

Executive Summary

On November 21, 2023, at 4:11 p.m., a children-only bus (hereinafter referred to as “Vehicle A”) and a private passenger car (hereinafter referred to as “Vehicle B”) collided at the intersection of Ziqiang Road and Daxin Lane on Section 1 of Zhulin Road in Shujiao Village, Zhutang Township, Changhua County. The occurrence resulted in 15 injuries.

In accordance with the Transportation Occurrence Investigation Act, the Taiwan Transportation Safety Board (TTSB) is the independent transportation occurrence investigation agency responsible for conducting the investigation. The investigation team also included members from the Highway Bureau, Ministry of Transportation and Communications (MOTC), the Changhua County Government, the Vehicle Safety Certification Center (VSCC), and China Motor Corporation.

The draft of this investigation report was completed in March 2025. In accordance with the relevant procedures, it was revised after preliminary review at the 74th Board Meeting of the TTSB on April 11, 2025, and then sent to relevant agencies (institutions) for their opinions. The investigation report was published after review and approval by the 75th Board Meeting on May 9, 2025.

After comprehensive investigation and analysis of the factual data, a total of 11 findings and 5 safety recommendations were obtained.

I. Investigation Findings

Findings Related to Probable Causes

1. The drivers' sight of both vehicles was blocked by roadside plants, and neither driver was able to detect the other vehicle in time through the convex mirror. In addition, both drivers failed to stop and yield before crossing the intersection due to a lack of safety awareness, and Vehicle B was speeding through the intersection, all of which caused this occurrence to take place.

Findings Related to Risks

1. Although the roadway maintenance authority (Zhutang Township Office), has deployed one convex mirror on the northeast side of the occurrence intersection, it was difficult to solve the problem of severe sight obstruction when the drivers, unaware of the speed limit, were speeding and failed to stop and yield.
2. Daxin Lane on Section 1 of Zhulin Road and Ziqiang Road connect to County Highway 152, and Rural Highways Chang 176 and Chang 127 respectively. There were no speed limit signs or pavement markings along the way. Drivers not familiar with road safety rules will have no traffic control devices to follow and are prone to speeding when the road is in good traffic condition.
3. At the intersection, there were no signs, markings, or signals for delineating the major roads and the minor roads. Moreover, the two sections had the same number of lanes, resulting in further inadequacy in delineation of the major roads and the minor roads. It is difficult for most drivers to distinguish whether they are on the right or left while

driving, or to realize that they are approaching the intersection. If there are no clear markings, signs, or other traffic control devices at unsignalized intersections, it is difficult for drivers to distinguish between the major roads and the minor roads, which may cause them to neglect the safety awareness of stopping and yielding, thereby increasing the risk of road accidents.

4. In this occurrence and another occurrence involving a children-only bus that took place on July 12, 2023, both the children and the attendant in the bus were not wearing seat belts. They were dislodged from their seats upon a side collision, resulting in injuries from impact with the seats, vehicle glass, and interior structures, or from mutual crushing. It was found that the passengers were not protected from impact as their bodies were not fastened when the side collision occurred.
5. In this occurrence and another occurrence involving a children-only bus that took place on July 12, 2023, the drivers and the attendant were injured and trapped, unable to provide assistance to the children in the buses immediately. If the driver's seat was equipped with an airbag and other seats with a seat belt, the injury sustained by the passengers could have been alleviated.

Other Findings

1. The brake pad and tire tread of both Vehicle A and Vehicle B were normal. Although the frame of right front wheel of Vehicle A was deformed and the tire was deflated, the investigation team found that those were not the contributing factors to the occurrence. Both drivers involved in the occurrence held a valid driving license issued by the

Highway Bureau; there is no evidence suggesting that alcohol or drugs were involved in this occurrence. Moreover, the kindergarten's management of the children-only bus was in compliance with the existing laws and regulations.

2. As the rural roadway management authorities have not set relevant standards for examining the sight distance, speed limit signs are not available on many rural roadways, and most of the unsignalized intersections on rural roadways have no delineation of the major roads and the minor roads. Therefore, road safety on rural roadways can be significantly enhanced if the traffic control devices are improved by referencing the Regulations Governing Traffic Safety, Regulations for Road Traffic Signs, Markings and Signals, and Design Directions of Urban Roads and Accessory Works, etc.
3. With the rapid development of automobile manufacturing technology, nowadays, automobiles can improve road safety, lower the probability of road accidents, and reduce casualties by active prevention, passive safety protection, and intelligent monitoring mechanisms. There is still room for improvement in child safety seats, seat belts, and other active and passive safety assistance systems for children-only buses in Taiwan.
4. Korean school buses for children are required to be equipped with seat belts. Furthermore, the use of seat belts is compulsory. This can provide adequate protection to passengers upon collision.
5. Both Japan and South Korea have formulated relevant standards or safety improvement guidelines regarding child safety seats and seat belts in children-only buses and school buses for children, which can serve as a good reference for Taiwan.

II. Safety Recommendations

To the Zhutang Township Office, Changhua County

1. Strengthen the road safety awareness of children-only bus drivers. When crossing unsignalized intersections without delineation of the major roads and the minor roads, drivers should pay attention to oncoming vehicles from all directions. Especially in sections where sight is obstructed, drivers should slow down or stop and yield to avoid collisions that might be due to delayed reactions.
2. Examine the safe sight distance of vehicles at unsignalized intersections on the roadways under jurisdiction. If there is any obstruction to the drivers' sight and road safety is endangered, delineation of the major roads and the minor roads should be provided on the roadways. Furthermore, signs, markings or signals, or appropriate traffic control devices should be provided to remind drivers to stop and yield before crossing intersections. Moreover, providing speed limit signs at appropriate locations along rural roadways should be considered to remind drivers of the speed limits, so as to improve road safety.

To the Changhua County Government

1. Supervise the road safety awareness of children-only bus drivers in public and private kindergartens under jurisdiction. When driving at unsignalized intersections without delineation of the major roads and the minor roads, remind drivers to pay attention to oncoming vehicles from all directions. Especially at sections where sight is obstructed, remind drivers to slow down or stop and yield to avoid collision due to delayed reaction.

2. Supervise the township offices under jurisdiction to examine the safe sight distance at the unsignalized intersections of rural roadways. If there is a possibility that the drivers' sight might be obstructed and road safety endangered, the roadways should be provided with delineation of the major roads and the minor roads. Signs, markings or signals, or appropriate traffic control devices should also be provided to remind drivers to stop or yield before crossing intersections.

To the Ministry of Transportation and Communications

1. Draw on the latest international safety regulations and practices regarding children-only buses, and establish the goals of children-only bus safety improvement in Taiwan. Devise promotion strategies and supporting measures to further improve the passenger safety of children-only buses.