OVERVIEW OF CURRENT ROAD SAFETY SITUATION IN MALAYSIA

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ABSTRACT

Road safety has long been considered as one of social responsibilities to the Malaysian Government. In the visibility of this responsibilities, multiples bodies concern on road safety have been formed within the government departments, private agencies and voluntary organisations. The Cabinet Committee of Road Safety chaired by the Prime Minister himself was formed by the Government. A National Road Safety Plan then was formulated to give an attention to road safety research programmes, behavioural modification of road users, road engineering and vehicle safety, medical treatment and safety administration.

This paper attempts to review the present status of road safety in Malaysia with special reference to road safety initiatives carried out by the Malaysian Government especially the Ministry of Works Malaysia. The contents of this paper will uses an overview of present road accident statistic, national road safety target, Road Safety Programmes by Ministry of Works Malaysia, and discussion of future strategies to reduce traffic accident.

Keyword: Road safety target, accident rate, accident statistic

STATUS OF ROAD ACCIDENTS IN MALAYSIA

Traffic accidents in Malaysia have been increasing at the average rate of 9.7% per annum over the last three (3) decades (see Fig.1). Compared to the earlier days, total number of road accidents had increased from 24,581 cases in 1974 to 328,264 cases in 2005, reaching more than 135% increase of accident cases over 30 years. The number of fatalities (death within 30 days after accident) also increased but at slower rate compared to total road accident from 2,303 in 1974 to 6,200 in 2005. However the upward trend of fatalities dropped in 1997 after Malaysia Government established a 5-year national road safety target to reduce road accident deaths[1] by 30% by the year 2000.

The increase of road accidents is in link with the rapid growth in population, economic in development, industrialisation and motorisation encountered by the country. Since 1970's, Malaysia had experienced a remarkable growth in these sectors. In facts, there is an increase in Malaysian population from 10.4 million in 1974 to 26.1 million in 2005 at an average growth rate of about 2.1% per year[2].

[1] Law, T.H., Wong, S.V. and Radin Umar, R.S. *The Malaysian Government's Road Accident Death Reduction Target for Year 2010*. Universiti Putra Malaysia, 2004.
[2] Department of Statistics, 2005

Furthermore, the total length of road had also increased from 11,161 km in 1974 to 71,814 km in 2005 to accommodate an increase in numbers of vehicles in Malaysia. This also led to an increase of ownership from 9.6 persons per vehicle in 1974 to 1.7 persons per vehicle in 2005. The total numbers of registered vehicles also increased from 1,090,279 to 15,026,660 vehicles in 2005 (refer Table 1).

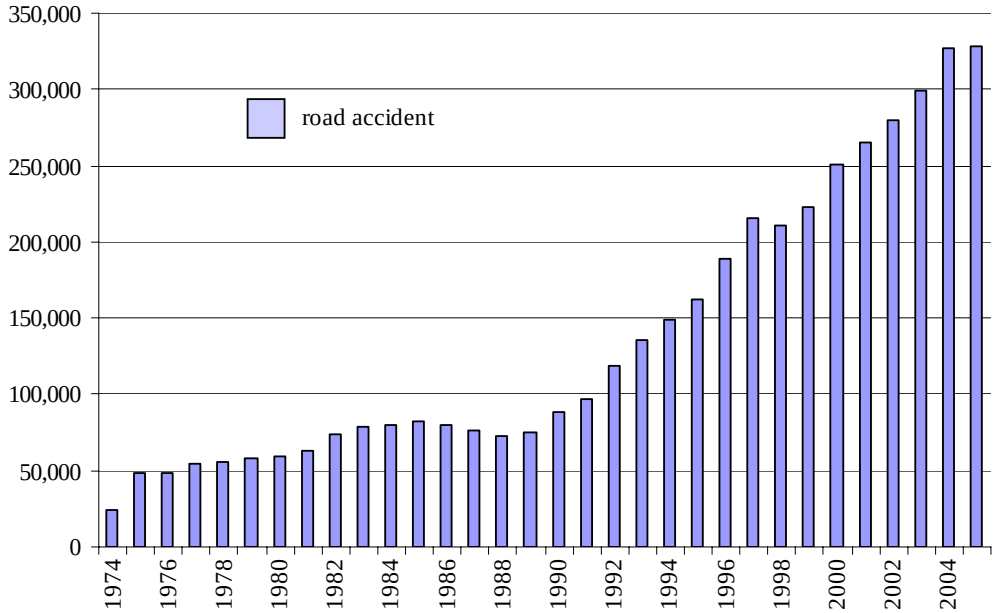

Figure 1: Statistics Road Accidents in Malaysia (2005)
Source: Royal Malaysian Police (PDRM)

Despite an increased in traffic accident and road fatalities, there is a drop in death rate (value of death per 10,000 registered vehicles). By further comparing the death rate over the last five (5) years, it shows that the death rate value has dropped from 5.17 in 2001 to 4.13 in 2005. Similarly during the same period, accident death rate per 100,000 peoples has also dropped from 24.35 in 2001 to 23.73 in 2005.

Table 1: General Road Accident Data in Malaysia (1982–2005)

Year	Population	Vehicles Registered	Vehicles Involved	Road Length (km)	Road Accidents	Road Casualties	Road Deaths	Vehicle Ownership
1974	10,434,592	1,090,279	39,056	11,161	24,581	13,332*	2,303	9.6
1975	10,438,137	1,267,119	75,653	12,043	48,233	19,440	2,317	8.2
1976	10,472,544	1,429,845	80,995	12,340	48,291	19,327	2,405	7.3
1977	10,716,642	1,621,271	86,688	12,637	54,222	20,305	2,512	6.6
1978	10,944,500	1,829,958	91,122	13,399	56,021	21,659	2,561	6.0
1979	11,188,630	1,989,391	94,788	13,772	57,931	22,611	2,607	5.6
1980	11,442,086	2,357,386	99,485	14,446	59,084	22,404	2,568	4.9
1981	14,128,354	2,901,182	107,552	31,568	63,192	22,303	2,769	4.9
1982	14,506,589	3,246,790	126,474	36,238	74,096	22,820	3,266	4.5
1983	14,886,759	3,594,943	139,006	40,664	79,150	26,557	3,550	4.1
1984	15,437,683	3,941,036	140,042	42,254	80,526	25,552	3,637	3.9
1985	15,866,592	4,243,142	142,653	43,994	82,059	24,824	3,603	3.7
1986	16,278,001	3,523,674	137,175	44,700	79,804	23,257	3,522	4.6
1987	16,527,973	3,674,482	131,609	44,239	76,882	21,467	3,320	4.5
1988	16,521,300	3,865,711	124,922	44,428	73,250	22,538	3,335	4.3
1989	17,376,800	4,155,197	127,279	44,592	75,626	30,037	3,773	4.2
1990	17,812,000	4,547,417	146,747	50,835	87,999	29,805	4,048	3.9
1991	18,178,100	4,942,040	161,823	55,367	96,513	30,107	4,331	3.7
1992	18,606,000	5,259,836	185,805	59,796	118,554	36,262	4,557	3.5
1993	19,050,000	5,656,037	220,939	59,796	135,995	41,686	4,666	3.4
1994	19,494,000	6,166,432	251,686	60,734	148,801	48,503	5,159	3.2
1995	20,096,700	6,802,375	275,430	62,221	162,491	52,152	5,712	3.0
1996	21,169,000	7,686,684	325,915	64,511	189,109	53,475	6,304	2.8
1997	21,665,600	8,550,469	373,526	66,108	215,632	56,574	6,302	2.5
1998	22,179,500	9,141,357	366,932	66,741	211,037	55,704	5,740	2.4
1999	22,711,900	9,929,951	390,674	67,069	223,166	52,937	5,794	2.3
2000	23,263,600	10,598,804	441,386	68,770	250,429	50,200	6,035	2.2
2001	23,795,300	11,302,545	483,351	74,217	265,175	50,473	5,849	2.1
2002	24,526,500	12,068,144	507,995	74,641	279,711	49,552	5,891	2.0
2003	25,048,300	12,819,248	555,634	79,667	298,653	52,741	6,286	2.0
2004**	25,580,000	13,828,889	-	71,814	326,815	54,091	6,228	1.8
2005**	26,130,000	15,026,660	-	71,814	328,264	47,012	6,200	1.7

Source: Royal Malaysian Police 2005.

*This figure is regarded as not reliable ** Figures for 2004 and 2005 have not been finalised
-= no data available.

NATIONAL ROAD SAFETY TARGET

In 1990, The Cabinet Committee of Road Safety was formed to formulate a national road safety target in reducing road accident and fatalities. The earlier target was established to monitor the rates of fatalities due to traffic accident which is commonly defined as death within 30 days of following an accident per 10,000 vehicles[3]. At that time, an earlier national road safety target[4] was to reduce deaths rate to 4 traffic accident deaths per 10,000 registered vehicles by the year 2010. This target was based on the statistical model developed by Road Safety Research Centre of Universiti Putra Malaysia which predicted 9,127 deaths in year 2000 if the traffic continued to increase at the continuing linear growth with 1989 as its base year (see Fig. 2).

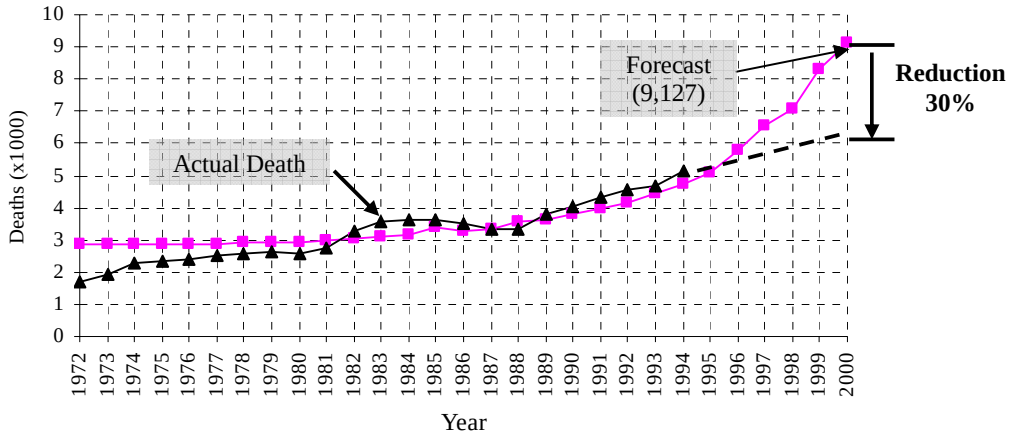

Figure 2: Fatality Model and Safety Target in Malaysia
Source: Radin Umar R.S. Updates of Road Safety Status in Malaysia, Universiti Putra Malaysia. 2005

Compared to the nation's safety performance, the deaths rate is still far behind other developed countries, which is below 3 deaths per 10,000 vehicles. Hence in 2001, the national road safety target[5] to reduce the death rate to 4 traffic accident deaths per 10,000 registered vehicles by the year 2010 was established. Following the positive trend in reducing fatality by safety intervention measures carried out, new safety targets[6] have been established based on 10,000 registered vehicles, 100,000 population and billion kilometre travelled. By the year 2010, Malaysia has set up her target to reduce death rates by 2.0 per 10,000 registered vehicles, 10.0 per 100,000 peoples and 10.0 for every billion kilometres travelled.

SAFETY INIATIVES

[3] Radin Umar Radin Suhadi. *Critical Review of Road Safety in Malaysia. Volume 7, No 1, The Proceeding of The Chartered Institute of Transport in the UK*. March 1998.
[4] Law, T.H., Wong, S.V. and Radin Umar, R.S. *The Malaysian Government's Road Accident Death Reduction Target for Year 2010*. Universiti Putra Malaysia, 2004.
[5] Radin Umar Radin Suhadi. *Critical Review of Road Safety in Malaysia. Volume 7, No 1, The Proceeding of The Chartered Institute of Transport in the UK*. March 1998.
[6] Radin Umar, R.S. *Update of Road Safety Status in Malaysia.* Universiti Putra Malaysia, 2005.

To achieve traffic accident reduction target set up by the Government, all the relevant Government departments and agencies need to give their contribution. The approach taken follows the 3 E's concept i.e. Education, Engineering and Enforcement. Note that PWD, MOW is a key player in engineering aspect of road safety.

Causes of Traffic accidents

There is rarely an accident situation in which only on thing or person is the sole cause of accident. Generally, accident causes can be a combination of either these three basic factors which are road user errors, road environment faults and vehicle defects.

In engineering point of view, these factors below constitute to road and road's environment that is usually related to an accidents:

i. Combination of traffic composition

No separation between traffic composition whereby most of traffic is a combination of small, medium and heavy vehicle. This is in view of motorcycle vs. other vehicle. Road accident statistics shows that in 2005[7], casualties from motorcycle accident constitute 66% (31,222) of all traffic accidents casualties (47,012) in Malaysia (refer Table 2).

Table 2 : Road accident statistics (2005)

Type	Casualties	Percentage (%)
Pedestrian	3,523	7.49
Motorcyle	31,222	66.41
Bycycle	1,679	3.57
Car	7,372	15.68
Van	824	1.75
Bus	359	0.76
Lorry	1,032	2.20
4 Wheel Drive	585	1.24
Other	416	0.88
Total	47,012	100

Source: Statistical Report Road Accident, Royal Malaysian Police. 2005

ii. Improper intersection design

Improper design at intersection can cause significant increase of accident. In 2003, accident occurrence at intersection is the second after straight road which constitute about 22% (inclusive of cross, T/Y and staggered junction) (refer Table 3). e.g. rear end collision usually cause by improper design of right turn which did not provide enough storage lane for vehicle while wait to turn right. Other related issue to improver design in lack of safe sight distance.

[7] Statistical Report Road Accident, Royal Malaysian Police. 2005 at http://www.rmp.gov.my/rmp03/statistikkemalanganjlnraya.htm

Table 3: Road Accident by Road Type (2003)

Road Type	Fatal	Serious	Total	%age
Straight	3,690	4,148	7,838	63.10
Bend	894	829	1,723	13.87
Roundabout	23	28	51	0.41
Cross Junction	215	457	672	5.41
T/Y Junction	576	1,424	2,000	16.10
Staggered Junction	36	78	114	0.92
Interchanges	12	11	23	0.19
Total	5,446	6,975	12,421	100

Source: Statistical Report Road Accident, Royal Malaysian Police. 2003

Furthermore, consideration to number of intersection per kilometre should be look into by the designer. A study done by Road Safety Research Centre, Universiti Putra Malaysia concluded that the road section with more than 15 junctions per kilometre are about 1.67 times higher to have an accident than with less than 15 junctions per kilometre[8].

iii. Provision of street lightning

Without proper street lighting and low visibility especially at junction during nighttimes will give higher cases of accident especially to the pedestrian.

iv. High traffic volume

High traffic volume is one of the contributors to traffic accident. It is found that an increase in traffic volume associated with an increase in traffic accident. A study concluded that an accident along sections with the average daily traffic (ADT) of above 30,000 is about 47% higher than ADT less than 30,000[9]. Not enough gaps in between vehicles at intersection and less chance to overtake other motorist are some of the concerns affected from high traffic volumes.

v. Provision of pedestrian crossing

Number of pedestrian involved in accident is about 3,523 cases, constituted 7.5% of overall casualties of accident. In view of availability of pedestrian crossing, there wasn't enough pedestrian crossings being put-up or there are no pedestrian crossing provided at all.

vi. Signal light

[8,9] Radin Umar R.S., Chai W.L., Hussain H. Law T.H. of Road Safety Research Centre, Universiti Putra Malaysia *Modelling of Traffic Accidents Along Major Trunk Roads in Malaysia.*. Journal – Institution of Engineers, Malaysia Vol.62 No. 3. 2001.

In urban area especially, there's a large number of traffic lights available. Sometimes, undesirable phase design at signalised intersection does happen. This would incur havoc to the traffic flow and movement pattern which gradually will increase the chance for accident to take place.

vii. Vehicle speed

With increase of road network and vehicle's specification, most of new vehicle will drove exceeding the posted speed limit. This may due to the availability and visibility of existing road signage. Furthermore, none realistic speed limit may impose to further increase in speeding motorist.

Approaches used in Road Safety Programmes

PWD, MOW especially Road Branch is the agency responsible in planning and manages the Federal Roads. In order to increase the safety of the road concerned, these engineering approaches are utilised:

i. Accident Preventions (proactive action)
ii. Accident Reduction (reactive action)
iii. Road Maintenance
iv. Building New Road

i. Accident Preventions

With this approach, PWD attempt to prevent an accident from happening. This target is achievable by provide road safety audit as a mandatory to all new road projects during feasibility & planning stage, preliminary and detail design stage, construction & pre-opening stage and operational stage. Furthermore, road safety audits also being done to existing roads.

The purpose of road safety audit was to provide remedial action to road safety issues at the right time to avoid higher redesign cost because of the reconstruction.

ii. Accident Reduction

Programmes under accident reduction were to reduce the accident, casualties and fatalities. There're numbers of programmes involved such as:

- Improvement of hazardous location

With this program, the hazardous accident locations along Federal Roads are improved. This location is earlier identified by Highway Planning Unit using the accident data record and provided by Royal Malaysian Police. In practice, this program involved only low cost remedial actions to include improvement to existing traffic management, providing pedestrian facilities, providing motorcycle facilities, upgrading intersection, installing signal light and road lighting, installing road signage, etc. This program was started since 6^{th} Malaysian Plan (1991 – 1995) and in 8^{th} MP, 153 hazardous locations have been treated.

- Motorcycle lane

  This program was to increase safety to motorcyclist by providing exclusive motorcycle lane. Research done by Road Safety Research Centre, Universiti Putra Malaysia estimated a decrease of 39% fatal accident involving motorcycle can be achieved with the usage of exclusive motorcycle lane. Under 8th MP, about MYR 100 million was provided by the Government to construction 15 location involving 150 km stretch of roads.

- Paving of road shoulder

  This program was to provide recovery and manoeuvring space for motorist from out of control and collision with others. It involved of paving 2 metres of road shoulder (both ways), road line marking and proper installation of road signage.

- Improvement of dangerous curve

  This program started in 2000 in which during that time, accident statistic shown that 25% of fatal accident happen involved motorist hitting object off-road, overturned and out of control. Because of this accident pattern is usually took place at road curve, and then safety action should be taken. Low cost remedial measure such as increase numbers of warning signage to improve safe vehicle speed and installing delineators to improve visibility of road alignment during nighttimes or heavy rain.

- Pedestrian crossing

  This program was to cater the safety for the pedestrian especially the school children. Estimated[10] pedestrian at the age of 6-10 (23%) is the highest percentage of pedestrian deaths toll followed by age ranging from 11-15 years old. Provision of pedestrian crossing involved 2 type of crossing which are i) at-grade signalised pedestrian crossing; and ii) pedestrian bridges.

- Overtaking lane

  Under this program, 1 km overtaking lane is provided for every 5 km stretch of road that have the most numbers of accident cases with head-on-collision. Overtaking lane will provide enough space for other high speed vehicle to overtake low speed vehicle. The work includes installing road signage, road line marking and proper drainage.

- Street lighting

[10] Statistical report Road Accident, Road Traffic Branch, Royal Malaysia Police Bukit Aman. 2000.

Installation of street lighting was done at particular stretch of road that has high pedestrian activities. Location was identified by recognising highest nigh time accidents involving pedestrian.

iii. Road Maintenance

For the purpose of this program, currently it only applied to Federal Roads. Government have allocated about MYR 500 million a year to maintain the Federal Roads. This program involved small works such as paving of potholes, cutting grass, road side furniture maintenance, drainage clean-up, etc.

Led by the increased of traffic accident during festive season, newly safety activity was initiated in 2003 by PWD to do low cost countermeasure for identified hazardous location. This low cost countermeasure is done in combination of numerous new installations such as road signage, road stud, road pavement marking and usage of traffic calming devices such as road hump and transverse bars. It hopes that with this improvement, early warning can be given to drivers to improve their driving.

iv. Building New Roads

Under 8th Malaysian Plan, the Government have invested about MYR 11.6 million for road projects. About 567 road projects have been implemented involved construction of new road, replacement of old bridges, construct more interchanges, improved signalised intersection and more.

Festive Seasons Road Safety Interventions

Accident statistic during Ops Sikap[11] IV (25 January – 2 February 2003) and V (20 November – 1 Disember 2003) showed that 5% of fatal accident took place during festive season. In order to improve safety during festive season period, MOW has taken the following prevention steps:

i. providing 24 hours observation at selected road stretch location;
ii. setting up observation towers to monitor traffic movement and their pattern;
iii. installing temporary warning signage and road furniture where location is identified as hazardous;
iv. 24 hours monitoring at hazardous location;
v. Installing road stud, blinkers to provide early warning sign to road users; and
vi. Repair all potholes.

FUTURE STRATEGIES AND CHALLANGES OF ROAD SAFETY

Accidents statistical[12] in 2001 to 2003 shows that estimated 46% to 49% fatal and serious accident occurred at State and Municipal roads. Current practice of road safety improvement only on Federal road and with an earlier finding, there's new type of road need to be tackle as to improve road safety for all road users.

[11,12] Statistical report Road Accident, Road Traffic Branch, Royal Malaysia Police Bukit Aman. 2001-2003.

In order to accomplish the target, Cabinet Committee on Road Safety on 25 May 2004 have decided that road safety audit and road safety programmes to be implemented onto State Road and Municipal Road. In 9th Malaysian Plan, allocation of about MYR 200 million was provided by the Government to improve the highest 5 hazardous locations along state and municipal roads.

CONCLUSION

Ministry of Works Malaysia, MOWs tried to provide a better safety of road in Malaysia alongside with the Government efforts to reduce traffic accident and to achieve its targets. Although studies shown that causes to most of the accident is because of the drivers themselves, MOWs always make it positive effort in order tom improve traffic accident by giving further stress on engineering aspect with proactive and reactive action during design, construction and maintenance stage. Furthermore, MOWs has taken steps which proven to give a positive responds required by all affected road user and agencies. Hopefully, in future with better collaboration intra and inter agency can improve more in road safety and furthermore Government would achieve its deaths rate target.

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