



# National Transportation Safety Board

## Highway Accident Brief

### Passenger Vehicle Median Crossover Crash, Robstown, Texas

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<b>Accident Number:</b>	HWY16FH007
<b>Accident Type:</b>	Passenger vehicle median crossover crash
<b>Location:</b>	US Highway 77, Robstown, Texas
<b>Date and Time:</b>	Sunday, March 20, 2016, 1:57 p.m. central daylight time
<b>Vehicle 1:</b>	2013 Hyundai Elantra
<b>Fatalities:</b>	3
<b>Injuries:</b>	1
<b>Vehicle 2:</b>	2009 Freightliner truck-tractor in combination with a 2014 flatbed semitrailer
<b>Operator:</b>	Suarez Bros. Crane and Heavy Haul, LLC
<b>Injuries:</b>	0

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## Crash Description

About 1:57 p.m. central daylight time on Sunday, March 20, 2016, a 2013 Hyundai Elantra passenger car (Hyundai) occupied by an 18-year-old driver and three passengers, ranging in age from 17 to 19, was traveling northbound in the left lane of US Highway 77 (US-77) in the city of Robstown, Nueces County, Texas.<sup>1</sup> (See figure 1.)

This section of US-77 consisted of four lanes, divided by a 42-foot-wide median. The Hyundai began drifting left toward the center median and entered the median edge at a location that included a left-turn lane. Upon entering the median, the driver attempted to steer the vehicle back into the northbound lanes but ultimately lost control of the vehicle. The Hyundai crossed the center median and entered into the southbound traffic lanes, where it collided with a 2009 Freightliner truck-tractor in combination with a 2014 flatbed semitrailer (Freightliner). As a result of the crash, the driver of the Hyundai was seriously injured and the three passengers died. The driver of the Freightliner was not injured.

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<sup>1</sup> All times in this accident brief are central daylight time.

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**Figure 1.** Robstown, Texas, crash location.

### Emergency Response

Robstown Police Department dispatch received a 911 call at 1:57 p.m. informing them of the crash.<sup>2</sup> Robstown police, fire, and emergency medical service (EMS) units were immediately dispatched to the crash scene, with the first unit arriving at 2:03 p.m. A helicopter ambulance was requested at 2:04 p.m., and a second one was requested at 2:08 p.m. State troopers from the Texas Department of Public Safety (TXDPS) arrived soon after the Robstown first responders. The Robstown Police Department set up temporary traffic control signals to channelize and divert traffic from the scene. The Hyundai's front-seat passenger was transported by air ambulance at 2:44 p.m., and its driver was transported about 6 minutes later. The two rear-seat passengers were pronounced dead at the scene.

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<sup>2</sup> Refer to Human Performance Attachment 7 – “Pertinent Information From Dispatch Recordings,” available in the accident docket.

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## Hyundai Driver

### ***Background***

At the time of the crash, the Hyundai driver was returning to Houston, Texas, from South Padre Island, Texas. She held a temporary Texas class “C” noncommercial driver’s license that was issued in February 2016 and was valid until February 2022. The license had no restrictions or endorsements. Her driver’s license records were obtained from the TXDPS on July 6, 2016.<sup>3</sup> The records indicated that she had completed an approved driver-education course, but they did not include a date of completion.<sup>4</sup> They also indicated that the driver did not have a history of enforcement actions and had not been involved in prior crashes.

NTSB investigators were denied an interview with the driver but spoke with her mother on March 25, 2016.<sup>5</sup> According to her mother, the driver was a senior in high school. On school days, the driver normally awoke at 6:15 a.m. and left home for school about 7:00 a.m. The driver was almost done with her required classes, so the school day normally ended for her at 1:00 p.m. The driver had normal vision and did not have any diagnosed medical conditions or known life stresses before the accident.

The driver had owned the Hyundai for about 8 months. This was the first time the driver had traveled US-77 northbound in the vicinity of Robstown.

### ***Pre-crash Activities***

NTSB investigators interviewed a witness who rode with the driver and other passengers on the trip to South Padre Island but did not ride with them on the return trip.<sup>6</sup> According to this passenger, the group departed Houston about 8:00 a.m. on Friday, March 18, 2016. The driver used a phone-based navigation application while traveling to South Padre Island, with the witness holding the phone and assisting the driver with directions from the front passenger seat. They reached their hotel in Harlingen, Texas, about 1:00 p.m. and departed for South Padre Island between 4:00 p.m. and 5:00 p.m. They returned to the hotel between 9:00 p.m. and 10:00 p.m., and they went to bed about 2:00 a.m.

The group awoke between 10:00 a.m. and 11:00 a.m. on Saturday, March 19, 2016. They returned to South Padre Island about 3:00 p.m. The group drove around South Padre Island and spent time with people they met. The witness stated, and the Hyundai driver’s mother confirmed,

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<sup>3</sup> Refer to Human Performance Attachment 8 – “Driver’s License Records,” available in the accident docket.

<sup>4</sup> Texas driver-education classes are required to consist of at least 32 hours of classroom instruction, 7 hours of in-car observation, and 7 hours of driving practice. A list of topics covered during classroom instruction can be found at [www.tdlr.texas.gov/driver/files/E-2\\_Classroom\\_Curriculum\\_Licensed\\_to\\_Drive\(2014\).pdf](http://www.tdlr.texas.gov/driver/files/E-2_Classroom_Curriculum_Licensed_to_Drive(2014).pdf), accessed December 5, 2016.

<sup>5</sup> Refer to Human Performance Attachment 5 – “Interview With Driver’s Mother,” available in the accident docket.

<sup>6</sup> Refer to Human Performance Attachment 4 – “Interview With Vehicle Passenger,” available in the accident docket.

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that the driver and passengers attended a party about midnight.<sup>7</sup> According to the driver's mother, the driver returned to the hotel about 4:00 a.m., awoke about 10:00 a.m., and departed Harlingen about 11:00 a.m. The crash occurred almost 3 hours later.

A state trooper from the TXDPS interviewed the Hyundai driver after she was transported to the hospital.<sup>8</sup> The driver told the trooper that she had been using her phone-based navigation application to route her trip from Harlingen to Houston. She said she propped her phone up on the center console forward of the gearshift and below the radio. The driver said she checked the screen of the phone periodically, but she denied viewing it at the time of the crash. The trooper accessed the phone with the driver's permission and noted that the navigation application was still running. He also checked incoming calls, outgoing calls, and text messages and determined that the driver was not on a phone call or texting at the time of the crash. The driver told the trooper that at the time of the crash, the car radio was off, the two back-seat passengers were asleep, and the front-seat passenger was drifting in and out of sleep; however, she said that she was not feeling tired at that time. The driver stated that she did not know why she lost control of the car and did not remember anything about the crash.

The driver recounted to her mother that she had been checking the passenger-side mirror before the crash and said that she had also taken a look back before changing from the left lane to the right lane. She told her mother that, as she was changing lanes, her car drifted slightly to the left, toward the median. She said that she steered right in an attempt to correct back into her lane, overcorrected, and turned the steering wheel back to the left. The driver said she remembered the car entering the median and spinning, but she did not recall much else. The driver's mother told NTSB investigators that her daughter did not mention the presence of glare or issues with the roadway. Table 1 presents a reconstruction of the driver's activities based on these interviews.

**Table 1.** Driver's activities from March 18 to 20, based on witness statements and statements from the driver's mother.

Friday, March 18, 2016		
Time	Description	Source
8:00 a.m.	Departed Houston	Witness statement
1:00 p.m. – 2:00 p.m.	Arrived at hotel in Harlingen, Texas	Witness statement
4:00 p.m. – 5:00 p.m.	Left hotel for South Padre Island	Witness statement
9:00 p.m. – 10:00 p.m.	Returned to hotel	Witness statement
Saturday, March 19, 2016		
Time	Description	Source
2:00 a.m.	Went to bed	Witness statement
10:00 a.m. – 11:00 a.m.	Awoke	Witness statement
3:00 p.m. – 4:00 p.m.	Drove around South Padre Island	Witness statement

<sup>7</sup> Refer to Human Performance Attachment 5 – “Interview With Driver's Mother,” available in the accident docket.

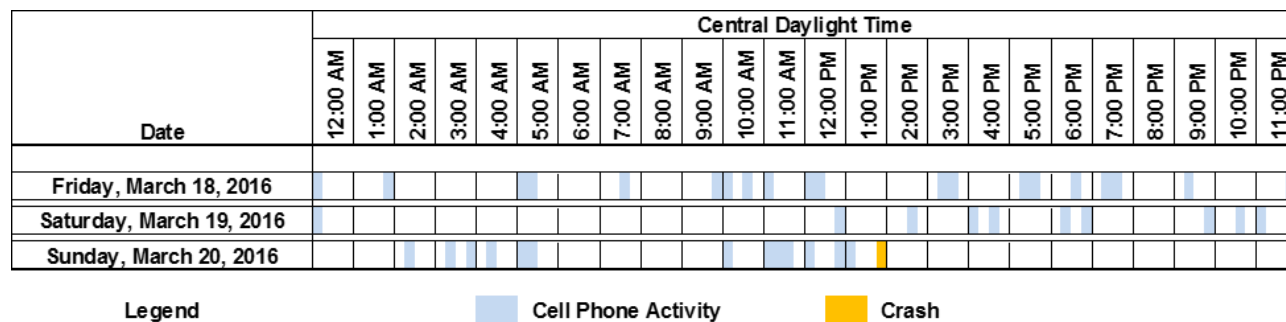
<sup>8</sup> This interview was not recorded by the state trooper, but he recounted it later to NTSB investigators.

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Sunday, March 20, 2016		
Time	Description	Source
12:00 a.m.	Went to party	Witness statement
4:00 a.m.	Returned to hotel	Driver's mother
10:00 a.m.	Awoke	Driver's mother
11:00 a.m.	Left hotel for Houston	Driver's mother
1:57 p.m.	Robstown crash	---

Table 2 presents the driver's cell phone activity on the day of the crash and the 2 days preceding the crash. Investigators used the driver's cell phone use data and her known activities to estimate the opportunities she had to sleep in the days leading to the crash. In the 24 hours before the crash, the driver had a time window of less than 5 hours for sleep, beginning shortly after 5:00 a.m. on the morning of the crash. Her sleep opportunities in the days preceding the crash were somewhat erratic, and her wake periods were shifted from her normal wake patterns. In addition, the crash occurred at a time of day when individuals commonly experience a dip in alertness and performance.

**Table 2.** Driver's cell phone activity in the days before the crash.



### Postcrash Toxicology Results

The TXDPS requested toxicology screening of the driver. Blood was drawn from the driver at the hospital at 3:32 p.m., about 1.5 hours after the crash. The sample was tested for alcohol and eight classes of commonly abused drugs.<sup>9</sup> The driver's blood tested negative for alcohol and all drugs except opiates, which had been administered to her at the hospital following the crash to alleviate pain.

<sup>9</sup> The eight classes of drugs tested for were amphetamines, barbiturates, benzodiazepines, cocaine, methadone, opiates, cannabinoids, and phencyclidine.

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### Passenger Vehicle Wreckage

The Hyundai was inspected at a wreckage facility near the crash scene.<sup>10</sup> (See figure 2.) The point of impact with the Freightliner appeared to be behind the driver's-side B-pillar, with the truck frame intruding 36 inches inward to the middle-rear seating position of the Hyundai.<sup>11</sup> The driver's-side airbag had deployed from the seat. The driver's front airbag did not deploy. The side curtain and rear curtain airbags on the driver's side did not deploy and had fallen out of their destroyed compartments.

The steering wheel was deformed, and the driver's seat was deformed and pushed inward toward the center of the vehicle. The rear passenger seat on the driver's side was pushed inward into the other rear seating position, which compromised the survivable space of the rear passengers. Although there appeared to be survivable space at the front passenger seating position, the seat was deformed and displayed contact marks from other passengers inside the vehicle. Based on the crash report, all four passengers were wearing their seat belts at the time of the crash.



**Figure 2.** Wreckage of the 2013 Hyundai Elantra.

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<sup>10</sup> NTSB investigators did not perform an inspection of the Freightliner, due to its incidental role in the crash.

<sup>11</sup> The B-pillar of a car is a frame component located between the front and rear passenger seats. It provides structural support for the vehicle's roof panel and is where the latching mechanism of the front door and the hinges for the rear doors are located.

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### Roadway Information

The crash occurred on US-77, in Nueces County, Texas. US-77 becomes part of US Highway 59, which runs through the central United States to the Canadian border, and it has been identified as the future Interstate Highway 69 network. The crash scene was within a 5-mile-long work zone, initiated in January 2016. The purpose of the work zone was to upgrade the roadway to interstate highway standards; the upgrade included plans to widen the shoulders, flatten the slopes, increase the center median width to 70 feet, and add one-way access roads. The work zone was not active at the time of the crash.

This section of US-77 was a four-lane highway, divided by a 42-foot-wide grassy median. There were two 12-foot-wide lanes in the northbound and southbound directions. The lanes were delineated by 10-foot-long dashed white pavement stripes placed at 30-foot intervals. The 10-foot-wide right-hand shoulder was separated from the travel lane by a solid white edge line, and the median (or left-hand) shoulder varied in width from 3 to 4 feet and was delineated from the travel lane by a solid yellow edge line. Both shoulders were equipped with depressed textured rumble strips that were installed when the roadway was repaved in 2001. On the immediate approach to the crash area, the median shoulder widened to 10 feet to provide a deceleration and turn lane for two median crossovers. Both crossovers were about 54 feet wide and were separated by a 200-foot-long median section. The posted speed limit for this location was 75 mph. In 2014, the average daily traffic was 19,123 vehicles per day; truck traffic composed about 19 percent of the total traffic.

### Crash Scene Evidence

Tire friction marks at the scene showed that the Hyundai traveled into the left-turn lane for the crossover and departed into the median at about a 2° angle to the left.<sup>12</sup> (See figure 3.)

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<sup>12</sup> Refer to “Robstown Highway Factors Factual Report,” available in the accident docket.

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**Figure 3.** Northbound US-77. The arrow indicates the point at which the Hyundai initially drifted into the median. The vehicle drifted into the left-turn lane before reaching the median.

The tire marks showing the vehicle's path into and out of the median were about 207 feet long. There was a gap of about 36 feet, then the tire friction marks curved back to the left along a radius of about 168 feet. At first contact, the Freightliner struck the Hyundai on the driver's side in the vicinity of the B-pillar. The Hyundai was pushed backward about 117 feet before coming to final rest in the area of the median where it had initially crossed over. The Hyundai had traveled about 522 feet from where it initially departed the travel lane into the median where the impact with the Freightliner occurred. The Freightliner left preimpact tire friction marks, which were about 185 feet long, and traveled 144 feet after impact to where it came to a final rest in the southbound lanes. (See figure 4.)



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**Figure 4.** Tire marks from the Hyundai as it was redirected toward the median. Furrows in the grass indicate travel through the median.

The Texas Department of Transportation (TXDOT) provided the crash history for the period 2011–2016 for an area that included County Road 36, which is 5 miles north of the crash site, to a location 5 miles south of the crash site.<sup>13</sup> The records showed no other fatal or incapacitating-injury cross-median crashes in this area during that period. Several cross-median crashes had occurred in a location about 1 mile south of the recorded area, near the town of Driscoll; TXDOT had responded by installing high-tension cable barriers in the median in that area.

NTSB investigators examined whether cable barriers were warranted in the area of the crash scene.<sup>14</sup> TXDOT uses engineering judgment and two general warrants to determine whether median barrier protection is needed. First, TXDOT uses a median-width traffic density warrant, which is a refined version of the median-width traffic density warrant in the American Association of State Highway and Transportation Officials *Roadside Design Guide* (RDG). The second warrant is based on the number of crashes in the area. TXDOT generally uses the rate quoted from the RDG, which is 0.5 cross-median crashes per mile per year along a 5-mile segment for a 5-year period. Additionally, if 0.12 fatal cross-median crashes occur per mile per year along a 5-mile segment, the warrant is satisfied, and median barrier protection improvements may be justified. It

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<sup>13</sup> Refer to Highway Factors Attachment 2 – “Accident History Information,” available in the accident docket.

<sup>14</sup> Refer to Highway Factors Attachment 3 – “TXDOT Median Cable Barrier Installation Guidance,” available in the accident docket.

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was determined that, based on the traffic volume and the crash rate, median barriers were not warranted at the crash site. Additionally, median barriers were not feasible due to the number of left-turn median crossover lanes in the area near the crash location.

### Probable Cause

The National Transportation Safety Board determines that the probable cause of the Robstown, Texas, crash was the loss of control by the driver of the Hyundai, due to inattention resulting from fatigue.

For more details about this accident, visit <http://dms.nts.gov/pubdms/> and search for NTSB accident ID HWY16FH007.

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties . . . and are not conducted for the purpose of determining the rights or liabilities of any person.” 49 *Code of Federal Regulations*, Section 831.4. Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. 49 *United States Code*, Section 1154(b).

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