Side Curtain and Side Air Bag Investigation/Vehicle to Vehicle
Dynamic Science, Inc./Case Number: DS06010
2006 Nissan Maxima
Washington
March 2006

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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 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.

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16. Abstract

This on-site investigation focused on the side curtain and side air bag systems in a 2006 Nissan Maxima. This two vehicle crash occurred in March 2006 at 1110 hours in an urban area of Washington. The crash occurred within the confines of a four-leg intersection. The case vehicle was a 2006 Nissan Maxima rental car being driven by a restrained 68-year-old male. There were no other occupants in the vehicle. The other vehicle was a 2000 Honda Odyssey minivan being driven by a restrained 51-year-old female. There was a 27-year-old restrained male passenger in the front right seat. Both vehicles were approaching an intersection controlled by traffic signals. The Nissan was traveling north in lane two of a three lane, one-way undivided roadway. The Honda Odyssey was traveling east in lane two of a four lane, two-way, undivided intersecting street. The driver of the Nissan entered the intersection, intending to travel straight through. The driver of the Honda also entered the intersection and the front of the Odyssey struck the left side of the case vehicle, resulting in the deployment of the Nissan's left front seat back mounted side air bag and left side curtain. The dual front air bags in the Odyssey also deployed on impact. The Maxima was pushed laterally from the impact and came to final rest still in the intersection, facing northwest. The Honda Odyssey came to final rest in the intersection, facing northeast. The driver of the case vehicle sustained a scratch to his left cheek and complained of neck pain and ringing in his ears. He went to see his private physician two days after the crash; no additional injuries were diagnosed. According to the police report, the two occupants in the Honda Odyssey were not injured. The Honda Odyssey was towed from the scene. The Nissan Maxima was towed from the scene by the rental car agency and was later declared a total loss.

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Crash Investigation
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BACKGROUND:

Description

This on-site investigation focused on the side curtain and side air bag systems in a 2006 Nissan Maxima.

Figure 1. Front/Left 2006 Nissan Maxima

This two vehicle crash occurred in March 2006 at 1110 hours in an urban area of Washington. The crash occurred within the confines of a four-leg intersection. The case vehicle was a 2006 Nissan Maxima rental car being driven by a restrained 68-year-old male. There were no other occupants in the vehicle. The other vehicle was a 2000 Honda Odyssey minivan being driven by a restrained 51-year-old female. There was a 27-year-old restrained male passenger in the front right seat. Both vehicles were approaching an intersection controlled by traffic signals.

Figure 2. Front left, 2000 Honda Odyssey

The Nissan was traveling north in lane two of a three lane, one-way undivided roadway. The Honda Odyssey was traveling east in lane two of a four lane, two-way, undivided intersecting street. The driver of the Nissan entered the intersection, intending to travel straight through. The driver of the Honda also entered the intersection and the front of the Odyssey struck the left side of the case vehicle, resulting in the deployment of the Nissan's left front seat back mounted side air bag and left side curtain. The dual front air bags in the Odyssey also deployed on impact. The Maxima was pushed laterally from the impact and came to final rest still in the intersection, facing northwest. The Honda Odyssey came to final rest in the intersection, facing northeast.

The driver of the case vehicle sustained a scratch to his left cheek and complained of neck pain and ringing in his ears. He went to see his private physician two days after the crash; no additional injuries were diagnosed. According to the police report, the two occupants in the Honda Odyssey were not injured.

The Honda Odyssey was towed from the scene. The Nissan Maxima was towed from the scene by the rental car agency and was later declared a total loss.

This crash was identified within a group of potential cases provided by NHTSA. DSI received the potential cases on April 28, 2006. DSI obtained permission to inspect the case vehicle on May 1, 2006 and was assigned the case on May 2, 2006. The case vehicle was inspected on May 2, 2006 and the scene inspection was completed on May 5, 2006. The Honda Odyssey was

inspected on June 2, 2006. There was a time delay between locating the Odyssey and securing permission to inspect it. The delay was caused by the fact that the owner of the Odyssey was out of the country and the repair facility required permission from the owner before they would allow the inspection. Before the Nissan was located, it had been repaired, but the repair shop personnel were able to recover the driver and front right passenger front air bag modules and seat belts for inspection. The Honda's damaged front bumper cover and other replaced parts, as well as the vehicle's Electronic Data Recorder had already been salvaged and were not available for inspection.

SUMMARY

Crash Site

This two vehicle crash occurred in March 2006 at 1110 hours in an urban area of Washington. The crash occurred within the confines of a four-leg intersection.

The case vehicle was traveling north in the center lane on an asphalt roadway consisting of three undivided travel lanes. This is a one-way street that has a -2% grade in the pre-crash area. On the south side of the intersection, there is a dedicated parking lane to the west of the travel lanes. On the north side of the intersection, the three northbound lanes continue north, but the parking lane becomes a southbound travel lane and can be used by southbound vehicles wanting to turn right at the intersection. This one southbound lane is separated from the three northbound lanes by painted, no-passing double lane lines. On both sides of this street there are sidewalks adjacent to the roadway. Tri-color phase traffic signals control the intersection for north and southbound vehicles.

Figure 3. Approach of case vehicle to intersection - north

Figure 4. Approach of other vehicle to intersection - east

The Honda Odyssey was traveling east in lane two on a four lane, two way, intersecting roadway. The two eastbound lanes are separated from the two westbound lanes by painted, no passing double lane lines. The eastbound asphalt travel lanes have a pre-crash uphill grade of over 7%, but the lanes level out where the two roadways intersect. There are sidewalks on both sides of this street and tri-color phase traffic signals controlling east/westbound traffic.

Figure 5. Area of impact (east)

The posted speed limit on both roadways was 48 km/h (30 mph). At the time of the crash both roadways were dry, there were no adverse weather conditions and no visual obstructions were present. According to the driver of the case vehicle, at the time of the crash, there were construction activities going on at the northwest corner of the intersection. He reported that the construction did not distract him, but may have distracted the other driver.

Pre-Crash

The case vehicle was a 2006 Nissan Maxima four-door sedan being driven by a restrained 68-year-old male. There were no other occupants in the vehicle. The case vehicle is a rental car. The Nissan was traveling north in the center lane on a three lane, one way street.

The other vehicle was a 2000 Honda Odyssey minivan being driven by a restrained 51-year-old female. There was a 27-year-old restrained male passenger in the front right seat. The Honda was traveling east in the inside eastbound lane of a four lane, two way intersecting street.

Both vehicles were approaching an intersection controlled by traffic signals. The driver of the Honda had a red light but continued eastbound as the Maxima was traveling straight through the intersection.

Crash

The front of the Honda struck the left side of the Nissan (10LYEW2). The impact severity was moderate and resulted in the deployment of the Nissan's left front seat back mounted side air bag and left side curtain. The missing vehicle routine of the WinSmash program computed a total delta V of 13.0 km/h (8.1 mph) for the case vehicle. The longitudinal and lateral components were -6.5 km/h (-4.0 mph) and 11.3 km/h (7.0 mph), respectively.

The dual front air bags in the Honda also deployed on impact. The case vehicle was pushed laterally from the impact and came to final rest in lane one, facing north. The Odyssey came to final rest near the northeast corner of the intersection, facing northeast. The Odyssey's front bumper was ripped off during the impact and was left tightly wedged in the Maxima's lower left front door panel.

Post-Crash

According to the police report, the driver of the Maxima was not injured and the case vehicle was not towed from the scene. The police report stated that the Odyssey was towed from the scene and its two occupants were not injured. When interviewed, the driver of the Maxima reported that his vehicle was towed from the scene by the rental car agency. It was later declared a total loss and was sold to a private party. The driver of the Maxima also reported that he sustained a scratch to his left cheek, and complained of neck pain and ringing in his ears immediately following the crash. He sought medical treatment from his private physician two days after the crash, and was not diagnosed with any additional injuries.

Vehicle Data - 2006 Nissan Maxima

The 2006 Nissan Maxima was identified by the Vehicle Identification Number (VIN: 1N4BA41E96Cxxxxxx). The Nissan Maxima is a four door, front wheel drive, full size passenger vehicle with seating for five. It was equipped with a 3.5 liter 6-cylinder engine, 5 speed automatic transmission, four wheel anti-lock disc brakes with electronic brake distribution, electronic traction control via ABS and engine management, and a tilt and telescoping steering wheel. The vehicle mileage could not be obtained from the digital odometer because the vehicle had no power.

The Maxima was equipped with advanced occupant protection systems including driver and front right passenger dual stage front air bags with occupants sensors, driver and front passenger side impact air bags, and left/right side curtains. The vehicle was also equipped with front row driver and passenger B pillar seat belt pretensioners.

The 2006 Nissan Maxima was equipped with Goodyear Eagle RS-A P245/45R18 tires. The recommended cold tire pressure was 221 kPa (32 psi) for both the front and the rear. The specific tire information is as follows:

Position	Measured Pressure	Measured Tread Depth	Restricted	Damage
LF	193 kPa (28 psi)	7 mm (9/32 in)	Yes	Rim scuffed; top of tire angled inward
LR	193 kPa (28 psi)	8 mm (10/32 in)	No	None
RR	179 kPa (26 psi)	8 mm (10/32 in)	No	None
RF	186 kpa (27 psi)	7 mm (9/32 in)	No	None

The front row seating in the 2006 Nissan Maxima was configured with dual cloth covered bucket seats. The seats were equipped with adjustable, active head restraints that were not damaged. The active head restraints did not actuate during the collision as they are only intended to activate during certain types of rear-end crashes. The second row was configured as a cloth covered 60/40 split bench seat with folding backs. The two outboard second row seating positions were equipped with adjustable head restraints that were not damaged. The second row center seat did not have a head restraint available. The second row outboard seating positions were equipped with the lower anchor points that are part of this vehicle's Lower Anchors and Tethers for Children (LATCH) system. All three second row seating positions were equipped with child safety top tether strap anchor points, located just behind the second row seat back cushions.

Vehicle Damage

Exterior Damage - 2006 Nissan Maxima

The 2006 Nissan Maxima sustained moderate left side damage as a result of the impact with the Honda Odyssey. The bumper backing bar from the 2000 Honda Odyssey was found embedded in the case vehicle's lower left front door panel and could not be removed. The Maxima sustained 259.0 cm (102.0 in) of direct damage along the left side beginning 82.0 cm (32.3 in) forward of the left rear axle, extending forward along the left side. Six crush measurements were documented beginning 96.0 cm (37.8 in) forward of the left rear axle, extending forward 191.0 cm (75.2 in). The crush measurements were as follows: C1=0.0 cm (0.0 in), C2=13.0 cm (5.1 in), C3=14.0 cm (5.5 in), C4=10.0 cm (3.9 in), C5=6.0 cm (2.4 in), C6=1.0 cm (0.4 in). An additional maximum crush measurement was taken 128.0 cm (50.4 in) forward of the left rear axle. There was 18.0 cm (7.1 in) of lateral crush at the maximum crush location. The maximum crush and C2 measurements were adjusted to account for the embedded bumper.

CDC:	10LYEW2	
Delta V:	Total	13.0 km/h (8.1 mph)
	Longitudinal	-6.5 km/h (-4.0 mph)
	Latitudinal	11.3 km/h (7.0 mph)
	Energy	16,703 joules (12,320 ft lbs)

Figure 6. Crush profile - 2006 Nissan Maxima

Figure 7. Bumper of the 2000 Honda Odyssey still embedded in the left front door (2006 Nissan Maxima)

Interior Damage - 2006 Nissan Maxima

The case vehicle sustained minor interior damage due to occupant contacts and normal air bag deployment related damage. The driver's seat belt was locked in place post-crash, but it does not appear that the B pillar pretensioner actuated during the collision. When the Odyssey's front bumper intruded through the Maxima's left front door panel, it damaged the left front seat belt retractor. There were signs of occupant contact below the steering column and to the left front door panel and armrest.
There was no passenger compartment integrity loss. There was a small gap present at the upper left front door window frame that resulted from the impact. The gap measured 10.0 cm (3.9 in) at its widest point. Both right side doors remained closed and operational. Both left side doors were jammed shut post crash. There was no damage or visible occupant contact to the windshield or any other glazing.

There was lateral intrusion into the driver's seating area, including intrusion of the left B pillar cover. The left B pillar itself did not intrude. There was also lateral intrusion of the lower left front door panel and the side panel located forward of the left A pillar. The specific passenger compartment intrusions were documented as follows:

Row/Position	Intruded Component	Magnitude of Intrusion	Direction
1L	B pillar cover	9.0 cm (3.5 in)	Lateral
1L	Lower LF door panel	3.0 cm (1.2 in)	Lateral
1L	Side panel forward of the A pillar	2.0 cm (0.8 in)	Lateral

Figure 8. Intrusion of the B pillar cover and scuff to the deployed outer driver side air bag

Figure 9. Intrusion - bottom of left B pillar cover. The RFBC of the Honda Odyssey intruded through the Maxima's LF door panel.

Manual Restraint Systems - 2006 Nissan Maxima

The 2006 Nissan Maxima was configured with manual 3-point lap and shoulder belts for each of the five seating positions. Both front seat belts were equipped with B-pillar pretensioners and seat belt height adjusters that were in the full up position. Neither pretensioner actuated during the crash, but the driver's seat belt retractor was locked in place post-crash due to damage. During the impact, the Honda Odyssey's right front bumper corner intruded through the left front door panel and damaged the driver's seat belt retractor. The left front safety belt was configured with a sliding latch plate and an emergency locking retractor (ELR). The right front safety belt had a sliding latch plate and a switchable ELR/Automatic Locking Retractor. All three second row seat belts had sliding latch plates and switchable retractors.

Figure 10. Damaged LF seat belt retractor (2006 Nissan Maxima)

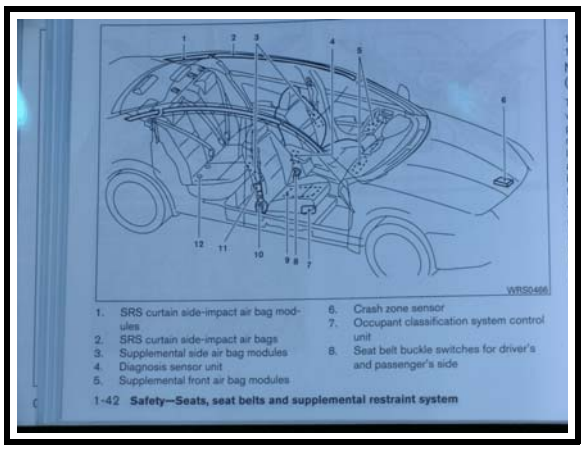

Figure 11. Supplemental Safety System & Sensor Locations (2006 Nissan Maxima)

Supplemental Restraint Systems - 2006 Nissan Maxima

The case vehicle was equipped with advanced occupant protection systems. The systems consisted of dual stage Certified Advanced 208-Compliant (CAC) driver and front right passenger front air bags with intelligent occupant sensors, including a crash zone sensor, seat belt buckle sensors, an occupant classification/pressure sensor, and a passenger seat belt tension sensor. To be CAC compliant, the air bags must meet the advanced air bag requirements specified in Federal Motor Vehicle Safety Standard 208. The crash severity and driver seat belt usage will determine the inflation operation of the driver's front air bag. The front right passenger air bag inflation depends on the crash severity, the weight of the occupant on the right front seat and the amount of tension in the seat belt. Neither front air bag deployed in the collision. The vehicle was also equipped with front row driver and passenger B pillar seat belt pretensioners which did not actuate during the crash.

The Maxima was also equipped with front row driver and passenger side impact air bags and left/right side curtains. Per the manufacturer, the side air bags and side curtains are designed to deploy in the event of a sufficient, "higher severity" side impact. The front row driver side air bag and the left side curtain deployed during the crash.

The deployed left seat back mounted side air bag was semi-circular in shape with a height of 54.0 cm (21.3 in) and an excursion of 20.0 cm (7.9 in) in its deflated state. There were no tethers or vent ports. Although there was some lateral intrusion of the B pillar cover into the side air bag deployment area, it appears that the air bag deployed properly. On the outer lower portion of the air bag there were black fabric transfers found. The transfers were most likely seat back fabric transfers and occurred during the deployment. There were no visible signs of occupant contact or damage.

The deployed left side curtain extended from the A pillar to the C pillar. There was a small coverage gap present at the A pillar. The gap consisted of a triangular shaped area measuring 22.0 cm (8.7 in) in height at the forward aspect of the bag, 36.0 cm (14.2 in) in width along the belt line and 43.0 cm (16.9 in) in length along the A-pillar. The side curtain was rectangular in shape and in its deflated state, measured 162.0 cm (63.8 in) in length. The height of the front section of the curtain measured 38.0 cm (15.0 in) and the back section measured 26.0 cm (10.2 in). The air bag had one external tether, located at the front of the curtain at the A pillar. There was one 1.5 cm (0.6 in) diameter vent port located on the outer lower front corner of the bag. The side curtain deployed from the left roof side rail. There were black seat belt webbing transfers found on the outer material of the bag in the driver's area. There were no visible signs of occupant contact or damage to the side curtain.

Figure 12. Deployed left side curtain (2006 Nissan Maxima)

Figure 13. Deployed driver side air bag (2006 Nissan Maxima)

Vehicle Damage - 2000 Honda Odyssey

The 2000 Honda Odyssey was identified by the Vehicle Identification Number (VIN: 2HKRL1866YHxxxxxx). The Honda Odyssey is a front wheel drive, four door minivan with a rear liftgate and seating for seven. It was equipped with a 3.5 liter 6-cylinder engine, 4 speed automatic transmission, an anti-lock brake system and a tilt steering wheel. The vehicle mileage was obtained from the insurance company and was 118,173 km (73,429 m) at the time of the crash.

The Odyssey was equipped with occupant protection systems including driver and front right passenger front air bags and front row driver and passenger B pillar seat belt pretensioners.

The 2000 Honda Odyssey was equipped with Toyo 800 Ultra Premium Touring P215/65R16 tires on the front and Michelin X Radial P215/65R16 tires on the rear. The recommended cold tire pressure was 241 kPa (35 psi) for both the front and the rear. The vehicle was fully repaired at the time of the inspection. According to the repair shop manager, there was no damage to any of the tires and none were restricted post-crash. The specific tire information is as follows:

Position	Measured Pressure	Measured Tread Depth	Restricted	Damage
LF	276 kPa (40 psi)	6 mm (8/32 in)	No	None
LR	241 kPa (35 psi)	7 mm (9/32 in)	No	None
RR	241 kPa (35 psi)	7 mm (9/32 in)	No	None
RF	241 kpa (35 psi)	6 mm (8/32 in)	No	None

The front row seating in the 2000 Honda Odyssey was configured with dual cloth covered bucket seats. The seats were equipped with adjustable head restraints that were not damaged, per the repair shop manager. The second row seats were configured as cloth covered bucket seats with adjustable head restraints that were not damaged. The third row was configured as a cloth covered bench seat that can be folded rearward into the cargo bed in order to increase cargo capacity. All three third row seating positions had adjustable head restraints that were found stowed in the rear cargo area and at the time of the inspection, the third row bench seat was folded down in the stowed position. The vehicle was not equipped with the LATCH system components.

Vehicle Data - 2000 Honda Odyssey

Description:	2000 Honda Odyssey	
VIN:	2HKRL1866YHxxxxxx	
Odometer:	118,173 km (73,429 m)	
Engine:	3.5L, 6 cylinder	
Reported Defects:	None	
Cargo:	Unknown - At the time of the inspection, there was approximately 9.1 kg (20.0 lb) of cargo.	
Damage Description:	The 2000 Honda Odyssey sustained moderate front end damage as a result of the impact with the Nissan Maxima. The Honda's bumper backing bar was found embedded in the case vehicle's left front door, and was wedged so tightly it could not be removed. The Honda Odyssey had been fully repaired at the time of the inspection and the damaged measurements could not be obtained. The repair facility storing the repaired vehicle did not have the damaged vehicle parts, but were able to obtain both front air bag modules and both front seat belts. The Electronic Data Recorder had been salvaged with the damaged sheet metal and could not be obtained.	
CDC:	Unknown	
Delta V:	Total	10.0 km/h (6.2 mph)
	Longitudinal	-8.7 km/h (5.4 mph)
	Latitudinal	-5.0 km/h (3.1 mph)
	Energy	6,180 joules (4,558 ft lbs)

Interior Damage - 2000 Honda Odyssey

The Odyssey had been fully repaired, but there was occupant contact evidence still visible in the passenger compartment. According to the manager of the repair shop, there was no intrusion as a result of the crash and the only interior components that were replaced were the dual front air bag modules and both front seat belts. Both front seat belt B pillar pretensioners actuated during the collision and were locked in place post-crash. There were signs of occupant loading to both front seat belts and evidence of occupant contact to the right front door panel.

Figure 14. RF seat and possible occupant contact to the RF door panel (2000 Honda Odyssey)

There was no passenger compartment integrity loss, which was verified by the insurance company's post-crash inspection photos and by the repair shop personnel. Repair shop personnel also reported that the four doors and rear liftgate all remained closed and operational and there was no glazing damage as a result of the crash.

Manual Restraints - 2000 Honda Odyssey

The 2000 Honda Odyssey was configured with manual 3-point lap and shoulder belts for each of the seven seating positions. The front seat belts had been removed and replaced during repairs, but were able to be inspected. Both front seat belts were equipped with B-pillar pretensioners and seat belt height adjusters that were in the full down position at the time of the inspection. Both pretensioners actuated during the crash, and both belts showed signs of occupant loading, demonstrating that they were being worn during the collision. The left front seat belt measured 104.0 cm (40.9 in) in length from the locked retractor to the anchorage point and the right front belt measured 229.0 cm (90.2 in) in length. The left front safety belt was configured with a sliding latch plate and an emergency locking retractor (ELR). The right front safety belt had a sliding latch plate and a switchable ELR/Automatic Locking Retractor. The two second row seat belts had sliding latch plates and switchable retractors. The third row outboard seating positions were equipped with sliding latchplates and switchable retractors. The third row center seat belt was configured as a manual lap belt with a locking latchplate and no retractor. The shoulder portion of this belt can be attached to the lap portion in order to form a 3-point lap and shoulder belt. The shoulder portion can be stored in the roof of the vehicle and had an ELR retractor.

Supplemental Restraint Systems - 2000 Honda Odyssey

The 2000 Honda Odyssey was equipped with occupant protection systems that included dual front driver and passenger air bags. The vehicle was also equipped with front row driver and passenger B pillar seat belt retractor pretensioners. As a result of the longitudinal deceleration that occurred during the collision event, the driver and front right passenger air bags deployed, and both seat belt pretensioners actuated.
The driver's front air bag had been removed from the vehicle during repairs, but had been mounted in the center of the steering wheel hub. The air bag module cover flaps had a general H configuration. The top cover flap measurements were as follows: the upper flap edge was 17.5 cm (6.9 in) wide, the lower flap edge was 14.0 cm (5.5 in) wide and both side flap edges were 8.0 cm (3.1 in) tall. The bottom cover flap measurements were as follows: the upper flap edge was 13.5 cm (5.3 in) wide and the lower flap edge was 7.0 cm (2.8 in) wide. The side flap edges were 5.0 cm (2.0 in) tall. The air bag was circular in shape and measured 55.0 cm (21.7 in) high/wide in its deflated state. The air bag had one internal tether and two circular vent ports on the back of the bag at the 11 and 1 o'clock positions. There were a few cover flap streaks on the face and back of the bag, but there were no visible signs of occupant contact or damage to either side of the driver air bag.

The passenger front air bag had also been removed during repairs, but had been mounted in the top portion of the right instrument panel. The single air bag module cover flap was rectangular in shape and measured 25.5 cm (10.0 in) wide and 10.5 cm (4.1 in) high. The air bag had a square shape and measured 75.0 cm (29.5 in) seam to seam laterally and 85.0 cm (33.5 in) in height in its deflated state. There were no tethers but there were two circular vent ports on the sides of the air bag at the 3 and 9 o'clock positions. There was no damage to the cover flaps or air bag. There was a light beige discoloration found in the upper right section on the front of the bag. This discoloration may have been dirt, as the modules had been pulled from a dumpster after the repair shop was contacted regarding the vehicle inspection. There were cover flap streaks found on the back of the air bag in several locations. There was no visible damage to the front or back of the air bag.

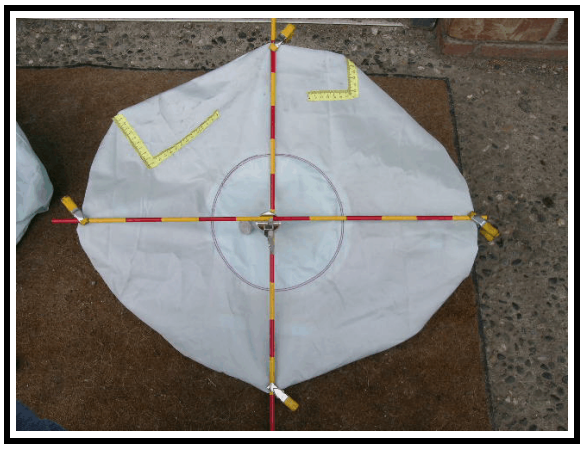

Figure 15. Driver air bag - 2000 Honda Odyssey (removed during repair)

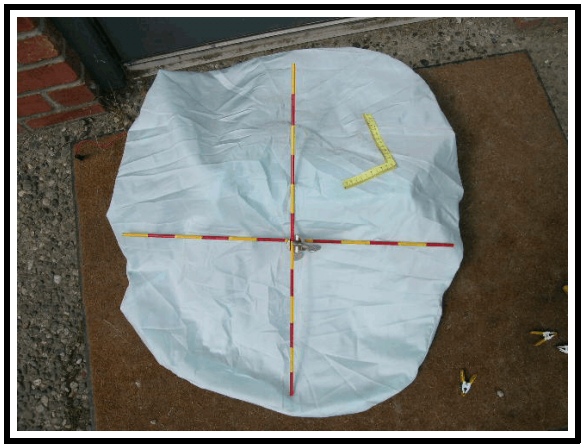

Figure 16. Front right passenger air bag - 2000 Honda Odyssey (removed during repair)

Occupant Demographics - 2006 Nissan Maxima

	Driver
Age/Sex:	68/Male
Seated Position:	Front left
Seat Type:	Fabric covered bucket seat
Height:	168 cm (66 in)
Weight:	59 kg (130 lb)
Occupation:	Clerk
Pre-existing Medical Condition:	None
Alcohol/Drug Involvement:	None
Driving Experience:	> 30 years
Body Posture:	Sitting upright, forward facing
Hand Position:	Left hand on steering wheel at the 3 o'clock position. Right hand on wheel at the 10 o'clock position.
Foot Position:	Left foot on floorboard. Right foot on accelerator.
Restraint Usage:	Manual 3-point lap and shoulder belt available - used
Air bag:	Front air bag available - non-deployed. Seat back mounted side air bag available - deployed. Side curtain available - deployed.
Eyewear:	Eyeglasses (flew off his face during the crash)

Occupant Demographics - 2000 Honda Odyssey

	Driver	Occupant
Age/Sex:	51/Female	27/Male
Seated Position:	Front left	Front right
Seat Type:	Fabric covered bucket seat	Fabric covered bucket seat
Height:	Approximately 165.0 cm (65 in) per repair shop personnel	Approximately 165.0 cm (65 in) per repair shop personnel
Weight:	Unknown	Unknown
Occupation:	Unknown	Unknown
Pre-existing Medical Condition:	None noted	None noted
Alcohol/Drug Involvement:	None	Not Applicable
Driving Experience:	Unknown	Not Applicable
Body Posture:	Presumed to be sitting upright, forward facing	Presumed to be sitting upright, forward facing
Hand Position:	Unknown	Unknown
Foot Position:	Right foot presumed to be the foot controls; Left foot presumed to be on the floorboards	Both feet presumed to be on the floorboards
Restraint Usage:	Manual 3-point lap and shoulder belt - used	Manual 3-point lap and shoulder belt - used

Occupant Injuries - 2006 Nissan Maxima

Driver: Injuries obtained from the driver interview. This driver sought medical treatment from his private physician two days after the crash but the official medical records were not able to be obtained.

Injury	OIC Code	Injury Mechanism	Confidence Level
Laceration (minor) left cheek	290602.1,2	Left side curtain air bag and/or driver's eyeglasses	Probable
Strain, cervical spine	640278.1,6	Impact forces	Certain

Occupant Injuries - 2000 Honda Odyssey

Driver: Not injured per the police report.

Front Right Occupant: Not injured per the police report.

Occupant Kinematics - 2006 Nissan Maxima

Driver Kinematics

The 68-year-old male driver of the case vehicle was seated in an upright posture in the cloth covered bucket seat and was restrained by the 3-point manual lap and shoulder belt. The shoulder belt anchorage adjustment was in the full up position. The seat track was adjusted to the rearward most track position at the inspection, but the driver reported that it was set to the center track position at the time of the crash. The seat back was reclined at a 109 degree angle and the seat bottom had a 15 degree angle. During the left side impact, the male driver initiated a lateral and slightly forward trajectory towards the 10 o'clock direction of force. The driver's side air bag and left side curtain deployed. There was no visible occupant contact evidence on either the side air bag or side curtain, but it is likely that the driver's upper left arm contacted the deployed side air bag and his face likely contacted the deployed side curtain. The driver reported that his eyeglasses flew off his face during the collision, but he was not sure if this was due to the deploying air bags or the force of the impact.

The case vehicle was pushed laterally from the impact and came to final rest in lane one, facing north. The driver's door was jammed shut post-crash, but he was able to exit the vehicle on his own out the right front door. He sustained a scratch to his left cheek and complained of neck pain. He also reported that he had ringing in his ears following the crash. This driver went to his private physician two days after the collision and was not diagnosed with any additional injuries. There was a small spot of blood found on the left front door armrest that was likely a result of the driver touching the scratch on his left cheek and transferring the blood to the armrest. There were yellow fabric transfers found on the left front door panel that may have been caused due to occupant contact, but the driver did not report any injury that would have been a result of contacting this area. It is possible that the fabric transfers occurred when the driver attempted to open the left front door in order to exit the vehicle. There were scuffs found below the steering wheel that may have been caused by occupant contact, although the driver reported no knee or leg injuries.

Figure 17. Possible driver contacts below steering column (2006 Nissan Maxima)

Figure 18. Possible occupant contact points to the LF door panel and armrest (2006 Nissan Maxima)

Occupant Kinematics - 2000 Honda Odyssey

Driver Kinematics

The 51-year-old female driver of the Honda Odyssey appears to have been seated in an upright posture in the cloth covered bucket seat and was restrained by the 3-point manual lap and shoulder belt. The shoulder belt anchorage adjustment was in the full down position. According to repair shop personnel, the seat was adjusted to the forward most track position. At the inspection, the seat back was reclined at a 116 degree angle and the seat bottom had a 20 degree angle. During the front end impact, the female driver initiated a forward and slightly lateral trajectory towards the 1 o'clock direction of force. The driver's side safety belt pretensioner actuated and the front air bag deployed. The vehicle's front bumper partially penetrated the Maxima's left front door, and was ripped off during the impact. The Odyssey rotated counterclockwise as it traveled towards the northeast corner of the intersection. The vehicle came to final rest still in the intersection, facing northeast. According to the driver of the Maxima, the driver of the Odyssey was able to exit the vehicle on her own and was ambulatory at the scene. According to the police report, this driver was not injured. According to repair shop personnel, this driver is approximately 165.0 cm (65 in) tall and has a slight build.

Figure 19. Driver's seat belt - removed during repair (2000 Honda Odyssey)

Front Right Occupant Kinematics

The 27-year-old front right male passenger was seated forward facing in the cloth covered bucket seat and was restrained by the 3-point manual lap and shoulder belt. The shoulder belt anchorage adjustment was in the full down position. According to repair shop personnel, the seat was adjusted to the forward most track position. At the inspection, the seat back was reclined at a 102 degree angle and the seat bottom had a 14 degree angle. During the front end impact, the male passenger initiated a forward and slightly lateral trajectory towards the 1 o'clock direction of force. The right front safety belt pretensioner actuated and the front air bag deployed. The vehicle's front bumper partially penetrated the Maxima's left front door, and was ripped off during the impact. The Odyssey rotated counterclockwise as it traveled towards the northeast corner of the intersection. It is likely that during the rotation, this passenger's right knee and/or lower right leg contacted the right front door panel, leaving a skin transfer. The vehicle came to final rest still in the intersection, facing northeast. According to the driver of the Maxima, this passenger was able to exit the vehicle on his own and was ambulatory at the scene. According to the police report, this passenger was not injured. According to repair shop personnel, this passenger is approximately 165.0 cm (65 in) tall and has a slight build.

Figure 20. RF passenger seat belt - removed during repair (2000 Honda Odyssey)

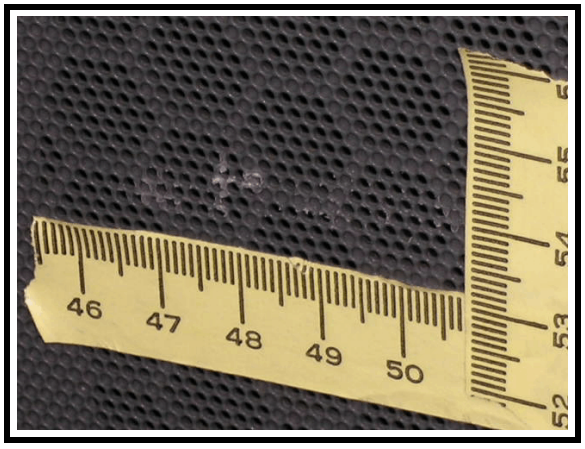

Figure 21. Close-up skin transfer to the RF door panel (2000 Honda Odyssey)

Attachment 1. Scene Diagram