

# MOTORCYCLE

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**SUMMARY**

In Fact sheet vol. 1, the number of motorcyclist fatalities has been discussed in detail. Yearly trend for the last two decades showed that the number of motorcyclist fatalities has outnumbered other road users since early 90's, and the trend continues towards 2010. Fact sheet vol. 2 will provide more information on road accidents involving motorcycles, complementing Fact sheet 1. Year on year (y-o-y) growth for all crashes and fatal crashes involving motorcyclist showed that the two series do not necessarily move in the same direction. There are circumstances that all of accidents increased, but the fatal accident decreased. In recent trend (2007 - 2010), fatal accidents have shown continuous positive growth with the highest of 15% in

2007. For collision type, a high proportion of crashes occurred by angular type, followed by head-on collision and rear end collision. Trend analysis for the ten-year period (2001 - 2010) has found an increase in the number of crashes with type of hitting object on road (32%), followed by overturned (23.8%) and hitting object off road (18.5%). In addition, significant reduction (around 70-80%) in number of riders involved in each fault is observed throughout the period. A higher number in motorcycle accidents were recorded at rural area (66.62%) as compared to city (4.60%), urban (11.49%) and built-up area (17.29%) from 2005 - 2010. During that period, 19.56% of crashes occurred at residential area, 7.62% at office area, 4.70% at shopping centre area, 3.41% at industrial area, 3.51% at school area and 1.53% occurred at bridge/foot bridge area.

**MOTORCYCLE CRASHES - YEAR ON YEAR (Y-O-Y) CASES**

Figure 1 shows the year-on-year (y-o-y) increment for the number of motorcycles involved in road accidents, both for all accidents and fatal accidents. These figures are derived by taking y-o-y percentage difference. However, figures from the year 1986 - 1996 for motorcycle involved in fatal accidents are not available.

For the year 2000 - 2010, the growth of all accidents involving motorcycle has been stable at below 10%, which is much better as compared to the 1990 - 2000 periods. However, there's a need for new interventions and rigorous effort to reduce the number as there are more increase observed as compared to reduction. During this period, only two reductions were recorded. For fatal accidents series involving motorcycle, there is one year (2007) that the growth of fatal accident is more than overall accident growth. Fatal accidents up to 15%, doubling this value whereas, total accidents only grew to 7%.

It can be observed that both series (all accidents and fatal accidents) are not necessarily following the same trend, even though fatal accident is a subset of all accidents. There are five observations that have the two series either increase or decrease in percentage together. The other nine observations have opposite trends. Therefore, it is not necessarily that when all

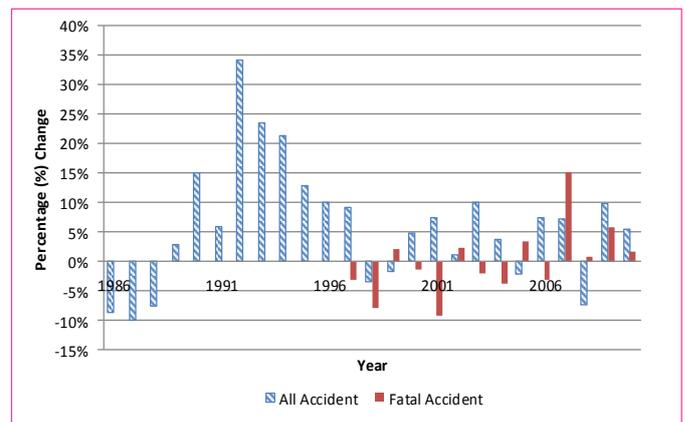


Figure 1: Year on year (y-o-y) change of fatal accidents and all accidents involving motorcycles.

accidents increases, fatal accidents would also increase. Since 1997, Malaysia has quite a balanced number of increment and reductions. However, it is a disappointment to see that for the last four years, fatal accidents involving motorcycles continue to have positive change even though the magnitude of the change is decreasing. There are many factors contributing to the road accident especially towards motorcyclist. They are considered as vulnerable road users as the vehicle itself does not provide full protection unlike other motor vehicles. A dedicated motorcycle lane does help, but sometimes, the attitude of riders who ignore the facilities provided for them, is also a contributing factor towards motorcycle accident.

## MOTORCYCLE CRASHES - DISTRIBUTION OF CASES BY CRASH CIRCUMSTANCES

Figure 2 shows the proportion of motorcycle riders involved in each type of collision for the past 10 years (2001 - 2010) for Killed and Seriously Injured (KSI) cases.

On average, there are 9,166 motorcyclist involved in KSI crashes yearly. A higher proportion of crashes occurred by angular type collision (26.2% overall, 7.3% fatal crashes and 18.9% severely injured crashes), followed by head-on collision (17.2% overall, 8% fatal crashes and 9.2% severely injured crashes) and rear end collision (14.7% overall, 6% fatal crashes and 8.7% seriously injured crashes). Majority of fatal crashes collision came from type head-on (19.7%), closely followed by out of control (19.4%) and angular collision (18.1%).

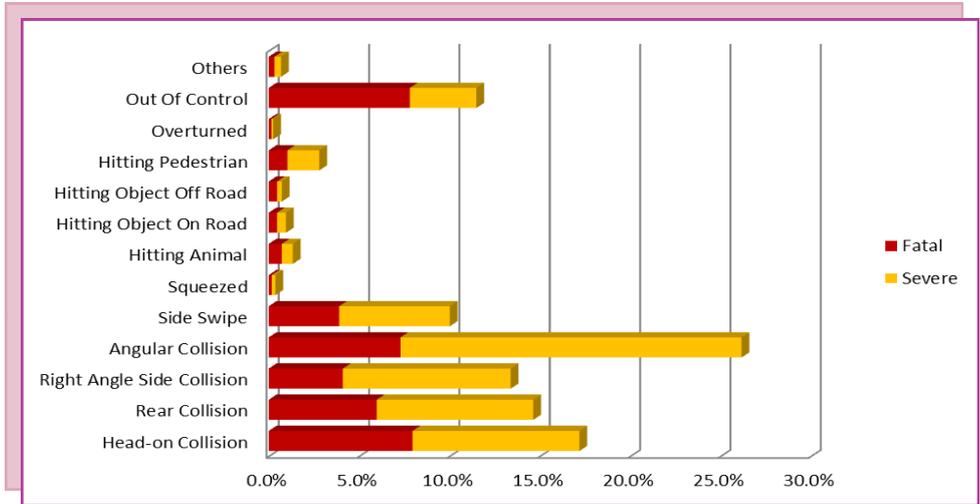


Figure 2: Motorcyclist (Rider) Involved in KSI Road Crashes by Type of First Collision (2001 - 2010)

Trend analysis for the ten-year period (2001 - 2010) has found an increase in the number of crashes for the type hitting object on road (32%), followed by overturned (23.8%) and hitting object off road (18.5%). However, improvement can be seen in the number of motorcyclist involved in right angle side collision where the figure has decreased by 36.8%, followed by hitting pedestrian, 24.8% and squeezed by 21.3%. The trend has also reveal that 49.9% of motorcyclists in fatal or seriously injured cases are generally involved in side impact collision category, either from right angle side collision, angular collision, side swipe or squeezed. Over the ten-year period, side impact collision category has shown reduction except for angular collision which has seen an increase by 16.8%. Figure 3 depicts the percentage of KSI side collisions involving motorcycle from 2001 - 2010.

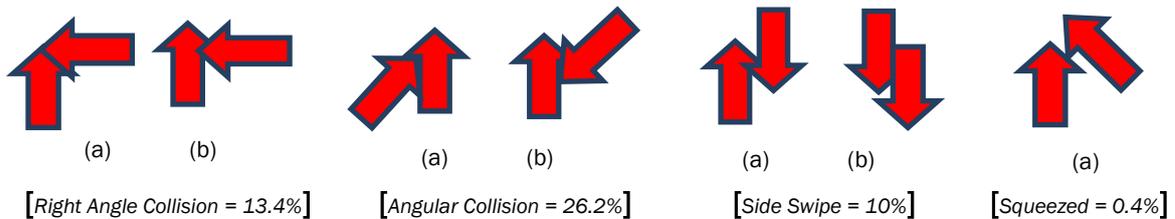


Figure 3: Percentage of KSI Side Collisions Involving Motorcycle from 2001 - 2010

## MOTORCYCLIST (RIDERS) CRASHES—CASES BY MOTORCYCLIST FAULTS

As the trend of fatal accidents involving motorcyclist has been on increasing trend for the last four years, it is essential to see what are the possible actions/riders fault that might be associated with the increment. Figure 4 shows types of rider's fault, based on 10 years data (2001-2010), for all fatal accidents involving motorcyclist. Top seven types of driver's fault are used to generate the chart. Overall, a significant reduction (around 70-80%) in number of riders involved in each fault is observed throughout the period. Biggest reduction on careless driving is quite obvious where the series start with 635 riders involved in 2001, and ends with only 92 drivers in 2010. Other types of driver faults also followed the same trend, except for the violation to traffic light. Violation to traffic light has been stagnant at around 30 since 2001-2009. However, there is

a sudden increase in violation to traffic light in year 2010, where the figure jumps to 118.

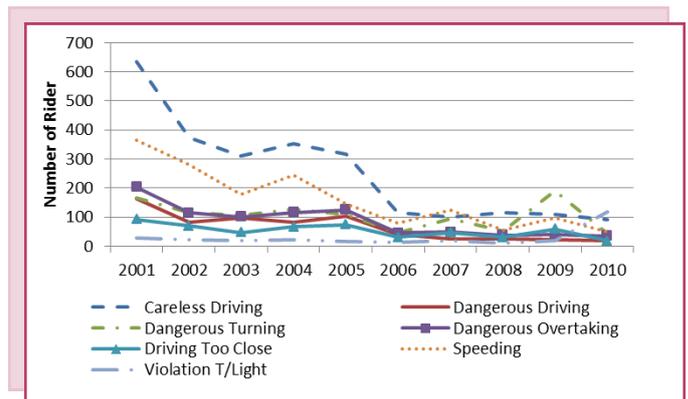


Figure 4: Rider hitting pedestrian

**MOTORCYCLE CRASHES-CASES BY CRASH AREA(LAND USE TYPES)**

“Different types of land use may generate or attract different volume of traffic which in turns has a potential to cause road accidents..”

Land use is based on the functional dimension of land for different human purposes or economic activities. Land use can be classified into the form of activities such as industry, housing, cities, institutions and others. In Malaysia, land use activity is influenced by the planning done by the Town and Country Planning Department (JPBD) in each district council or local authority (PBT).

Land use classification based on Town and Country Planning Department (JPBD) are: residential; industries; business and services; institutions and public amenities; open space and recreation; vacant land; transportation; infrastructure and utilities; agriculture; livestock and aquaculture; forest; and water body. Land use and transportation can be considered as two sides of the same coin. Decision made in transportation will affect land use and is also two for the other way around. A different types of land use may generate or attract different volume of traffic which in turns has a potential to cause road accidents.

Figure 5 shows accidents involving motorcycle by area type. The result that there are not much different in number of motorcycle accidents recorded between 2005 until 2010. High number of fatalities recorded at rural area (66.62%) compared to city (4.60%), urban (11.49%) and built-up area (17.29%). Urban areas are defined as the area under the territory of a city council while suburban areas are defined as areas with populations exceeding 50,000. The rural sector economy is mainly agriculture-based.



Figure 5: Area of accidents involved motorcycle (2005-2010)

Figure 6 shows the crash locations of motorcycle accidents for the past 10 years (2001 – 2010). The result shows that 40.34%

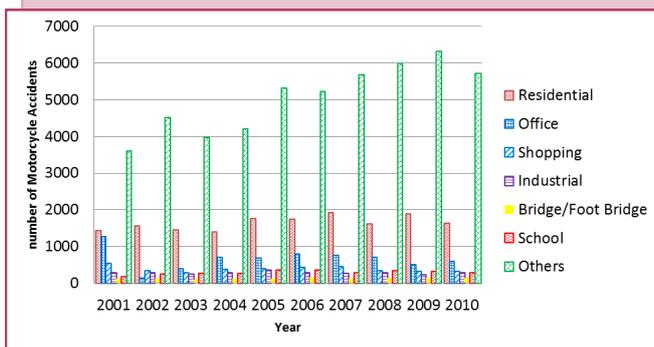


Figure 6: Crash locations of motorcycle accidents (2001-2010)

crash occurred in active land use which generate and attract more traffic and consequently cause road accidents. This percentage include 19.56% crashes occurred at residential area, 7.62% at office area, 4.70% at shopping centre area, 3.41% at industrial area, 3.51% at school area and 1.53% occurred at bridge/foot bridge. Meanwhile the remaining 59.66% crashes occurred in other types of land use such as green area (forest, agriculture, recreation, open space etc.) which are mainly found in rural areas.



## LIST OF PUBLICATIONS RELATED TO MOTORCYCLE RESEARCH IN MALAYSIA (2010-2011)

- Adnan M.A, Mohamad Yusof, A. et.al. "Exploration of Traffic Performance Measures for Exclusive Motorcycle Lane at Diverging and Basic Segment Facilities." *Road Transport Information and Control Conference and the ITS United Kingdom Members Conference (RTIC)*. 2010.
- Azzuhana Roslan, Rohayu Sarani, Sh. Allyana Syd. Mohamed Rahim. "Does Land Use Have Any Impact on Motorcycle Accidents: A Case Study of Urban District in Malaysia." *10th National Conference on Injury Prevention and Safety Promotion*. Brisbane, Australia, 2011. 138-139.
- C.L.Tan, S.V.Wong. "Establishment and Development of Laboratory Based Motorcycle Crash Test Facility." *IMPLAST*. Rhode Island USA, 2010.
- H.Hashim, Syed Iqbal. "Motorcycle Accidents is The Main Cause of Maxillofacial Injuries in The Penang Mainland, Malaysia." *Dental Traumatology* (2011): 19-22.
- MKA Ibrahim, M. Faudzi MY. "Use of Instrumented Motorcycle to Measure the Effectiveness of Malaysian Rider Training: A pilot Study." *Proceeding of the Sixth Inter Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design*. n.d.
- R.Ramli, N.A.Rahmanet.al. "A Retrospective Study of Oral and Maxillofacial Injuries in Seremban Hospital, Malaysia." *Dental Traumatology vol. 27* (2011): 122-126.
- Rohayu Sarani, Hizal Hanis Hashim. "Head Injury Characteristics Among Helmeted and Non-Helmeted Motorcyclist in Urban Setting." *10th National Conference on Injury Prevention and Safety Promotion*. Brisbane, Australia, 2011. 184-185.
- S.R.Davood Hussain Hamid, Mahdieh Pazhouhanfar, Jeffry W. Muttart. "Motorcyclist Perception Response Time In Stopping Sight Distance Situations." *Safety Science* (n.d.).
- S.S. Ooi, S.V. Wong, J.S. Yeap, radin Umar R.S. "Relationship Between Cervical Spine Injury and Helmet Use in Motorcycle Road Accidents." *Asia Pacific Journal of Public Health Vol.23* (2011): 608-619.
- SF Faezi, H. Hamid, SR Davoodi. "Predicting Speed Model of Horizontal Curves on Exclusive Motorcycle Lane". *Australian Journal of Basic and Applied Science 5* (2011): 590-598.
- SF Faezi, H. Hamid, SR Davoodi. "The Effect of Pavement Marking on Speed Reduction in Exclusive Motorcycle lane in Malaysia." *Contemporary Engineering Science Vol. 3* (2010): 149-155.

### DISCLAIMER

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