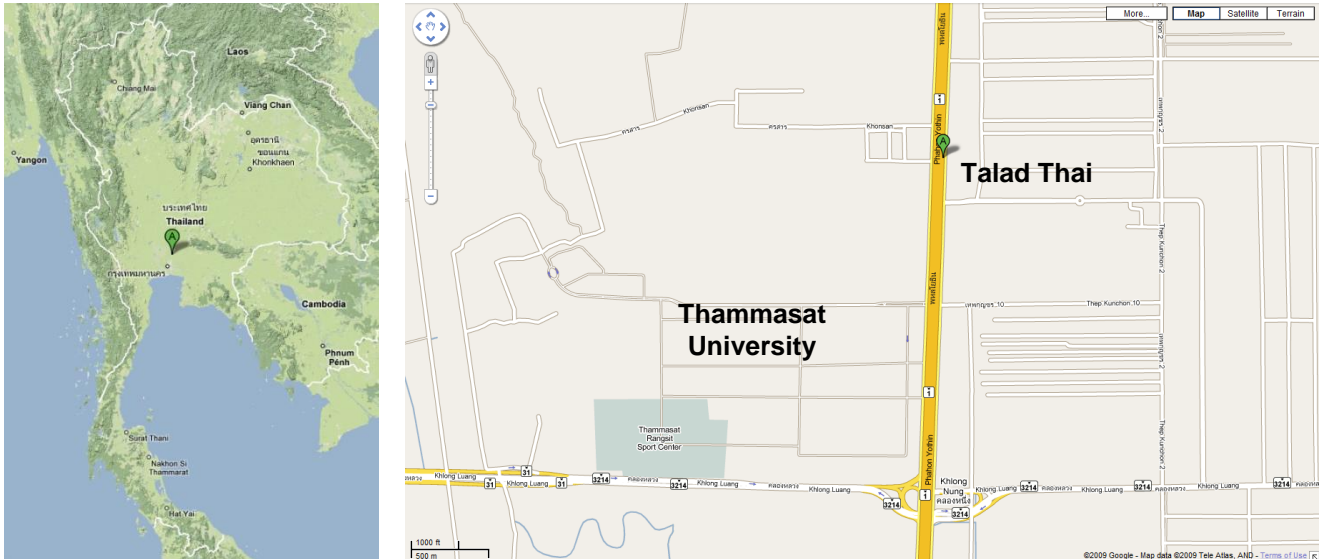


# Case ID: 081212-01

## Accident Narrative

At about 04:00 on 12 December 2008, a ten-wheel truck lost control on Highway No.1 (Paholyothin Road) at KM. 43+000 (**Figure 3-1**) and hit a traffic sign, causing the entire structure to collapse. The driver suffered light injuries with no hospital treatment needed.



**Figure 3-1: Crash Location at km. 43+000 on Highway No.1**

The truck, contained plastic seeds from Lopburi. As usual a stop was planned in Samut Prakarn. However, after travelling for one hour the driver admitted that he fell asleep while at a speed of about 60 km/hr. After leaving the roadway, the vehicle fell into a roadside ditch (**Figure 3-2**). It continued moving and hit a traffic sign pole. The foundation structure of the pole almost collapsed following the impact.

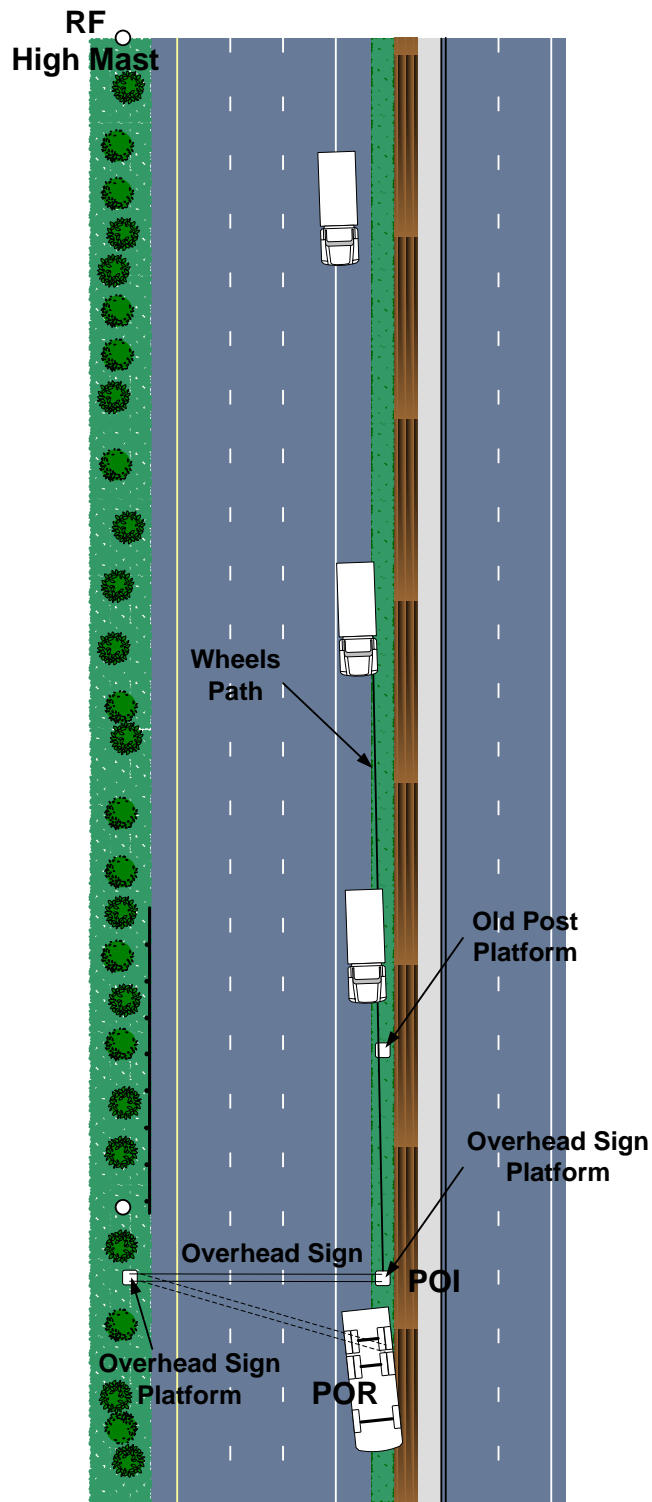


Figure 3-2: Crash Diagram

## Vehicle Information

The Isuzu ten-wheel truck was a late body design truck (**Figure 3-3**), equipped with a 6-cylinder engine with 195 horse power. There were two wheels on the first axle and four wheels on the second and third axles. The dimension was 7.60 m long, 2.20 m wide, and 2.38 m high. The 19,000 kg total weight on board was the combination of 7,000 kg curb weight and 12,000 kg of cargo weight. Most of the body structures were made from wood. The cargo bed was made of wooden plates and allowed each side to be opened with several rotating hinges. Tires details are shown in **Table 3-1**.



**Figure 3-3: Truck Design**

**Table 3-1: Tires Detail**

Location	Manufacture	Tire Name	Year	Size	Pressure (psi)
1L	Siam Tyre	EM	2808	9:00 – 20	110
1R	Siam Tyre	EM	3008	9:00 – 20	110
2L <sub>in</sub>	Hero	Mighty MX101	3008	9:00 – 20	125
2L <sub>out</sub>	Hero	Mighty MX101	3008	9:00 – 20	125
2R <sub>in</sub>	Hero	Mighty MX101	3008	9:00 – 20	120
2R <sub>out</sub>	Hero	Mighty MX101	3008	9:00 – 20	125
3L <sub>in</sub>	Hero	Mighty MX101	3008	9:00 – 20	125
3L <sub>out</sub>	Hero	Mighty MX101	3008	9:00 – 20	125
3R <sub>in</sub>	Deestone	DS-L	0306	9:00 – 20	130
3R <sub>out</sub>	Deestone	DS-L	0306	9:00 – 20	130

The driver's seat was a long wooden bench with two seating pads in the occupant compartment. No seatbelt were installed. No doors were fitted on either side of the compartment.



**Figure 3-4: Occupant Seat**



## Truck Damage

After closely examining the truck, it was found that the major structure of the truck was totally damaged (**Figure 3-5**). It was in the overturn position. The vertical structure and the roof were deflected and tilted to the right while frontal body was separated from its original position. A steel floor in the pickup bed was deformed by the impact during the overturn. The entire wooden seat structure was missing.



**Figure 3-5: Exterior Damage**



**Figure 3-6: Interior Damage**

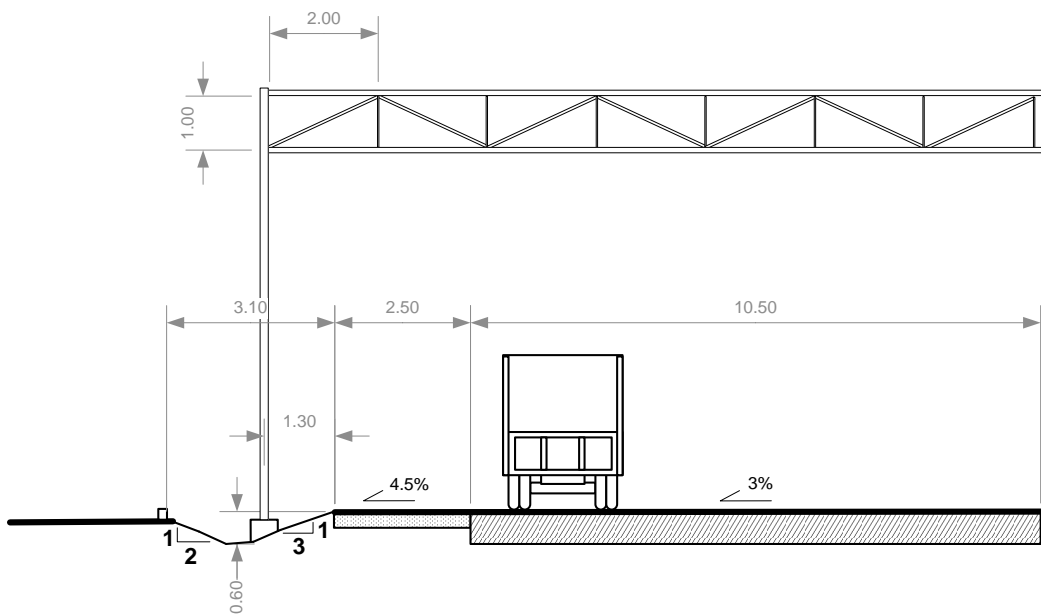
## Driver Information

The driver was a 49 year old male. He started his carrier as a bus driver when he was 23 years old and had owned this truck since 1995. This was his routine trip to transport plastic seeds from Tha Wung, Lopburi to Lam Luk Ka, Pathumthani. Before this trip, he left his house to Ban Mee at about 21:00 the night before. Waiting to travel in the morning, he slept at a gas station in Phromburi from 22:30 to 03:00 and drank one coffee can. He admitted that he fell asleep and caused the truck to leave the roadway. He mentioned driving at a speed of 60 km/hr as usual for this journey.

## Highway Information

The crash occurred on the south approach of Highway No.1 in Klong Luang, Pathumthani. It is a primary road connecting Bangkok to the Northern and Northeastern regions of Thailand. It starts at Victory Monument in Bangkok, runs through the province of Pathumthani, Ayutthaya, Saraburi, Lopburi, Nakhon Sawan, Chainat, again Nakhonsawan, Kamphaeng Phet, Tak, Lampang, Phayao and ends in Mae Sai district of Chiang Rai. The total length of the road is approximately 1,005 km.

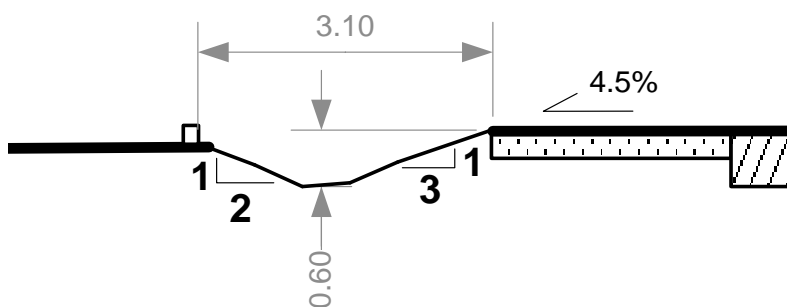
In the area of the crash, the road is a straight ten-lane divided road with frontage (**Figure 3-7**). There are 3.5 m. wide three-lane on the main road and two-lane on the frontage road. The outer shoulder width is 2.5 m. There is a 3% crown slope on the traveling way and a 4.5% slope on the shoulder. The asphalt pavement had a coefficient of friction of 0.84 on the travelling lanes and shoulder.



**Figure 3-7: Highway No.1 Cross Section**

**Separator**

A waterless 3.1 m. wide roadside ditch is located next to the outer shoulder, covered with grass and small plants. A 0.6 coefficient of friction was measured. A cross section of the ditch shows a depth of 51 cm. at the middle of the canal. A 19 cm. high roadside curb is installed on the opposite side of the canal, the frontage road (**Figure 3-8**).



**Figure 3-8: Ditch Profile**

**Overhead Sign**

An overhead sign is officially named “Steel Frame for Mounting Overhead Sign Type I Span 20.00 m. Max”, according to DOH 1994 standard drawing for highway construction. A 9 m. tall steel structure based on a concrete foundation was constructed on each side of the road for four 150 mm. diameter steel columns. A concrete foundation column is 50x50 cm. in dimension.

**Physical Evidence**

After examining the crash scene (**Figure 3-9**), it can be clearly seen that the wheel tracks ran out of the road into the roadside ditch. The tracks which are likely to be the left wheel showed that the truck gradually left the outer shoulder 61.7 m. before the overhead sign.

The truck then kept moving with its remaining speed and started to overturn on its left. At Point of Impact (POI), it hit the overhead sign steel column on the left side, and pushed the steel columns about 7 m. forward. During this event, the deflected concrete column was damaged and the connecting bolts disappeared. It was marked here that the truck moved past an old concrete column hit by a previous crash located about 27 m. before this damaged sign.

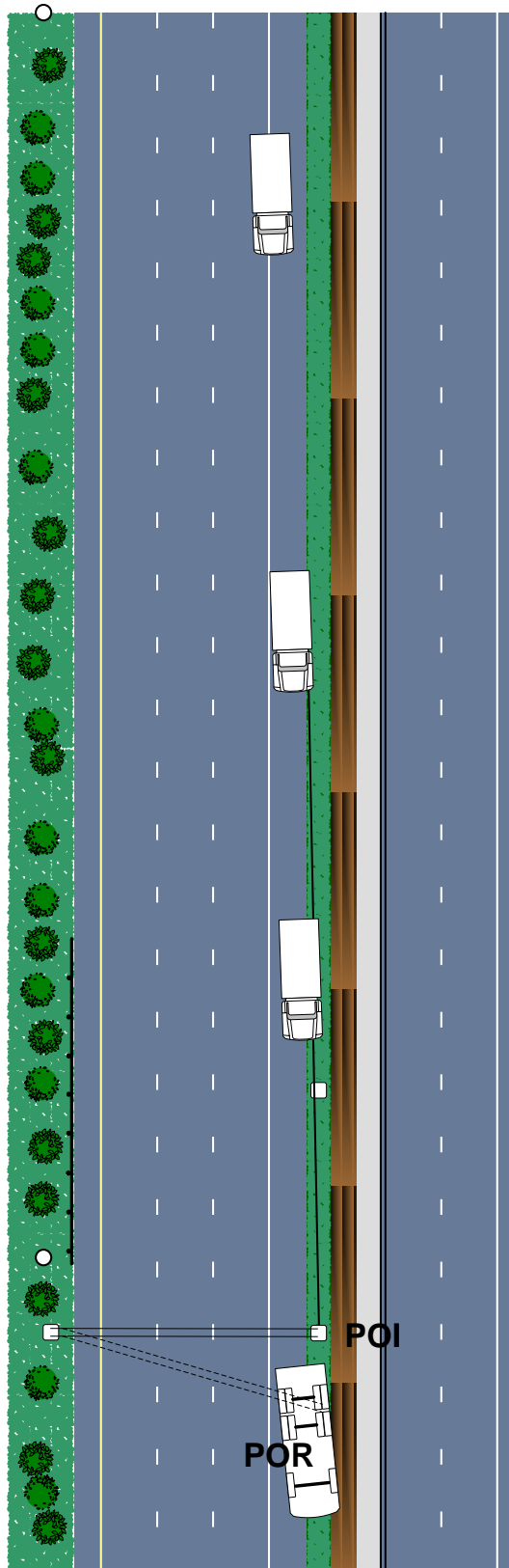


Figure 3-9: Major Events from Evidences



## Injuries Information

The driver was still at the crash scene at the time of the investigation. He didn't request any hospitalized treatment. However, he suffered light injuries to his head resulting from the contact with the interior during the overturn but there were no other harmful injuries to other parts of his body.

## Accident Contributing Factors

### Drowsy Driving

The driver admitted to the TARC team that he fell asleep before the truck left the roadway. However, the distance from the point of origin to the crash scene was not a noticeably long, only 90 km. approximately. He also stated that he slept 4.30 hours the night before. Nevertheless, after leaving Highway No.32, there is no other conflict point for the traffic on Highway No.1 (**Figure 3-10**). This means that he stayed on this widen road section which is about 10 km. in length without being interrupted by any geometric changes. Likewise, according to scene documentation, there were no marks or evidences on the pavement showing the movement of the vehicle prior to leaving the roadway. No other traffic involvement prior to the crash was reported.

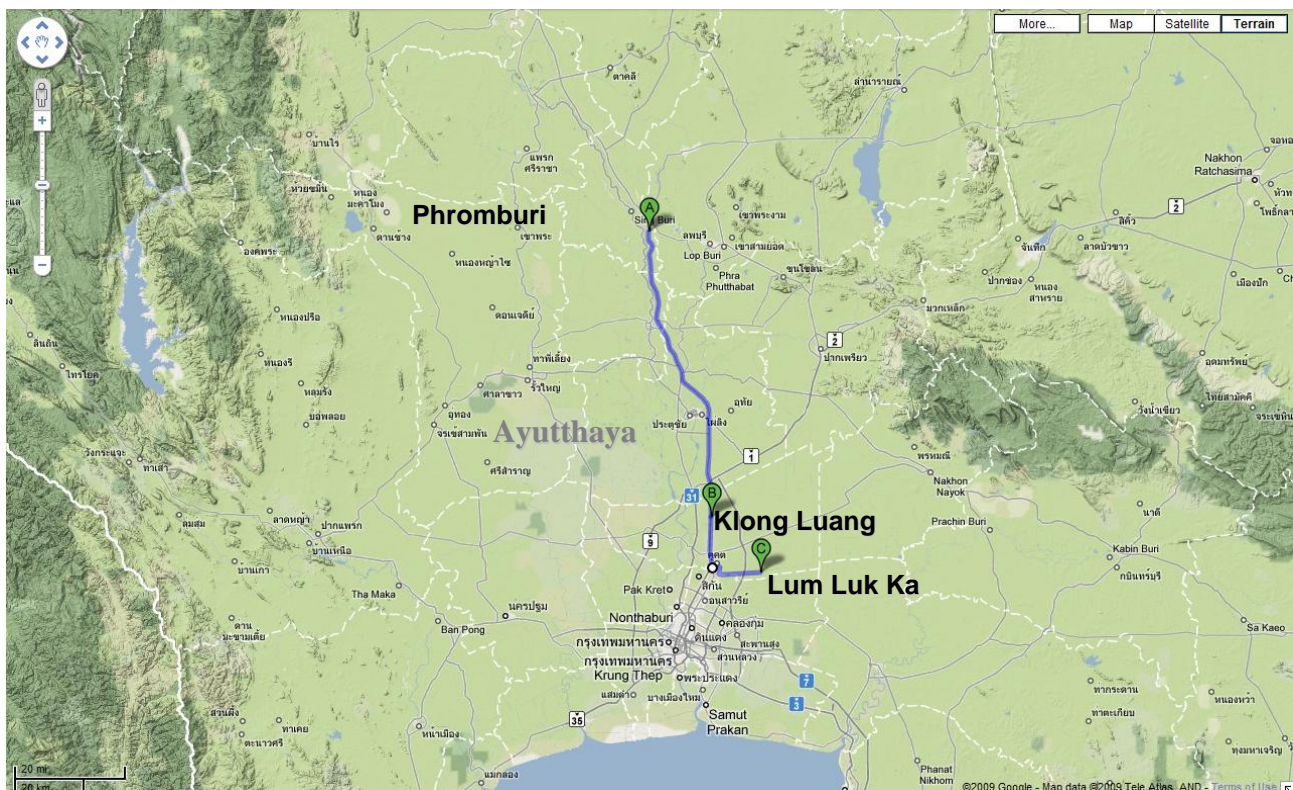


Figure 3-10: Traveled Route

### Unprotected Roadside

The overhead sign and the ditch are located along the roadside without any protection from errant vehicles. This small ditch with a slope of 1:3 was steep enough to overturn the truck, as mentioned. The level of severity was increased when the truck collided with the strong fixed overhead sign. However, the speed calculation based on the crush energy approach could not be performed in this crash since the stiffness coefficient of this late body design truck is not available.

## **Significant Factors**

TARC determined that the probable cause of the 081212-01 crash occurrence was drowsy driving on a long straight road section, as supported by the above mentioned evidences. The severity of the crash consequences was increased by the lack of a sufficient roadside protection system.