

## **Executive Summary**

On August 1, 2022 at 1200 hours. A commercial bus with plate #059-FS owned by Yalan Bus Transportation Co., Ltd., hereinafter referred to as “the occurrence vehicle”, which was a national highway bus route 1728. While it was traveling at approximately 105 km/h in the center lane of 57.4 kilometers southbound of National Highway No. 3, the bus gradually veered to the right, and then the front right of the bus hit the rear left of a private-owned heavy truck in the outer lane. After the impact, the driver of the occurrence vehicle tried to move back to the center lane. During the process, the occurrence vehicle tilted and swung left and right. In the end, the occurrence vehicle overturned to the right and slid to a stop at 57.6 kilometers. A total of 16 people, including the driver and passengers, were injured in this occurrence.

In accordance with the Transportation Occurrence Investigation Act, the TTSB is an independent transportation occurrence investigation agency, and responsible for conducting the investigation. The investigation team also included members from the Ministry of Transportation and Communications (MOTC), Highway Bureau, Freeway Bureau, Daimler Trucks Asia Taiwan Ltd. and Yalan Bus Transportation Co. Ltd.

The “Draft Final Report” of the occurrence investigation was, by the procedures, reviewed at TTSB’s 55th TTSB Board Meeting on October 13, 2023 and then sent to relevant organizations and authorities for comments. After comments were collected and integrated, the Final Report was reviewed and approved by TTSB’s 56th Board Meeting on November 17, 2023.

Based on comprehensive information and analyses, the final report presents 11 findings along with 5 safety recommendations issued to the relevant organizations.

## **Findings From Investigation**

### **Findings Related to Probable Causes**

1. While driving at high speed, the driver of the occurrence vehicle repeatedly lowered his head to the left, drove with one hand, and engaged in activities unrelated to operating the vehicle. Approximately one minute before the occurrence, the driver changed lanes to the left and then frequently looked down to the left, probably looking at a mobile phone or other items in the door rack. Finally, when the occurrence vehicle was shifting to the right, the driver was distracted and thus failed to pay attention to the movement of the vehicle on the right, resulting in a collision with the heavy truck in the right lane, causing the occurrence.

### **Findings Related to Risks**

1. During the occurrence, the driver of the occurrence vehicle consistently engaged in distracted driving. Diverting his attention away from driving may have resulted in his attention not being fully focused on the situation outside the bus, making him unable to grasp the situation in front and discover the occurrence vehicle's deviation from the lane in a timely way.
2. The driver of the occurrence vehicle frequently controlled the steering wheel with one hand or both elbows while driving. Before the occurrence, he used his right hand to control the steering wheel. As he was about to collide with the heavy truck in the front right, controlling the occurrence vehicle quickly and accurately became challenging, thereby increasing the risk of losing control.
3. Although Yalan Bus Transportation Co. Ltd. has relevant regulations and penalties, they are not implemented in actual management, and education and training fail to play an effective role. The driver's unsafe behavior remained uncorrected due to

inadequate management and ineffective training, allowing drivers to drive a vehicle with an unsafe concept.

### **Other Findings**

1. Passengers who were not wearing seat belts in this occurrence had a higher probability and severity of injury. Additionally, passengers in the front half of the bus may have had a higher seat belt usage rate due to the driver's reminder. This could have prevented or reduced severity of injuries.
2. The driver of the occurrence vehicle did not have the correct habit of using the turn signal, which may have affected traffic safety and also affected the driving judgment of other drivers.
3. Promoting Safety Management Systems (SMS) in the Taiwan's highway automobile transportation enterprise still faces challenges. In addition to the fact that relevant regulations for promoting SMS have not yet been formulated, if senior management lacks active awareness of autonomous safety management and only maintains the existing safety management mechanism, it is difficult to further implement in-depth SMS management methods.
4. Safety Management Systems (SMS) is not yet widely used in Taiwan's highway automobile transportation enterprise, and the company in this case, Yalan Bus Transportation Co., Ltd., has not introduced relevant systems or standards. Upon reviewing its existing management practices, it was evident that they only align with certain elements of the four major pillars, and failed to fully exert its management effect.
5. The audio-visual equipment in the occurrence vehicle could only display satellite TV and did not have an audio-visual playback system, so it was unable to show

relevant promotional videos. The promotion on the use of seat belts depended only on verbal reminders from the drivers, or posting of relevant slogans in obvious places.

6. There is no relevant standard operating procedure for Yalan Bus Transportation Co., Ltd. drivers to promote passengers on the use of seat belts. As a result, different drivers may have different methods and the level of detail of promotion may vary, which may prevent passengers from receiving a consistent promotion message.
7. The regulations did not require the occurrence vehicle to be equipped with Lane Departure Warning Systems (LDWS). Even if this system had been installed, the continuous use of the turn signal by the driver before the occurrence would lead the LDWS to interpret it as an intentional lane change, and no warning would be provided.

#### **Transportation Safety Recommendations**

##### **To Yalan Bus Transportation Co., Ltd.**

1. Enhance the driver management system, education and training methods, and ameliorate driver's unsafe distracted driving and steering wheel operation to improve driving safety.
2. Enhance the operating procedures for promoting passengers on the use of seat belts, ensuring drivers follow a consistent promotion method to make passengers aware of regulations on the use of seat belts.
3. Enhance the company's safety management mechanism to improve safety awareness within the organization and form a safety culture.

##### **To the Highway Bureau, MOTC**

1. Supervise Yalan Bus Transportation Co., Ltd. to enhancing its driver management

system and education and training methods to ameliorate driver unsafe distracted driving and steering wheel operation; supervise Yalan Bus Transportation Co., Ltd. to enhancing the operating procedures for promoting passengers on the use of seat belts.

2. Provide guidance to Taiwan's highway automobile transportation enterprise to introduce and enhance company's autonomous safety management mechanism.