

Establishment of an Independent Safety Board in Malaysia: A Case Study of the Genting Highlands Bus Crash

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ABSTRACT

On August 21, 2013, a stage bus went off the road, crashed through the guardrail and rubble wall, and plunged 34.5 m into a ravine near KM 3.6 Genting Highlands--Kuala Lumpur Road. The tragic incident claimed the highest number of fatalities on Malaysian road to date, with 37 deaths including the driver while another 16 suffered serious injuries. MIROS has conducted an in-depth investigation, presented the analysis and reconstruction of the crash based on the physical evidence at the crash site and the damaged vehicle. The final investigation report from MIROS containing 137 pages has been submitted to the Ministry of Transport Malaysia. Further to that, an Independent Advisory Panel was appointed by the Minister of Transport Malaysia with the main aim to evaluate and review the investigation reports submitted by MIROS and other related agencies. Recognising the magnitude of the severity and other safety issues arises from the crash, the Panel had put forward recommendation to establish a safety board that serves as an independent body to conduct high profile investigation and analysis of road, rail, aviation and maritime crashes. The Board shall monitor and report the implementation of safety measures, interventions and related operations nationwide, and ensure evaluation of such to be carried out scientifically.

Keywords:

MIROS, MTSB, independent body, in depth investigation, monitoring

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1. Introduction

Road traffic crashes have been a major public health issues for more than five decades, leading to high numbers of injuries and deaths. The World Health Organization (WHO) report has discussed the nature and dynamics of the problem for quite an extensive period since the early 1960's [1]. Malaysia too, has a very high road related casualties in global terms and the increase in the number of fatalities due to road crashes has not slowed down in years.

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The Malaysian Institute of Road Safety Research (MIROS) was established in January 2007 to provide Malaysia, in particular the government, with new and innovative approaches that are customized to the needs of the Malaysian scenario to reduce fatalities from road crashes. From the onset, MIROS' researchers have begun to address the underlying issues with regards to road safety in order to develop evidence-based solutions [2]. Focus was given to safer road environment, safer vehicles, and safer road users. MIROS' research and reports are all policy driven that are aimed to not only prevent fatalities but also to reduce casualties. One of the core business in MIROS road safety improvement effort was through the in-depth investigation and analysis works.

Since year 2007 till July 2019, MIROS have investigated a total of 39 national inquiry cases which mainly involved cases with national and public interest or cases which involved mass casualties. From the investigation findings, quite a number of proposed recommendations have been formulated and reported to the Ministry of Transport. Despite all the investigation works and recommendations being proposed, lack of monitoring and assessment activities by relevant agencies towards the implementation of the said recommendations have resulted in poor level of execution and response by the agencies towards the proposed recommendations [3].

Furthermore, no method on continuous monitoring on the progressive status of the implementation was available and implemented. Without proper monitoring on the implementation of the proposed recommendations, it is doubtful that the highlighted issues from the in-depth investigations have been properly taken into actions and that the reoccurrence of such major crashes may still exist, which was later proven by series of high casualties' crashes, particularly involving Heavy Commercial Passenger Vehicles (HCPV).

2. Methodology

This paper refers to the Genting Highland bus crash as a case study. In order to obtain sufficient information pertaining to the crash, including the findings and recommendations from the Independent Advisory Panel (IAP) and in sights of the proposed safety body, qualitative review of the following areas was made.

Several reports which inclusive of publicly available literatures and some restricted documents were referred. However, with regards to the restricted documents, only insensitive and appropriate information were included in this paper. The discussed areas in this paper are as follows:

- Overview of the Genting Highlands Bus Crash
- Independent Panel Findings and Recommendations
- Functions of the Malaysian Transport Safety Board
- Monitoring Mechanism Outline

3. Results and Discussion

The Genting Highlands Bus Crash

The single bus crash occurred on August 21, 2013, involving a stage bus which was travelling downhill from Genting Highlands, carrying 53 passengers (including bus driver) heading towards Pekeliling Terminal in Kuala Lumpur. The crash occurred at approximately 2:15 p.m., when the bus was encountering a right curve along the downhill stretch of the Genting–Kuala Lumpur road. As the bus went through KM 3.6 of the road, the driver lost control of his vehicle and failed to negotiate the curve, resulting the bus to crash through the guardrail and rubble wall installed at the road shoulder and plunged down 34.5 m into a ravine [4]. 37 people including the bus driver were killed in the crash.

The deceased were sent to Selayang Hospital, Bentong Hospital and Kuala Lumpur Hospital. It was recorded as the country's worst road tragedy. The aerial view of the crash site is shown in Figure 1.

A team from the Malaysian Institute of Road Safety Research (MIROS) Crash Reconstruction Unit was dispatched to inspect the crash site and the damaged vehicle on the same day as the crash occurred, to investigate, analyze and reconstruct the crash, in order to identify the cause of the crash and resulted injuries, as well to provide safety recommendations. Consequently, discussions among responsible government agencies and related private organizations were carried out by MIROS to look into the road design issues, vehicle components damage, accountability and traceability of vehicle inspection records, Industrial Code of Practice for Safety Health and Environment (ICOP SHE) policy of bus company and emergency response of rescue operation.



Fig. 1. Aerial view of the crash site

MIROS investigation revealed that the bus began applying brakes at about 174.1 m prior to the point of impact. Six skid marks were found on the road surface including the gouge marks at the last skid mark. After the last skid mark, the bus hit the guardrail and rubble wall before plunging into the ravine. Based on site inspection, it was found that the rubble wall damaged width is approximately 8.84 m [4]. The following Figure 2 shows the damaged rubble wall which was impacted by the bus before it went airborne and plunged 55 m into the ravine.



Fig. 2. Damaged guardrail and rubble wall at the crash site

The in-depth comprehensive analysis of the said crash concluded that the crash was contributed by a combination of factors mainly the driver, the vehicle and the road environment. Specifically, they were:

- speeding and reckless driving while negotiating curves in the road;
- inefficient frontal brake performance due to poor maintenance of vehicle safety components and extremely worn out brake linings of the bus;
- steep downhill road with challenging curves to maneuver at much lower safe speed of typical driving;
- elements of the road geometrics that do not fit to render a safe driving environment i.e. high-speed limit, wide lanes and tight curves;
- poor road design and road safety facilities provided is ineffective to mitigate the outcome of the crash namely, a combination used of a sub-standard rubble wall and a semi-rigid W-beam guardrail was ineffective as a barrier and insufficient to prevent vehicles from going off the road.

In order to minimize if not to avoid the injury risk of similar crashes in the future, recommendations have been formulated by MIROS after consulting various relevant agencies. MIROS has also presented the analysis and reconstruction of the crash based on the physical evidence at the crash site, damaged vehicle analysis and reconstruction of the crash to the Minister of Transport and the Cabinet Ministers on September 4, 2013 [5].

Independent Panel Findings and Recommendations

Further to that, on October 29, 2013, an Independent Advisory Panel (IAP) was appointed by the Minister of Transport with the main aim to evaluate and review the investigation reports submitted by MIROS and other related agencies pertaining to the said crash [6]. The Panel has conducted series of meetings, site visits to the crash site, and also face-to-face interview sessions with relevant personnel. The Panel evaluation and review covered road factors, vehicle factors, human factors, institutional issues related to operational and occupational safety and health in the transportation sector, emergency response and rescue; and future requirements and their recommendations.

In general, the Panel acknowledges the extensive work carried out by MIROS in investigating the Genting Crash. The Panel has benefited from the crash reconstruction and investigation carried out by MIROS which includes the mechanics of the crash as well as contributing factors that led to the crash. The Panel agreed that various factors had contributed to the crash even though the primary event leading to the crash was high speed driving. Among issues and weaknesses identified were related to the road design and approval, brake system, vehicle design, construction, approval and inspection, safe operation and occupational safety and health in the transportation sector, lack of effective enforcement by the respective agencies related to their best operational practices, and coordination and communication of rescue operation. Further to that, the Panel also decided to address issues that were not covered in the reports and to go beyond this particular case encompassing the overall issues to enhance road safety system in Malaysia. A total of 51 recommendations were formulated after comprehensive evaluation and review in order to avoid or minimize the occurrence and the outcomes of similar incidences and to improve the national road safety system holistically [6].

One of the most important recommendations was to reorganize institutional structure for transportation safety in Malaysia. This was proposed to be done by establishing a national transportation safety board that serves as an independent body to conduct investigation and should directly responsible to the Cabinet on issues related to transportation safety in Malaysia. This board should be the catalyst for National Road Safety Policy and should push for the implementation of MS ISO 39001 (Road traffic safety Management System) in Malaysia [2].

The Malaysian Transport Safety Board

To ensure that the proposed improvements are implemented effectively, a monitoring mechanism for transportation safety in Malaysia needs to be established. To this end, the IAP proposed that an independent body, which later referred to as the Malaysian Transportation Safety Board (MTSB) be formally established within two (2) years (from the date of submission of the Panel Report to the Minister of Transport on January 28, 2014) to investigate and analyse crashes related to roads, rail, aviation and maritime [5].

The Board is intended to be a technical board and shall focus on conducting in depth investigation and analysis of high-profile crashes, including crashes which involves national interest, monitoring and reporting on the implementation of relevant security, intervention and operations measures and ensuring that scientific evaluations are carried out and is directly responsible to the Cabinet. Its investigation includes gathering scientific evidences including interviewing relevant parties, and conducting scientific and state of the art analysis of vehicle and occupant kinematics. The investigation reports by the MTSB in which will be publicly announced, shall not only able to identify the root cause and contributing factors of the crash, but also identifies the reliable parties which needed to take actions to remedy the situation, either immediate, mid-term or in long term period. The Board shall also be empowered to conduct monitoring and surveillance on each of the parties being addressed to measure the implementation progress in which the findings shall be tabled to the Parliament and publicly announced [6].

The MTSB is a huge upgrade of MIROS which currently conducts technical in-depth investigations and is also an elevated solution to the inquiry performed by the 'case-by-case basis appointed inquiry board' or royal commissions. The MTSB shall serve with the power to prosecute, at the same time hold no liability to attend legal hearings, and most importantly its investigation is deemed independent, and shall be followed through with continuous monitoring which is the biggest missing link in current road safety process loop in Malaysia, as shown in Figure 3.

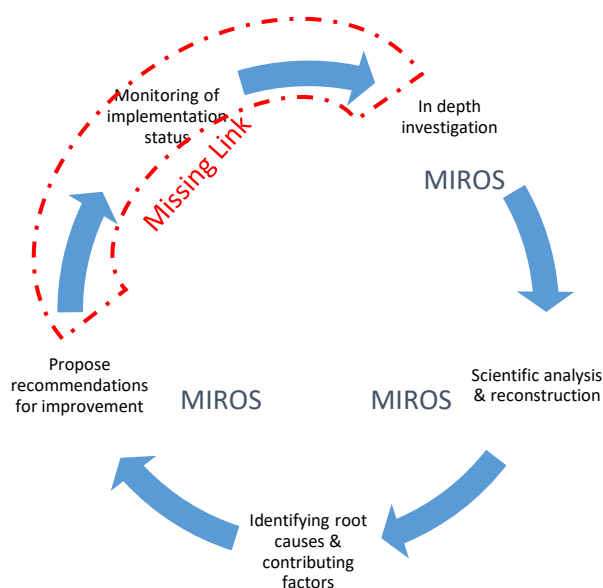


Fig. 3. Missing link in current road safety process loop

However, the intention of the establishment of MTSB was not realized in the two (2) years as it was proposed, and has resulted in the monitoring tasks of the implementation of the 51 recommendations by the IAP to the relevant agencies could not be identified until then [7]. On December 24, 2016, a fatal crash involving an express bus took place at KM 137.1, North-South Expressway (northbound) near Pagoh, Johor which killed 14 people [8]. MIROS has been directed by the Minister of Transport to carry out investigations to identify the cause of the crash, occupant injuries as well as providing safety recommendations for improvement. Again, the crash has opened the eyes of all parties to the importance of establishing a monitoring body for the proposed improvement measures. Subsequently, to ensure that all 51 recommendations made by the IAP on the bus crash in Genting Highland were considered by relevant agencies, the Minister of Transport had recommended the establishment of a Recommendations Review Panel (RRP) whose membership consisted of the members of the IAP immediately in force [9,10]. On July 19, 2018, the re-election of the RRP members was then made by the current Minister of Transport, intended to enable the new RRP to continue monitoring the IAP's recommendations and assist the government in ensuring that the 51 recommendations for improvement are implemented effectively.

Monitoring Mechanism Outline for Road Transportation Sector

In March 2010, the United Nations (UN) General Assembly resolution 64/255 proclaimed a Decade of Action for Road Safety 2011–2020 with a goal of stabilizing and then reducing the forecasted level of road traffic fatalities around the world by increasing activities conducted at national, regional and global levels. The guiding principles underlying the Decade of Action (DoA) are those included in the "safe system" approach [11]. This approach aims to develop a road transport system that is better able to accommodate human error and take into consideration the vulnerability of the human body.

This monitoring mechanism for road transportation which shall be conducted by the future MTSB needs to be ensured to cater the five pillars addressed under the DoA in order to provide objective and efficient monitoring. The pillars cover areas ranging from the road safety management aspect, which refers to the pre-crash element in road safety, during crash element that mainly addresses

issues on vehicles, roads and road users until the post-crash element of rescue response [3]. Overall, the proposed scheme will basically focus on five main pillars under the DoA with each specific outcome, as illustrated in Table 1.

Table 1

Five pillars of road safety referred in the scheme

Pillar 1	Pillar 2	Pillar 3	Pillar 4	Pillar 5
Road Safety Management	Safer Roads	Safer Vehicles	Safer Road Users	Post-Crash Response
Outcome 1 Multi-sectoral partnership to develop and lead the delivery of national road safety strategies	Outcome 2 Roads networks with inherent safety and protective quality	Outcome 3 Vehicles with improved vehicle safety technologies, good crashworthiness capability and roadworthy	Outcome 4 Prudent road users with appropriate road safety awareness and education	Outcome 5 Responsive post-crash emergency, well-coordinated and appropriate emergency treatment for crash victims

4. Conclusion

In order to improve current transport safety level in Malaysia, particularly in the scope of road transportation which possess the highest number of casualties (16 fatalities per day) [12] in comparison to other mode of transport, the needs of establishing a national transportation safety board in the form of MTSB may be one of the effective measures. MTSB shall monitor and report the implementation of safety measures, interventions and related operations nationwide, and ensure evaluation of such to be carried out scientifically. The Board shall be made directly responsible to the Cabinet on issues related to transportation safety, which will help to place road safety as the central agenda and Key Performance Indicator (KPI) for the government. Furthermore, the Board shall also act as the catalyst for the National Transport Safety Policy and drive for its implementation.

It is worth to note that other respectable road safety performance countries have already establish their own safety boards to address issues related to transportation safety such as Australia, United States, Netherlands, South Korea and others. Whilst the benchmarking of other available transport safety agencies such as the Australian Transport Safety Bureau (ATSB) [13], National Transportation Safety Board (NTSB) in the United States [14], the Dutch Safety Board (DSB) [15], the Korea Transportation Safety Authority (TS) [16] found that the scope of investigation and activities differs from one to another, the MTSB should be unique so that it will suit the local legislation framework, at the same time be effective in closing the loop in transport safety matters, particularly in the field of road transportation.

Most importantly, efforts in establishing Malaysian's own safety board needs to be made a priority and expedited swiftly by the related authorities to avoid any repercussion of similar safety issues recurring in the forms of potential road crashes such as Genting Highland bus crash, which will cost many more valuable and innocent lives on our roads.

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