Tires/ground	Certain
13	Brain stem laceration	140212.6	Tires/ground	Certain
14	Right thigh abrasion	810202.1	Tires	Certain
15	Right lower leg contusion	810402.1	Tires	Certain
16	Right hand contusion	710402.1	Tires	Certain
17	Scalp contusion	110402.1	Tires	Certain
18	Mild subarachnoid hemorrhage	140693.2	Tires/ground	Certain

Source: Medical examiner report

### Child Kinematics

The 14-month-old child appeared to have been on the west side of the driveway (Figure 9), near the fence and trash cans. He likely crawled or walked into the driveway from the right when he saw his father open the gate and enter the driveway. His actions after getting into the driveway are unknown. He was run over by both right-side tires.

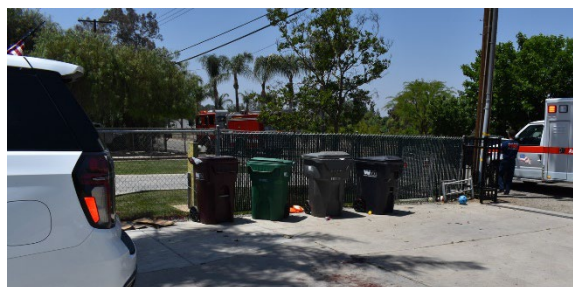
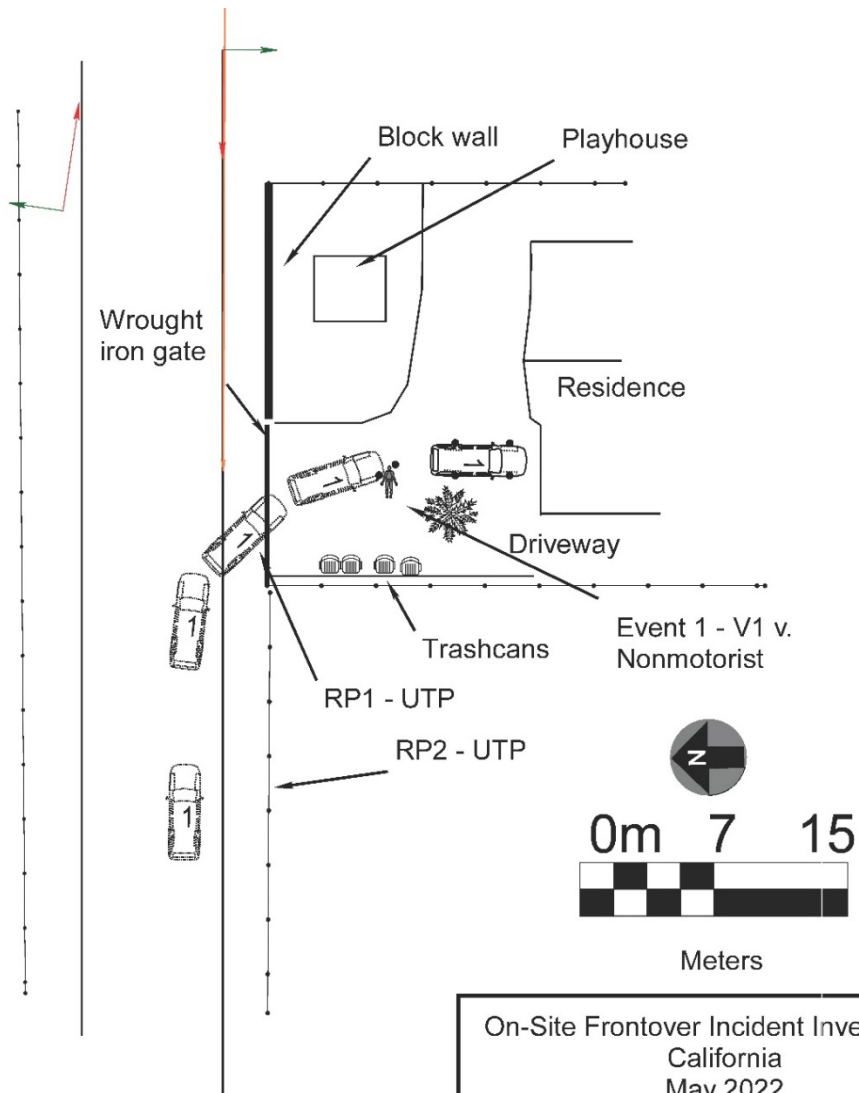


Figure 9. Likely child's location, looking

# Incident Diagram



On-Site Frontover Incident Investigation  
 California  
 May 2022  
 V1: 2022 Chevrolet Tahoe  
 Nonmotorist: 14-month-old male  
 Daylight, clear and dry  
 (Scaled Satellite Image was Used for  
 Portions of Diagram)

Case Number:	DS22025

## Satellite View of Incident Site



*Figure 10. Image source: Google Maps ©2024 Maxar Technologies*

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