UNIVERSITI PUTRA MALAYSIA

PASSSENGER KILOMETER TRAVELED OF THE EXPRESS BUSES IN MALAYSIA

KARIM BIN AB.HADI

PASSSENGER KILOMETER TRAVELED OF THE EXPRESS BUSES IN MALAYSIA

By

Karim bin Ab.Hadi

This project report is submitted as part of fulfillment for Master of Science Degree of Highway & Transportation Engineering

May 2008

Abstract of project report presented in fulfillment of the requirement for the

Master of Science Degree

PASSENGER KILOMETER TRAVELED OF THE EXPRESS BUSES

IN MALAYSIA

By

KARIM BIN AB.HADI

May 2008

Supervisor : Dr. Hussain Hamid

Faculty : Engineering

It is the time for Malaysia to move forward to a certain level by having a variety and reliable road safety indicators. Study on passenger kilometer traveled specifically for express buses in Malaysia maybe relatively small effort but very significant step and meaningful contribution towards road safety development in Malaysia.

This study intends to develop another road accident fatality indicator .i.e. fatality per billion passenger kilometer traveled (PKT) for road transport in Malaysia. Since passenger and distance traveled are the main components of risk exposure, therefore PKT is seen to be more appropriate road safety indicator especially related to fatality and injuries involving occupants of the vehicles. It is hoped that further research or study especially those related to passenger kilometer traveled could be benefited from this study.

The conventional method of data collection in terms of travel data and traffic casualties was employed. Secondary data required for analysis were obtained mainly from the bus operators and police records. To ensure data has significant level of confidence, validation and verification measures were carried out through statistics approaches and use of the latest technology such as GPS for verification purpose. Analysis was carried out using two different approaches with intention to compare the results obtained from each method.

Fatality per billion passenger kilometer traveled (PKT) depends on the reliability of the number of fatality and the accuracy of the passenger kilometer traveled estimation. Based on the study finding the estimated PKT value of express bus in Malaysia in 2007 was 25.05 billion. Using this estimated PKT value together with estimated fatality of 26 specifically involving drivers and passengers of express buses in 2007, it is therefore estimated that fatality per billion PKT of the express buses in Malaysia in 2007 was 1.04.

Abstrak laporan projek dikemukakan sebagai memenuhi keperluan untuk

Ijazah Sains Master

PERJALANAN KILOMETER PENUMPANG BAGI BAS EKSPRES DI MALAYSIA

Oleh

KARIM BIN AB.HADI

Mei 2008

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Sudah tiba masanya untuk Malaysia melangkah ke hadapan untuk mencapai suatu tahap standing dengan negara-negara maju di dunia iaitu mewujudkan petunjuk keselamatan jalan raya yang pelbagai dan boleh diharapkan. Kajian perjalanan kilometer penumpang khusus untuk bas ekspres di Malaysia mungkin dilihat kecil namun ianya merupakan langkah yang positif dan sumbangan yang amat bermakna terhadap usaha penambahbaikan tahap keselamatan jalan raya di Malaysia.

Kajian ini bertujuan untuk mewujudkan suatu indeks kematian membabitkan kemalangan jalan raya iaitu kemation per billion perjalanan kilometer penumpang untuk pengangkutan jalan di Malaysia khususnya bas ekspres itu sendiri. Memandangkan penumpang dan jarak perjalanan merupakan komponen utama risiko pendedahan, oleh itu ia dilihat sebagai indeks keselamatan jalan yang lebih tepat terutama berkaitan kematian dan kecederaan pengguna kenderaan. Diharapkan kajian lanjut khususnya berkaitan perjalanan kilometer penumpang akan mendapat manfaat daripada kajian ini.

Pengumpulan data secara konvensional dari segi data perjalanan dan kematian akibat kemalangan jalan raya telah digunapakai dalam kajian ini. Data sekunder yang diperlukan dalam analisis telah diperolehi terutama daripada rekod pihak pengusaha bas dan polis. Bagi memastikan data yang digunakan dalam analisis mempunyai tahap keyakinan yang tinggi, penapisan dan penilaian data telah dijalankan melalui kaedah statistik dan penggunaan teknologi terkini seperti GPS. Analisis telah dijalankan melalui dua kaedah berbeza bertujuan membandingkan keputusan kedua-dua kaedah berkenaan.

Kematian per billion perjalanan kilometer penumpang bergantung kepada tahap kebolehpercayaan angka kematian yang dilaporkan serta ketepatan anggaran perjalanan kilometer penumpang. Berdasarkan hasil kajian ini, perjalanan kilometer penumpang untuk bas ekspres di Malaysia pada 2007 ialah 25.05 billion. Mengambil kira anggaran ini beserta anggaran kematian sebanyak 26 orang membabitkan pemandu dan penumpang bas ekspres, maka kematian per billion perjalanan kilometer penumpang bas ekspres di Malaysia pada tahun 2007 ialah 1.04.

ACKNOWLEDGEMENTS

Alhamdulillah praise to Allah the most gracious the most merciful for giving me everything to complete this project report.

In fact it is not possible to complete this project report without good cooperation and support from various parties. I would like to take this opportunity to thank my supervisor Dr. Hussain Hamid and Prof. Dato' Ir. Dr. Radin Umar Radin Sohadi for their valuable advice, constructive criticism, support, and most importantly the guidance given. Not to forget special appreciation to Assoc. Prof. Dr. Ratnasamy Muniandy for his valuable advice in many aspects.

Contribution of data from the express bus operators involved in this study is highly appreciated. Without good participation in terms of willingness to give their important data this study definitely will face remarkable difficulties.

Additionally contribution in terms of data and cooperation from government agencies like Royal Malaysian Police (PDRM), Malaysian Road Transport Department (JPJ), Commercial Vehicle Licensing Board (LPKP), Malaysian Institute of Road Safety Research (MIROS), Malaysian Road Safety Department (JKJR) is highly acknowledged and appreciated.

Lastly I would like to thank everybody who support and giving me valuable idea in the preparation process of this project report including my beloved family.

This project report entitled,

PASSSENGER KILOMETER TRAVELED OF THE EXPRESS BUSES IN MALAYSIA

By

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DECLARATION

I hereby declare that the project report is based on my original work except quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

KARIM BIN AB.HADI

Date: 9 May 2008

CHAPTER I

INTRODUCTION

1.1 ROAD SAFETY ISSUES IN MALAYSIA

Based on the available statistics from year 2000 up to year 2005 as shown in Table 1.1 it is found that casualties involving commercial vehicles such as express bus, school bus, trailer, lorry, etc are raising. Within five year period the casualties involving commercial vehicles increased by about 92% from 1357 in year 2000 up to 4467 in year 2005 as shown in Table 1.1. It means an average of about 18% increase per year. In addition, there was about 123% increased of the fatalities from 384 up to 856 within the same period, i.e. an average increase per annum of 25%. The same scenario goes to serious or hospitalized category with number of increase by 643 (120%) from 538 in year 2000 and reached 1181 in year 2005. The worst case is found on light injury with a huge amount of increase by almost 460% with respective increase of about 92% per annum within the same period. Figure 1.1 shows the trend of casualties involving commercial vehicles in Malaysia. This scenario is alarming and need to be addressed by improving various aspects including the driver management, fleet management, vehicle management, journey management, better infrastructure, road safety education among the drivers, public, etc.

Table 1.1. Road Accident Casualties Involving Commercial Vehicles in Malaysia

Year	Casualties Involving Commercial Vehicle in Malaysia			
	Fatal	Serious / Hospitalized	Slight Injury	Total
2000	384	538	435	1357
2001	492	683	475	1650
2002	496	661	439	1596
2003	709	795	466	1970
2004	869	1133	608	2610
2005	856	1181	2430	4467

Note: Commercial vehicles include lorry, trailer, express bus, tour bus, etc.
(Source: Malaysian Commercial Vehicle Licensing Board, LPKP)

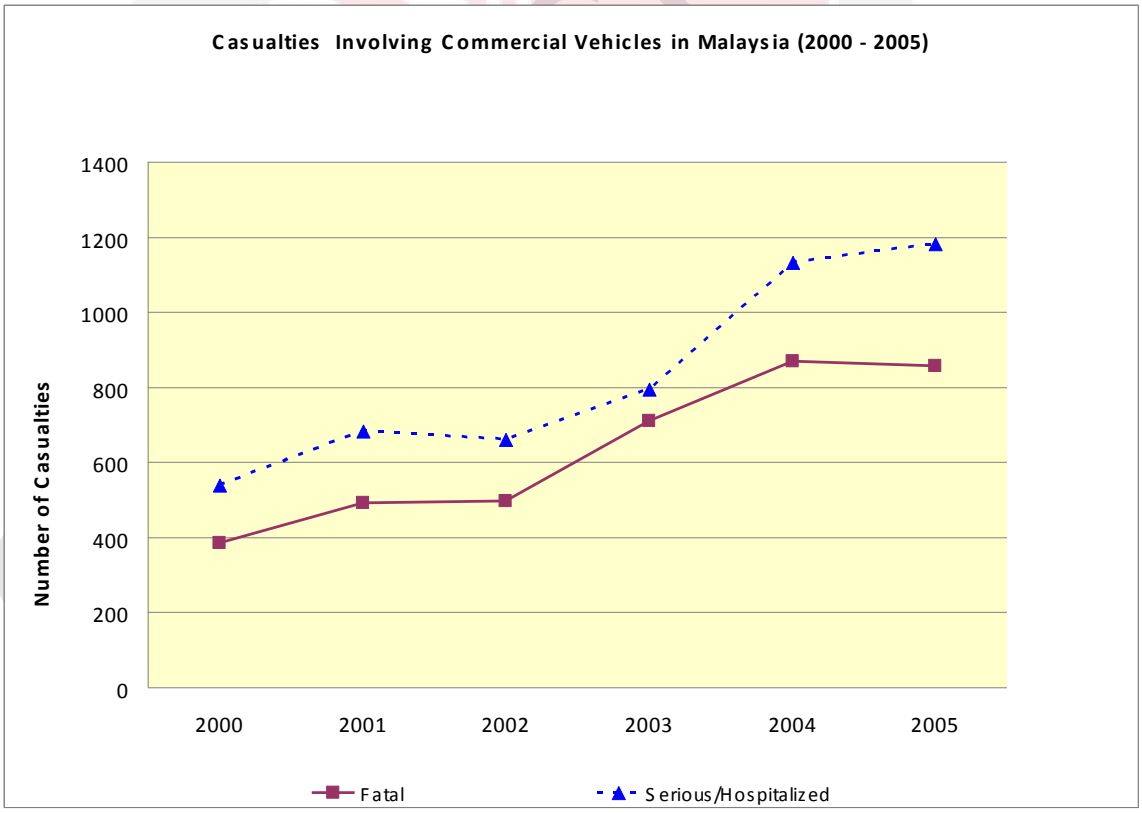

Figure 1.1. Road Accident Casualties Involving Commercial Vehicles in Malaysia
(Source: Malaysian Commercial Vehicle Licensing Board, LPKP)

1.1.1 Express Buses

Express buses are among the main transport system used in Malaysia especially for long distance travel. Recent development with high profile accident involving express buses drawn the public concerned about safety standard of this popular transport system. The public have the right to know about safety situation involving this important transport. This statistics will help to provide necessary information to the public in general and to those directly involved in road safety about the current scenario involving express buses.

In year 2005 number of casualties involving express buses were 918 an increased of 721 cases (366%) as compared to 197 cases back in year 2000. This is about 73% increase per annum within five years period. Numbers of fatalities in year 2005 were more than double the cases in year 2000 with about 186% increase from 56 to 160 cases. Serious or hospitalize cases follow almost the same pattern with fatalities cases with increase of 145 cases from 89 to 234 cases within year 2000 up to 2005 as shown in Table 1.2.

Table 1.2. Road Accident Casualties Involving Express Buses in Malaysia (2000-2005).

Year	Casualties Involving Express Buses in Malaysia			
	Fatal	Serious / Hospitalized	Slight Injury	Total
2000	56	89	52	197
2001	89	143	61	293
2002	107	185	117	409
2003	140	176	126	442
2004	192	314	207	713
2005	160	234	524	918

(Source: Malaysian Commercial Vehicle Licensing Board, LPKP)

As shown in Figure 1.2 the casualties involving express buses are rapidly increasing. Even though the road accident fatality is seen continuously increasing year by year between year 2000 up to 2004 but 160 cases reported in year 2005 was lower 32 (17%) cases as compared to the previous year. Additionally serious/hospitalized cases dropped about 25% from 314 to 234 cases within the same period. This is something very important development towards meaningful overall progress in reducing the fatalities and serious injuries involving this mode of transport in particular.

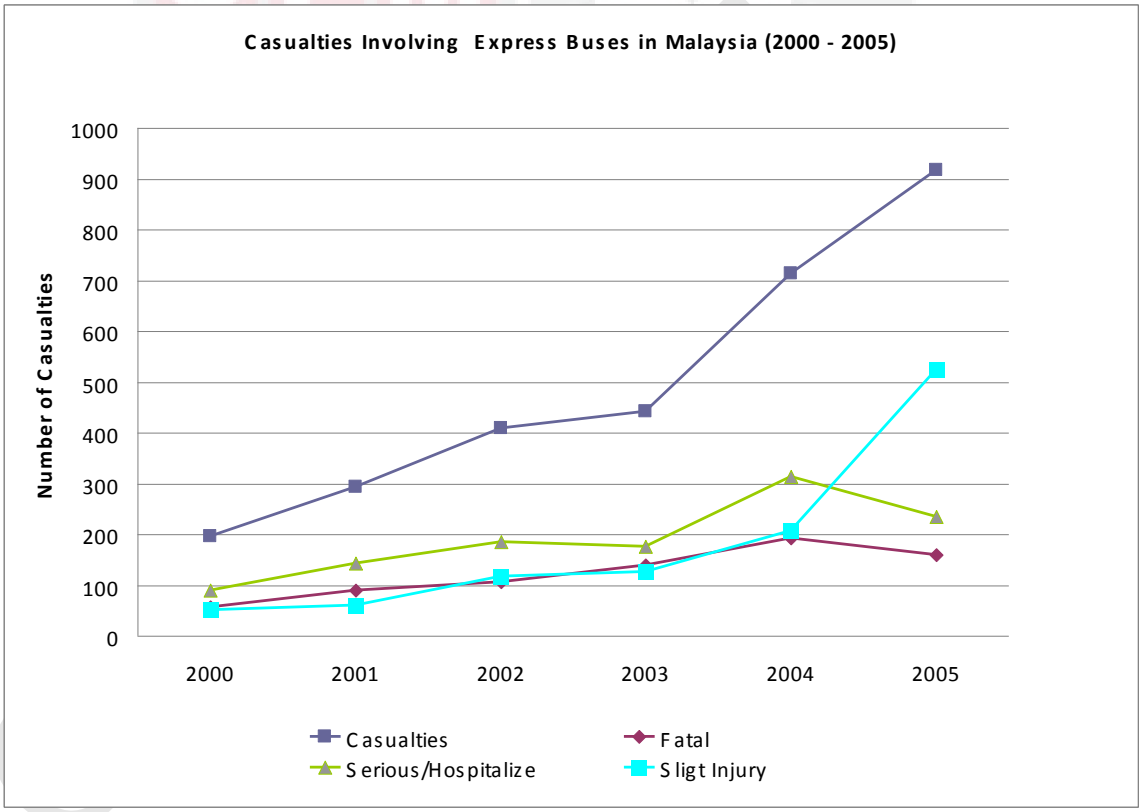

Figure 1.2. Road Accident Casualties Involving Express Buses in Malaysia (Source: Malaysian Commercial Vehicle Licensing Board, LPKP)

Safety situation involving commercial vehicles including express buses must be appropriately evaluated to find out the causing factors and the possible practical and cost effective countermeasures to enhance the current safety situation. PKT study

can be part of the efforts. Through this study casualties and fatalities could be related with more realistic parameters to come out with appropriate safety indicators such as casualties per billion PKT or fatalities per billion PKT.

1.1.2 Fatality Rate Comparison between Malaysia and Other Countries

Statistics data shows Malaysia needs a lot more efforts to be in line with developed countries based on the currently available and used road safety indicators i.e. fatality per 10,000 registered vehicles, fatality per 100,000 population and fatality per billion VKT.

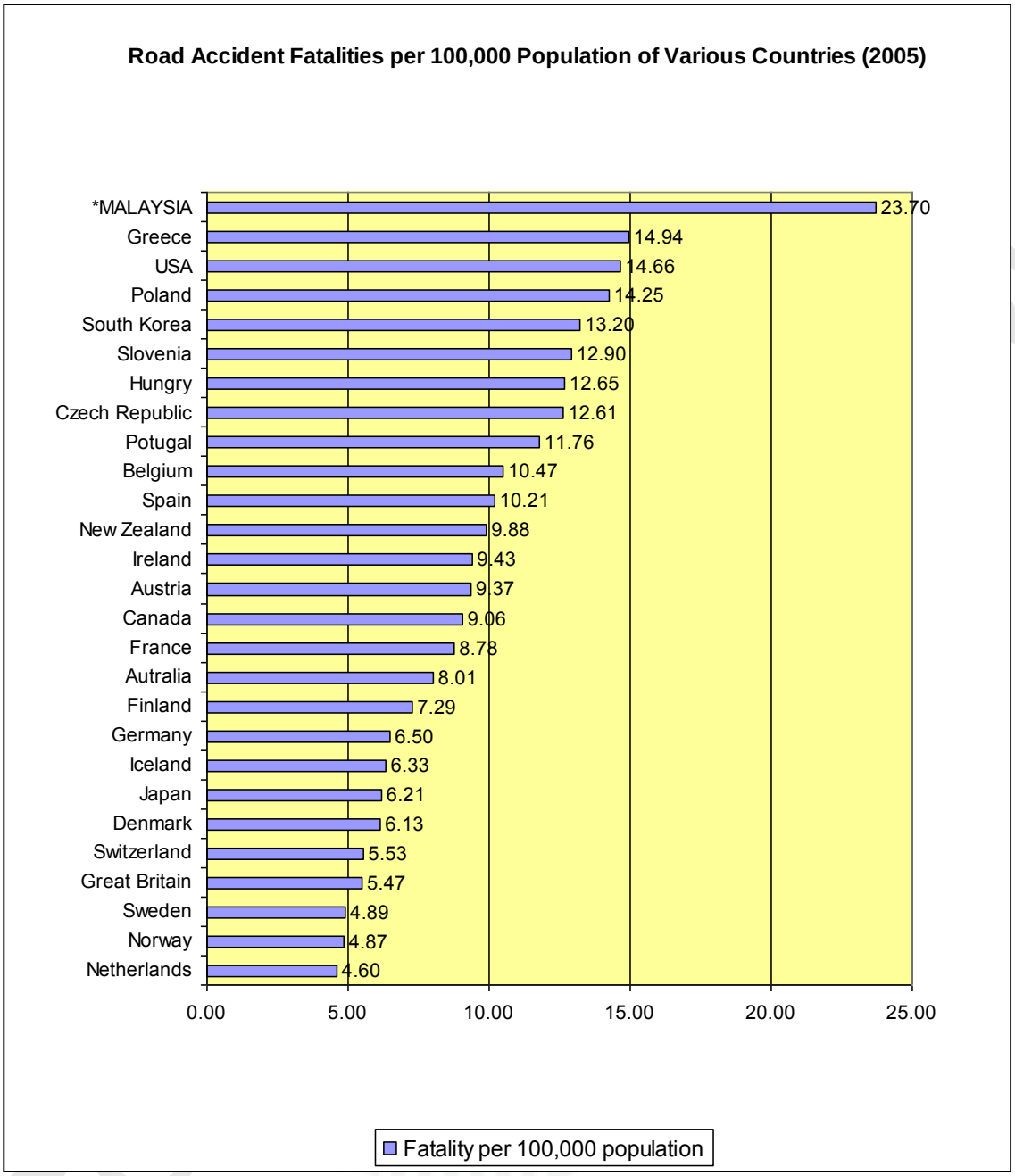

Figure 1.3. Road Accident Fatalities per 100,000 populations of Various Countries (Source: Australian Transport Safety Bureau, ATSB and * Malaysian Institute of Road Safety Research, MIROS)

Based on Figure 1.3 the number of fatality per 100,000 populations passing 20 had made Malaysia at the top of the list. The fatality rate in Malaysia is almost four times higher than Japan, Denmark and Great Britain.

It is clear that most of developed countries like France, Canada, Japan, UK, etc have fatality rate less than 10 except USA with 14.5 fatalities per 100,000 populations. To achieve the national target of reducing the fatality rate to 10 by year 2010 is a big challenge and need a lot of efforts and strategies. Within five years the fatality rate must be brought down by almost 60 percent from 23.70 as recorded in 2005 to 10 by 2010.

In terms of fatality per billion VKT it is noted from figure 1.4 that Malaysia is not left far behind South Korea as in the case of fatality per 100,000 populations. The figure indicates that a lot more efforts and strategies need to be done by those respective parties in Malaysia within five years to come to bring down the fatality per billion VKT to targeted value of 10 as mentioned in Malaysian Road Safety Plan 2006-2010.

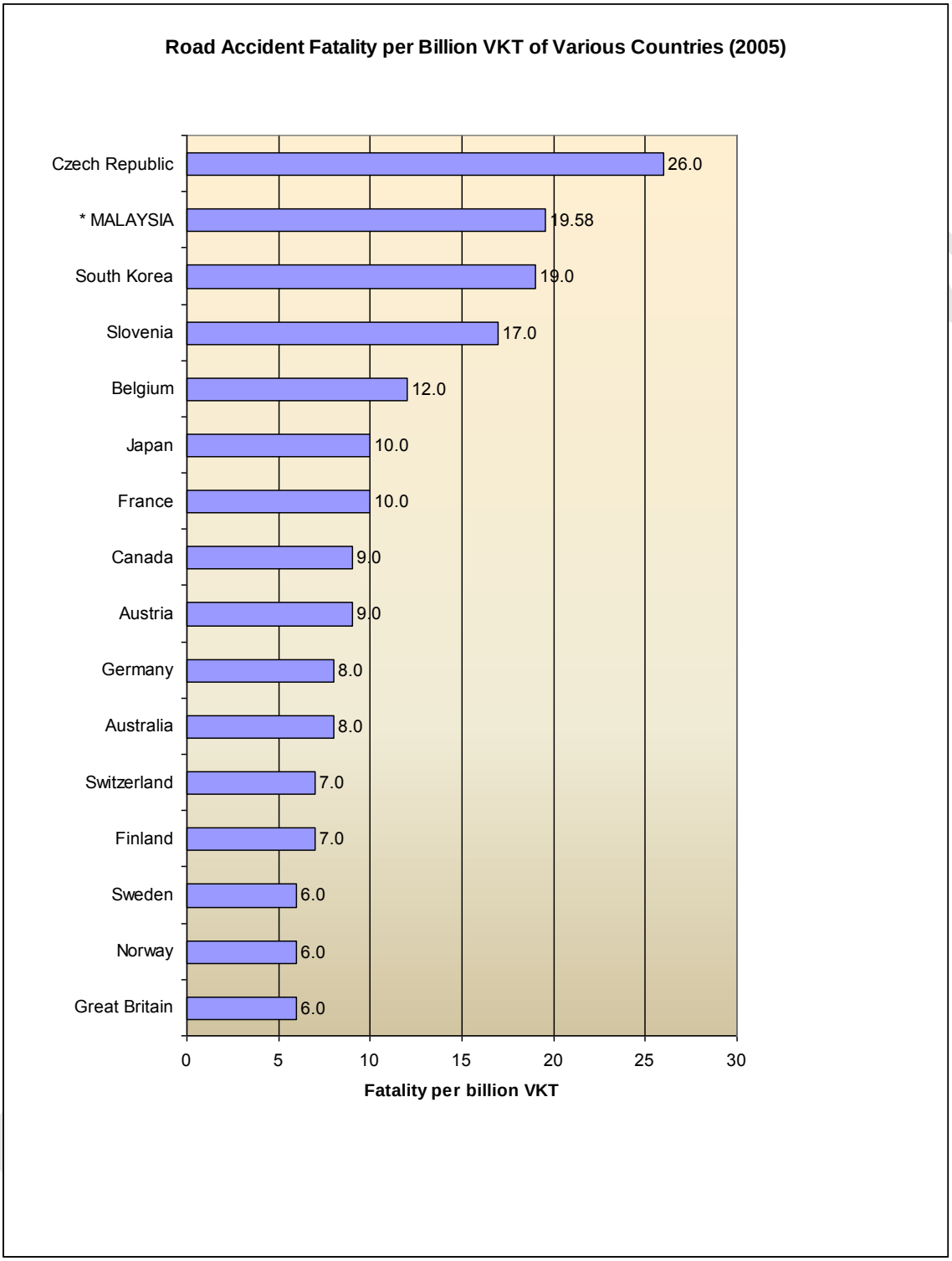

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Figure 1.4. Fatality per Billion VKT of Various Countries

(Source: Australian Transport Safety Bureau, ATSB May 2007 and * Malaysian Institute of Road Safety Research, MIROS)

The trend of fatality rate using Mileage Death Rate, MDR for developed countries seem followed with fatality per 100,000 population i.e. developed countries recorded value of less than 10 for both indicators.

1.1.3 Efforts by Malaysian Government to Reduce Road Accident Fatality Rate

Malaysian government has continuously put its very best efforts to make its road more safer hence reduce the fatalities, injuries and number of accidents involving motor vehicle on Malaysian road. Basically the efforts could be divided into two categories namely prevention and reduction measures respectively.

Malaysian Road Safety Plan 2006 – 2010 comprising nine major strategies aim to improve road safety situation in Malaysia is seen to be the latest effort and strong commitment by Malaysian government to achieve its target by reducing the current fatality per 10,000 registered vehicle into 2 while fatality per 100,000 population and fatality per billion VKT into 10 respectively by year 2010.

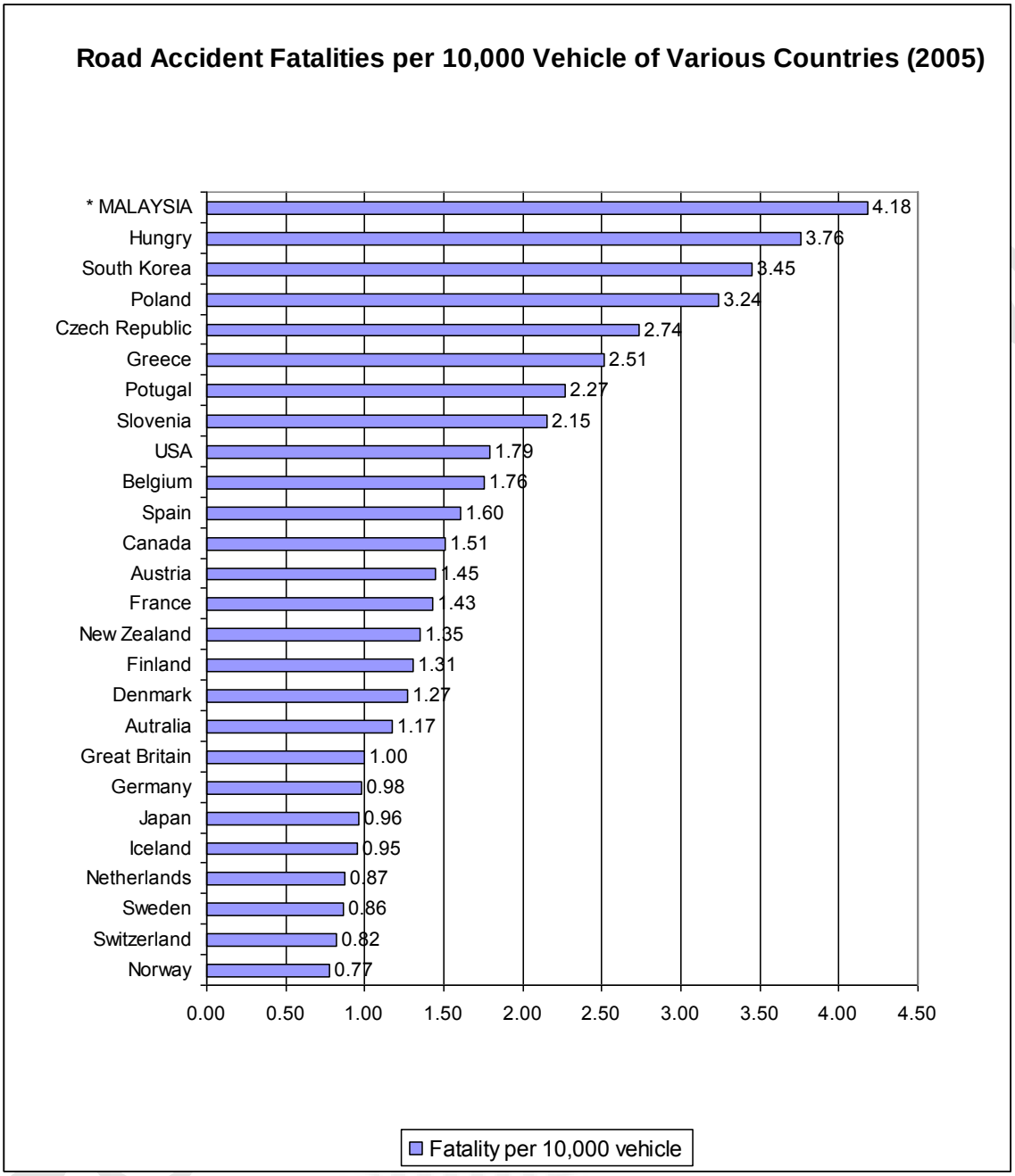

Figure 1.5. Road Accident Fatalities per 10,000 Registered Vehicles of Various Countries.

(Source: Australian Transport Safety Bureau, ATSB and * Malaysian Institute of Road Safety Research, MIROS)

The current situation related to the road safety has became more challenging due to increasing number of vehicles, populations, drivers behavior and other related factors therefore necessary measures should be taken as part of collective and

concrete efforts to achieve the above-mentioned targets. It is therefore necessary to know the reduction of fatality rates in Malaysia as compared to other countries worldwide. It is noted from the following Figures 1.6 that number of yearly road accident fatalities in Malaysia between year 2000 up to 2005 are almost 'constant' at value of 6000 i.e. without significant reduction as compared to other countries. Other Asian countries like Japan and South Korea has experienced tremendous reduction in the number of yearly road accident fatalities.

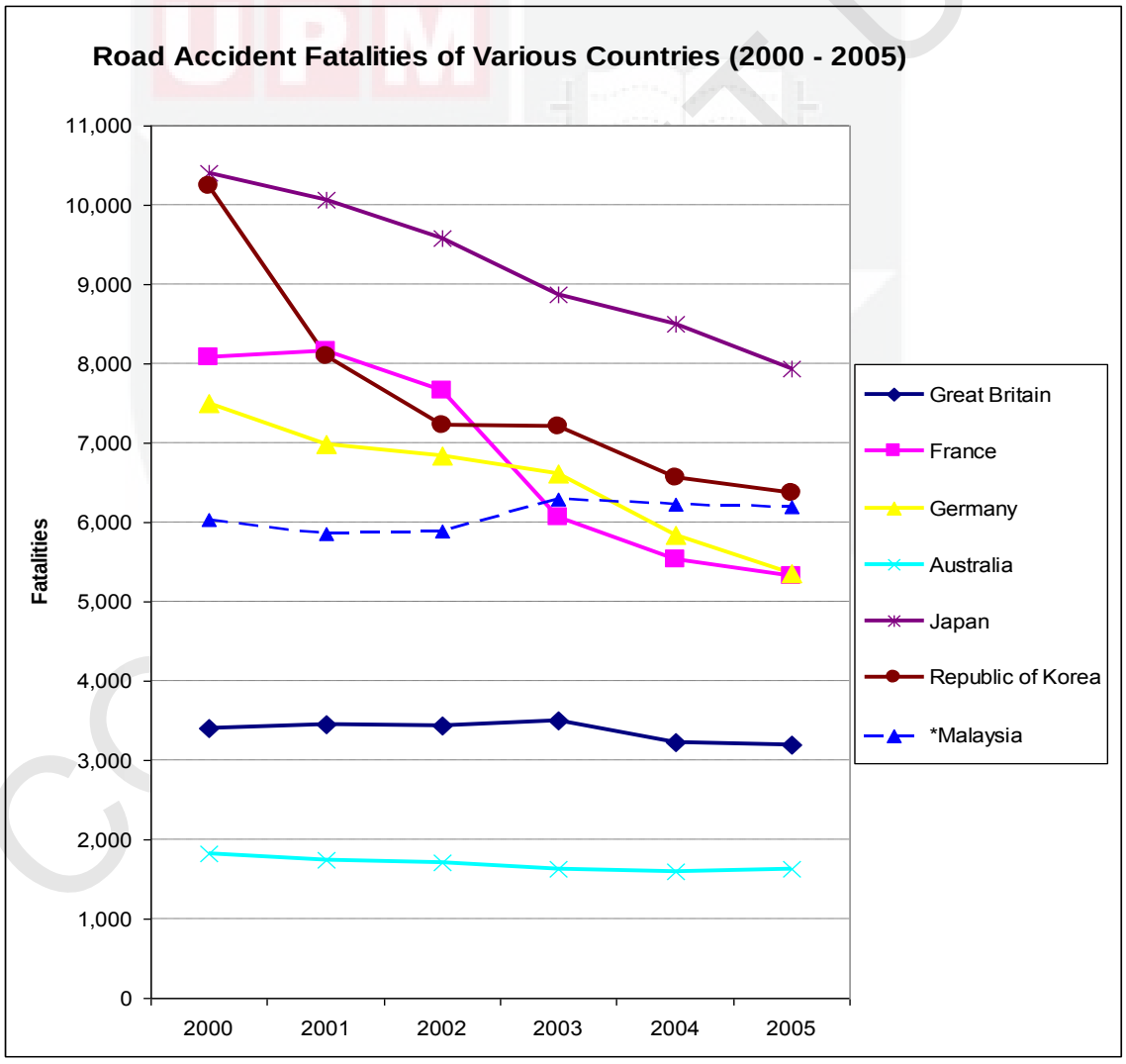

Figure 1.6. Road Accident Fatalities of Various Countries (2000 – 2005)

(Source: Australian Transport Safety Bureau, ATSB and * Royal Malaysian Police, PDRM)

For instant South Korea managed to bring down almost fifty percent of the number of road accident fatalities of 10,236 in 2000 to 6,376 in 2005 within five years period.

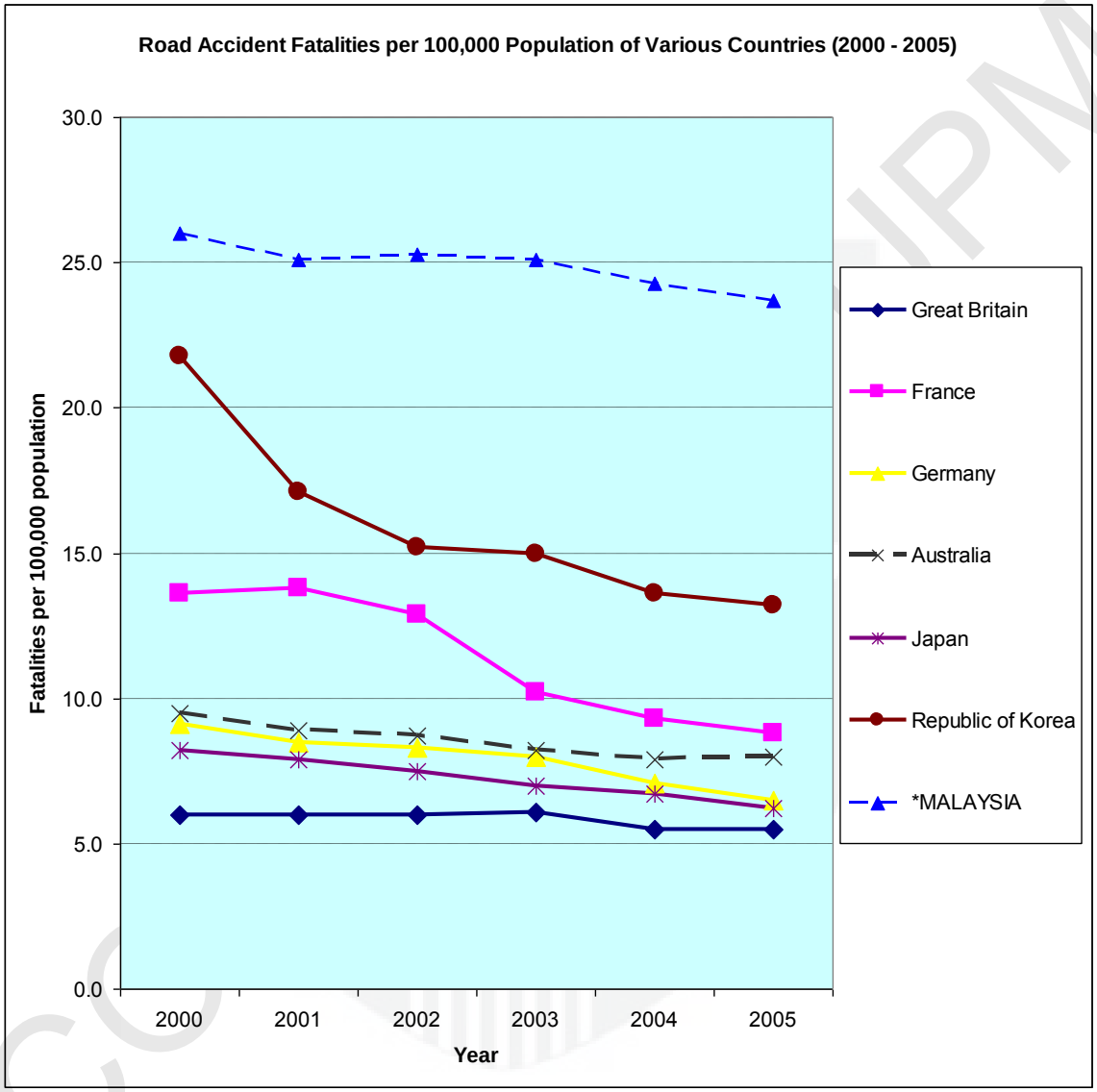

Figure 1.7. Road Accident Fatalities per 100,000 Populations of Various Countries (2000 – 2005)

(Source: Australian Transport Safety Bureau, ATSB and * Malaysian Institute of Road Safety Research, MIROS)

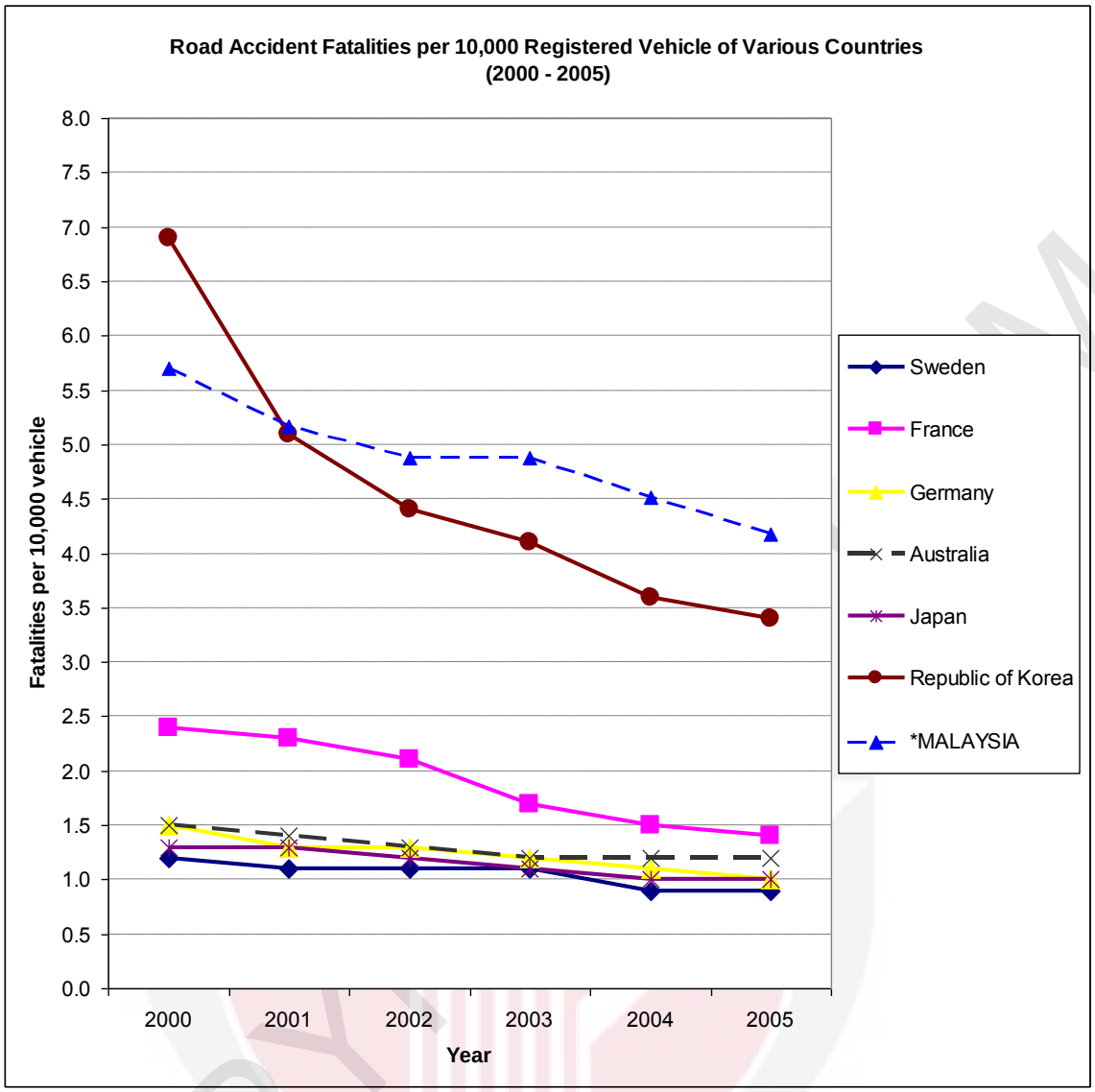

Figure 1.8. Road Accident Fatalities per 10,000 Registered Vehicles of Various Countries (2000 – 2005)

(Source: Australian Transport Safety Bureau, ATSB and * Malaysian Institute of Road Safety Research, MIROS)

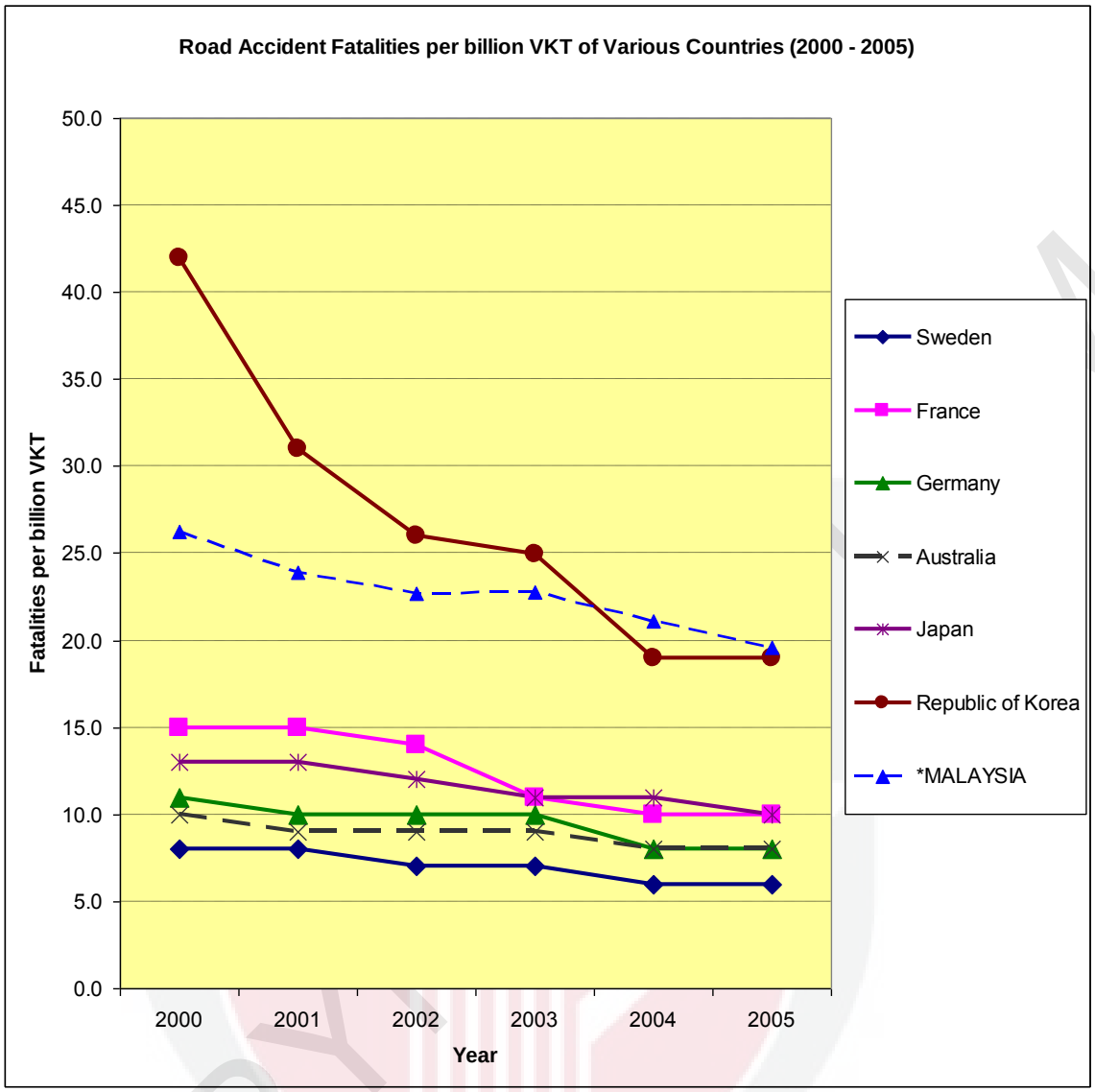

Figure 1.9. Road Accident Fatalities per Billion VKT of Various Countries (2000 – 2005)

(Source: Australian Transport Safety Bureau, ATSB and * Malaysian Institute of Road Safety Research, MIROS)

It is obvious that the reduction of the fatality rate in Malaysia including fatality per 100,000 populations, fatality per 10,000 vehicles and fatality per billion VKT are relatively lower compared to other developing countries like South Korea and Japan. Even though the fatality rates were generally higher for South Korea as compared to Malaysia back in year 2000 but due to dramatic reduction in number of fatality and

increasing number of vehicle and population, the fatality rates in South Korea experienced remarkable reduction. As a result in year 2006 the road fatality rates of South Korea are lower than Malaysia as shown in Figure 1.7, Figure 1.8, and Figure 1.9.

Formation of Malaysian Institute of Road Safety Research (MIROS) to carry out research and development (R&D) on the road safety aspect is an attempt to strengthen and enhances the effectiveness of previous efforts. Elements related to human, vehicle, road and environment which form the main contributing factors to road accidents will be given due respect in R&D. Ability to make necessary improvement in these three main contributing factors would be the key elements to a more successful efforts for more safer road in Malaysia and faster reduction in fatality rates as proven by other countries.

1.1.4 Better Public Transport

Promotion of public transport as the better and safer mode of transport won't be successful otherwise concrete efforts in terms of research, development of the infrastructure, education to boost the road safety awareness among the public etc are considered and given due attention and priority.

1.1.4.1 Problems of the Public Transport

First and foremost the problem involving public transport needs to be evaluated and analyzed to have a better picture of the extent and seriousness of the problem. Sufficient and reliable information or data on public transport such as number of accidents, fatalities, and injuries are required for analysis. Apart from that, travel

information such as kilometer traveled, number of passengers, number of trips for a given duration period are necessary for comprehensive analysis.

Analysis of data aims to come out with useful and meaningful indicators such as fatality per billion PKT, injuries per billion PKT, accidents per billion VKT, etc which can be used as a basis for comparison with other countries worldwide. Having reliable indicators is fundamental for a better and reliable comparison which can be used as a 'tool' to measure the road safety situation of public transport under consideration.

Having road safety indicators could be a good 'alarm' for necessary action taken accordingly. If in case the indicators show that the road safety situation of the public transport is in the worst situation then it should trigger urgency for prompt action from the parties concerned.

1.1.4.2 Main Causes of the Problem in Public Transport

By having reliable indicators it does not mean the task for a better and safer public transport is over. It should be followed by identifying the causes of the problem. This process required more efforts to gather and analyze the available data. Data on accidents, fatality, injuries, etc are required for analysis aim to have an idea of the main causes of the problem.

Study shows that there are three main general factors which contribute to the road accidents i.e. human factors, road and surroundings, and the vehicle itself. In most cases the accidents occurred are due to combination of these three general main factors.

Lack of driver management, vehicle management, journey and risk management are seen to be the most common problems which contribute to the road accidents involving public transport especially the express buses. Poor driver management can be a significant factor for driver fatigue. Long driving and working hours with a little rest period are common phenomenon of public transport industry in developing countries and of course not inline with the intended international standard.

Additionally the vehicle is not well-maintained by having regular inspection and maintenance. In some cases the vehicle is not up to even minimum safety standard requirements.

1.1.4.3 Actions and Countermeasures

PKT and VKT related indicators related to the public transport (bus) can be considered as part of the efforts to analyze the public transport safety situation. The public need to be informed by conducting evaluation, analysis and comparison with public transport worldwide especially with developed countries. This can be part of efforts to promote use of public transport in an attempt to reduce accidents and congestion in urban or city center area. Public transport involvement in high profile accidents which caused many deaths may pose undesired impact otherwise appropriate countermeasures taken to regain the public confidence towards it.

1.2 PROBLEM STATEMENT

Based on the available data from various agencies in terms of registered vehicles, records of accidents, casualties (fatal, serious, and slight injuries) for respective mode of transport it is therefore possible to make a general safety comparison between modes of transport using registered vehicle based index, for instance registration death rate (RDR). However safety index based on registered vehicles such as fatality per 10,000 registered vehicles is not good enough for that purpose due to some extent of limitation.

Road safety indicators based on registered vehicles are not taking into consideration the risk exposure. Risk of being involved in an accident which results casualties (fatal, serious, and slight injuries) may not be appropriately related to the number of registered vehicles. Additionally indicators based on the population are suffered with the similar limitation.

Therefore it is inappropriate to make meaningful road safety comparison neither between countries nor modes of transports using both registration death rate (RDR) and population death rate (PDR) criteria as the basis.

1.2.1 Road Safety Indicators Used in Malaysia

As mentioned earlier the road safety target of Malaysian road safety plan 2006-2010 is based on three main available road safety indicators i.e. registration death rate (RDR), population death rate (PDR), and mileage death rate (MDR) as widely used by other countries especially the developing one. Although these three road safety indicators are well-accepted internationally but for a more appropriate and meaningful method of comparison in terms of road accident fatality index, effort

needed to establish fatality index which takes into consideration the travel risk exposure as in case of mileage death rate (MDR) or specifically the fatality per passenger kilometer traveled (PKT) (Halperin, 1993).

1.2.2 Appropriate Road Accident Fatality Indicator

National fatality per billion PKT could be a better alternative indicator that can be used to compare road accident fatality situation in Malaysia with those in developed countries in particular and developing countries in general. However it is well understood that to establish this form of indicator required not only a better travel survey but at the same time requires a more reliable reporting of casualties (fatal, serious, and slight injuries). A good travel survey may acquire a much better infrastructure and supported by a good fleet management system of the respective parties concerned, used of new technology such as GPS, etc.

Estimation of national PKT can be very costly and time consuming too. On the other hand, to obtain records on road accidents, fatalities, injuries, etc required for road safety index estimation could be much easier because Malaysia has relatively better reporting on the fatalities and injuries from the relevant authorities especially the PDRM as compared to other developing countries in the region such as Indonesia, Philippines, Laos, etc as shown in Table 1.3 (Proceeding of Eastern Asia Society for Transportation Studies, 2005).

Table 1.3. Records of Road Accidents Fatalities and Injuries in ASEAN Countries

Country	Reported by Police		Estimated	
	Fatalities	Injuries	Fatalities	Injuries
Malaysia	6,282	46,420	6,282	46,420
Indonesia	8,761	13,941	30,464	2,550,000
Brunei	28	645	28	1,273
Philippines	995	6,790	9,500	774,000
Singapore	211	7,975	211	9,072
Cambodia	824	6,329	1,017	20,340
Laos	415	6,231	581	18,690
Myanmar	1,308	9,299	1,308	45,780
Thailand	13,116	69,313	13,186	1,529,034
Vietnam	11,319	20,400	13,186	31,000

(Source: Proceeding of the Eastern Asia Society for Transportation, 2005)

Estimating PKT for express buses is relatively easier as compared to other mode of transport such as motorcycle, private cars, etc. Proper recording of the number of passengers, trips, and distance traveled (mileage), etc were the key factors for a more reliable fatality index based on PKT**.**

1.2.3 Appropriate Comparison

Using Registration Death Rate (RDR) and Population Death Rate (PDR) for international comparison in terms of degree of road safety problem may not be appropriate as raised by Andreassen (Andreassen, 1985) and Preston (Care on the Road, 1984).

It is more appropriate and meaningful comparison using Mileage Death Rate (MDR) in terms of fatality per billion PKT for comparison purpose between different modes of transport since person trip and travel day trip which form the risk exposure are taken into consideration for PKT computation. In contrast no risk exposure taken into account in the currently used fatality indicators based on RDR and PDR respectively. In addition vehicle kilometer traveled (VKT) which is related to vehicle mobility has more appropriate relationship with accident (involved vehicles) rather than the fatality (involved vehicle users). Therefore fatality per PKT is the most appropriate fatality index as compared to others.

1.3 RESEARCH OBJECTIVES

Basically the objectives of this study could be categorized into two i.e. the main and the specific objective respectively. The main objective is to estimate both the passenger kilometer traveled (PKT) and vehicle kilometer traveled (VKT) of the express buses in Malaysia specifically in year 2007.

In addition, the specific objective of the study is to determine the fatality index i.e., fatality per billion PKT and fatality per billion VKT involving the express buses in Malaysia for the same period and make use of it for road safety evaluation involving this long distance travel mode of transport.

1.4 SIGNIFICANCE OF THE STUDY

The search for a much better approach for evaluation of the road safety situation must be continued in order to overcome the disadvantages found in the existing methods used especially the RDR and PDR respectively. For developing countries like Malaysia efforts should be there to take proactive and good strategies towards

more appropriate method for road safety situation evaluation as already being done by most of the developed countries.

Realizing the challenges ahead, this study is part of the continuous effort to establish data on PKT in Malaysia. To start with, this study will focus on estimation of PKT and related index of the express buses in year 2007. The findings would be used for evaluation and comparison with other countries worldwide especially the developed countries.

The outcome of this study is not only for the purpose mentioned earlier i.e. to have a much better road safety indicator but it can be useful for other purposes such as evaluation and comparison of travel risk between various modes of transport (motorcar, motorcycle, etc) in the country.

Mileage death rate (MDR) which consists of passenger kilometer traveled (PKT) and vehicle kilometer traveled (VKT) is more preferable especially for those who involved in transportation planning (Halperin, 1993). MDR can be one of the most important elements that need to be considered in the analysis process to choose the right investment from various available options. For instance it can be useful for decision making of the transportation investment option by computing the saving offered by an option to another. Additionally PKT can be used for other evaluation purposes such as emission of carbon dioxide (CO_2) per PKT or fuel consumption per PKT as a measure of transit efficiency.

1.5 SCOPE OF STUDY

Mileage Death Rate (MDR) in terms of passenger kilometer traveled (PKT) will be estimated but limited to only one important and popular category of public transport

in Malaysia in year 2007 i.e., express buses. In other words other modes of transport such as motorcar, motorcycles, trucks, etc would not be covered in the study.

The type of data that going to be used in this study will be the secondary data obtained from various parties. There are expected two main categories of secondary data i.e. travel data (number of operating bus, trip, passenger, distance traveled, etc) and road traffic data i.e. road accident fatality.

Travel data which consist of traveled distances, number of passengers, trips, and number of buses involved will be collected from various express bus operators' records in terms of log book, GPS, etc. Additionally road accident fatality will be obtained from Royal Malaysian Police (PDRM) records.

Other important information such as the number of registered express buses in Malaysia in year 2007 is expected from Malaysian Commercial Vehicle Licensing Board (LPKP) or Malaysian Road Transport Department (JPJ).

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