

## MAIDS – Summary of Findings

*The 921 on-scene, in-depth accident investigations have provided a large volume of data related to the general characteristics of PTW accidents; including accident causation and rider and passenger injury information. The outcome of these investigations can be considered in the identification, development and introduction of countermeasures.*

The major findings of this study are as follows:

1. In 37.4 % of cases, the primary accident contributing factor was a human error on the part of the PTW rider.
2. Among the secondary contributing factors, PTW riders failed to see the other vehicle (OV) and they also made a large number of faulty decisions, i.e., they chose a poor or incorrect collision avoidance strategy. In 13% of all cases, there was a decision failure on the part of the PTW rider.
3. The number of cases involving alcohol use among the PTW riders was less than 5%, which is low in comparison to other studies, but such riders were more likely to be involved in an accident.
4. In comparison to the exposure data, unlicensed PTW riders, illegally operating a PTW for which a license is required, have a significantly increased risk of being involved in an accident.
5. PTW riders between 41 and 55 years of age were found to be under-represented, suggesting that they may have a lower risk of being involved in an accident when compared to other rider age categories.
6. When compared with the exposure data, 18 to 25 year old riders were found to be over-represented.
7. In 50% of the cases, the primary accident contributing factor was a human error on the part of the OV driver.
8. OV drivers holding PTW licenses were less likely to commit a perception failure than those without a PTW licence, i.e., they did not see the PTW or its rider.
9. In about 1/3 of the accidents PTW riders and OV drivers failed to account for visual obstructions and engaged in faulty traffic strategies.

10. Traffic control violations were frequently reported, in 8% of the cases for PTW riders and in 18% for OV drivers.
11. Amongst the wide diversity of PTW accident and collision configurations that were observed in this study, not one configuration dominated.
12. 90% of all risks to the PTW rider, both vehicular and environmental, were in front of the PTW rider prior to the accident.
13. Among the primary contributing factors, over 70% of the OV driver errors were due to the failure to perceive the PTW.
14. The roadway and OVs were the most frequently reported collision partners. In 60.0% of accidents, the collision partner was a passenger car.
15. Tampering in order to increase performance was observed by visual inspection in 17.8% of all moped cases. This value is lower than those reported in other studies. The exposure study only shows 12.3% of tampering
16. Only modified conventional street motorcycles were found to be over-represented in the accident data. There was no evidence of an increased risk associated with riding any other PTW style.
17. PTW technical problems were the primary contribution factor in 0.3% of the accidents. Most of all technical problem is identified as contributing factors were related to the tyres, illustrating the need for regular PTW inspections by the owner.
18. In over 70% of the cases the PTW impact speeds were below 50 km/h.
19. In 18% of all cases, PTW travelling speeds were greater than or less than the surrounding traffic and this speed difference was considered to be a contributing factor.
20. 62.2% of all PTW riders attempted some form of collision avoidance immediately prior to impact.
21. 90.4% of the PTW riders wore helmets. However, 9.1% of these helmets came off the wearer's head at some time during the accident, due to improper fastening or helmet damage during the accident. Overall, helmets were found to be an effective protective device to reduce the severity of head injuries.

22. 55.7% of PTW rider and passenger injuries were to the upper and lower extremities. The majority of these were minor injuries, e.g. abrasions, lacerations and contusions. Appropriate clothing was found to reduce, but not completely eliminate, many of these minor injuries.
23. Roadside barriers presented an infrequent but substantial danger to PTW riders, causing serious lower extremity and spinal injuries as well as serious head injuries.
24. For PTW riders, a roadway maintenance defect caused the accident or was a contributing factor in 3.6% of all cases.
25. For PTW riders, a traffic hazard caused the accident or was a contributing factor in 3.8% of all cases.
26. Weather-related problems either caused the accident or contributed to accident causation in 7.4% of PTW accidents in the study.