

**THE EFFECTIVENESS OF “OPS STATIK” IN REDUCING  
ROAD ACCIDENTS IN PULAU PINANG**

**By**

**AHMAD SHAMSURI BIN AHMAD MUKRI**

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**Supervisor :** Ir. Fuad Abas

**Co-Supervisor:** Prof. Madya Dr. Faku’l Radzi Ahmadun

Laporan ini menggandungi keputusan yang lengkap mengenai keberkesanan “Ops Statik” yang dijalankan oleh Polis Diraja Malaysia Pulau Pianang dalam mengurangkan kadar kemalangan di jalanraya pada musim perayaan .

Kajian ini juga bertujuan untuk mengetahui sejauh mana keberkesanan intervensi yang diwujudkan oleh Polis Trafik di lokasi-lokasi yang telah dikenalpasti serta bagaimana intervensi mempengaruhi sikap dan perlakuan pemandu-pemandu terhadap intervensi yang diletakan berdasarkan keperluan.

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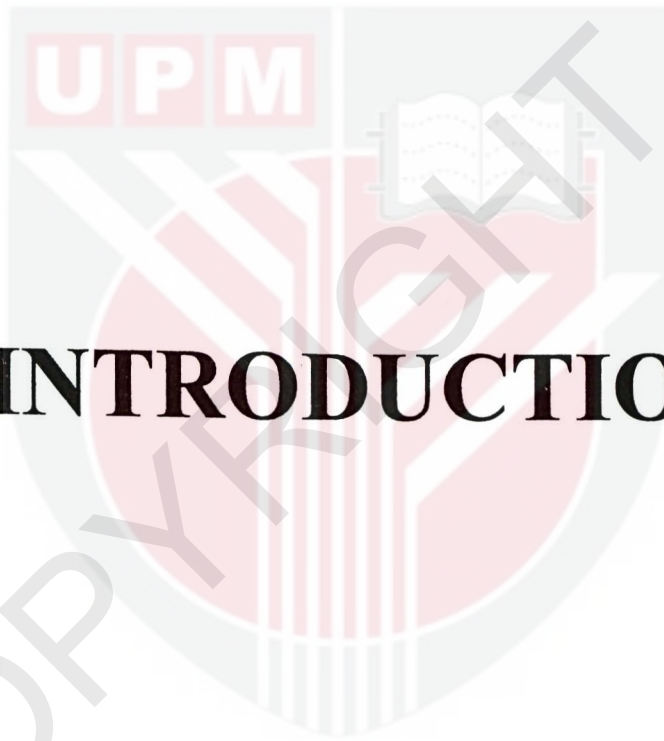
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# **CHAPTER I**

## **INTRODUCTION**



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## CHAPTER I.

### Introduction

Malaysia is relatively a small country and consists of two territories, Peninsular Malaysia in the West and Sabah and Sarawak in the East, which is located in the island of Borneo. It shares border with Thailand, Indonesia, Brunei and Singapore. The total land area of the Peninsular, Sabah and Sarawak is 329 750 square kilometres and it stretches over 2000 kilometres from the west to the east. The Peninsular is separated from Sabah and Sarawak by the South China Sea. Since gaining independence in 1957, Malaysia has been experiencing rapid growth in population, economy, industrialization and motorization.

Between 1975 and 2000, the population doubled from 10 438 137 to 23 200 000 and the average growth rate was about 5 percent per year (Radin Umar, 1996). During the same period, the total length of roads increased from 12 043 to some 65 000 kilometres, forming a transportation network in Peninsular and East Malaysia (Table 1.1). The growth in traffic during the same period also experienced a similar trend. Over a span of 25 years, the number of registered vehicles increased from 1 267 119 in 1975 to 10 589 804 in the year 2000 and the ownership increased accordingly from 8.2 persons per vehicle in 1975 to 2.2 person per vehicle in 2000.

The increase in population and motorization also led to an increase in the number of road traffic accidents. In 1975 (Table 1.1), there were only 48 233 cases,

whereas in the year 2000, this figure increased to a total of 250 417 cases, an increase of more than fivefold just within two and a half decades. (Radin Umar 1996).

Table 1.1: Road Accidents and Casualties in Malaysia from 1975 to 2000

Year	Population	Vehicles	Road	Number of	Casualties			
		Registered	Length (Km)	Acc.	Death	Serious	Slight	Total
1975	10,438,137	1,267,119	12,043	48,233	2,317	2,280	14,843	19,440
1976	10,472,544	1,429,845	12,340	48,291	2,405	2,585	14,337	19,327
1977	10,716,642	1,621,271	12,637	54,222	2,512	3,033	14,760	20,305
1978	10,944,500	1,829,958	13,399	56,021	2,561	3,883	15,215	21,659
1979	11,188,630	1,989,391	13,772	57,981	2,607	5,384	14,620	22,611
1980	11,442,086	2,357,386	14,446	59,084	2,568	5,097	14,739	22,404
1981	14,128,354	2,901,182	31,568	63,192	2,769	4,898	14,636	22,303
1982	14,506,589	3,246,790	36,238	74,096	3,266	4,871	14,683	22,820
1983	14,886,729	3,594,943	40,664	79,150	3,550	5,656	17,351	26,557
1984	15,437,683	3,941,036	42,254	80,526	3,637	5,532	16,383	25,552
1985	15,866,592	4,243,142	43,944	82,059	3,603	5,652	14,699	23,924
1986	16,278,001	4,458,735	44,100	79,804	3,525	5,442	14,290	23,257
1987	16,527,973	4,595,434	44,239	76,882	3,320	5,548	12,931	21,799
1988	16,921,300	4,783,506	44,428	73,250	3,335	5,548	13,655	22,538
1989	17,376,800	5,071,786	44,592	75,626	3,773	7,249	19,015	30,037
1990	17,812,000	5,462,792	50,835	87,999	4,048	8,076	17,690	29,814
1991	18,178,100	5,877,176	55,367	96,513	4,331	8,524	17,252	30,107
1992	18,606,000	6,263,383	59,796	118,554	4,557	10,634	21,071	36,262
1993	19,050,000	6,712,479	59,796	135,995	4,666	11,930	25,090	41,686
1994	19,494,000	7,210,089	60,734	148,801	5,159	13,387	29,957	48,503
1995	20,096,700	6,802,375	60,734	162,491	5,712	15,313	31,127	52,152
1996	21,169,000	7,686,684	60,734	189,109	6,304	14,218	32,953	53,475
1997	21,665,600	8,550,469	63,382	215,632	6,302	14,105	36,137	56,574
1998	22,679,600	9,141,357	63,382	211,037	5,740	12,068	37,896	55,784
1999	22,711,900	9,929,951	64,981	223,166	5,794	10,366	36,777	52,937
2000	23,200,000	10,589,80	64,981	250,417	6,035	9,773	34,246	50,054

Source: Accident Black Spot Database Retrieval and Perioritisation System. Final Report 2001

The number of fatalities (death within 30 days after an accident) also increased from 2,317 in 1975 to 6,035 in 2000. However, it should be noted that since



1997, the death figures dropped significantly following (a) targeted safety programs carried out and (b) economic slow down experienced by Malaysia in 1998 and 1999. This figure was verified by an in-depth multivariate time series analysis of traffic fatalities per 10 000 vehicles, which showed an impressive improvement from 18.2 in 1975 to 5.7 in 2000 (Law and Radin 2000).

To address the problem, a Cabinet Committee on Road Safety (CCRS), chaired by the Prime Minister, with target of reducing fatalities to 30% by the year 2000 was set up in 1990. Various efforts were made to reduce the accident and death rates on the road. Efforts to contain the high death toll were enhanced through road safety campaign, increasing traffic enforcement, and building more quality highways. However, the number of deaths increased from year to year, especially in the 1990s when the fatalities were higher than the target (Radin Umar et. al 1998).

Many projection models were developed to project deaths due to road accidents. Among the models known, is the non-linear model developed by Smeed in 1949. The equation is as follows:

$$\text{Fatalities} = 0.00012 (\text{Population})^{0.7323} (\text{Number of Vehicles})^{0.3372}$$

Earlier, two models were developed to project fatalities. Aminuddin developed the linear model in 1990 and projected 4950 fatalities in the year 2000. This model was suitable in 1990 when the increase rate of vehicles was slow due to economic downturn.



In 1995 Mohamed Rehan improved Aminuddin's model by suggesting a model similar to Smeed's. Mohamed Rehan's equation to project fatalities is as follows:

$$\text{Fatalities} = 0.08193 (\text{Population} \times \text{Number of Vehicles})^{0.3355}$$

Based on this model, Rehan projected 5073 fatalities in the year 2000. This projection was based on the expected change in the death exposure, that is 23.2 million people to 10 million vehicles in the year 2000.

Obviously, the individual projections of death toll by Aminuddin (1990) and Mohamed Rehan (1995) of 4950 and 5073 respectively for the year 2000, were much lower than the actual death toll of 5519 in the year 1994. Among factors, which may probably influence the accuracy of the projections, was the increased exposure to accidents, which in turn was caused by the growing number of population, vehicles and road distances. Although the population increased at a slow pace, the number of vehicles and road distances increased exponentially especially during the recent years. This was due to the improvement in the economy and infrastructure development.

To improve earlier projections, Radin Umar suggested another model that could correlate the following exposure factors:

- Number of vehicles according to year
- Population according to year
- Road distances according to year
- Effect of coordinating accident data

$$\text{Fatalities} = 2289(e^{0.00007 \text{ Kenderaan. Penduduk, Jalan}}) (e^{0.2073 \text{ Data Collection System}})$$

This model shows that fatalities due to road accidents will increase exponentially ( $e^{0.00007}$ ) with the increase in the interaction between number of vehicles, population and road distances. Based on this model, the number of fatalities in the year 2000 can be projected if the exposure factor of the number of vehicles, population and road distances for that particular year is accurate. The accuracy of the exposure factor is critical because the model developed is sensitive to the variables. Exposure projection issued by the responsible authorities and available sources (Table 1.2) are the assumptions used for this model. By using this model, a realistic target of reducing death toll by 30 percent as set by CCRS, the projected fatalities for the year 2000 was 6389. This figure was obtained by taking 30% of the year 2000 projection, if the assumptions made for population, vehicles and road distances were 23.2 million, 10 million and 72.4 thousand kilometres respectively.

Table 1.2: Exposure Projection for the Year 2000

<b>Projection Source</b>	<b>Population (Million)</b>	<b>Vehicle (Million)</b>	<b>Distance Thousand (KM)</b>
Seventh Malaysian Plan	23.2	-	80.4
Model Linear (1880 – 1994) Road distance > 0.95	21.9	8.74	72.4
Model Koonstra (1993)	-	10.0	-
Estimated Projection for the year 2000	23.2	10.0	72.4

Even though the projected fatalities of 6389 for the year 2000 was still considered high, a radical and integrated strategy with respect to engineering, enforcement, education and health is required. Integrated programmes especially towards control over travelling should be emphasised. The objective of the interventions is to change the death trend by preventing and reducing road accidents. Among the interventions strategised are:

- a) the 3Es approaches (education, engineering and enforcement);
- b) injury reduction and post injury reduction programme;
- c) road safety campaign to riders especially young motorcycle riders;
- d) the introduction of motorcycle lanes; and (Motorcycle accidents reduced by 34 percent in the first nine months following the introduction of motorcycle lanes.)
- e) introduction of methods so that motorcycle riders are conspicuous to other road users. (Methods introduced were the use of running headlights (day/night), reflective stripes, reflective number plates, fluorescent clothings and reflectors, conspicuous road structure, reflective tyres and spokes, fluorescent helmets and high visibility painted vehicles.)

The accident prevention audit involves the application of safety principles or checks by independent qualified personnel so that potential safety hazard is evaluated before a new road is open to traffic. Two approaches are adopted under the accident reduction strategy. First is on the engineering approach and second on the education and campaign programme.



On the engineering approach, the Cabinet has approved RM262 million to repair and improve 15 federal roads, which have been identified as accident prone areas throughout the country. The first phase will involve 200 spots. There are another 108 prone accidents areas to be given the same treatment in the future (Berita Harian, September 22, 2000, pg.5).

For education and campaign programmes, the focus is on motorcyclists. Motorcycle day and night time rear visibility, proper use of helmets, injury risk during crashes, speeding, vulnerability and true testimony by parents who lost their young children in traffic crashes are part of the approach. Another strategy introduced by the government to reduce road accidents is “Ops Statik”. Traffic police is responsible for implementing these strategies. According to Manual Procedure of “Ops Statik”, the implementation of “Ops Statik” has produced various kinds of actions and traffic police presence at identified locations has to achieve the objective of “Ops Statik”. The five main objectives of “Ops Statik” are:

- a) To smoothen and improve traffic flow at identified routes.
- b) To increase confidence of road users that police are able to respond fast to their need.
- c) To make road users feel save while they are driving.
- d) To instil a sense of fear to those who intentionally disobey the traffic laws.
- e) To create awareness that the police are friends and always ready to give excellent service and are friends.

On these score, researchers will study in depth the effectiveness of “Ops Statik” since it was launched in 1996 until 2000. The findings of the study are explained in Chapter IV.

## Background of the State of Pulau Pinang

Pulau Pinang is only 1031 square kilometres in area. Length of the roads is 2729 kilometres: 55 percent is federal roads and 45 percent town roads. Vehicle ownership is on the average of 8,400 for every 10,000 population. The population survey in 1998 showed that the population is 1.234 million. The estimated population and distribution by districts are shown in Table 1.3, and the estimated population by gender is as in Table 1.4, and the estimated population by ethnic groups is as in Table 1.5.

Table 1.3: Pulau Pinang Estimated Population (in ‘000) and Distribution by Districts

District	1991 (Census)	1997 (Estimated)	1998 (Estimated)
Timur Laut	395.7	433.8	443.7
Barat Daya	122.8	147.4	151.6
Seberang Perai Utara	224.6	254.9	256.3
Seberang Perai Tengah	236.3	278.9	284.9
Seberang Perai Selatan	84.8	96.9	97.9
<b>State of Pulau Pinang</b>	<b>1064.2</b>	<b>1221.9</b>	<b>1234.4</b>

Source: *State Population Report, Penang, 1991, Department of Statistics, Malaysia; State/District Data Bank, 1997, 1998, Department of Statistics, Malaysia.*



Table 1.4: Pulau Pinang Estimated Population by Gender (in '000)

<b>Gender</b>	<b>1991</b>	<b>1997</b>	<b>1998</b>
	(Census)	(Estimated)	(Estimated)
Male	526.0	607.2	613.3
Female	538.1	614.7	621.1
<b>Total</b>	<b>1064.2</b>	<b>1,221.9</b>	<b>1,234.4</b>

Source: *State Population Report, Penang, 1991, Department of Statistics, Malaysia; State/District Data Bank, 1997, 1998, Department of Statistics, Malaysia.*

Table 1.5: Pulau Pinang Estimated Population by Ethnic Group (in '000)

<b>Ethnic Group</b>	<b>1991</b>	<b>1997</b>	<b>1998</b>
	(census)	(estimated)	(estimated)
Malaysian:	526.0	607.2	613.3
Malays	405.4	465.5	486.7
Other Bumiputeras	1.1	1.3	1.9
Chinese	523.2	600.8	581.9
Indian	112.8	129.5	129.5
Others	5.8	6.6	6.6
Non-Malaysian Citizens	15.9	18.2	27.7
<b>Total</b>	<b>1,064.2</b>	<b>1,221.9</b>	<b>1,234.4</b>

Source: *State Population Report, Pulau Pinang, 1991, Department of Statistics, Malaysia; State/District Data Bank, 1997, 1998, Department of Statistics, Malaysia*

Pulau Pinang is a paradise island for tourists. The island is a sure attraction during any festive seasons, or weekends or public holidays due to its beautiful sandy beaches and sheltered sea and other places of interests. During such times the number of vehicles on the roads in Pulau Pinang increase. Thus inevitably

there will be more traffic accidents. Presently the government is facing the problem of overcoming traffic accidents during festive seasons.

The existing roads could not help the traffic police to solve the congestion problem. According to Japan International Corporation Agency (JICA), which conducted survey on traffic congestion and traffic accident for Pulau Pinang Government in 1985, reported ratio of registered vehicles versus population in Penang was about 0.39. This number was considered high. The ratio increased to 0.89 in the year 2000. The problems will remain as long as road development is not improved. Seventy five percent of the recommendations by JICA were not implemented. Perhaps some of the traffic problems would be solved if most of the recommendations were carried out.

Five factors that lead to traffic congestion and accident in Pulau Pinang as reported by JICA in 1985 are:

- i) Inefficient traffic education and lack of discipline of road users.
- ii) Lack of traffic ethics such as ignoring the concept of “right of way” dangerous lane changing and overtaking into the opposite side of the street by road users.
- iii) High usage of motorcycles .
- iv) The congestion becomes worse during on and off school hours especially during mid days and evenings.

v) Inadequate provision of intersection approach facilities.

(The situation is also augmented by various adverse conditions. About 70% of the bus stops do not have lay by to allow traffic flow to continue undisturbed. Bus stopping especially on heavy volume roadways, parked cars and cars in the act of parking, on street waiting cars, loading and unloading of merchandise on busy roadways, pedestrian movement on carriageway, roadside activities, trishaw and hawker movement on carriageway always disrupt the traffic flow.)

### **“Ops Statik”**

The “Ops Statik” started in 1996. In Pulau Pinang, there are 32 identified accident prone-areas to be observed under that “Ops Statik”. The locations are eight (8) in the Timur Laut District, seven (7) in the Seberang Perai Utara District, ten (10) in the Seberang Perai Tengah District, three (3) in the Seberang Perai Selatan District and four (4) in the Barat Daya District. Figures in Table 1.6 show accidents reported since 1996 until 2000 under the “Ops Statik” in Malaysia and Pulau Pinang.

Table 1.6: Accidents in Malaysia and Pulau Pinang During 1996~2000 “Ops Statik”

YEAR	MALAYSIA (15 DAY PERIOD)			PENANG (15 DAY PERIOD)		
	ACC.	FATAL	DEATH	ACC.	FATAL	DEATH
1996 (DWI)	7,945	283	321	688	22	24
1997 (DWI)	8,517	231	262	618	14	14
1998 (DWI)	9,901	240	274	871	10	15
1999 (HRP)	9,416	185	203	733	10	11
1999 (CNY)	8,259	177	206	672	11	13
2000 (HRP)	10,277	199	220	823	5	5
2000 (CNY)	9,711	196	219	921	17	18
2000 (HRP)	10,919	187	215	1036	8	9
2001 (CNY)	10,797	174	218	1074	11	13
TOTAL	85,742	1,872	2,138	7436	108	122

Source: Statistic Department of Traffic Police Bukit Aman

Note: DWI = Double Festival Celebration HRP = Hari Raya Puasa CNY= Chinese New Year

### Statement of Problems

Statistics reported by traffic police of the Royal Malaysian Police Department show that traffic accidents in Malaysia increases almost every year. For the year 2000, a total of 250 417 cases were reported in Malaysia; 6035 were involved in fatal accidents and 44 019 were injured. Pulau Pinang is fifth after Selangor,



Johor, Kuala Lumpur and Perak where the rate of accidents is high. The average accident rate was 15 013 a year from 1991 to 2000. Fatal accidents average at 355 and injuries 695 a year. Table 1.7 shows accident cases reported in Pulau Pinang from 1991 to 2000. (Statistical Report of Road Accidents by Royal Malaysian Police 1999).

Table 1.7: Number of Accidents reported in Pulau Pinang from 1991 to 2000

YEAR	NO ACC.	DEATH	SERIOUS INJURIES	MINOR INJURIES	P'LATION	REG. VEHICLE
1991	6,123	232	497	3,469	1,133,600	602,367
1992	11,630	211	711	4,180	1,149,200	649,363
1993	11,895	326	758	4,536	1,165,000	705,458
1994	12,883	375	1065	4,602	1,181,300	760,818
1995	14,406	415	1389	5,122	1,978,000	752,452
1996	16,745	425	873	4,391	1,209,900	845,689
1997	17,985	428	390	4,494	1,222,210	952,622
1998	18,236	395	369	3,777	1,234,400	976,085
1999	17,914	368	388	3,968	1,224,680	1,047,076
2000	22,312	367	510	5,213	1,259,400	1,122,064

Source: Statistics of the Department of Traffic Police of Pulau Pinang

### Objective of the Study

Table 1.6 shows that the number of deaths for the 135 day period was 2138 with an average of more than 15 deaths a day. In Pulau Pinang, the number of deaths



for the same period was 122, an average of one death per day. From the data, the study is trying to find the effectiveness of “Ops Statik” as an intervention in reducing accidents in Pulau Pinang especially during the festive seasons (*Hari Raya Puasa* and Chinese New Year).

The objective of this research is to determine the effectiveness of “Ops Statik” ever since its was introduced by the Royal Malaysian Police in 1996 till 2000. The focus of the research will be on the implementation concept, approach, deployment of personnel and tools used during the “Ops Statik”. Besides that, this research is also to look into the effectiveness of the traffic police presence towards attitude of all drivers who are prone to accidents such as driving above the permitted speed, overtaking in a dangerous manner, reckless driving at junctions, driving dangerously into the opposite lanes when overtaking a stretch of cars . In this aspect, changing lanes are used as a guideline to measure negative attitude of drivers. Other traffic offenses due to negative attitude are:-

- a) Overtaking along double lined lanes
- b) Overtaking a stretch of cars (jumping queues)
- c) Not stopping at junctions
- d) Not observing traffic light
- e) Not observing road signs
- f) Speeding
- g) Not using safety belts
- h) Not weqaring safety helmets

- i) Using hand phones without hands free kit.

Kindly note the list of offences obtained from 1996 to 2000 in Pulau Pinang is shown in Table 1.8.

Table 1.8: Offences due to Negative Attitude.

<b>OFFENCES</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>TOTAL</b>
<b>Overtaking double line</b>	31	27,123	2,009	275	1,909	62,694
<b>Overtaking (cutting queues)</b>	1,278	1,367	-	129	1,096	3870
<b>Not stopping at junctions</b>	699	1,342	1404	6685	287	10,410
<b>Traffic light offences</b>	7,796	14,724	13,498	12,293	9,775	58,086
<b>Speeding</b>	9,532	34,931	54,708	136,707	71,483	307,361
<b>Not using safety belt</b>	3,816	9,370	7,027	4,956	4,094	29,263
<b>Not wearing safety helmet</b>	1,690	3,533	2,434	1,771	656	10,084
<b>Ignoring road signs</b>	7,982	56,104	34,978	27,177	3,530	129,771

Source: Yearly Statistical Road Accident Report Traffic by Royal Malaysian Police Pulau Pinang

### Specific Objective

Specific objective of this study is to determine the appropriate conditions for critical surveillance during “Ops Statik” in Pulau Pinang.

## General Objective

Besides specific objective, researcher is also emphasizing four general objectives.

- i) To prove the effectiveness of “Ops Statik” based on road accidents reported before and during “Ops static” for the period of 15 days for the year 2000 through chi-square analysis.
- ii) To estimate the significant magnitude of intervention if the study is true.
- iii) To prove that the concept carried out during the launch of “Ops Statik” is significant in changing drivers’ attitude. The aspect of following the traffic regulation by not changing lanes in a dangerous way will be used as a significant study. Besides that, this objective will become evidence to support the launch of “Ops Statik” through prime data collection (through experiment).
- iv) To find other alternatives, which can replace the concept of “Ops Statik” as a tradition. The other alternative is to erect a signboard with the message “POLIS TRAFIK 100M DI HADAPAN” Police Traffic 100M Ahead, to warn motorists the presence of traffic police and police vehicle ahead.

The importance of launching this objective must be weighed against fresh data, because “Ops Statik” has a positive result in decreasing the number of road accidents in Pulau Pinang. However, the answers should be obtained on given details such as:

- i) The genuineness of the “Ops Statik” (Is it actually reducing the number of accidents or is it just coincidental?)
- ii) Whether the intervention of “Ops Statik” (a week before and after the festive season) is a practical move in terms of duration as well as the manpower involved. If it were proven that “Ops Statik” is a successful step towards changing the trend of traffic accidents in Pulau Pinang, would there be any other better alternatives, which would have a similar impact on the road users?
- iii) To observe drivers' reaction as soon as they are aware of the intervention, such as a traffic police vehicle with the beacon light on, a signboard stating “POLIS TRAFIK 100M DI HADAPAN” Police traffic 100M Ahead, and the presence of traffic police in the area, which is used as a guideline to obtain a significant result.

### **Scope/Benefits of the Study**

The study will mainly be concentrated in the state of Pulau Pinang . This report provides information, finding specifically on the effectiveness of the “Ops Statik” in Pulau Pinang since it was launched in 1996 till 2000. This report also contains suggestions about the suitable instruments as interventions to be used in the future “Ops Statik”.



## Hypothesis

Based on the research shown above, four hypothesis were obtained:

- a) There is evidence showing that the intervention “Ops Statik”, which was implemented from 1996 till year 2000 did influence the number of traffic accidents in Penang.
- b) There is a change in the attitude of road users during the presence of traffic police in comparison to when none is stationed at the area.
- c) There is a change in the attitude of road users during the presence of police vehicle in comparison to when none is stationed at the area.
- d) There is a change in the attitude of road users when the signboard stating “POLIS TRAFIK 100M DI HADAPAN” Police Traffic 100M Ahead is erected.
- e) There are drastic changes in road users’ attitude when they approach the experimental area without any intervention.

## Terms and Definitions

Certain terms or concepts used in this research need to be clearly defined as follows :

**Road Accident:** An occurrence on the public or private roads due to the negligence or omission by any party concerned (on the aspect of roads

user conducts, maintenance of vehicle or road conditions) or due to environment factor (excluding natural disaster) resulting in a collision (including) “out of control” cases and condition or victims in a vehicle against object inside or outside the vehicle. (Statistical Report of Road Accidents in Malaysia in 1991 – Traffic Police Bukit Aman)

**Death:** Any person who died within 30 days as a result of an accident. (Statistical Report Road accident Malaysia – 1999 – Traffic Police Bukit Aman ).

**Serious Injury:** Any person who has injured as a result of an accident as referred to section 320 of panel code that includes any of the following:-

- a) Emasculation
- b) Permanent privation of the sight of either eye.
- c) Permanent privation of the hearing of either ear.
- d) Privation of any member of joint.
- e) Destruction or permanent impairing of the powers of any member of joint.
- f) Permanent disfiguration of the head or face.
- g) Fracture or dislocation of a bone.
- h) Any hurt which endangers life, or which causes suffering, during the space of twenty days, in severe bodily pain, or unable to follow

his ordinary pursuits. (Statistic Report and Accidents – Traffic Police Bukit Aman).

**Minor Injury:** Any injury that does not fall under death or serious injury. (Statistical Report and Accidents – Traffic Police Bukit Aman).

**Fatal Road Accident:** A road accident in which one or more persons are injured but none killed. (Statistical Report and Accident – Traffic Police Bukit Aman).

**Federal road:** Any road maintains by Federal Government of which its route number begins with an integer or the letter 'F' (Peninsular Malaysia Only) Example: Main Road JB-B 1 or F1, 2, Kayu Hitam Federal Route 2 or F2. (Statistical Report and Accident – Traffic Police Bukit Aman).

**State Road:** Any state main road of which its route number begins with an alphabet letter in accordance with vehicle registration number (Peninsular Malaysia only). Examples: Route 12 Selangor – B 12 Route 105 Negeri Sembilan – N 105 (Statistical Report and Accident – Traffic Police Bukit Aman).

**Municipal Road:** Any road without a route number within Town Council, District Council or City council but not a private road. (Statistical Report and Accident – Traffic Police Bukit Aman).

**Expressway:** Any road using tolled transit ticket of which its route number begins with the letter “E”. Example: North – South Expressway NKVE (Statistical Report and Accident – Traffic Police Bukit Aman).

**Road Rage:** “Road Rage” refers to any display of aggression by a driver. But often it is used to refer to the more extreme acts of aggression, such as a physical assault, that occur as a direct result of a disagreement between drivers:

- i) “It was an argument over parking space”.
- ii) “He cut me off”.
- iii) “She wouldn’t let me pass”.
- iv) “The bastard kept honking and honking his horn”.
- v) “He/she was driving too slowly”.
- vi) “He wouldn’t turn off his high beams”.
- vii) “They kept tailgating me”.
- viii) “She kept crossing lanes without signaling maybe I overreacted but it taught her a lesson”. (Sources: Louis Mizell, Inc., 1996)



**Intervention:** Reference has been made to extraordinary factors from the usual objective to change the present situation at the specific locations. This research is using the police vehicle, traffic police and signboard as mentioned above.

**Minimum Drivers Offence:** Refers to the average traffic offences recorded in this research.



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