

MOTORIZATION IN INDONESIA AND ITS IMPACT TO TRAFFIC ACCIDENTS

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This paper discusses motorization in Indonesia representing most of the traffic phenomena in many growing cities in Indonesia like Jakarta. This motorization has, however, created traffic safety problems due to poor traffic management and a failure of controlling motorization especially the growth of motorcycles. Fatalities in traffic accidents are significantly high and remain at a high rate. The imbalance of supply-demand in transport needs seems to be the main problem, that growth of motorization of 10% per year is only followed by less than 1% per year of road infrastructure growth. Unfortunately, human errors have been indicated as the main cause of many traffic accidents and so the fatalities. In such a situation, traffic safety improvement may have vast task to involve human behaviour and its characteristics, so it requires accurate data and information for analyses. Finally this paper also proposes some mechanism of acquiring useful traffic data and information through some traffic portraits that may cover analysis needs qualitatively and quantitatively.

Key Words: Motorization, Traffic safety, Traffic fatalities, Human errors, Traffic portraits

1. INTRODUCTION

It has been a long debate among stakeholders of the transport system in Indonesia regarding the responsibilities of the tremendous increase in traffic accidents. Among stakeholders are the Police Department, Ministry of Communications, Ministry of Public Works, Local Governments, Operators of Public Transports as well as users. Reports on transport accidents of all modes, e.g., air transport, sea transport and even land transport covering rail, bus, and private cars and motorcycles are steadily increasing from time to time. Causes of accidents are indicated as a combination of human, vehicle, facility and infrastructure and even environment errors, but most blame is due to human errors.

Despite desultory errors occur in any accidents, it is suspected that basic problems may be embedded from the imbalance of supply and demand of transport itself, and it includes all modes of transport especially in the urban areas. It is not an uncommon situation that when demands reach the condition above supply capacities then any chaotic performance may happen, i.e., traffic accidents. An illustration can be made regarding this imbalance situation such as the growth rate of motorization in Jakarta that has reached over 10% per year compared to

the growth rate of road infrastructure that does not even reach 1% per year. This phenomenon has been made worse off by the popularity of motorcycles that is skyrocketing due to its flexibility in the movement as well as the ease of ownership. Nevertheless, local government has no control of the situation and seems to be enjoying the revenue from ownership taxes, but as a result there is a steady increase in traffic accidents coming from these two-wheelers. Similar trends could be also found in other cities of the country, and may aggregate to an even higher number of traffic accidents as a whole.

The content of this paper is three-fold. Firstly, a tight relationship of motorization and traffic accident is elaborated in the ensuing section. Secondly, general difficulty of determining traffic safety indicators as impacted by motorization is discussed. Thirdly, a mechanism of acquiring prevailing indicators is proposed through some portraits in order to reach consensus on accurate or firm motorized traffic safety data and cases.

2. MOTORIZATION & TRAFFIC ACCIDENTS

Rapid motorization in almost all big cities in Indonesia has become a current trend of the transport phenomena. However such rapid motorization is not followed

by proportional growth of road infrastructure and other land transport facilities, such bus terminals or stops, parking facilities and others, that have made worse off the traffic circulation that tries to ease performance. Seeing the phenomena in a broader picture may give some insight also that motorization in Indonesia is very much weighted to the private vehicle, namely four and two wheelers.

Elaborative discussion in section 4 is definitive that unstable growth of any supply and demand especially amplified by motorization of road vehicles (see Fig. 3) are the main problems to notorious traffic accidents. A case can be made also to other modes of transport such as rail transport, water and air transport in which there are slow growth of capacities in such alternative modes. The railway system as one of the competitors of road transport and is underdeveloped and has made almost no progress for many decades. Needless to mention, air and water transport could hardly compete to gain patronage switching from road vehicles. So the more patronage of trip makers has somehow overloaded road capacity and raised adverse impact such as traffic accidents.

Rapid motorization in many big cities has not been followed, not only by road growth, but also by restructuring road network development like the road hierarchy that should have been expected to eliminate some of the traffic chaos. Furthermore, inconsistency in land use plan and rapid growth of the population in some cities again has made it that motorization has gained an image of traffic destruction rather than improvement. The number of traffic accidents has shown this notorious impact of motorization, and has been even dramatized by traffic accident fatalities. So this paper tempts not only to discuss motorization but also to discuss traffic safety related to motorization, and even its indicators which is an important issue to traffic accident alleviation and its related counter actions.

3. TRAFFIC SAFETY INDICATORS IN INDONESIA

Up to this moment measuring traffic safety in Indonesia is hard to conduct, and it is mainly due to the irrelevance of traffic accident data available at the Police Department for indicator determination. Recording data of traffic accidents at the Police Department has been made since initially being introduced in the 1950's. It is, however, the fact that not all data is able to be recorded since there are some cases which are not reported to the police by victims or those involved, and they make their own settlement at the accident scene. Self-settlements

among victims are not always beyond the knowledge of the police, and as a consequence they are not put in formal police reports. It is also indicated that such self-settlement often occurs when an accident does not involve any casualties.

Due to such low quality of reporting, most traffic accident data in Indonesia is not accurate and so cannot be used for traffic safety analyses. Internal problems of the Police Department have made even worse the quality and quantity of traffic accidents. There has, however, been efforts to improve such quality gradually as performed by the Jakarta Police Department. For example, some improve data is depicted in Figure 1 whereas the number of fatalities have risen more than 100% in the years between 2002 and 2004 due to better records.

At a national level traffic safety is not being a main issue or agenda yet, though there is a good intention of making a gradual improvement for transport safety due to current significance growth of transport accidents. As for road traffic accidents, the National Police Department had reported in 2006 of 16,000 fatalities. However, this number did not comply with data available at insurance companies (e.g., PT Jasa Raharja) which showed 30,000 fatalities. This difference might be caused by different definition of both institutions for death, whereas the Police Department may determine death at the accident scene while insurance companies may have to wait and count 30 days after the event.

So it is then necessary as discussed in the ensuing sections that some prevailing indicators of traffic safety should be determined for traffic safety analyses. As proposed in the sections an approach mechanism to portray problems seem to be reasonable in acquiring more accurate data of accidents.

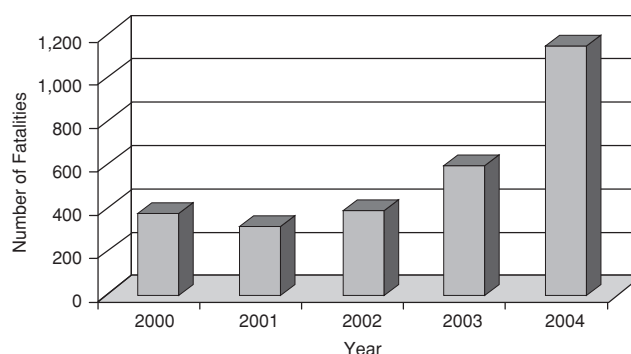
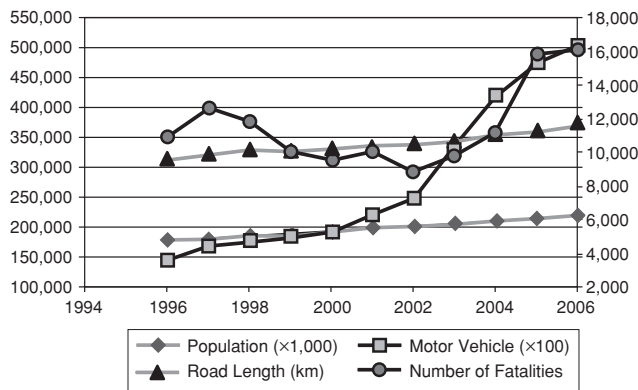


Fig.1 Data of traffic fatalities in Jakarta Metropolitan area¹

4. PORTRAIT OF TRAFFIC ACCIDENTS

Figure 2 depicts traffic safety performance in Indonesia as comparing number of fatalities (right Y-axis) with other indicators such as population (left Y-axis), number of vehicles (right Y-axis) and length of road (left Y-axis). It is clear from Figure 2 that growth of vehicles is dramatically increasing within last five years until 2005. This number has grown doubled with highest contribution coming from motorcycles as can also be shown by Figure 3. This growth of vehicles had also been followed by number of fatalities in traffic accidents. It has also been reported in many studies that suspecting no significant traffic improvement in five to ten years to come such fatalities would have been growing and multiplying. And this number could have even become the highest number of fatalities as compared to fatalities due to epidemic diseases, work accidents or natural disasters.



Source: National Police Dept, 2006

Fig. 2 Traffic safety performance²

4.1 Portraying traffic accidents with vehicle growth

Portrait 1: Motor vehicle growth or motorization has a direct correlation with the number of fatalities in traffic accidents

This portrait can be denoted by Figure 3 that shows definite growth of vehicles of all modes in the last four to five years. Significant growth in every year had been dominated by motorcycles, and this number keeps growing until now. Motorcyclist's behaviour, which is reckless and more dense of roads is the blame of higher fatalities of motorcycle accidents.

4.2 Portraying traffic accidents with age of victims

Portrait 2: Age of victims in traffic accidents seems to have a certain correlation

Figure 4 depicts the correlation among ages of traffic accident victims and their number of fatalities, based on data recorded in 2004 and 2005 and total fatalities of 273,319 people. This correlation may not be simple since it can inter-relate with other variables, but some correlation may explain that maturity in age may have an impact to frequency of accidents itself. From Figure 4, it can be analysed that productive ages of between 20 to 45 years old occupy the highest number of fatalities. These numbers may have to represent the number of those road users who are high due to the population structure, and also some other intervening maturity of drivers as driving behaviors. This maturity can further be elaborated from the young drivers of 20 to 30 years old who have an even higher rate of fatalities.

This fatality phenomenon that relates to age has some further impact on economic loss. It is because the higher rates affect those who are at their productive age with economic value in their work. So an uncontrollable

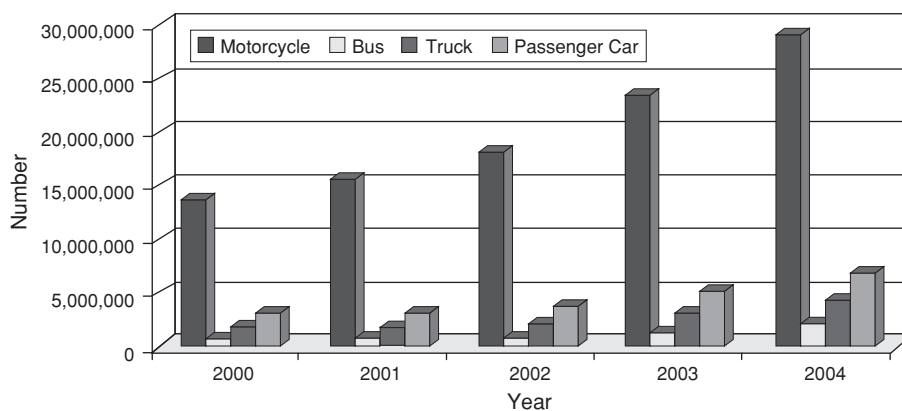


Fig. 3 Motor vehicle growth by modes in Indonesia¹

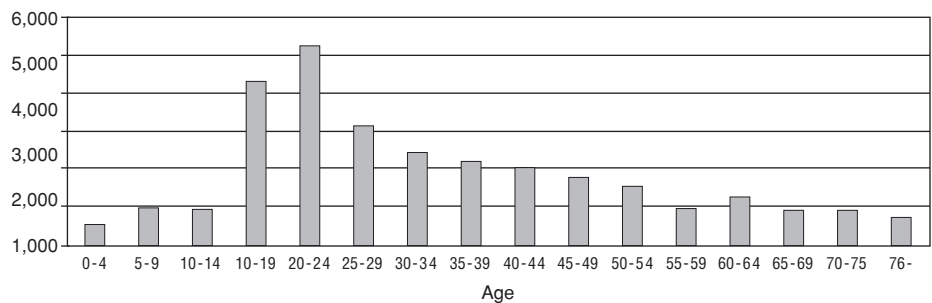


Fig. 4 Number of fatalities in correlation with age¹

growth in fatalities of traffic accidents that takes some of the productive age may represent the an economic loss in the future unless counter-measures are taken into place.

4.3 Portraying traffic accidents with driving license

Portrait 3: There are some reckless drivers with ignorance of having no driving license. It can be suspected that some correlation with traffic accidents due to less driving knowledge and capacity exists.

Figure 5 depicts the situation of which growth of vehicle ownership may not necessarily be followed by increase in number driving licenses. The explanation can be twofold, firstly the ownership of a vehicle can be more than one for each person, and secondly use of vehicles at one time could have increased at the same time. So the prevailing reason would be not only the number of owned vehicles per person increases, but also new owners are

increasing. This is especially true when motorcycles are being discussed. There have also been many traffic violators caught by police are motorcyclists.

So growth of vehicles is sometimes not followed by increase in driver licenses. The notorious culprits are mostly motorcyclists, but special care should also be given to existence of public transport vehicles. It is apparent also from Figure 5 that increase in public transport vehicles is not followed by growth of public transport driving licenses. The argument is logical, though absolute number of fatalities from motorcycle accidents is high but its ratio (number of fatalities per vehicle) is not high as compared to public transport (e.g., bus). It means further that bus accidents are low in frequency but it does cause more casualties or fatalities. Similar arguments can also be made for commercial vehicles such as trucks Figure 6 (a and b) depict further this ratio of fatalities per mode of vehicle.

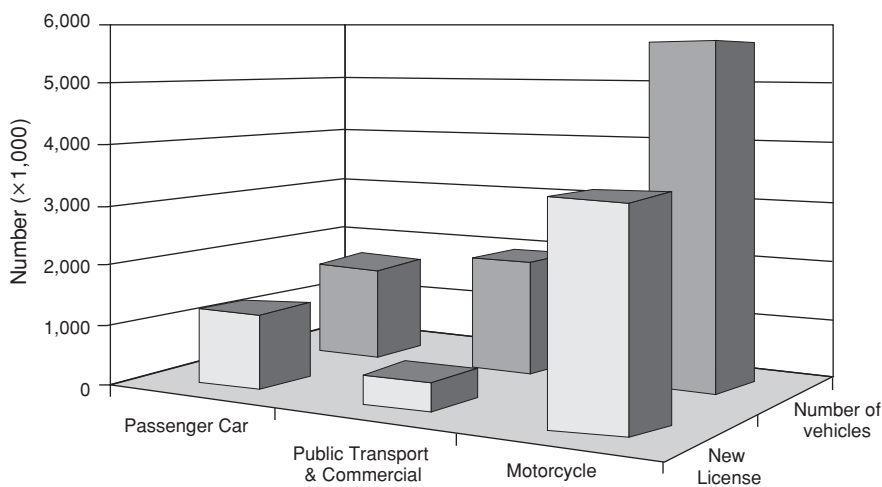


Fig. 5 Comparison of growth of vehicle number and driving licenses (2004)¹

4.4 Portraying traffic accidents with pedestrians

Portrait 4: There are some rationale also to correlate traffic accidents with pedestrians. The fatalities coming from this group of road users are sufficiently high.

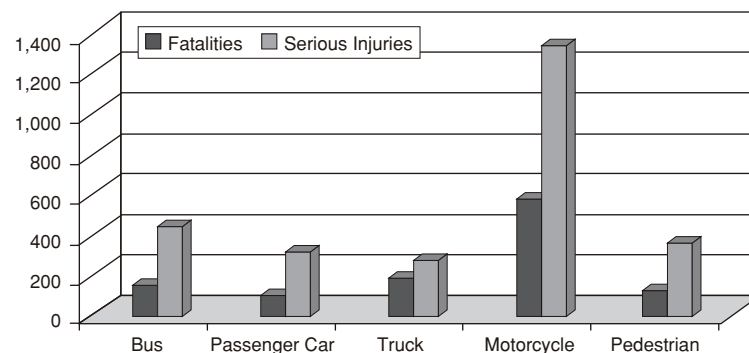
Figure 6 (a) depicts also that quite sufficiently high number of fatalities and serious injuries are associated with pedestrians. This group of road users sometimes has the most adverse impact from other modes, and results in severe fatalities. This group then should obtain more attention from traffic policy makers because they do not have any self-protection. There are a lot of unreported

cases of 'hit-and-run' accidents involving pedestrians, and even it is suspected that pedestrians get have a greater proportion of such a kind of traffic accidents in Indonesia.

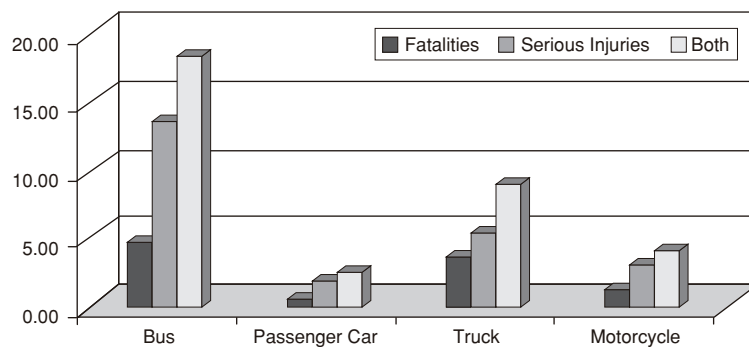
4.5 Portraying traffic accidents with human errors

Portrait 5: This is recognized that most traffic accidents are caused by human errors. However, further investigation must take place as for not blaming the dead victims as the cause.

The cause of traffic accidents may be categorized into three components, namely human (driver) errors, ve-



(a) Number of fatalities & serious injuries of traffic accidents by modes



(b) Ratio of fatalities & serious injuries per 1,000 vehicles by modes

Source: Jakarta Police Department

Fig. 6 Traffic accident fatalities by modes¹

Table 1 Factors influencing traffic accidents in Indonesia¹

Factor	Cases	Fatalities	Serious Injuries	Slight Injuries
Human	93 %	92 %	90 %	90 %
Vehicle	4 %	5 %	6 %	7 %
Roads & Environments	3 %	3 %	4 %	3 %

Source: Jakarta Police Department (2005)

hicles, and roads and their environments. This is indicated in many traffic accident cases that human errors occupy the highest number as the cause. Table 1 further depicts a high proportion of human errors in many traffic accidents.

In many developing countries rates of errors due to vehicles and road/environment occupy significant portions too. This situation may occur for lack of inspections to poor conditions of cars, and roads both geometrically and structurally. For example, traffic accidents caused by human errors in England is 95% in proportion which is higher as compared to the situation in Indonesia.

Many traffic accident reports in Indonesia claim for poor brake system of vehicles as well as poor performance of road pavements and others, and it denotes that human errors are not the only cause. Even in many traffic accident studies and research, it is convinced that traffic accidents cannot be caused by only one factor, rather it is caused by many interacting factors of human, vehicle, road and environment. However, in many developing countries the human factor as accident causes should be learnt further since it has many troublesome backgrounds. For example many public transport drivers are forced to drive vehicles with loads exceeding the capacity, many poor road maintenances, and poor vehicle conditions, and this adverse condition is amplified by poor or non-existence of traffic enforcement.

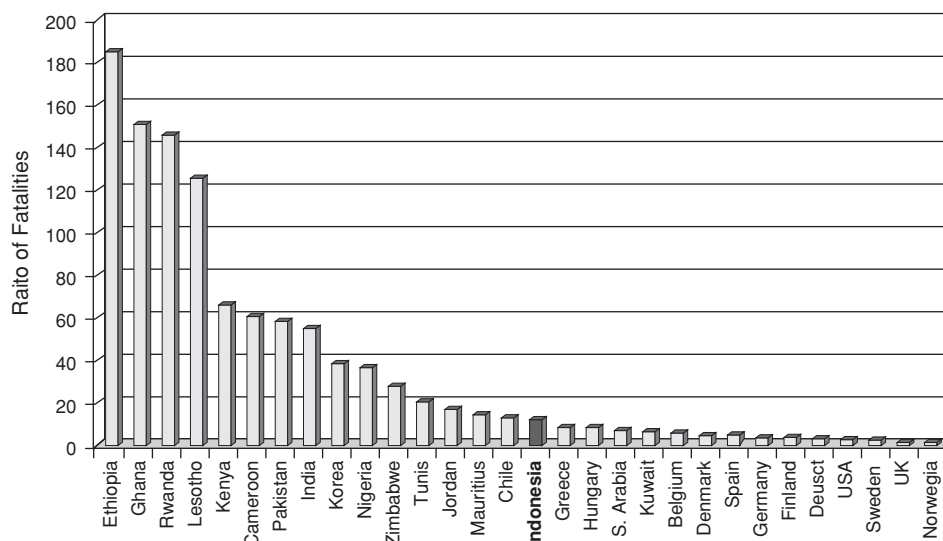
Better public awareness on traffic safety and strong enforcement on traffic regulation may seem wise to recover weakness of human errors in any single traffic ac-

cident. The tendency of claiming drivers as human errors that causes traffic accidents should not overshoot and come up to be the easiest way to get rid of the problems. It is, in whatsoever, unfair to claim the dead in traffic accidents besides such human errors may be influenced by other factors beyond the driver alone.

4.6 Portraying traffic accidents with international conditions

Portrait 6: Having some comparison or benchmark with other countries may sometimes be wise to comprehend traffic safety. This comparison may give an insight on self-position and learn a lot of resolution.

Figure 7 depicts the position of traffic accidents in Indonesia as compared to many other countries in the world as of 2001. Figure 7 is taken from Transport Research Laboratory (TRL) of United Kingdom with the addition of Indonesia in order to see Indonesia’s position. This figure denotes the ratio of fatalities defined in traffic safety concession as the number of fatalities by 100,000 population or 10,000 vehicles depending on the size of the country. From this picture any traffic analyst may have some wisdom to overview the embedded problems of traffic accidents or safety. Furthermore, a lot can be learnt from others regarding similarities and differences so that prompt action and affirmative resolution may be made efficiently and effectively.



Source: TRL, UK (1991) and Indonesia Police Department

Fig. 7 Comparison of traffic accident fatalities among countries in the world^{3,4}

5. CONCLUSION

This paper tempts to discuss impact of motorization in Indonesia and its impact to traffic accidents in Indonesia, as further accident impact to trip makers themselves, e.g., fatalities. Complication of embedded transportation problems related to the imbalance of supply and demand of the transport system in the frame of quantities or capacities known as motorization might have to come up as the main cause. Reports on fatalities of traffic accidents further reflect inaccuracy which cannot be considered as reliable data and for accident analyses. It is then proposed that some prevailing indicators should be determined in order to perform better and more accurate data.

Some of the portraits are indicated and proposed as a mechanism to locate traffic accident data. Such mechanisms are expected further to be used as indicators to elaborate the cause of accidents, spot of accidents (i.e., black spot), and to be utilized to predicting traffic accidents in traffic planning, and even further as economic assessment of traffic safety valuation.

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