

3.1.2 Facility Questionnaire

QUESTIONNAIRE FORM FOR BOILERS

FORM NO. 1

NO.

FACTORY NAME			
ADDRESS			
NUMBER OF WORKERS	INSTALLATION YEAR		
RESPONDENT'S NAME	DATE		
PLANT NAME			
PRODUCT			
VAPOUR VOLUME	MAXIMUM CAPACITY T/H	NORMAL CAPACITY T/H	
VAPOUR	PRESSURE kg/cm ²	TEMP. °C	
BOILER	MODEL	TYPE	MAKER
	DRAWINGS OR CATALOG (ANNEX)		
FUEL TYPE	FUEL COMPOSITION		FUEL COMPOSITION
CONSUMPTION	kg/H	GAS	Nm ³ /H
CALORIFIC LOAD	kcal/m ³ /H	GAS	kcal/Nm ³
MIXING RATIO	%	GAS	%
INPUT HEAT	kcal/m ³ /H		
	PRESSURE IN THE FURNACE		mmH ₂ O
TYPE AND STRUCTURE OF THE FURNACE	MODEL	TYPE	DRAWINGS OR CATALOG
BURNER CAPACITY	CAPACITY	kg/H	NORMAL CAPACITY kg/H
	CAPACITY	kg/H	NORMAL CAPACITY kg/H
FUEL TEMPERATURE	TEMP.	°C	PRESSURE mmH ₂ O
ATOMIZE PRESSURE	kg/cm ²		
AIR PRE-HEAT	TEMP.	°C	
SUPPLIED WATER	TEMP.	°C	
TYPE OF WATER SOFTENER			
EXCESS AIR			
AUTOMATIC CONTROL			
GAS TEMPERATURE AT THE EXIT		ENTRANCE	EXIT
	AIR HEATER	°C	°C
	STACK	°C	
EMITTED GAS COMPOSITION			
STACK	HEIGHT	m	DIAMETER m
EXISTENCE OF MEASURING HOLE			
TECHNICAL SUPPORTER			
REMARKS			
QUESTIONER			

QUESTIONNAIRE FORM FOR CEMENT KILN

FORM NO.2

NO.

FACTORY NAME					
ADDRESS					
NUMBER OF WORK		INSTALLATION YEAR			
RESPONDENT'S NAME		DATE			
PLANT NAME					
PRODUCTIVE CAPACITY	CAPACITY	T/H	NORMAL CAPACITY	T/H	
OPERATING HOURS		H/D			
BURNING TEMP.	MAX TEMP.	°C			
TYPE & STRUCTURE OF FURNACE	MODEL	TYPE	MAKER	DRAWINGS OR CATALOG (ANNEX)	
KIND OF FUEL CONSUMED	COMPONENT OF FUEL				
	OIL		COAL		
CONSUMPTION	OIL	kg/H	COAL	kg/H	
CALORIFIC VALUE	OIL	kcal/kg	COAL	kcal/kg	
FUEL CONSUMPTION PER UNIT PRODUCT	kcal/T				
TYPE & STRUCTURE BURNER	MODEL TYPE		DRAWINGS OR CATALOG		
BURNER CAPACITY	CAPACITY	kg/H	NORMAL CAPACITY	kg/H	
	CAPACITY	kg/H	NORMAL CAPACITY	kg/H	
OIL HEATING	TEMP.	°C	PRESSURE	mmH ₂ O	
ATOMIZER PRESSURE	kg/cm ²				
AIR PREHEATER	PRIMARY AIR	°C	SECONDARY AIR	°C	
MATERIAL PREHEATING APPARATUS	TEMP.		COOLING SYSTEM	°C → °C	
EXCESS AIR RATIO					
EXHAUST GAS TEMP. EACH POINT		°C		°C	
		°C		°C	
		°C		°C	
EXHAUST GAS COMPONENT					
STACK	HEIGHT	m	DIAMETER	m	
EXISTENCE OF SAMPLING HOLE					
TECHNICAL SUPPORTER					
REMARKS					
QUESTIONER					

QUESTIONNAIRE FORM FOR MELTING
FURNACE FOR GLASS

FORM NO. 3

NO.

FACTORY NAME			
ADDRESS			
NUMBER OF WORKERS	INSTALLATION YEAR		
RESPONDENT'S NAME			DATE
PLANT NAME			
PRODUCTIVE CAPACITY	CAPACITY	T/H	T/D
COMPONENT OF GLASS			
MELTING & EXTRACTION TEMP.	MELTING ROOM	°C	WORKING ROOM °C
MELTING FURNACE	MODEL TYPE		DRAWING OR CATALOG
KIND OF FUEL	CONSUMED COMPONENT OF FUEL		
CONSUMPTION	OIL	kg/H	
CALORIFIC VALUE	OIL	kcal/kg	
FUEL CONSUMPTION PER UNIT PRODUCT			kcal/T
TYPE & STRUCTURE BURNER	MODEL TYPE		DRAWINGS OR CATALOG
BURNER CAPACITY	CAPACITY	kg/H	NORMAL CAPACITY kg/H
OIL HEATING	TEMP.	°C	PRESSURE mmH ₂ O
ATOMIZER PRESSURE	STEAM OR COMPRESSED AIR		STEAM · COMPRESSED AIR kg/cm ²
AIR PREHEATER	TEMP	°C	
EXCESS AIR RATIO			
AUTOMATIC CONTROLLER			
TEMP. IN FURNACE	MELTING ROOM	°C	WORKING ROOM °C
	EXHAUST GAS AT INLET OF REGENERATOR		°C
	AIR		°C
	EXHAUST GAS AT OUTLET OF REGENERATOR		°C
EXHAUST GAS COMPONENT			
STACK	HEIGHT	m	DIAMETER m
EXISTENCE OF SAMPLING HOLE			
ENVIRONMENT OF MEASUREING POINT			
TECHNICAL SUPPORTER			
REMARKS			
QUESTIONER			

QUESTIONNAIRE FORM FOR MELTING
FURNACE FOR METAL
(ELECTRIC FURNACE OR CUPOLA)

FORM NO. 4

NO.

FACTORY NAME			
ADDRESS			
NUMBER OF WORKERS	INSTALLATION YEAR		
RESPONDENT'S NAME	DATE		
PLANT NAME			
PRODUCT			
CAPACITY OF MELTING	T/CHARGE		T/H
TIME OF MELTING	CHARGE	H	REFINING
	MELTING	H	TOTAL
TYPE & STRUCTURE	MODEL TYPE		DRAWING OR CATALOG (ANNEX)
	HEAT SOURCE TO BE USED		COMPONENT OF FUEL
CONSUMPTION	kwh/CHARGE		kg/CHARGE
CALORIFIC VALUE PER UNIT PRODUCT	kwh/T		kcal/T kg/T
BLAST TEMP. & PRESSURE	CUPOLA	°C	PRESSURE mmH ₂ O
EXHAUST GAS TEMP.	AT CHARGE		°C
	AT MELTING		°C
	AT REFINING		°C
EXHAUST GAS COMPONENT	AT MELTING		
	AT REFINING		
EXISTENCE OF SAMPLING HOLE			
TECHNICAL SUPPORTER			
REMARKS			
QUESTIONER			

QUESTIONNAIRE FORM FOR CERAMICS FURNACE

FORM NO. 5

NO.

FACTORY NAME			
ADDRESS			
NUMBER OF WORKERS	INISTALLATION YEAR		
RESPONDENT'S NAME			DATE
PLANT NAME			
PRODUCT			
PRODUCTIVE CAPACITY	MATERIAL SIZE STANDARD	WEIGHT	kg
		mm x mm x	mm
CAPACITY		T/H	T/D
FIRING TEMP.	MAX TEMP.	°C	
TYPE OF FURNACE		MODEL TYPE	DRAWINGS OR CATALOG (ANNEXA)
KIND OF FUEL CONSUMED		COMPONENT OF FUEL	
CONSUMPTION	OIL	kg/H	GAS Nm ³ /H
CALORIFIC VALUE	OIL	kcal/kg	GAS kcal/Nm ³
MIXING COMBUSTION RATIO	OIL	%	GAS %
FUEL CONSUMPTION PER UNIT PRODUCT	kcal/T		
BURNER	MODEL TYPE		DRAWINGS OR CATALOG
BURNER CAPACITY	CAPACITY	kg/H	NORMAL CAPACITY kg/H
	CAPACITY	Nm ³ /H	NORMAL CAPACITY Nm ³ /H
OIL HEATING	TEMP.	°C	PRESSURE mmH ₂ O
GAS BURNER PRESSURE	PRESSURE mmH ₂ O		
ATOMIZER PRESSURE	STEAM OR COMPRESSED AIR		kg/cm ²
AIR PREHEATER	TEMP.	°C	
EXCESS AIR RATIO			
EXHAUST GAS TEMP.	PREHEATING	°C	FIRING °C
	COOLING	°C	AVRAGE °C
EXHAUST GAS COMPONENT			
STACK	HEIGHT	m	DIAMETER m
EXISTENCE OF SAMPLING HOLE			
ENVIRONMENT OF MEASUREING POINT			
TECHNICAL SUPPORTER			
REMARKS			
QUESTIONER			

QUESTIONNAIRE FORM FOR DRYING FURNACE

FORM NO. 6

NO.

FACTORY NAME				
ADDRESS				
NUMBER OF WORKERS		INSTALLATION YEAR		
RESPONDENT'S NAME			DATE	
PLANT NAME				
COMPONENT OF MATERIAL				
	MOISTURE			%
DRYING CAPACITY		T/H		T/D
OPERATING HOURS		H/D		
DRYING FURNACE	MODEL TYPE		DRAWINGS OR CATALOG (ANNEX)	
TEMP. OF FURNACE		°C		
KIND OF FUEL CONSUMED	COMPONENT			
CONSUMPTION	OIL	kg/H	GAS	Nm ³ /H
CALORIFIC VALUE	OIL	kcal/kg	GAS	kcal/Nm ³
MIXING COMBUTION RATIO	OIL	%	GAS	%
FUEL CONSUMPTION PER UNIT PRODUCT		kcal/T		
TYPE & STRUCTURE OF BURNER	MODEL TYPE		DRAWINGS OR CATALOG	
BURNER CAPACITY	CAPACITY	kg/H	NORMAL CAPACITY	kg/H
OIL HEATING	TEMP.	°C	PRESSURE	mmH ₂ O
ATOMIZER PRESSURE		kg/cm ²		
EXHAUST GAS TEMP.		°C		
EXHAUST GAS COMPONENT				
STACK	HEIGHT	m	DIAMETER	m
EXISTENCE OF SAMPLING HOLE				
ENVIRONMENT OF MEASUREING POINT				
TECHNICAL SUPPORTER				
REMARKS				
QUESTIONER				

QUESTIONNAIRE FORM FOR INCINERATOR

FORM NO. 7

NO.

FACTORY NAME			
ADDRESS			
NUMBER OF WORKERS		INSTALLATION YEAR	
RESPONDENT'S NAME		DATE	
PLANT NAME			
MATERIAL OF INCINERATION	COMPONENT	%	%
		%	%
	MOIST.	%	kcal/kg
INCINERATING CAPACITY		T/H	T/D
OPERATING HOURS		H/D	
TEMP. AT FURNACE		°C	°C
EACH POINT		°C	°C
TYPE & STRUCTURE OF FURNACE	MODEL TYPE	DRAWINGS OR CATALOG (ANNEX)	
KIND OF FUEL CONSUMED	COMPONENT	COMPONENT	
CONSUMPTION	OIL	kg/H	GAS Nm ³ /H
CALORIFIC VALUE	OIL	kcal/kg	GAS kcal/Nm ³
MIXING COMBUSTION RATIO	OIL	%	GAS %
FUEL CONSUMPTION PER UNIT PRODUCT			kcal/T
BURNER	MODEL TYPE	DRAWING OR CATALOG	
BURNER CAPACITY	CAPACITY	kg/H	NORMAL CAPACITY kg/H
	CAPACITY	Nm ³ /H	NORMAL CAPACITY Nm ³ /H
OIL HEATING	TEMP.	°C	
GAS BURNER PRESSURE		PRESSURE	mmH ₂ O
ATOMIZER PRESSURE	STEAM OR COMPRESSED AIR		kg/cm ²
AIR PREHEATER	TEMP.	°C	
EXCESS AIR RATIO			
AUTOMATIC CONTROLLER			
EXHAUST GAS TEMP.		°C	°C
EXHAUST GAS COMPONENT			
STACK	HEIGHT	m	DIAMETER m
EXISTENCE OF SAMPLING HOLE			
ENVIRONMENT OF MEASUREING POINT			
TECHNICAL SUPPORTER			
TYPE OF DUST COLLECTOR	MODEL TYPE		
DUST CONCENTRATION	INLET	g/m ³	OUTLET g/m ³
REMARKS			
QUESTIONER			

QUESTIONNAIRE FORM FOR GENERAL
HEATING FURNACE

FORM NO. 8

NO.

FACTORY NAME					
ADDRESS					
NUMBER OF WORKERS		INSTALLATION YEAR			
RESPONDENT'S NAME			DATE		
PLANT NAME					
HEATING MATERIALS					
HEATING CAPACITY		T/H	T/D		
OPERATING HOURS		H/D			
EXISTING MATERIAL HEATING TEMP.		°C	°C		
TYPE & STRUCTURE OF FURNACE		MODEL	TYPE	MEKER	DRAWINGS OR CATALOG (ANNEX)
KIND OF FUEL CONSUMED		COMPONENT			
CONSUMPTION		OIL	kg/H	GAS	Nm ³ /H
CALORIFIC VALUE		OIL	kcal/kg	GAS	kcal/Nm ³
MIXING COMBUSTION RATIO		OIL	%	GAS	%
FUEL CONSUMPTION PER UNIT PRODUCT					kcal/T
BURNER		MODEL TYPE		DRAWING OR CATALOG	
BURNER CAPACITY		CAPACITY	kg/H	NORMAL CAPACITY	kg/H
		CAPACITY	Nm ³ /H	NORMAL CAPACITY	Nm ³ /H
OIL HEATING		TEMP.	°C		
GAS BURNER PRESSURE				PRESSURE	mmH ₂ O
ATOMIZER PRESSURE		STEAM OR COMPRESSED AIR			kg/cm ²
AIR PREHEATER		TEMP.	°C		
EXCESS AIR RATIO					
AUTOMATIC CONTROLLER					
TEMP. IN FURNACE & EXHAUST GAS		FURNACE	°C	EXHAUST GAS	°C
EXHAUST GAS COMPONENT					
STACK		HEIGHT	m	DIAMETER	m
EXISTENCE OF SAMPLING ENVIRONMENT OF MEASUREING POINT					
TECHNICAL SUPPORTER					
REMARKS					
QUESTIONER					

Directions for Completing Furnace Questionnaire Form

1. With regard to furnaces to be studied, use a representative furnace for the report if the same types are available.
2. Fill out every item to be the best of your ability. Also fill in those items for which measurements were previously made.
3. Presence of a furnace's general drawing or catalog.

4. Concerning the component of fuel, please indicate the following:

* For solid fuel,

Percentage (%) of C, H, S, N, O, moisture, volatile matter, fixed carbon and ash, grain size and mesh.

* For liquid fuel,

Percentage (%) of C, H, S, N, O, moisture, residual carbon and ash content, specific gravity and viscosity.

* For gas fuel,

Percentage (%) of H_2 , CH_4 , C_2H_6 , C_3H_8 , C_4H_{10} , CO , CO_2 , N_2 , and O_2 , tar content (g/m^3).

Indicate moisture content using an external value of %.

Indicate viscosity by using cSt at $50^\circ C$.

5. Use "gross Kcal" to indicate the calorific value of fuel.

6. For burner model types, distinguish between nonpremixing type and premixing type. Present or submit entire drawings of burner and nozzle gun drawings.

7. When several burners are available indicate the capacity of each burner unit.

8. Show whether or not automatic control is available. If available, indicate every control system one by one as in the case for temperature control, air-fuel ratio control and furnace pressure control.

9. For the component of exhaust gas, show CO_2 , O_2 , CO , N_2 , in %, SO_2 , NO_x , HC in ppm and dust in g/m^3 . Indicate the measuring location.

10. In any piece of air pollution control equipment is installed, indicate model type and values measured at the inlet and outlet of the equipment to comment column.

3.1.3 Emission Factor

Emission factors are applied to estimate quantities of air pollutants.

(1) Derivation of Emission Factors

Each emission factor is obtained by dividing the average measurement data of each pollutant from the equipment in the same classification code and the same type of fuel, by the fuel or production rate.

Table 4.1.7 shows characteristics of fuel used for the derivation. Liquid and solid fuel properties were analyzed in this study. Table 4.1.8 is the list of emission factors for the types of fuel.

Table 4.1.7 Fuel Characteristics

1. Liquid and Solid Fuels

	Ultimate analysis (%)						HV kcal/kg	D ₄ ¹⁵ g/ml	G ₀ m ³ N/kg	G ₀ ' m ³ N/kg
	S	C	H	N	M	A				
Heavy Fuel oil	2.51	84.78	10.79	0.98	—	—	10337	0.96	11.12	9.91
Medium Fuel oil	2.42	84.63	11.31	1.02	—	—	10290	0.96	11.09	9.85
Industrial Fuel oil	2.37	78.63	11.90	0.50	—	—	10306	0.95	10.90	9.57
Light Fuel oil (I.D.O)	0.33	78.71	11.18	1.27	—	—	10248	0.85	10.80	9.55
Coal	0.60	58.92	5.45	1.41	4.38	9.86	6902	—	7.03	6.42
Coal	1.02	62.21	4.70	1.21	10.55	9.60	6019	—	7.09	6.56
Palm waste	0.19	42.02	5.54	0.86	28.14	7.37	4442	—	5.47	4.50
Wood Waste	0.20	47.16	5.28	0.18	9.02	0.07	4204	—	5.01	4.31
Diesel oil	0.323	—	—	—	—	—	—	0.85	—	—
Gasoline	0.003	—	—	—	—	—	—	0.78	—	—

Note ; HV - Heat Value, D - Density G₀ - Theoretical Wet Combustion Gas Volume
G₀' - Theoretical Dry Combustion Gas Volume

2. Natural Gas

CH ₄	C ₂ H ₆	C ₃ H ₈	C ₄ H ₁₀	C ₅ H ₁₂	CO ₂	N ₂	HV kcal/m ³ N	G ₀ m ³ N/m ³ N	G ₀ ' m ³ N/m ³ N
80	13	3	0.8	0.008	2.7	0.3	10750	11.8	9.39

Source : DOE

3. Propane Gas

C ₂ H ₆	C ₃ H ₈	C ₄ H ₁₀	C ₅ H ₁₂	HV kcal/kg	A ₀ m ³ N/m ³ N	G ₀ m ³ N/m ³ N	G ₀ ' m ³ N/m ³ N	D ₄ ¹⁵ g/ml
0.38	30.03	67.43	2.16	16560	28.91	31.36	26.64	0.54

Note ; A₀ - Theoretical Air Volume * 1 m³N = 1.40ℓ

Table 4.1.8 Emission Factors for Solid and Liquid Fuels

	Actual				O ₂ : 0%		
	O ₂	Dust	SO _x	NO _x	Dust	SO _x	NO _x
Wood Waste	16.6	0.29	33.7	52	1.54	215	247
Palm Waste	15.3	0.87	44	109	2.46	140	330
MFO	19.3	0.12	0	8	1.48	0	99
IDO	20.9	0.008	0	3	1.68	0	630

Few types of facility and fuel were measured during this period since there were many facilities without appropriate sampling holes. To these facilities without flue gas measurements were assigned emission factors obtained from published data the U.S.EPA and various sources in Japan. It is necessary to improve the accuracy of the measured factors by including data from different operating conditions and different types of facilities.

Emission factor for SO_x is not derived, because sulfur in the fuel is converted to SO_x completely where there is no absorption of SO_x in the facility. SO_x emitted from coal burning boilers are assumed to come from 77.5% of sulfur content in the coal (#4013). The measured data of SO_x emission from cement kilns were used as the emission factor, since 90 to 100% of SO_x would be absorbed in the kiln.

Emission factors for natural gas combustion turbines are assumed to be the same as ones for the natural gas fired power plants.

(2) Equations for Calculation of Emission Factor

The following equations were used to calculate emission factors from the actual measured data at the factories.

The emission factor is expressed as per unit of fuel burnt for those fuel burning facilities such as boilers and metal heaters, or as per unit of raw material fed or as per unit of electricity consumed for those material processing facilities such as electric furnaces, cupolas, etc.

Units of kg/kl for liquid fuel and kg/ton for solid fuel are used in this report for boilers.

a) Conversion of Concentration

Actual measured concentration is converted by the following equation into zero oxygen concentration in order to avoid the diluting effect by excessive air.

$$C_s = C \times 21 / (21 - O_2)$$

C_s : Converted Concentration at $O_2=0\%$, ppm or Nm³/g

O_2 : O_2 concentration in the flue gas as measured, %

C : Pollutant concentration as measured, ppm or Nm³/g

b) Dust

$$E.F = C_s \times G_o' \times 10^{-3}$$

E.F: Emission factor, kg/kl or kg/ton or kg/103Nm³

G_o' : Theoretical flue gas volume (dry), Nm³/(l or kg or Nm³)

c) NO_x (as NO₂)

$$E.F = C_s \times G_o' \times 46 \times 10^{-6} / 22.41$$

46: Molecular weight of NO₂

22.41: Ideal gas volume of one mole

3.1.4 Prediction of Future Fuel Consumption of Liquid and Gaseous Fuels in Factories

1. Prediction Method

(1) Target Year

The year 2005 was selected as the target year of the estimation, as the traffic volume estimation was made for that year in relation with the overall traffic system.

(2) Power Stations

TNB has planned the future of power stations, the major emission source, until 2000. The plan was elongated to the year 2005 without change in this study.

(3) Factories (except power stations)

- 1) Coal: Coal consumption in the cement factory was assumed to increase at a rate of 9.5% per year as in JACTIM report (#4021).
- 2) Wood Waste: Wood waste was decided to be consumed at rates amounting to the current amounts taking into consideration of the trends in forest preservation.
- 3) Palm Waste: Based on PORIM report (#4019) palm waste consumption was estimated to increase rate at 3.3% per year.
- 4) Petroleum and Gas: Future consumption of fuel oil, diesel oil and LPG were assumed in the following manner.

2. Available for Future Assumption of KVR

PETRONAS listed fuel consumption in KVR in 1990 as Table 1.

Table 1 Fuel Consumption in KVR in 1990

	million liters
LPG	204
Motor Gasoline	897
Diesel Oil	801
Ind. Fuel Oil	171

Source Petronas (#4009)

Also it estimated demand growth (lower case) of fuel consumption in the whole country as in Table 2.

Table 2 Fuel Market Demand Growth in Malaysia

Year	1990	1992	2000
LPG	1.0	1.404	2.209
Motor Gasoline	1.0	1.201	1.865
Diesel Oil	1.0	1.086	1.493
Ind. Fuel Oil	1.0	1.102	1.017

Source: Petronas (#4009)

By assuming the growth rate in KVR to be the same as that in the country, fuel market in KVR would be as in Table 3.

Table 3 Future Fuel Market Demand in KVR

Year	1990	1992	2000
LPG	204	286	451
Motor Gasoline	897	1077	1673
Diesel Oil	801	870	1196
Ind. Fuel Oil	171	188	174

unit: million liters

3. Estimate by JICA Study Team

Table 4 is the result of JICA Study Team estimation for the 1992 fuel (petroleum and LPG) consumption in KVR. The consumption in the factories is based on the questionnaire survey and data in DOE, and the one in motor vehicles is from the calculation on numbers of cars on roads, road length, and fuel economy. In Table 4, these results are compared with those of Petronas and they are found to be very close.

Table 4 Fuel Consumption in KVR in 1992 (million liters)

		JICA	PETRONAS
LPG	Factory	85	286*
Motor Gasoline		1141	1077
Diesel Oil	Factory	265	-
	Motor Vehicle	657	-
	Total	922	870
Fuel Oil	Factory	190	188

Note: * total, not only for factories

4. Future Demand of Fuel and Diesel Oils

Future demand was estimated for fuel and diesel oils consumed in general factories except power stations as in Table 5. The demand in 2000 almost equal or less than that in 1990.

Diesel demand here is taken to be the difference of the total demand and the demand by motor vehicles. According to JICA team estimate as in Table 4, diesel oil is consumed at the ratio of 0.576 to the gasoline consumption. This value is used to estimate future demand of diesel by motor vehicles.

Table 5 Future Fuel Demand of General Factories in KVR

Year	1990	1992	2000
Diesel Oil	293	265	232
Fuel Oil	171	188	174

unit: million liters

5. Future Gas Demand

From Tables 3 and 4, LPG consumption by households (including restaurants and hotels) in 1992 is estimated to be 201 million liters. Based on the growth rate of LPG demand between 1990 and 1992, LPG demand by households is estimated to be 143 million liters in 1990. According to the JICA study (#1032), LPG demand by households in 2000 is predicted to be 1.53 times as high as that in 1990; the LPG demand by households in 2000 will be 232 million liters. So, LPG demand by factories in 2000 will be 232 million liters, which is 2.73 times as high as that in 1992; the annual growth rate of LPG by factories during these years is 13.4%. When this growth rate is assumed to continue by the year 2005, LPG demand by factories in 2005 will reach to 436 million liters, which is 5.13 times of that in 1992.

6. Conclusion

Table 7 is the summary of the estimation on the consumption of petroleum and gas in general factories in Klang Valley Region in 2005. Their consumption of fuel and diesel oils in 2005 was assumed to be the same as in 1992.

Energy demand by factories are shown in Table 8. Their total energy demand in 2005 will be 1.88 times of that in 1992.

Table 7 Factory Fuel Consumption in KVR

Fuel Type	1992 (A)	2005 (B)	B/A
LPG	85	436	5.13
Fuel Oil	190	190	1.0
Light Fuel Oil	265	265	1.0

unit: million liters

Table 8 Factory Energy Consumption in KVR

Fuel Type	1992 (A)	2005 (B)	B/A
LPG	1175	6028	5.13
Fuel Oil	1866	1866	1.0
Light Fuel Oil	2459	2459	1.0
Total	5500	10423	1.88

unit: trillion kcal

3.2 Motor Vehicles

3.2.1 Traffic Volume Survey

Station of Traffic Counting Survey

No.	Survey Station	Type	Hour
1	Federal Route 2 (west of Jln Pantai Dalam)	M	16
2	Jln Syed Putra (Wisma Belia)	M	16
3	Jln Bangsar (KTM Quarters)	M	16
4	KL-Seremban Exp. (Lpg. Ter. Lama)	M	16
5	Jln Loke Yew (Taman Maharja)	M	16
6	Jln Pudu (Tan Chong)	M	16
7	Jln Kampong Pandang (east of roundabout)	M	16
8	Jln Maharajalela (Stadium)	M	16
9	Jln Hang Tuah (Pudu Prison)	M	16
10	Jln Sultan Hishamuddin (Masjid Negara)	M	24
11	Jln Tun Razak (north of Jln U Thant)	M	24
12	Jln Bukit Bintang (BB PLaza)	M	24
13	Jln Pudu (Magnum Finance)	M	16
14	Jln Sultan Ismail (Wisma SPK)	M	24
15	Jln T.A.Rahman (north of Jln Selat)	M	24
16	Jln Kucing (Arch)	M	16
17	Jln Ampang (AIA)	M	16
18	Jln Templer (east of Jln Selangor)	S	16
19	Jln Ampang (Wisma Angkasa)	M	16
20	Jln T.A.Rahman (Hankyu Jaya)	M	16
21	Jln Ampang (French Embassy)	M	24
22	Jln Tun Razak (Bernama)	M	16
23	Jln Tun Razak (PWTC)	M	16
24	Jln Pahang (Tawakal)	M	16
25	Jln Parlimen (Padang Merbuk)	M	24
26	Jln Sultan Salahuddin	M	16
27	Jln Duta (Semantan-NKVE)	M	16
28	Jln Kucing (south of Jln Duta)	M	16
29	Jln Ipoh (HKSB)	M	16
30	PJ Highway	M	16
31	Federal Route 2 (Kota Darul Ehsan)	M	24
32	Federal Route 1 (north of Jln Kepong)	M	16
33	Jln Semantan (Jln D Bakar-Jln S17)	M	16
34	KL-Seremban Exp. (FR2-Jln Kucai Lama)	M	24
35	Federal Route 2	M	16
36	Federal Route 1 (KL-Sel border)	M	16
37	State Road (KL-Sel border)	M	16
38	Federal Route 2 (east of NKS Bypass)	M	24
39	Federal Route 5 (south of Jln Kim Chuan)	M	16
40	Jln Pelabuhan Utara (south of bridge)	M	16
41	Federal Route 2 (Carlsberg)	M	16
42	Jln Chan Sow Lin	S	16
43	Jln Cochrane	S	16
44	Jln Maarof (just north of Jln Bangsar int.)	S	16
45	Jln Raja Muda	S	16
46	Jln Semarak (Wisma Keramat)	S	16
47	Jln Raja Chulan (Plaza See Hoy Chan)	S	16
48	Jln Hang Kasturi	S	16
49	Jln Stadium	S	16
50	Jln Kebun Bunga	S	16

Notes 1. Survey Type M : Main Road , S : Secondary Road

Table

The Summary of Traffic Volume

Station Code	Weekday Traffic Volume		Sunday Traffic Volume		Ratio to Weekday	
	(16H)	(24H)	(16H)	(24H)	(16H)	(24H)
1	85,822		59,076		0.688	
2	80,131		133,316		1.664	
3	131,128		59,282		0.452	
4	94,167		91,528		0.972	
5	114,833		103,005		0.897	
6	48,739		34,127		0.700	
7	75,459		56,594		0.750	
8	96,108		77,031		0.802	
9	55,500		52,384		0.944	
10	143,996	166,066	96,745	115,642	0.672	0.696
11	115,166	131,662	88,170	102,102	0.766	0.775
12	30,627	38,615	26,688	31,893	0.871	0.826
13	56,182		45,411		0.808	
14	76,552	85,426	42,505	50,031	0.555	0.586
15	70,772	81,521	45,641	52,855	0.645	0.648
16	125,225		96,202		0.768	
17	29,524		16,478		0.558	
18	24,412		21,729		0.890	
19	54,209		24,725		0.456	
20	117,101		83,320		0.712	
21	52,441	62,419	44,206	54,140	0.843	0.867
22	97,849		70,210		0.718	
23	140,155		115,430		0.824	
24	89,187		113,134		1.269	
25	53,205	55,995	19,227	21,820	0.361	0.390
26	76,923		99,982		1.300	
27	42,771		25,515		0.597	
28	98,008		112,016		1.143	
29	60,023		54,887		0.914	
30	37,139		29,832		0.803	
31	350,267	386,476	184,633	215,853	0.527	0.559
32	80,634		82,432		1.022	
33	100,201		94,613		0.944	
34	88,807	98,336	91,660	106,382	1.032	1.082
35	123,513		71,970		0.583	
36	54,078		55,079		1.019	
37	23,264		20,400		0.877	
38	60,835	68,865	50,850	59,428	0.836	0.863
39	34,282		39,553		1.154	
40	36,976		15,519		0.420	
41	85,880		85,663		0.997	
42	20,525		11,585		0.564	
43	29,727		13,408		0.451	
44	43,324		32,563		0.752	
45	35,936		26,593		0.740	
46	47,610		28,388		0.596	
47	53,686		19,727		0.367	
48	13,168		7,852		0.596	
49	15,324		6,817		0.445	
50	3,453		3,966		1.149	
Average	73,497		57,633		0.784	

TRAFFIC VOLUME(16&24 HOURS) and VEHICLE COMPOSITION ON WEEKDAY

Location Code		Total	Car	Taxi	Small Bus	M/Large Bus	M.Cycle	Van	Small Truck	M/Large Truck	Lorry & Trailer
1	16H	85,822 100.0%	54,815 63.9%	1,899 2.2%	26 0.0%	372 0.4%	11,631 13.6%	6,019 7.0%	2,487 2.9%	4,530 5.3%	4,043 4.7%
2	16H	80,131 100.0%	48,012 59.9%	4,765 5.9%	2,445 3.1%	2,450 3.1%	5,050 6.3%	6,276 7.8%	3,393 4.2%	4,079 5.1%	3,661 4.6%
3	16H	131,128 100.0%	59,946 45.7%	9,044 6.9%	2,028 1.5%	1,440 1.1%	41,868 31.9%	9,954 7.6%	3,570 2.7%	1,958 1.5%	1,320 1.1%
4	16H	94,162 100.0%	57,129 60.7%	3,176 3.4%	248 0.3%	646 0.7%	17,669 18.8%	7,200 7.6%	4,931 5.2%	1,796 1.9%	1,367 1.4%
5	16H	114,833 100.0%	63,397 55.2%	5,478 4.8%	212 0.2%	392 0.3%	30,629 26.7%	7,464 6.5%	4,653 4.1%	2,187 1.9%	421 0.3%
6	16H	48,739 100.0%	18,099 37.1%	9,678 19.9%	2,828 5.8%	4,337 8.9%	10,203 20.9%	2,426 5.0%	911 1.9%	215 0.4%	42 0.1%
7	16H	75,459 100.0%	39,063 51.8%	6,906 9.2%	926 1.2%	387 0.5%	19,023 25.2%	5,881 7.8%	2,527 3.3%	561 0.7%	185 0.3%
8	16H	96,108 100.0%	45,671 47.5%	7,627 7.9%	244 0.3%	372 0.4%	20,900 21.7%	9,060 9.4%	6,927 7.2%	3,285 3.4%	2,022 2.2%
9	16H	55,500 100.0%	29,638 53.4%	6,018 10.8%	166 0.3%	335 0.6%	14,461 26.1%	3,830 6.9%	632 1.1%	303 0.5%	117 0.3%
10	16H	143,996 100.0%	66,738 46.3%	11,178 7.8%	1,436 1.0%	1,352 0.9%	39,127 27.2%	12,997 9.0%	4,443 3.1%	4,017 2.8%	2,708 1.9%
	24H	166,066	77,368	13,403	1,571	1,551	43,409	14,908	5,543	4,354	3,959
11	16H	115,166 100.0%	65,364 56.8%	5,863 5.1%	352 0.3%	446 0.4%	29,031 25.2%	7,802 6.8%	4,009 3.5%	1,683 1.5%	616 0.4%
	24H	131,662	75,329	7,383	400	519	32,024	9,009	4,420	1,885	693
12	16H	30,627 100.0%	15,164 49.5%	5,615 18.3%	54 0.2%	152 0.5%	7,026 22.9%	1,831 6.0%	483 1.6%	252 0.8%	50 0.2%
	24H	38,615	18,559	7,753	59	164	8,734	2,444	547	277	78
13	16H	56,182 100.0%	20,493 36.5%	10,175 18.1%	3,116 5.5%	3,628 6.5%	13,835 24.6%	3,389 6.0%	679 1.2%	569 1.0%	298 0.6%
14	16H	76,552 100.0%	39,551 51.7%	10,357 13.5%	954 1.2%	273 0.4%	18,488 24.2%	4,889 6.4%	1,174 1.5%	198 0.3%	668 0.8%
	24H	85,426	44,317	12,504	1,031	287	19,546	5,471	1,325	208	737
15-1	16H	37,184 100.0%	14,129 38.0%	3,844 10.3%	2,505 6.7%	736 2.0%	12,699 34.2%	2,642 7.1%	251 0.7%	301 0.8%	77 0.2%
	24H	44,371	17,201	5,225	2,630	797	14,509	3,252	342	317	98
15-2	16H	33,588 100.0%	14,549 43.3%	3,235 9.6%	1,555 4.6%	1,238 3.7%	10,279 30.6%	2,220 6.6%	391 1.2%	104 0.3%	17 0.1%
	24H	37,150	15,962	3,898	1,684	1,297	11,357	2,383	399	129	41
16	16H	125,225 100.0%	61,635 49.2%	9,061 7.2%	365 0.3%	1,075 0.9%	27,662 22.1%	12,547 10.0%	6,066 4.8%	5,049 4.0%	1,765 1.5%
17	16H	29,524 100.0%	11,345 38.4%	3,398 11.5%	1,748 5.9%	2,714 9.2%	8,237 27.9%	1,383 4.7%	482 1.6%	185 0.6%	32 0.2%
18	16H	24,412 100.0%	13,687 56.1%	1,777 7.3%	272 1.1%	141 0.6%	4,938 20.2%	2,052 8.4%	1,015 4.2%	422 1.7%	108 0.4%
19	16H	54,209 100.0%	28,930 53.4%	5,317 9.8%	663 1.2%	1,124 2.1%	13,426 24.8%	2,935 5.4%	699 1.3%	524 1.0%	591 1.0%
20-1	16H	48,156 100.0%	15,161 31.5%	6,658 13.8%	2,941 6.1%	2,563 5.3%	15,670 32.5%	3,781 7.9%	1,262 2.6%	99 0.2%	21 0.1%
20-2	16H	68,945 100.0%	21,786 31.6%	10,395 15.1%	5,552 8.1%	3,278 4.8%	16,275 23.6%	7,069 10.3%	2,936 4.3%	1,370 2.0%	284 0.2%
21	16H	52,441 100.0%	26,383 50.3%	3,506 6.7%	1,080 2.1%	1,177 2.2%	13,496 25.7%	3,999 7.6%	1,389 2.6%	691 1.3%	720 1.5%
	24H	62,419	31,744	4,915	1,161	1,282	15,269	4,846	1,628	776	798
22	16H	97,849 100.0%	54,249 55.4%	5,153 5.3%	146 0.1%	181 0.2%	26,573 27.2%	7,468 7.6%	2,591 2.6%	1,364 1.4%	124 0.2%
23	16H	140,155 100.0%	78,568 56.0%	8,072 5.8%	236 0.2%	660 0.5%	34,453 24.5%	11,005 7.8%	3,775 2.7%	2,746 2.0%	640 0.5%
24	16H	89,187 100.0%	44,810 50.2%	6,891 7.7%	1,021 1.1%	1,947 2.2%	24,449 27.4%	6,321 7.1%	2,791 3.1%	636 0.7%	321 0.5%
25	16H	53,205 100.0%	28,209 53.0%	5,376 10.1%	1,697 3.2%	1,723 3.2%	10,081 18.9%	3,505 6.6%	1,714 3.2%	633 1.2%	267 0.6%
	24H	55,995	30,110	5,631	1,705	1,732	10,484	3,640	1,771	649	273

TRAFFIC VOLUME(16&24 HOURS) and VEHICLE COMPOSITION ON WEEKDAY

Location Code	Total	Car	Taxi	Small Bus	M/Large Bus	M.Cycle	Van	Small Truck	M/Large Truck	Lorry & Trailer
26 16H	76,923 100.0%	49,487 64.3%	2,838 3.7%	83 0.1%	251 0.3%	11,952 15.5%	6,296 8.2%	3,577 4.7%	1,469 1.9%	970 1.3%
27 16H	42,771 100.0%	25,352 59.2%	1,615 3.8%	83 0.2%	154 0.4%	8,587 20.1%	3,274 7.7%	2,215 5.2%	977 2.3%	514 1.1%
28 16H	98,008 100.0%	51,900 53.0%	3,650 3.7%	132 0.1%	759 0.8%	20,622 21.0%	8,804 9.0%	6,081 6.2%	3,402 3.5%	2,658 2.7%
29 16H	60,023 100.0%	27,235 45.4%	4,165 6.9%	1,816 3.0%	1,856 3.1%	15,837 26.4%	5,355 8.9%	2,417 4.0%	962 1.6%	380 0.7%
30 16H	37,139 100.0%	25,493 68.6%	2,791 7.5%	37 0.1%	45 0.1%	5,429 14.6%	2,174 5.9%	1,022 2.8%	126 0.3%	22 0.1%
31 16H	350,267 100.0%	188,383 53.8%	14,076 4.0%	2,165 0.6%	3,073 0.9%	66,135 18.9%	30,332 8.7%	21,403 6.1%	14,704 4.2%	9,996 2.8%
24H	386,476	210,136	16,169	2,422	3,481	71,020	33,695	22,813	15,653	11,087
32 16H	80,634 100.0%	42,746 53.0%	2,186 2.7%	977 1.2%	1,437 1.8%	15,906 19.7%	7,246 9.0%	4,938 6.1%	3,237 4.0%	1,961 2.5%
33 16H	100,201 100.0%	67,905 67.8%	5,114 5.1%	370 0.4%	299 0.3%	16,389 16.4%	7,230 7.2%	2,494 2.5%	344 0.3%	56 0.0%
34 16H	88,807 100.0%	48,200 54.3%	1,481 1.7%	81 0.1%	758 0.9%	18,303 20.6%	7,284 8.2%	5,945 6.7%	4,271 4.8%	2,484 2.7%
24H	98,336	53,525	1,704	94	1,024	19,480	8,134	6,458	4,674	3,243
35 16H	123,513 100.0%	68,868 55.8%	2,208 1.8%	201 0.2%	1,898 1.5%	23,482 19.0%	9,553 7.7%	8,402 6.8%	4,767 3.9%	4,134 3.3%
36 16H	54,078 100.0%	28,581 52.9%	1,713 3.2%	6 0.0%	809 1.5%	12,852 23.8%	4,243 7.8%	3,407 6.3%	2,007 3.7%	460 0.8%
37 16H	23,264 100.0%	11,356 48.8%	386 1.7%	14 0.1%	327 1.4%	4,768 20.5%	2,270 9.8%	2,041 8.8%	1,231 5.3%	871 3.6%
38 16H	60,835 100.0%	31,353 51.5%	585 1.0%	59 0.1%	1,165 1.9%	12,205 20.1%	4,804 7.9%	2,496 4.1%	3,425 5.6%	4,743 7.8%
24H	68,865	35,978	674	66	1,339	13,583	5,498	2,699	3,662	5,366
39 16H	34,282 100.0%	16,661 48.6%	1,118 3.3%	169 0.5%	341 1.0%	8,231 24.0%	2,712 7.9%	2,215 6.5%	1,638 4.8%	1,197 3.4%
40 16H	36,976 100.0%	10,862 29.4%	571 1.5%	59 0.2%	454 1.2%	16,758 45.4%	2,229 6.0%	1,125 3.0%	1,750 4.7%	3,168 8.6%
41 16H	85,880 100.0%	50,207 58.5%	1,384 1.6%	58 0.1%	1,470 1.7%	14,205 16.5%	6,927 8.1%	4,719 5.5%	3,786 4.4%	3,124 3.6%
42 16H	20,525 100.0%	6,368 31.1%	1,627 7.9%	169 0.8%	474 2.3%	6,694 32.7%	2,185 10.6%	1,588 7.7%	928 4.5%	492 2.4%
43 16H	29,727 100.0%	15,243 51.3%	3,120 10.5%	317 1.1%	251 0.8%	6,456 21.7%	2,747 9.2%	1,207 4.1%	308 1.0%	78 0.3%
44 16H	43,324 100.0%	27,435 63.3%	4,582 10.6%	58 0.1%	238 0.5%	6,951 16.1%	2,582 6.0%	1,161 2.7%	236 0.5%	81 0.2%
45 16H	35,936 100.0%	15,671 43.6%	4,482 12.5%	730 2.0%	860 2.4%	10,573 29.4%	2,878 8.0%	638 1.8%	72 0.2%	32 0.1%
46 16H	47,610 100.0%	22,851 48.0%	2,920 6.1%	336 0.7%	619 1.3%	17,033 35.8%	2,675 5.6%	648 1.4%	444 0.9%	84 0.2%
47 16H	53,686 100.0%	30,135 56.2%	7,430 13.8%	617 1.1%	657 1.2%	11,763 21.9%	2,445 4.6%	545 1.0%	46 0.1%	48 0.1%
48 16H	13,168 100.0%	4,680 35.5%	1,871 14.2%	840 6.4%	127 1.0%	4,366 33.2%	917 7.0%	308 2.3%	42 0.3%	17 0.1%
49 16H	15,324 100.0%	8,326 54.4%	1,446 9.5%	34 0.2%	51 0.3%	4,064 26.5%	1,038 6.8%	175 1.1%	171 1.1%	19 0.1%
50 16H	3,453 100.0%	2,667 77.2%	112 3.2%	4 0.1%	2 0.1%	434 12.6%	156 4.5%	27 0.8%	40 1.2%	11 0.3%

TRAFFIC VOLUME(16&24 HOURS) and VEHICLE COMPOSITION ON SUNDAY

Location Code	Total	Car	Taxi	Small Bus	M/Large Bus	M.Cycle	Van	Small Truck	M/Large Truck	Lorry & Trailer
1 16H	59,076 100.0%	42,464 71.9%	1,536 2.6%	55 0.1%	429 0.7%	6,279 10.6%	4,699 8.0%	1,954 3.3%	1,339 2.3%	321 0.5%
2 16H	133,316 100.0%	101,966 76.5%	9,633 7.2%	1,387 1.0%	1,817 1.4%	1,744 1.3%	7,140 5.4%	3,110 2.3%	2,809 2.1%	3,710 2.8%
3 16H	59,282 100.0%	27,477 46.3%	5,373 9.1%	958 1.6%	662 1.1%	19,205 32.4%	3,951 6.7%	1,187 2.0%	418 0.7%	51 0.1%
4 16H	91,528 100.0%	59,846 65.4%	4,153 4.5%	154 0.2%	864 0.9%	13,597 14.9%	8,110 8.9%	1,226 1.3%	1,705 1.9%	1,873 2.0%
5 16H	103,005 100.0%	63,270 61.3%	6,471 6.3%	158 0.2%	192 0.2%	21,410 20.8%	7,790 7.6%	2,665 2.6%	915 0.9%	134 0.1%
6 16H	34,127 100.0%	14,231 41.8%	7,405 21.8%	1,611 4.7%	3,045 8.9%	5,915 17.3%	1,500 4.4%	353 1.0%	51 0.1%	16 0.0%
7 16H	56,594 100.0%	31,930 56.4%	6,394 11.3%	696 1.2%	219 0.4%	11,484 20.3%	4,351 7.7%	1,134 2.0%	211 0.4%	175 0.3%
8 16H	77,031 100.0%	45,714 59.3%	6,166 8.0%	64 0.1%	254 0.3%	15,228 19.8%	6,071 7.9%	2,388 3.1%	937 1.2%	209 0.3%
9 16H	52,384 100.0%	30,661 58.6%	9,123 17.4%	89 0.2%	465 0.9%	7,712 14.7%	3,320 6.3%	682 1.3%	254 0.5%	78 0.1%
10 16H	96,745 100.0%	54,303 56.2%	9,792 10.1%	990 1.0%	859 0.9%	18,993 19.6%	7,957 8.2%	2,422 2.5%	1,035 1.1%	394 0.4%
24H	115,642	64,062	11,997	1,097	1,043	21,992	10,003	3,230	1,544	674
11 16H	88,170 100.0%	53,852 61.0%	6,590 7.5%	158 0.2%	249 0.3%	17,499 19.8%	6,396 7.3%	1,518 1.7%	1,377 1.6%	531 0.6%
24H	102,102	62,186	7,955	194	322	20,046	7,581	1,626	1,574	618
12 16H	26,688 100.0%	13,618 51.1%	7,111 26.6%	24 0.1%	130 0.5%	4,111 15.4%	1,267 4.7%	187 0.7%	89 0.3%	151 0.6%
24H	31,893	15,825	9,035	33	146	4,854	1,532	222	93	153
13 16H	45,411 100.0%	17,576 38.8%	12,041 26.5%	1,490 3.3%	3,065 6.7%	8,262 18.2%	2,154 4.7%	494 1.1%	247 0.5%	82 0.2%
14 16H	42,505 100.0%	23,938 56.4%	8,436 19.8%	748 1.8%	191 0.4%	6,401 15.1%	2,092 4.9%	465 1.1%	101 0.2%	133 0.3%
24H	50,031	27,900	10,472	827	211	7,362	2,485	526	110	138
15-1 16H	24,695 100.0%	9,516 38.5%	3,530 14.3%	2,095 8.5%	527 2.1%	7,343 29.7%	1,323 5.4%	212 0.9%	110 0.4%	39 0.2%
24H	29,039	11,050	4,411	2,225	572	8,716	1,664	234	124	43
15-2 16H	20,946 100.0%	7,561 36.2%	2,396 11.4%	1,564 7.5%	1,161 5.5%	7,045 33.6%	962 4.6%	208 1.0%	41 0.2%	8 0.0%
24H	23,816	8,440	2,729	1,641	1,219	8,319	1,172	239	46	11
16 16H	96,202 100.0%	54,565 56.7%	8,530 8.9%	293 0.3%	759 0.8%	18,438 19.2%	8,030 8.3%	2,374 2.5%	1,930 2.0%	1,283 1.3%
17 16H	16,478 100.0%	5,754 34.9%	2,743 16.6%	1,429 8.7%	2,435 14.8%	3,153 19.1%	768 4.7%	118 0.7%	52 0.3%	26 0.2%
18 16H	21,729 100.0%	13,962 64.2%	1,561 7.2%	261 1.2%	39 0.2%	3,772 17.4%	1,465 6.7%	523 2.4%	101 0.5%	45 0.2%
19 16H	24,725 100.0%	12,004 48.5%	3,698 15.0%	917 3.7%	632 2.6%	5,375 21.7%	1,630 6.6%	300 1.2%	100 0.4%	69 0.3%
20-1 16H	39,937 100.0%	13,149 32.9%	7,145 17.9%	3,051 7.6%	1,933 4.8%	11,048 27.7%	2,850 7.1%	699 1.8%	40 0.1%	22 0.1%
20-2 16H	43,383 100.0%	16,042 37.1%	7,826 18.0%	3,272 7.5%	1,899 4.4%	10,727 24.7%	2,558 5.9%	527 1.2%	409 0.9%	123 0.3%
21 16H	44,206 100.0%	25,853 58.5%	4,044 9.1%	1,048 2.4%	972 2.2%	7,509 17.0%	2,984 6.8%	769 1.7%	489 1.1%	538 1.2%
24H	54,140	29,219	4,972	1,149	1,094	10,669	4,307	1,140	925	665
22 16H	70,210 100.0%	42,982 61.3%	4,315 6.1%	50 0.1%	154 0.2%	15,021 21.4%	5,770 8.2%	1,222 1.7%	611 0.9%	85 0.1%
23 16H	115,430 100.0%	69,423 60.2%	8,654 7.5%	134 0.1%	458 0.4%	22,639 19.6%	10,043 8.7%	2,934 2.5%	987 0.9%	158 0.1%
24 16H	133,134 100.0%	55,807 42.0%	12,201 9.2%	2,814 2.1%	3,113 2.3%	25,491 19.1%	10,385 7.8%	22,037 16.6%	833 0.6%	453 0.3%
25 16H	19,227 100.0%	12,903 67.0%	2,204 11.5%	262 1.4%	238 1.2%	2,327 12.1%	1,032 5.4%	165 0.9%	68 0.4%	28 0.1%
24H	21,820	14,587	2,474	270	244	2,741	1,209	194	72	29

TRAFFIC VOLUME(16&24 HOURS) and VEHICLE COMPOSITION ON SUNDAY

Location Code	Total	Car	Taxi	Small Bus	M/Large Bus	M.Cycle	Van	Small Truck	M/Large Truck	Lorry & Trailer
26 16H	99,982 100.0%	60,858 60.9%	4,170 4.2%	363 0.4%	549 0.5%	16,332 16.3%	10,802 10.8%	4,116 4.1%	1,756 1.8%	1,036 1.0%
27 16H	25,515 100.0%	18,237 71.6%	1,151 4.5%	48 0.2%	89 0.3%	3,298 12.9%	1,482 5.8%	760 3.0%	318 1.2%	132 0.5%
28 16H	112,016 100.0%	71,963 64.2%	4,457 4.0%	201 0.2%	1,082 1.0%	19,338 17.3%	9,208 8.2%	3,176 2.8%	1,663 1.5%	928 0.8%
29 16H	54,887 100.0%	29,873 54.5%	4,725 8.6%	2,267 4.1%	2,164 3.9%	10,379 19.0%	3,532 6.4%	1,417 2.6%	453 0.8%	77 0.1%
30 16H	29,832 100.0%	22,146 74.2%	1,955 6.6%	14 0.0%	17 0.1%	3,700 12.4%	1,620 5.4%	354 1.2%	19 0.1%	7 0.0%
31 16H	184,633 100.0%	122,758 66.5%	11,873 6.4%	1,892 1.0%	1,953 1.1%	24,817 13.4%	13,232 7.2%	4,763 2.6%	2,165 1.2%	1,180 0.6%
24H	215,853	141,711	14,251	2,159	2,287	29,239	16,386	5,717	2,472	1,631
32 16H	82,432 100.0%	48,729 59.2%	2,552 3.1%	591 0.7%	1,365 1.7%	15,852 19.2%	8,117 9.8%	3,076 3.7%	1,358 1.6%	792 1.0%
33 16H	94,613 100.0%	72,336 76.4%	5,179 5.5%	467 0.5%	220 0.2%	8,848 9.3%	5,070 5.4%	1,501 1.6%	733 0.8%	259 0.3%
34 16H	91,660 100.0%	62,542 68.2%	2,739 3.0%	90 0.1%	1,216 1.3%	13,480 14.7%	7,322 8.0%	2,567 2.8%	974 1.1%	730 0.8%
24H	106,382	72,365	3,093	111	1,496	14,964	8,793	3,088	1,242	1,230
35 16H	71,970 100.0%	47,526 66.1%	2,094 2.9%	103 0.1%	1,497 2.1%	11,063 15.4%	6,070 8.4%	1,897 2.6%	1,095 1.5%	625 0.9%
36 16H	55,079 100.0%	32,834 59.6%	2,052 3.7%	21 0.0%	562 1.0%	11,668 21.2%	5,435 9.9%	1,530 2.8%	767 1.4%	210 0.4%
37 16H	20,400 100.0%	12,471 61.2%	508 2.5%	22 0.1%	313 1.5%	3,965 19.4%	2,044 10.0%	743 3.6%	256 1.3%	78 0.4%
38 16H	50,850 100.0%	31,578 62.1%	798 1.6%	61 0.1%	1,006 2.0%	9,512 18.7%	4,465 8.8%	1,584 3.1%	904 1.8%	942 1.8%
24H	59,428	36,684	958	74	1,139	10,919	5,404	1,861	1,018	1,371
39 16H	39,553 100.0%	20,387 51.6%	1,812 4.6%	453 1.1%	478 1.2%	8,757 22.2%	3,892 9.8%	2,075 5.2%	966 2.4%	733 1.9%
40 16H	15,519 100.0%	4,724 30.4%	528 3.4%	51 0.3%	199 1.3%	7,607 49.0%	1,081 7.0%	303 2.0%	374 2.4%	652 4.2%
41 16H	85,663 100.0%	59,397 69.2%	1,824 2.1%	53 0.1%	1,342 1.6%	12,429 14.5%	6,848 8.0%	1,843 2.2%	1,358 1.6%	569 0.7%
42 16H	11,585 100.0%	4,937 42.5%	1,027 8.9%	101 0.9%	403 3.5%	3,529 30.5%	712 6.1%	503 4.3%	286 2.5%	87 0.8%
43 16H	13,408 100.0%	6,409 47.8%	2,015 15.0%	185 1.4%	148 1.1%	3,433 25.6%	895 6.7%	249 1.9%	57 0.4%	17 0.1%
44 16H	32,563 100.0%	21,603 66.3%	4,774 14.7%	27 0.1%	66 0.2%	3,660 11.2%	1,727 5.3%	544 1.7%	102 0.3%	60 0.2%
45 16H	26,593 100.0%	10,751 40.3%	4,327 16.3%	603 2.3%	580 2.2%	7,780 29.3%	2,163 8.1%	307 1.2%	61 0.2%	21 0.1%
46 16H	28,388 100.0%	12,843 45.2%	2,828 10.0%	299 1.1%	428 1.5%	9,521 33.5%	2,019 7.1%	306 1.1%	109 0.4%	35 0.1%
47 16H	19,727 100.0%	10,360 52.6%	5,190 26.4%	475 2.4%	401 2.0%	1,970 10.0%	956 4.8%	88 0.4%	61 0.3%	226 1.1%
48 16H	7,852 100.0%	3,182 40.5%	1,551 19.8%	998 12.7%	163 2.1%	1,486 18.9%	372 4.7%	36 0.5%	57 0.7%	7 0.1%
49 16H	6,817 100.0%	1,064 15.6%	223 3.3%	32 0.5%	10 0.1%	1,116 16.4%	3,584 52.5%	761 11.2%	14 0.2%	13 0.2%
50 16H	3,966 100.0%	3,204 80.8%	108 2.7%	0 0.0%	6 0.2%	425 10.7%	164 4.1%	40 1.0%	19 0.5%	0 0.0%

3.2.2 Travel Speed Survey

Survey Routes and Check Points of Driving Speed Survey

No.1 : Federal Highway 2
(Shah Alam - KL)

NO.	Check Point Name
1- 1	Jln Istana Kayangan
1- 2	Jln Subang
1- 3	Jln Klang Lama
1- 4	Jln Templer
1- 5	Jln Gasing
1- 6	Jln Bangsar
1- 7	Jln Pantai Dalam
1- 8	Jln Klang Lama
1- 9	Jln Brickfield
1-10	Jln Istana
1-11	Jln Sulaiman
1-12	Jln Damansara
1-13	Jln Raja

No.2 : KL-Seremban Expressway
(Kajang - KL)

NO.	Check Point Name
2- 1	Kajang Toll Plaza
2- 2	UPM Flyover
2- 3	Toll Gate
2- 4	Federal Highway
2- 5	Jln Sg. Besi
2- 6	Jln Lpg. Terbang Lama
2- 7	Jln Cheras/Loke Yew
2- 8	Jln Tun Razak
2- 9	Changkat Thambi Dollah
2-10	Jln Imbi
2-11	Jln Bukit Bintang
2-12	Pudu Roundabout
2-13	Jln Raja Chulan
2-14	Jln Melaka
2-15	Jln T.A.R.
2-16	Jln Parlimen

No.3 : Jln Pahang/Jln Geg. Klang
(Taman Bunga Raya - KL)

NO.	Check Point Name
3- 1	Jln J1/Jln Tumbunan
3- 2	Jln Gombak
3- 3	Jln Titiwangsa
3- 4	Pahang Roundabout
3- 5	Jln Raja Muda
3- 6	Jln Sultan Ismail
3- 7	Jln Dang Wangi
3- 8	Jln Tun Perak
3- 9	Jln Raja

No.4 : Inner Ring Road
(KL City)

NO.	Check Point Name
4- 1	Jln Sultan Hishamudin
4- 2	Jln Sulaiman
4- 3	Jln Wisma Putra
4- 4	Jln Loke Yew
4- 5	Jln Hang Jebat
4- 6	Jln Pudu
4- 7	Jln Imbi
4- 8	Jln Bukit Bintang
4- 9	Jln Raja Chulan
4-10	Jln P. Ramlee
4-11	Jln Ampang
4-12	Jln Raja Abdullah
4-13	Jln T.A.R.
4-14	Jln Raja Laut
4-15	Jln Kuching
4-16	Jln Raja
4-17	Jln Sultan Hishamudin

No.5 : Middle Ring Road
(KL City)

NO.	Check Point Name
5- 1	Jln Sg. Besi
5- 2	Jln Loke Yew
5- 3	Jln Cheras
5- 4	Jln Kg. Pandan
5- 5	Jln Bukit Bintang
5- 6	Jln U Thant
5- 7	Jln Ampang
5- 8	Jln Yap Kwan Seng
5- 9	Jln Semarak
5-10	Jln Pahang
5-11	Jln Ipoh
5-12	Jln Kuching
5-13	Jln Parlimen
5-14	Jln Travers
5-15	Jln Brickfield
5-16	Jln Syed Putra
5-17	Jln Lapangan Terbang
5-18	Jln Sg. Besi

AGERAGE TRAVEL SPEED at SECTION

Route	Section	Morning Prek			Off Prek			Evening Prek				
		Dist. (km)	Travel dir1 (sec)	Travel dir2 (sec)	Travel Speed (km/h)	Travel dir1 (sec)	Travel dir2 (sec)	Travel Speed (km/h)	Travel dir1 (sec)	Travel dir2 (sec)	Travel Speed (km/h)	
1. Federal Highway	WD Batu Tiga - P.J		7.30	973	543	34.7	508	591	47.8	684	1547	23.6
			4.60	616	335	34.8	361	379	44.8	492	670	28.5
			6.30	1265	1255	18.0	540	500	43.6	969	1041	22.6
			0.80	367	205	10.1	290	125	13.9	443	264	8.1
	SD Batu Tiga - P.J		7.30	385	420	65.3	599	586	44.4	487	556	50.4
			4.60	245	260	65.6	351	315	49.7	326	358	48.4
			6.30	393	349	61.1	478	413	50.9	448	441	51.0
			0.80	124	135	22.2	99	152	22.9	182	121	19.0
2. KL-Seremban Expressway	WD Kajang - F.Highway		15.40	1304	851	51.5	876	868	63.6	1124	879	55.4
			3.50	349	270	40.7	264	223	51.7	538	282	30.7
			2.05	287	244	27.8	360	318	21.8	420	325	19.8
			2.25	517	346	18.8	363	370	22.1	478	620	14.8
	SD Kajang - F.Highway		15.40	867	853	64.5	880	952	60.5	1037	932	56.3
			3.50	199	208	61.9	225	219	56.8	229	204	58.2
			2.05	256	208	31.8	328	229	26.5	199	245	33.2
			2.25	194	252	36.3	406	277	23.7	383	287	24.2
3. Jln Pahan/ Genting Klang	WD T.B.R - M/R		5.35	1700	486	17.6	730	498	31.4	555	973	25.2
			1.80	217	212	30.2	247	209	28.4	214	322	24.2
			1.85	301	273	23.2	330	207	24.8	482	330	16.4
	SD T.B.R - M/R		5.35	463	378	45.8	565	634	32.1	474	763	31.1
			1.80	148	155	42.8	167	201	35.2	213	196	31.7
			1.85	169	178	38.4	233	224	29.1	311	198	26.2
4. Inner Ring Road	WD Jln Syed Putra - Jln Loke Yew		1.05	118	166	26.6	116	457	13.2	200	218	18.1
			4.60	807	993	18.4	874	1771	12.5	1589	2358	8.4
			2.50	218	258	37.8	229	275	35.7	643	407	17.1
	SD Jln Syed Putra - Jln Loke Yew		1.05	113	189	25.0	161	187	21.7	139	213	21.5
			4.60	848	832	19.7	1046	1248	14.4	1545	1059	12.7
			2.50	248	276	34.4	341	296	28.3	480	346	21.8
5. Middle Ring Road	WD Jln Syed Putra - Jln Sungai Besi		2.95	527	301	25.7	250	265	41.2	372	220	35.9
			9.10	1045	1300	27.9	1155	1153	28.4	1562	1436	21.9
			5.10	351	337	53.4	353	338	53.1	377	536	40.2
	SD Jln Syed Putra - Jln Sungai Besi		2.95	245	215	46.2	175	217	54.2	215	196	51.7
			9.10	832	816	39.8	946	1072	32.5	767	1076	35.6
			5.10	361	305	55.1	309	322	58.2	311	317	58.5

Note: P.J : Petaling Jaya
I/R : Inner Ringroad
M/R : Middle Ringroad
WD : Weekday
SD : Sunday

RESULT OF TRAVEL SPEED SURVEY (Federal Highway 2)

(1) Weekday : from Shah Alam to KL

No.	Check Point	Dist. (km)	Morning Peak (7:00)			Off Peak (10:00)			Evening Peak (16:30)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)
1	Batu Tiga crossing	4.00	0 0	591	24.4	0 0	291	49.5	0 0	402	35.8
2	Jln Subang crossing	3.30	9 51	382	31.1	4 51	217	54.7	6 42	282	42.1
3	Jln Klang Lama crossing	2.00	16 13	247	29.1	8 28	161	44.7	11 24	203	35.5
4	Jln Templer crossing	2.60	20 20	369	25.4	11 9	200	46.8	14 47	289	32.4
5	Jln Gasing crossing	1.25	26 29	191	23.6	14 29	93	48.4	19 36	201	22.4
6	Jln Bangsar crossing	1.15	29 40	194	21.3	16 2	94	44.0	22 57	168	24.6
7	Jln Pantai Dalam crossing	0.65	32 54	155	15.1	17 36	56	41.8	25 45	96	24.4
8	Jln Klang Lama crossing	1.20	35 29	246	17.6	18 32	108	40.0	27 21	206	21.0
9	Jln Brickfield crossing	2.05	39 35	479	15.4	20 20	189	39.0	30 47	298	24.8
10	Jln Istana crossing	0.30	47 34	124	8.7	23 29	77	14.0	35 45	118	9.2
11	Jln Sulaiman crossing	0.25	49 38	143	6.3	24 46	95	9.5	37 43	205	4.4
12	Jln Kinabalu crossing	0.25	52 1	100	9.0	26 21	118	7.6	41 8	120	7.5
13	Jln S.Hishamuddin crossing		53 41			28 19			43 8		
TOTAL		19.00	53 41	3221	21.2	28 19	1699	40.3	43 8	2588	26.4

(2) Weekday : from KL to Shah Alam

No.	Check Point	Dist. (km)	Morning Peak (8:57)			Off Peak (14:00)			Evening Peak (18:00)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)
1	Batu Tiga crossing	4.00	38 58	305	47.2	26 35	334	43.1	58 42	931	15.5
2	Jln Subang crossing	3.30	33 53	238	49.9	21 1	257	46.2	43 11	616	19.3
3	Jln Klang Lama crossing	2.00	29 55	145	49.7	16 44	169	42.6	32 55	300	24.0
4	Jln Templer crossing	2.60	27 30	190	49.3	13 55	210	44.6	27 55	370	25.3
5	Jln Gasing crossing	1.25	24 20	112	40.2	10 25	97	46.4	21 45	185	24.3
6	Jln Bangsar crossing	1.15	22 28	120	34.5	8 48	97	42.7	18 40	150	27.6
7	Jln Pantai Dalam crossing	0.65	20 28	205	11.4	7 11	54	43.3	16 10	95	24.6
8	Jln Klang Lama crossing	1.20	17 3	338	12.8	6 17	93	46.5	14 35	240	18.0
9	Jln Brickfield crossing	2.05	11 25	480	15.4	4 44	159	46.4	10 35	371	19.9
10	Jln Istana crossing	0.30	3 25	77	14.0	2 5	25	43.2	4 24	83	13.0
11	Jln Sulaiman crossing	0.25	2 8	68	13.2	1 40	40	22.5	3 1	89	10.1
12	Jln Kinabalu crossing	0.25	1 0	60	15.0	1 0	60	15.0	1 32	92	9.8
13	Jln S.Hishamuddin crossing		0 0			0 0			0 0		
TOTAL		19.00	38 58	2338	29.3	26 35	1595	42.9	58 42	3522	19.4

RESULT OF TRAVEL SPEED SURVEY (Federal Highway 2)

(3) Holiday : from Shah Alam to KL

No.	Check Point	Dist. (km)	Morning Peak (7:01)				Off Peak (10:07)				Evening Peak (16:30)						
			Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)
			H	M	S			H	M	S			H	M	S		
1	Batu Tiga crossing	4.00	0	0	215	67.0	0	0	346	41.6	0	0	261	55.2			
2	Jln Subang crossing	3.30	3	35	170	69.9	5	46	253	47.0	4	21	226	52.6			
3	Jln Klang Lama crossing	2.00	6	25	105	68.6	9	59	151	47.7	8	7	139	51.8			
4	Jln Templer crossing	2.60	8	10	140	66.9	12	30	200	46.8	10	26	187	50.1			
5	Jln Gasing crossing	1.25	10	30	70	64.3	15	50	88	51.1	13	33	86	52.3			
6	Jln Bangsar crossing	1.15	11	40	62	66.8	17	18	80	51.8	14	59	74	55.9			
7	Jln Pantai Dalam crossing	0.65	12	42	38	61.6	18	38	50	46.8	16	13	48	48.8			
8	Jln Klang Lama crossing	1.20	13	20	79	54.7	19	28	82	52.7	17	1	91	47.5			
9	Jln Brickfield crossing	2.05	14	39	144	51.3	20	50	178	41.5	18	32	149	49.5			
10	Jln Istana crossing	0.30	17	3	23	47.0	23	48	34	31.8	21	1	29	37.2			
11	Jln Sulaiman crossing	0.25	17	26	29	31.0	24	22	26	34.6	21	30	52	17.3			
12	Jln Kinabalu crossing	0.25	17	55	72	12.5	24	48	39	23.1	22	22	101	8.9			
13	Jln S.Hishamuddin crossing	0.25	19	7			25	27			24	3					
TOTAL		19.00	19	7	1147	59.6	25	27	1527	44.8	24	3	1443	47.4			

(4) Holiday : from KL to Shah Alam

No.	Check Point	Dist. (km)	Morning Peak (7:21)				Off Peak (14:00)				Evening Peak (17:31)						
			Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)
			H	M	S			H	M	S			H	M	S		
1	Batu Tiga crossing	4.00	19	24	235	61.3	24	26	320	45.0	24	36	297	48.5			
2	Jln Subang crossing	3.30	15	29	185	64.2	19	6	266	44.7	19	39	259	45.9			
3	Jln Klang Lama crossing	2.00	12	24	117	61.5	14	40	135	53.3	15	20	170	42.4			
4	Jln Templer crossing	2.60	10	27	143	65.5	12	25	180	52.0	12	30	188	49.8			
5	Jln Gasing crossing	1.25	8	4	73	61.6	9	25	87	51.7	9	22	91	49.5			
6	Jln Bangsar crossing	1.15	6	51	66	62.7	7	58	81	51.1	7	51	74	55.9			
7	Jln Pantai Dalam crossing	0.65	5	45	35	66.9	6	37	44	53.2	6	37	42	55.7			
8	Jln Klang Lama crossing	1.20	5	10	63	68.6	5	53	77	56.1	5	55	80	54.0			
9	Jln Brickfield crossing	2.05	4	7	112	65.9	4	36	124	59.5	4	35	154	47.9			
10	Jln Istana crossing	0.30	2	15	27	40.0	2	32	29	37.2	2	1	33	32.7			
11	Jln Sulaiman crossing	0.25	1	48	32	28.1	2	3	44	20.5	1	28	33	27.3			
12	Jln Kinabalu crossing	0.25	1	16	76	11.8	1	19	79	11.4	0	55	55	16.4			
13	Jln S.Hishamuddin crossing	0.25	0	0			0	0			0	0					
TOTAL		19.00	19	24	1164	58.8	24	26	1466	46.7	24	36	1476	46.3			

RESULT OF TRAVEL SPEED SURVEY (KL-Seremban Expressway)

(1) Weekday : from Kajang to KL

No.	Check Point	Dist. (km)	Morning Peak (7:04)				Off Peak (10:00)				Evening Peak (16:28)						
			Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)
			H	M	S			H	M	S			H	M	S		
1	Kajang I.C	1.80	0	0	143	45.3	0	0	104	62.3	0	0	108	60.0			
2	UPM I.C	6.20	2	23	451	49.5	1	44	356	62.7	1	48	432	51.7			
3	Sg Besi Toll Plaza	7.40	9	54	710	37.5	7	40	416	64.0	9	0	584	45.6			
4	Federal Highway crossing	2.10	21	44	196	38.6	14	36	125	60.5	18	44	351	21.5			
5	Jln Sg Besi crossing	0.50	25	0	55	32.7	16	41	45	40.0	24	35	72	25.0			
6	Jln L.Terbang crossing	0.90	25	55	98	33.1	17	26	94	34.5	25	47	115	28.2			
7	Jln Loke Yew crossing	0.60	27	33	70	30.9	19	0	76	28.4	27	42	82	26.3			
8	Jln Cheras crossing	1.20	28	43	183	23.6	20	16	180	24.0	29	4	145	29.8			
9	Jln Davis crossing	0.25	31	46	34	26.5	23	16	104	8.7	31	29	193	4.7			
10	Jln Imbi crossing	0.20	32	20	26	27.7	25	0	27	26.7	34	42	26	27.7			
11	Jln Bukit Bintang crossing	0.90	32	46	113	28.7	25	27	116	27.9	35	8	115	28.2			
12	Pudu Roundabout	0.30	34	39	74	14.6	27	23	42	25.7	37	3	53	20.4			
13	Jln Raja Chulan crossing	0.25	35	53	95	9.5	28	5	80	11.3	37	56	72	12.5			
14	Jln Melaka crossing	0.30	37	28	110	9.8	29	25	50	21.6	39	8	99	10.9			
15	Jln TAR crossing	0.30	39	18	99	10.9	30	15	48	22.5	40	47	113	9.6			
16	Jln Kuching crossing		40	57			31	3			42	40					
TOTAL		23.20	40	57	2457	34.0	31	3	1863	44.8	42	40	2560	32.6			

(2) Weekday : from KL to Kajang

No.	Check Point	Dist. (km)	Morning Peak (7:46)				Off Peak (13:57)				Evening Peak (17:34)						
			Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)
			H	M	S			H	M	S			H	M	S		
1	Kajang I.C	1.80	28	31	106	61.1	29	39	101	64.2	35	6	103	62.9			
2	UPM I.C	6.20	26	45	347	64.3	27	58	363	61.5	33	23	348	64.1			
3	Sg Besi Toll Plaza	7.40	20	58	398	66.9	21	55	404	65.9	27	35	428	62.2			
4	Federal Highway crossing	2.10	14	20	131	57.7	15	11	121	62.5	20	27	173	43.7			
5	Jln Sg Besi crossing	0.50	12	9	50	36.0	13	10	36	50.0	17	34	38	47.4			
6	Jln L.Terbang crossing	0.90	11	19	89	36.4	12	34	66	49.1	16	56	71	45.6			
7	Jln Loke Yew crossing	0.60	9	50	68	31.8	11	28	88	24.5	15	45	76	28.4			
8	Jln Cheras crossing	1.20	8	42	140	30.9	10	0	194	22.3	14	29	182	23.7			
9	Jln Davis crossing	0.25	6	22	36	25.0	6	46	36	25.0	11	27	67	13.4			
10	Jln Imbi crossing	0.20	5	46	34	21.2	6	10	71	10.1	10	20	50	14.4			
11	Jln Bukit Bintang crossing	0.90	5	12	109	29.7	4	59	114	28.4	9	30	286	11.3			
12	Pudu Roundabout	0.30	3	23	38	28.4	3	5	40	27.0	4	44	46	23.5			
13	Jln Raja Chulan crossing	0.25	2	45	40	22.5	2	25	37	24.3	3	58	42	21.4			
14	Jln Melaka crossing	0.30	2	5	49	22.0	1	48	39	27.7	3	16	64	16.9			
15	Jln TAR crossing	0.30	1	16	76	14.2	1	9	69	15.7	2	12	132	8.2			
16	Jln Kuching crossing		0	0			0	0			0	0					
TOTAL		23.20	28	31	1711	48.8	29	39	1779	46.9	35	6	2106	39.7			

RESULT OF TRAVEL SPEED SURVEY (KL-Seremban Expressway)

(3) Holiday : from Kajang to KL

No.	Check Point	Dist. (km)	Morning Peak (7:00)			Off Peak (10:00)			Evening Peak (16:30)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)
1	Kajang I.C		0	0		0	0		0	0	
2	UPM I.C	1.80	1	38	98	1	44	104	1	56	116
3	Sg Besi Toll Plaza	6.20	7	40	362	7	33	349	8	54	418
4	Federal Highway crossing	7.40	14	27	407	14	40	427	17	17	503
5	Jln Sg Besi crossing	2.10	16	20	113	16	40	120	19	34	137
6	Jln L.Terbang crossing	0.50	16	48	28	17	15	35	20	7	33
7	Jln Loke Yew crossing	0.90	17	46	58	18	25	70	21	6	59
8	Jln Cheras crossing	0.60	18	33	47	19	28	63	21	51	45
9	Jln Davis crossing	1.20	21	12	159	21	59	151	23	30	99
10	Jln Imbi crossing	0.25	22	2	50	23	53	114	24	25	55
11	Jln Bukit Bintang crossing	0.20	22	28	26	24	17	24	24	55	30
12	Pudu Roundabout	0.90	23	43	75	26	6	109	26	49	114
13	Jln Raja Chulan crossing	0.30	23		23	26	43	37	27	28	39
14	Jln Melaka crossing	0.25	24	6	20	26	43	32	27	28	37
15	Jln TAR crossing	0.30	24	26	24	27	15	95	28	5	65
16	Jln Kuching crossing	0.30	24	50	26	28	50	109	29	10	98
			25	16	41.5	30	39	9.9	30	48	11.0
	TOTAL	23.20	25	16	1516	30	39	1839	30	48	1848
					55.1			45.4			45.2

(4) Holiday : from KL to Kajang

No.	Check Point	Dist. (km)	Morning Peak (7:26)			Off Peak (14:00)			Evening Peak (17:30)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)
1	Kajang I.C		25	21		27	57		27	48	
2	UPM I.C	1.80	23	41	100	25	58	119	25	57	111
3	Sg Besi Toll Plaza	6.20	17	54	347	19	39	379	19	33	384
4	Federal Highway crossing	7.40	11	8	406	12	5	454	12	16	437
5	Jln Sg Besi crossing	2.10	9	14	114	9	53	132	10	15	121
6	Jln L.Terbang crossing	0.50	9	14	35	9	53	32	10	15	28
7	Jln Loke Yew crossing	0.90	8	39	59	9	21	55	9	47	55
8	Jln Cheras crossing	0.60	7	40	39	8	26	38	8	52	46
9	Jln Davis crossing	1.20	7	1	144	7	48	165	8	6	164
10	Jln Imbi crossing	0.25	4	37	25	5	3	26	5	22	35
11	Jln Bukit Bintang crossing	0.20	4	12	20	4	37	22	4	47	25
12	Pudu Roundabout	0.90	3	52	88	4	15	86	4	22	126
13	Jln Raja Chulan crossing	0.30	2	24	28	2	49	32	2	16	33
14	Jln Melaka crossing	0.25	1	56	27	2	17	30	1	43	26
15	Jln TAR crossing	0.30	1	29	40	1	47	31	1	17	32
16	Jln Kuching crossing	0.30	0	49	49	1	16	76	0	45	45
			0	0	22.0	0	0	14.2	0	0	24.0
	TOTAL	23.20	25	21	1521	27	57	1677	27	48	1668
					54.9			49.8			50.1

RESULT OF TRAVEL SPEED SURVEY (Jln Pahang/Jln Genting Klang)

(1) Weekday : from Taman Bunga Raya to KL

No.	Check Point	Dist. (km)	Morning Peak (7:03)			Off Peak (10:00)			Evening Peak (16:29)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)
1	Taman Bunga Raya	3.30	0 0	1444	8.2	0 0	478	24.9	0 0	332	35.8
2	Jln Gonbak crossing	1.05	24 4	132	28.6	7 58	128	29.5	5 32	113	33.5
3	Jln Titiwangsa crossing	1.00	26 16	124	29.0	10 6	124	29.0	7 25	110	32.7
4	Pahang Roundabout	0.80	28 20	108	26.7	12 10	99	29.1	9 15	82	35.1
5	Jln Raja Muda crossing	0.90	30 8	109	29.7	13 49	148	21.9	10 37	132	24.5
6	Jln Sultan Ismail crossing	0.35	31 57	53	23.8	16 17	80	15.8	12 49	67	18.8
7	Jln Dang Wangi crossing	0.75	32 50	115	23.5	17 37	125	21.6	13 56	224	12.1
8	Jln Tun Perak crossing	0.75	34 45	133	20.3	19 42	125	21.6	17 40	191	14.1
9	Jln S.Hishamuddin crossing		36 58			21 47			20 51		
TOTAL		8.90	36 58	2218	14.4	21 47	1307	24.5	20 51	1251	25.6

(2) Weekday : from KL to Taman Bunga Raya

No.	Check Point	Dist. (km)	Morning Peak (7:45)			Off Peak (14:00)			Evening Peak (17:30)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)	H M S	(Sec)	(Km/h)
1	Taman Bunga Raya	3.30	16 11	327	36.3	15 14	286	41.5	27 5	340	34.9
2	Jln Gonbak crossing	1.05	10 44	81	46.7	10 28	118	32.0	21 25	191	19.8
3	Jln Titiwangsa crossing	1.00	9 23	78	46.2	8 30	94	38.3	18 14	442	8.1
4	Pahang Roundabout	0.80	8 5	89	32.4	6 56	81	35.6	10 52	147	19.6
5	Jln TAR crossing	0.20	6 36	24	30.0	5 35	20	36.0	8 25	34	21.2
6	Jln Ipoh crossing	0.90	6 12	99	32.7	5 15	108	30.0	7 51	141	23.0
7	Jln Sultan Ismail crossing	0.45	4 33	56	28.9	3 27	51	31.8	5 30	91	17.8
8	Jln Dang Wangi crossing	1.40	3 37	217	23.2	2 36	156	32.3	3 59	239	21.1
9	Jln S.Hishamuddin crossing		0 0			0 0			0 0		
TOTAL		9.10	16 11	971	33.7	15 14	914	35.8	27 5	1625	20.2

RESULT OF TRAVEL SPEED SURVEY (Jln Pahang/Jln Genting Klang)

(3) Holiday : from Taman Bunga Raya to KL

No.	Check Point	Dist. (km)	Morning Peak (7:00)			Off Peak (10:01)			Evening Peak (16:30)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)
1	Taman Bunga Raya		0 0			0 0			0 0		
		3.30		305	39.0		363	32.7		309	38.4
2	Jln Gongbak crossing	1.05	5 5	82	46.1	6 3	103	36.7	5 9	84	45.0
3	Jln Titiwangsa crossing	1.00	6 27	76	47.4	7 46	99	36.4	6 33	81	44.4
4	Pahang Roundabout	0.80	7 43	64	45.0	9 25	76	37.9	7 54	81	35.6
5	Jln Raja Muda crossing	0.90	8 47	84	38.6	10 41	91	35.6	9 15	132	24.5
6	Jln Sultan Ismail crossing	0.35	10 11	32	39.4	12 12	45	28.0	11 27	60	21.0
7	Jln Dang Wangi crossing	0.75	10 43	70	38.6	12 57	97	27.8	12 27	137	19.7
8	Jln Tun Perak crossing	0.75	11 53	67	40.3	14 34	91	29.7	14 44	114	23.7
9	Jln S.Hishamuddin crossing		13 0			16 5			16 38		
TOTAL		8.90	13 0	780	41.1	16 5	965	33.2	16 38	998	32.1

(4) Holiday : from KL to Taman Bunga Raya

No.	Check Point	Dist. (km)	Morning Peak (7:15)			Off Peak (14:00)			Evening Peak (18:15)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)
1	Taman Bunga Raya		11 51			17 39			19 17		
		3.30		232	51.2		306	38.8		346	34.3
2	Jln Gongbak crossing	1.05	7 59	77	49.1	12 33	228	16.6	13 31	257	14.7
3	Jln Titiwangsa crossing	1.00	6 42	69	52.2	8 45	100	36.0	9 14	160	22.5
4	Pahang Roundabout	0.80	5 33	52	55.4	7 5	83	34.7	6 34	87	33.1
5	Jln TAR crossing	0.20	4 41	16	45.0	5 42	23	31.3	5 7	22	32.7
6	Jln Ipoh crossing	0.90	4 25	87	37.2	5 19	95	34.1	4 45	87	37.2
7	Jln Sultan Ismail crossing	0.45	2 58	51	31.8	3 44	51	31.8	3 18	60	27.0
8	Jln Dang Wangi crossing	1.40	2 7	127	39.7	2 53	173	29.1	2 18	138	36.5
9	Jln S.Hishamuddin crossing		0 0			0 0			0 0		
TOTAL		9.10	11 51	711	46.1	17 39	1059	30.9	19 17	1157	28.3

RESULT OF TRAVEL SPEED SURVEY (Inner Ring Road)

(1) Weekday : Counterclockwise

No.	Check Point	Dist. (km)	Morning Peak (7:02)			Off Peak (10:00)			Evening Peak (16:30)					
			Passing	Travel	Travel	Passing	Travel	Travel	Passing	Travel	Travel			
			Time	Time	Speed	Time	Time	Speed	Time	Time	Speed			
H	M	S	(Sec)	(Km/h)	H	M	S	(Sec)	(Km/h)	H	M	S	(Sec)	(Km/h)
1	Jln Syed Putra crossing	0.30	0	0	33	32.7	0	0	29	37.2	0	0	64	16.9
2	Jln Sulaiman crossing	0.75	0	33	85	31.8	0	29	87	31.0	1	4	136	19.9
3	Jln Loke Yew crossing	0.45	1	58	72	22.5	1	56	120	13.5	3	20	90	18.0
4	Jln Hang Jebat crossing	0.35	3	10	71	17.7	3	56	86	14.7	4	50	258	4.9
5	Jln Pudu crossing	0.45	4	21	84	19.3	5	22	62	26.1	9	8	88	18.4
6	Jln Sultan Ismail crossing	0.35	5	45	74	17.0	6	24	132	9.5	10	36	169	7.5
7	Jln Bukit Bintang crossing	0.40	6	59	100	14.4	8	36	50	28.8	13	25	108	13.3
8	Jln Raja Chulan crossing	0.55	8	39	68	29.1	9	26	85	23.3	15	13	247	8.0
9	Jln P.Ramlee crossing	0.45	9	47	55	29.5	10	51	57	28.4	19	20	87	18.6
10	Jln Ampang crossing	0.45	10	42	70	23.1	11	48	59	27.5	20	47	84	19.3
11	Jln Raja Abdullah crossing	0.55	11	52	67	29.6	12	47	101	19.6	22	11	179	11.1
12	Jln TAR crossing	0.20	12	59	62	11.6	14	28	33	21.8	25	10	45	16.0
13	Jln Raja Laut crossing	0.40	14	1	84	17.1	15	1	89	16.2	25	55	234	6.2
14	Jln Kuching crossing	1.35	15	25	115	42.3	16	30	124	39.2	29	49	383	12.7
15	Jln Parlimen crossing	1.15	17	20	103	40.2	18	34	105	39.4	36	12	260	15.9
16	Jln Syed Putra crossing		19	3			20	19			40	32		
TOTAL		8.15	19	3	1143	25.7	20	19	1219	24.1	40	32	2432	12.1

(2) Weekday : Clockwise

No.	Check Point	Dist. (km)	Morning Peak (7:17)			Off Peak (14:03)			Evening Peak (17:31)					
			Passing	Travel	Travel	Passing	Travel	Travel	Passing	Travel	Travel			
			Time	Time	Speed	Time	Time	Speed	Time	Time	Speed			
H	M	S	(Sec)	(Km/h)	H	M	S	(Sec)	(Km/h)	H	M	S	(Sec)	(Km/h)
1	Jln Syed Putra crossing	0.30	23	38	43	25.1	41	43	48	22.5	49	43	58	18.6
2	Jln Sulaiman crossing	0.75	22	55	123	22.0	40	55	409	6.6	48	45	160	16.9
3	Jln Loke Yew crossing	0.45	20	52	105	15.4	34	6	128	12.7	46	5	206	7.9
4	Jln Hang Jebat crossing	0.35	19	7	65	19.4	31	58	106	11.9	42	39	149	8.5
5	Jln Pudu crossing	0.45	18	2	145	11.2	30	12	129	12.6	40	10	375	4.3
6	Jln Sultan Ismail crossing	0.35	15	37	65	19.4	28	3	140	9.0	33	55	239	5.3
7	Jln Bukit Bintang crossing	0.40	14	32	104	13.8	25	43	168	8.6	29	56	221	6.5
8	Jln Raja Chulan crossing	0.55	12	48	79	25.1	22	55	137	14.5	26	15	240	8.3
9	Jln P.Ramlee crossing	0.45	11	29	116	14.0	20	38	391	4.1	22	15	264	6.1
10	Jln Ampang crossing	0.45	9	33	123	13.2	14	7	215	7.5	17	51	229	7.1
11	Jln Raja Abdullah crossing	0.55	7	30	85	23.3	10	32	172	11.5	14	2	222	8.9
12	Jln TAR crossing	0.20	6	5	32	22.5	7	40	39	18.5	10	20	70	10.3
13	Jln Raja Laut crossing	0.40	5	33	74	19.5	7	1	146	9.9	9	10	143	10.1
14	Jln Kuching crossing	1.35	4	19	143	34.0	4	35	156	31.2	6	47	229	21.2
15	Jln Parlimen crossing	1.15	1	56	116	35.7	1	59	119	34.8	2	58	178	23.3
16	Jln Syed Putra crossing		0	0			0	0			0	0		
TOTAL		8.15	23	38	1418	20.7	41	43	2503	11.7	49	43	2983	9.8

RESULT OF TRAVEL SPEED SURVEY (Inner Ring Road)

(3) Holiday : Counterclockwise

No.	Check Point	Dist. (km)	Morning Peak (7:15)				Off Peak (10:02)				Evening Peak (16:27)							
			Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	
			H	M	S			H	M	S			H	M	S			
1	Jln Syed Putra crossing		0	0					0	0				0	0			
		0.30			31	34.8				54	20.0			40	27.0			
2	Jln Sulaiman crossing	0.75	0	31	82	32.9	0	54	107	25.2	0	40	99	27.3				
3	Jln Loke Yew crossing	0.45	1	53	60	27.0	2	41	76	21.3	2	19	82	19.8				
4	Jln Hang Jebat crossing	0.35	2	53	72	17.5	3	57	154	8.2	4	43	62	20.3				
5	Jln Pudu crossing	0.45	4	5	78	20.8	6	31	90	18.0	4	43	97	16.7				
6	Jln Sultan Ismail crossing	0.35	5	23	98	12.9	8	1	89	14.2	6	20	123	10.2				
7	Jln Bukit Bintang crossing	0.40	7	1	77	18.7	9	30	68	21.2	8	23	65	22.2				
8	Jln Raja Chulan crossing	0.55	8	18	143	13.8	10	38	109	18.2	9	28	175	11.3				
9	Jln P.Ramlee crossing	0.45	10	41	63	25.7	12	27	76	21.3	12	23	144	11.3				
10	Jln Ampang crossing	0.45	11	44	50	32.4	13	43	73	22.2	14	47	74	21.9				
11	Jln Raja Abdullah crossing	0.55	12	34	59	33.6	14	56	79	25.1	16	1	135	14.7				
12	Jln TAR crossing	0.20	13	33	52	13.8	16	15	109	6.6	18	16	327	2.2				
13	Jln Raja Laut crossing	0.40	14	25	96	15.0	18	4	123	11.7	23	43	261	5.5				
14	Jln Kuching crossing	1.35	16	1	137	35.5	20	7	189	25.7	28	4	237	20.5				
15	Jln Parlimen crossing	1.15	18	18	111	37.3	23	16	152	27.2	32	1	243	17.0				
16	Jln Syed Putra crossing		20	9			25	48			36	4						
	TOTAL	8.15	20	9	1209	24.3	25	48	1548	19.0	36	4	2164	13.6				

(4) Holiday : Clockwise

No.	Check Point	Dist. (km)	Morning Peak (7:29)				Off Peak (14:15)				Evening Peak (18:01)							
			Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	Passing Time			Travel Time (Sec)	Travel Speed (Km/h)	
			H	M	S			H	M	S			H	M	S			
1	Jln Syed Putra crossing		21	37					28	51				26	58			
		0.30			48	22.5				40	27.0			68	15.9			
2	Jln Sulaiman crossing	0.75	20	49	141	19.1	28	11	147	18.4	25	50	145	18.6				
3	Jln Loke Yew crossing	0.45	18	28	114	14.2	25	44	66	24.5	23	25	130	12.5				
4	Jln Hang Jebat crossing	0.35	16	34	53	23.8	24	38	56	22.5	21	15	114	11.1				
5	Jln Pudu crossing	0.45	15	41	64	25.3	23	42	68	23.8	19	21	103	15.7				
6	Jln Sultan Ismail crossing	0.35	14	37	99	12.7	22	34	165	7.6	17	38	96	13.1				
7	Jln Bukit Bintang crossing	0.40	12	58	55	26.2	19	49	97	14.8	16	2	135	10.7				
8	Jln Raja Chulan crossing	0.55	12	3	101	19.6	18	12	79	25.1	13	47	86	23.0				
9	Jln P.Ramlee crossing	0.45	10	22	89	18.2	16	53	154	10.5	12	21	74	21.9				
10	Jln Ampang crossing	0.45	8	53	53	30.6	14	19	74	21.9	11	7	92	17.6				
11	Jln Raja Abdullah crossing	0.55	8	0	67	29.6	13	5	92	21.5	9	35	83	23.9				
12	Jln TAR crossing	0.20	6	53	24	30.0	11	33	94	7.7	8	12	50	14.4				
13	Jln Raja Laut crossing	0.40	6	29	113	12.7	9	59	303	4.8	7	22	96	15.0				
14	Jln Kuching crossing	1.35	4	36	158	30.8	4	56	154	31.6	5	46	191	25.4				
15	Jln Parlimen crossing	1.15	1	58	118	35.1	2	22	142	29.2	2	35	155	26.7				
16	Jln Syed Putra crossing		0	0			0	0			0	0						
	TOTAL	8.15	21	37	1297	22.6	28	51	1731	16.9	26	58	1618	18.1				

RESULT OF TRAVEL SPEED SURVEY (Middle Ring Road)

(1) Weekday : Counterclockwise

No.	Check Point	Dist. (km)	Morning Peak (8:05)			Off Peak (10:00)			Evening Peak (16:30)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)
1	Jln S. Besi/Jln L.Terbang	0.90	0 0	76	42.6	0 0	130	24.9	0 0	102	31.8
2	Jln Loke Yew crossing	0.50	1 16	44	40.9	2 10	59	30.5	1 42	53	34.0
3	Jln Cheras crossing	0.90	2 0	77	42.1	3 9	97	33.4	2 35	91	35.6
4	Jln Kg. Pandan crossing	1.00	3 17	91	39.6	4 46	221	16.3	3 66	104	34.6
5	Jln Bukit Bintang crossing	0.60	4 48	84	25.7	8 27	83	26.0	5 50	62	34.8
6	Jln U Thant crossing	0.80	6 12	238	12.1	9 50	141	20.4	6 52	254	11.3
7	Jln Ampang crossing	0.65	10 10	96	24.4	12 11	64	36.6	11 6	118	19.8
8	Jln Yap Kwan Seng crossing	0.50	11 46	95	18.9	13 15	68	26.5	13 4	206	8.7
9	Jln Semarak crossing	1.80	13 21	149	43.5	14 23	178	36.4	16 30	416	15.6
10	Jln Pahang crossing	0.80	15 50	52	55.4	17 21	67	43.0	23 26	103	28.0
11	Jln Ipoh crossing	0.65	16 42	43	54.4	18 28	47	49.8	25 9	53	44.2
12	Jln Kuching crossing	2.40	17 25	154	56.1	19 15	164	52.7	26 2	173	49.9
13	Jln Parlimen crossing	1.50	19 59	100	54.0	21 59	101	53.5	28 55	107	50.5
14	Jln Travers crossing	0.80	21 39	53	54.3	23 40	57	50.5	30 42	58	49.7
15	Jln Brickfield crossing	0.40	22 32	44	32.7	24 37	31	46.5	31 40	39	36.9
16	Jln Syed Putra crossing	1.20	23 16	284	15.2	25 8	94	46.0	32 19	226	19.1
17	Jln L. Terbang crossing	1.75	28 0	243	25.9	26 42	156	40.4	36 5	146	43.2
18	Jln S. Besi/Jln L.Terbang		32 3			29 18			38 31		
TOTAL		17.15	32 3	1923	32.1	29 18	1758	35.1	38 31	2311	26.7

(2) Weekday : Clockwise

No.	Check Point	Dist. (km)	Morning Peak (7:29)			Off Peak (14:00)			Evening Peak (16:57)		
			Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed	Passing Time	Travel Time	Travel Speed
			H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)	H M S (Sec)	(Sec)	(Km/h)
1	Jln S. Besi/Jln L.Terbang	0.90	32 18	347	9.3	29 16	298	10.9	36 32	124	26.1
2	Jln Loke Yew crossing	0.50	26 31	61	29.5	24 18	40	45.0	34 28	102	17.6
3	Jln Cheras crossing	0.90	25 30	74	43.8	23 38	71	45.6	32 46	86	37.7
4	Jln Kg. Pandan crossing	1.00	24 16	79	45.6	22 27	73	49.3	31 20	93	38.7
5	Jln Bukit Bintang crossing	0.60	22 57	47	46.0	21 14	44	49.1	29 47	63	34.3
6	Jln U Thant crossing	0.80	22 10	69	41.7	20 30	100	28.8	28 44	100	28.8
7	Jln Ampang crossing	0.65	21 1	130	18.0	18 50	161	14.5	27 4	83	28.2
8	Jln Yap Kwan Seng crossing	0.50	18 51	225	8.0	16 9	110	16.4	25 41	51	35.3
9	Jln Semarak crossing	1.80	15 6	165	39.3	14 19	162	40.0	24 50	181	35.8
10	Jln Pahang crossing	0.80	12 21	56	51.4	11 37	52	55.4	21 49	348	8.3
11	Jln Ipoh crossing	0.65	11 25	47	49.8	10 45	42	55.7	16 1	205	11.4
12	Jln Kuching crossing	2.40	10 38	159	54.3	10 3	160	54.0	12 36	256	33.8
13	Jln Parlimen crossing	1.50	7 59	95	56.8	7 23	99	54.5	8 20	139	38.8
14	Jln Travers crossing	0.80	6 24	54	53.3	5 44	53	54.3	6 1	108	26.7
15	Jln Brickfield crossing	0.40	5 30	29	49.7	4 51	26	55.4	4 13	33	43.6
16	Jln Syed Putra crossing	1.20	5 1	94	46.0	4 25	101	42.8	3 40	89	48.5
17	Jln L. Terbang crossing	1.75	3 27	207	30.4	2 44	164	38.4	2 11	131	48.1
18	Jln S. Besi/Jln L.Terbang		0 0			0 0			0 0		
TOTAL		17.15	32 18	1938	31.9	29 16	1756	35.2	36 32	2192	28.2

RESULT OF TRAVEL SPEED SURVEY (Middle Ring Road)

(3) Holiday : Counterclockwise

No.	Check Point	Dist. (km)	Morning Peak (7:00)				Off Peak (14:27)				Evening Peak (16:29)			
			Passing Time		Travel Time	Travel Speed	Passing Time		Travel Time	Travel Speed	Passing Time		Travel Time	Travel Speed
			H	M	S	(Sec)	(Km/h)	H	M	S	(Sec)	(Km/h)	H	M
1	Jln S. Besi/Jln L.Terbang	0.90	0	0	78	41.5	0	0	75	43.2	0	0	62	52.3
2	Jln Loke Yew crossing	0.50	1	18	44	40.9	1	15	37	48.6	1	2	36	50.0
3	Jln Cheras crossing	0.90	2	2	78	41.5	1	52	67	48.4	1	38	62	52.3
4	Jln Kg. Pandan crossing	1.00	3	20	110	32.7	2	59	73	49.3	2	40	100	36.0
5	Jln Bukit Bintang crossing	0.60	5	10	49	44.1	4	12	46	47.0	4	20	47	46.0
6	Jln U Thant crossing	0.80	5	59	98	29.4	4	58	258	11.2	5	7	140	20.6
7	Jln Ampang crossing	0.65	7	37	75	31.2	9	16	50	46.8	7	27	55	42.5
8	Jln Yap Kwan Seng crossing	0.50	8	52	68	26.5	10	6	133	13.5	8	22	52	34.6
9	Jln Semarak crossing	1.80	10	0	128	50.6	12	19	116	55.9	9	14	125	51.8
10	Jln Pahang crossing	0.80	12	8	56	51.4	14	15	49	58.8	11	19	49	58.8
11	Jln Ipoh crossing	0.65	13	4	48	48.8	15	4	42	55.7	12	8	39	60.0
12	Jln Kuching crossing	2.40	13	52	165	52.4	15	46	146	59.2	12	47	139	62.2
13	Jln Parlimen crossing	1.50	16	37	105	51.4	18	12	93	58.1	15	6	90	60.0
14	Jln Travers crossing	0.80	18	22	60	48.0	19	45	46	62.6	16	36	49	58.8
15	Jln Brickfield crossing	0.40	19	22	31	46.5	20	31	24	60.0	17	25	33	43.6
16	Jln Syed Putra crossing	1.20	19	53	92	47.0	20	55	70	61.7	17	58	94	46.0
17	Jln L. Terbang crossing	1.75	21	25	162	38.9	22	5	104	60.6	19	32	121	52.1
18	Jln S. Besi/Jln L.Terbang	0.90	24	7	78	41.5	23	49	75	43.2	21	33	62	52.3
TOTAL		17.15	24	7	1447	42.7	23	49	1429	43.2	21	33	1293	47.7

(4) Holiday : Clockwise

No.	Check Point	Dist. (km)	Morning Peak (7:27)				Off Peak (14:00)				Evening Peak (15:02)			
			Passing Time		Travel Time	Travel Speed	Passing Time		Travel Time	Travel Speed	Passing Time		Travel Time	Travel Speed
			H	M	S	(Sec)	(Km/h)	H	M	S	(Sec)	(Km/h)	H	M
1	Jln S. Besi/Jln L.Terbang	0.90	22	16	102	31.8	26	51	160	20.3	26	29	174	18.6
2	Jln Loke Yew crossing	0.50	20	34	54	33.3	24	11	63	28.6	23	35	52	34.6
3	Jln Cheras crossing	0.90	19	40	101	32.1	23	8	86	37.7	22	43	88	36.8
4	Jln Kg. Pandan crossing	1.00	17	59	93	38.7	21	42	92	39.1	21	15	92	39.1
5	Jln Bukit Bintang crossing	0.60	16	26	56	38.6	20	10	55	39.3	19	43	64	33.8
6	Jln U Thant crossing	0.80	15	30	75	38.4	19	15	215	13.4	18	39	108	26.7
7	Jln Ampang crossing	0.65	14	15	62	37.7	15	40	105	22.3	16	51	211	11.1
8	Jln Yap Kwan Seng crossing	0.50	13	13	42	42.9	13	55	44	40.9	13	20	50	36.0
9	Jln Semarak crossing	1.80	12	31	137	47.3	13	11	157	41.3	12	30	141	46.0
10	Jln Pahang crossing	0.80	10	14	55	52.4	10	34	54	53.3	10	9	55	52.4
11	Jln Ipoh crossing	0.65	9	19	39	60.0	9	40	41	57.1	9	14	41	57.1
12	Jln Kuching crossing	2.40	8	40	143	60.4	8	59	147	58.8	8	33	148	58.4
13	Jln Parlimen crossing	1.50	6	17	89	60.7	6	32	96	56.3	6	5	93	58.1
14	Jln Travers crossing	0.80	4	48	48	60.0	4	56	51	56.5	4	32	50	57.6
15	Jln Brickfield crossing	0.40	4	0	25	57.6	4	5	28	51.4	3	42	26	55.4
16	Jln Syed Putra crossing	1.20	3	35	86	50.2	3	37	88	49.1	3	16	82	52.7
17	Jln L. Terbang crossing	1.75	2	9	129	48.8	2	9	129	48.8	1	54	114	55.3
18	Jln S. Besi/Jln L.Terbang	0.90	0	0	78	41.5	0	0	75	43.2	0	0	62	52.3
TOTAL		17.15	22	16	1336	46.2	26	51	1611	38.3	26	29	1589	38.9

3.2.3

CHASSIS DYNAMOMETER TEST

ITEMS / Sample No.	(1)			(2)			(3)			(4)		
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	4-3
Testing Mode	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60
1 Vehicle Name	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Charade	Charade	Charade
2 Registered Year	1988	1988	1988	1990	1990	1990	1989	1989	1989	1986	1986	1986
3 Engine Capacity(cc)	1,300	1,300	1,300	1,300	1,300	1,300	1,500	1,500	1,500	1,000	1,000	1,000
4 Mileage(km)	100,276	100,276	100,276	48,261	48,261	48,261	42,440	42,440	42,440	100,404	100,404	100,404
5 Air Condition	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
6 CO (g/km)	5.25	6.03	0.45	5.67	6.62	0.42	15.80	17.27	3.39	11.99	10.34	5.46
7 HC (g/km)	3.08	3.43	0.17	2.75	3.28	0.17	2.86	3.35	0.86	2.19	2.35	0.63
8 NOX (g/km)	3.39	3.53	3.49	3.85	3.65	3.50	3.90	4.01	3.97	1.39	1.28	1.13
9 CO2 (g/km)	175.60	177.97	106.54	204.56	191.40	114.32	205.93	197.30	122.25	161.05	131.00	91.22
10 Fuel Economy(km/L)	11.94	11.99	22.05	10.52	11.20	20.58	9.83	10.11	18.24	12.42	12.42	27.79
11 Testing Speed(km/h) *1	19.24	17.94	60.00	19.04	17.99	60.00	21.98	17.96	60.00	19.16	18.13	60.00
12 Engine Type	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
13 Vehicle Weight(Kg)	940	940	940	940	940	940	960	960	960	740	740	740
14 Max. Loading Capacity(Kg)	405	405	405	405	405	405	405	405	405	-	-	-
15 Total Weight(Kg)	1,345	1,345	1,345	1,345	1,345	1,345	1,365	1,365	1,365	-	-	-
16 Max. Horsepower(PS/R)	81.0	81.0	81.0	81.0	81.0	81.0	83.5	83.5	83.5	53.0	53.0	53.0

Note *1 : Testing speed is average speed.

CHASSIS DYNAMOMETER TEST

	(5)		(6)			(7)			(8)			
ITEMS / Sample No.	5-1	5-2	5-3	6-1	6-2	6-3	7-1	7-2	7-3	8-1	8-2	8-3
Testing Mode	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60
1 Vehicle Name	Proton Proton Proton			F.Laser F.Laser F.Laser			M.Tredia M.Tredia M.Tredia			H.Civic H.Civic H.Civic		
2 Registered Year	1992	1992	1992	1983	1983	1983	1983	1983	1983	1978	1978	1978
3 Engine Capacity(cc)	1,500	1,500	1,500	1,500	1,500	1,500	1,400	1,400	1,400	1,200	1,200	1,200
4 Mileage(Km)	977	977	977	186,660	186,660	186,660	366,173	366,173	366,173	424,672	424,672	424,672
5 Air Condition	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
6 CO (g/Km)	4.50	5.01	0.34	17.93	18.50	4.34	25.04	24.76	13.93	18.50	19.65	9.88
7 HC (g/Km)	2.26	3.01	0.68	3.04	3.40	0.85	2.61	2.56	1.02	2.08	2.46	0.80
8 NOx (g/Km)	2.66	2.77	2.88	1.17	1.27	0.95	1.27	1.61	1.48	0.71	0.76	0.62
9 CO2 (g/Km)	211.89	210.22	122.29	218.26	215.39	115.73	169.50	173.54	118.54	173.77	171.23	107.52
10 Fuel Economy(Km/l)	10.34	10.44	18.97	9.05	9.31	18.98	10.75	10.78	16.55	11.16	11.32	18.93
11 Testing Speed(Km/h) *1	19.02	18.15	60.00	19.19	18.13	60.00	19.05	17.92	60.00	19.02	18.07	60.00
12 Engine Type	Gasoline Gasoline Gasoline			Gasoline Gasoline Gasoline			Gasoline Gasoline Gasoline			Gasoline Gasoline Gasoline		
13 Vehicle Weight(Kg)	960	960	960	850	850	850	985	985	985	780	780	780
14 Max. Loading Capacity(Kg)	405	405	405	-	-	-	-	-	-	-	-	-
15 Total Weight(Kg)	1,365	1,365	1,365	-	-	-	-	-	-	-	-	-
16 Max. Horsepower(PS/R)	81.0	81.0	81.0	70.0	70.0	70.0	81.0	81.0	81.0	70.0	70.0	70.0

Note *1 : Testing speed is average speed.

CHASSIS DYNAMOMETER TEST

ITEMS / Sample No.	(9)			(10)			(11)			(12)		
	9-1	9-2	9-3	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Testing Mode	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60
1 Vehicle Name	Proton	Proton	Proton	Renault	Renault	Renault	Proton	Proton	Proton	H-Accord	H-Accord	H-Accord
2 Registered Year	1986	1986	1986	1991	1991	1991	1990	1990	1990	1987	1987	1987
3 Engine Capacity(cc)	1,500	1,500	1,500	1,800	1,800	1,800	1,500	1,500	1,500	2,000	2,000	2,000
4 Mileage(Km)	154,688	154,688	154,688	22,113	22,113	22,113	20,884	20,884	20,884	70,966	70,966	70,966
5 Air Condition	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
6 CO (g/Km)	9.37	11.79	2.54	4.79	5.26	0.22	7.05	8.41	1.13	2.34	2.68	0.04
7 HC (g/Km)	2.61	3.09	0.61	0.77	0.77	0.04	2.19	2.80	0.59	0.31	0.26	0.02
8 NOx (g/Km)	1.33	1.59	1.05	1.30	1.48	0.85	2.23	2.72	2.83	0.33	0.25	0.38
9 CO2 (g/Km)	219.19	224.10	106.60	307.36	324.38	182.04	211.51	207.15	122.99	230.02	215.38	120.28
10 Fuel Economy(Km/l)	9.82	9.42	21.12	7.49	7.09	13.03	10.15	10.37	18.77	9.95	10.79	19.74
11 Testing Speed(Km/h) *1	19.09	17.79	60.00	18.94	18.02	60.00	19.09	18.19	60.00	19.03	17.96	60.00
12 Engine Type	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
13 Vehicle Weight(Kg)	980	980	980	1080	1080	1080	980	980	980	1220	1220	1220
14 Max. Loading Capacity(Kg)	405	405	405	-	-	-	405	405	405	-	-	-
15 Total Weight(Kg)	1,385	1,385	1,385	-	-	-	1,385	1,385	1,385	-	-	-
16 Max. Horsepower(PS/R)	81.0	81.0	81.0	113.0	113.0	113.0	87.0	87.0	87.0	120.0	120.0	120.0

Note *1 : Testing speed is average speed.

CHASSIS DYNAMOMETER TEST

ITEMS / Sample No.	(13)			(13A)			(14)			(14A)		
	13-1	13-2	13-3	13-1A	13-2A	13-3A	14-1	14-2	14-3	14-1A	14-2A	14-3A
Testing Mode	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60
1 Vehicle Name	Proton	Proton	Proton	Proton	Proton	Proton	Charade	Charade	Charade	Charade	Charade	Charade
2 Registered Year	1989	1989	1989	1989	1989	1989	1984	1984	1984	1984	1984	1984
3 Engine Capacity(cc)	1,500	1,500	1,500	1,500	1,500	1,500	1,000	1,000	1,000	1,000	1,000	1,000
4 Mileage(Km)	43,789	43,789	43,798	43,799	43,812	43,815	421,328	421,339	421,393	421,440	421,452	421,522
5 Air Condition	Off	Off	Off	On	On	On	Off	Off	Off	On	On	On
6 CO (g/Km)	15.34	16.45	3.11	16.46	18.56	3.91	24.10	18.48	9.97	21.93	17.80	10.21
7 HC (g/Km)	2.63	3.43	0.81	2.35	2.85	0.85	3.82	3.72	0.88	3.40	3.92	0.89
8 NOx (g/Km)	1.96	2.00	1.86	2.59	2.63	2.45	1.77	2.12	0.77	2.74	2.99	0.94
9 CO2 (g/Km)	210.22	204.81	117.50	239.40	236.87	126.24	148.67	151.20	92.24	174.59	171.06	98.24
10 Fuel Economy(Km/L)	9.63	11.69	25.51	8.61	10.52	23.56	11.94	14.67	28.59	10.65	13.35	26.82
11 Testing Speed(Km/h) *1	19.02	18.20	60.00	18.93	17.75	60.00	18.75	18.23	60.00	18.98	18.12	60.00
12 Engine Type	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
13 Vehicle Weight(Kg)	980	980	980	980	980	980	-	-	-	-	-	-
14 Max. Loading Capacity(Kg)	405	405	405	405	405	405	-	-	-	-	-	-
15 Total Weight(Kg)	1,385	1,385	1,385	1,385	1,385	1,385	-	-	-	-	-	-
16 Max. Horsepower(PS/R)	81.0	81.0	81.0	81.0	81.0	81.0	-	-	-	-	-	-

Note *1 : Testing speed is average speed.

CHASSIS DYNAMOMETER TEST

ITEMS / Sample No.	(15)			(15A)			(16)			(17)		
	15-1	15-2	15-3	15-1A	15-2A	15-3A	16-1	16-2	16-3	17-1	17-2	17-3
Testing Mode	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60	ECE	J10	HS60
1 Vehicle Name	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Proton	Proton
2 Registered Year	1991	1991	1991	1991	1991	1991	1992	1992	1992	1992	1992	1992
3 Engine Capacity(cc)	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
4 Mileage(Km)	15,037	15,045	15,052	15,062	15,066	15,070	80	80	80	1,361	1,361	1,361
5 Air Condition	Off	Off	Off	On	On	On	Off	Off	Off	Off	Off	Off
6 CO (g/Km)	8.43	8.88	0.94	10.19	13.12	1.38	3.34	3.87	0.49	7.09	7.64	0.82
7 HC (g/Km)	2.76	3.37	0.86	2.18	2.88	1.02	2.36	2.96	0.67	2.42	3.13	0.72
8 NOx (g/Km)	2.77	2.99	3.21	1.86	4.26	3.94	1.23	1.33	1.21	2.69	2.79	3.04
9 CO2 (g/Km)	196.20	195.64	119.80	217.24	235.38	134.80	223.40	215.68	122.45	215.63	203.67	125.46
10 Fuel Economy(Km/L)	10.64	12.80	25.81	8.89	10.59	22.60	9.86	10.29	18.97	10.14	10.54	24.56
11 Testing Speed(Km/h) *1	19.15	18.22	60.00	20.83	18.30	60.00	19.09	18.10	60.00	19.22	18.45	60.00
12 Engine Type	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
13 Vehicle Weight(Kg)	980	980	980	980	980	980	960	960	960	980	980	980
14 Max. Loading Capacity(Kg)	405	405	405	405	405	405	390	390	390	405	405	405
15 Total Weight(Kg)	1,385	1,385	1,385	1,385	1,385	1,385	1,350	1,350	1,350	1,385	1,385	1,385
16 Max. Horsepower(PS/R)	87.0	87.0	87.0	87.0	87.0	87.0	81.0	81.0	81.0	81.0	81.0	81.0

Note *1 : Testing speed is average speed.

3.2.4 Vehicle Exhaust Gas Measurement at Idling State

RESULTS OF EXHAUST GAS AT IDLING FROM MOTOR VEHICLES

Car Type	Car Name	Plate Number	Ages	Fuel Type	Capa. (cc)	CO (%)	HC (PPM)	NOx (PPM)
1	Yamaha	BDG 1535	0	2	80	6.0	7140	0
1	Honda	BCM 9907	0	3	90	0.2	280	25
1	Yamaha	WCU 5508	0	3	100	3.5	5460	5
1	Yamaha	JCM 8001	0	4	100	3.1	3920	5
1	Yamaha	WCG 4347	1	2	135	4.4	8960	10
1	Suzuki	WCD 482	1	3	80	5.2	6440	0
1	Yamaha	WCC 9056	1	3	100	2.5	5040	5
1	Kawasaki	WCD 9217	1	3	1100	0.3	1400	30
1	Suzuki	WCN 948	1	3	110	2.8	5180	0
1	Suzuki	WCS 4406	1	3	100	2.6	2940	5
1	Yamaha	WCJ 8140	1	4	135	3.0	6300	5
1	Suzuki	BCV 4603	2	2	110	4.4	8120	5
1	Suzuki	BDC 7910	2	3	150	2.6	5600	5
1	Suzuki	WCA 6525	2	3	125	2.2	4620	0
1	Honda	WAP 4527	2	3	70	2.0	840	35
1	Kawasaki	WBR 262	2	3	750	0.2	840	50
1	Yamaha	NF 5710	3	4	100	3.9	7280	0
1	Suzuki	DS 2220	3	3	110	4.0	7000	5
1	Yamaha	NQ 903	3	3	90	1.5	2240	5
1	Honda	WK 7456	4	3	110	0.8	140	5
1	Suzuki	WBP 1066	4	3	80	1.0	1400	0
1	Yamaha	WM 9251	5	3	100	0.2	3920	5
1	Yamaha	WBE 2578	6	4	135	2.7	4620	5
1	Honda	MP 4002	7	3	250	1.1	1960	115
1	Vespa	CQ 3918	7	3	150	2.4	3220	0
1	Honda	AAX 4840	9	3	90	1.6	140	15
1	Yamaha	BBN 923	10	3	250	1.8	4340	0
1	Suzuki	BAV 8904	10	3	80	4.5	9940	5
1	Suzuki	WAF 2588	11	3	550	0.2	1820	10
1	Honda	WD 7045	18	4	500	2.6	700	45
** Motor Cycle **						2.4	4,060	13
2	Opel	HW 5045	5	1	1800	0.1	0	200
2	Opel	Hw 5519	7	1	1800	0.2	0	200
2	Opel	HW 3456	8	1	1800	0.0	0	415
2	Opel	HW 21	9	1	1800	0.1	0	255
2	Opel	HW 1276	10	1	1800	0.0	0	160
2	Gemini	HW 2519	10	1	1800	0.0	0	405
** Taxi / Diesel Oil **						0.1	0	273
2	Proton	HW 6732	2	3	1500	3.0	140	80
2	Proton	HW 7714	2	4	1500	5.2	140	150
2	Proton	HW 5883	3	3	1500	9.3	280	45
2	Proton	HB 1096	3	3	1500	6.7	280	80
2	Proton	HW 5716	3	3	1500	0.4	140	500
2	Proton	HW 5206	4	3	1500	5.0	280	225
2	Datsun	HW 4989	6	3	1300	10.1	280	35
2	Toyota	HW 3454	8	4	1300	0.3	420	65
2	Datsun	HW 2201	10	3	1200	6.2	420	110
2	Datsun	HW 21	12	3	1200	3.5	420	80
2	Datsun	HW 336	12	3	1200	7.5	280	65
2	Datsun	H 9913	12	4	1200	0.9	140	250
** Taxi / Gasoline **						4.8	268	140

Table RESULTS OF EXHAUST GAS AT IDLING FROM MOTOR VEHICLES

Car Type	Car Name	Plate Number	Ages	Fuel Type	Capa. (cc)	CO (%)	HC (PPM)	NOx (PPM)
2	Proton	HW 6642	2	5	1500	9.6	980	5
2	Proton	HW 6778	2	5	1500	3.8	140	40
** Taxi / LPG **						6.7	560	23
3	Proton	WCR 7235	0	3	1500	3.7	140	75
3	Proton	WCE 9627	0	3	1500	3.1	0	90
3	Proton(I)	BDQ 9978	0	3	1500	1.8	140	130
3	Proton(I)	WCU 4703	0	3	1500	2.7	140	100
3	Proton(I)	WCU 1188	0	4	1500	2.1	0	135
3	Proton(I)	WCU 9814	0	4	1300	3.1	140	80
3	Proton	WCG 4653	1	3	1500	4.7	140	100
3	Proton	WCL 1768	1	4	1500	2.6	280	65
3	Proton	TP 1386	1	3	1500	3.6	0	205
3	Proton	WCP 7475	1	4	1500	3.7	0	95
3	Proton	WCJ 5262	1	4	1300	2.3	140	80
3	Proton	BDH 1603	1	4	1300	3.4	140	70
3	Proton	WBX 9907	2	4	1500	2.9	140	60
3	Proton	BDJ 7267	2	3	1500	5.9	140	80
3	Proton	WBX 7193	2	3	1500	4.6	280	40
3	Proton	WBW 9151	2	3	1500	1.2	0	160
3	Proton	WCA 8546	2	3	1300	3.7	140	65
3	Proton	NAD 7786	2	4	1500	3.9	140	70
3	Proton	BCY 735	2	3	1300	5.7	280	65
3	Proton	WBX 9907	2	4	1500	3.1	140	70
3	Proton	BCU 4287	3	3	1500	7.0	280	65
3	Proton	JBR 7171	3	3	1500	4.3	140	85
3	Proton	WBU 3321	3	4	1500	10.4	420	20
3	Proton	WBS 2657	3	3	1300	3.0	0	60
3	Proton	WBV 927	3	3	1500	2.1	0	440
3	Proton	WBP 3924	4	3	1500	8.2	1120	40
3	Proton	BCP 7128	4	4	1500	6.9	280	60
3	Proton	WBK 8878	5	4	1500	6.9	140	60
3	Proton	BCM 7364	5	3	1500	0.2	0	510
** Passenger Car (PROTON) / Gasoline **						4.0	169	109
4	Mitsubishi	WCU 8192	1	1	2400	0.0	0	125
4	Toyota	BDL 8101	1	1	2800	0.0	0	235
4	Isuzu	WBP 1874	4	1	2300	0.1	140	220
4	Isuzu	WBE 2682	6	1	2300	0.0	0	65
4	M. Benz	WAD 8863	10	1	3000	0.0	0	115
** Passenger Car (Others) / Diesel Oil **						0.0	28	152
4	Honda	WCJ 3399	1	3	1500	1.3	700	135
4	Nissan	BDC 6360	1	3	1300	3.5	560	70
4	Mazda	WCU 3836	1	3	1600	4.8	560	65
4	Ford	WCA 8608	1	3	1600	4.5	280	70
4	Honda	WCJ 9604	1	3	2000	1.0	140	140
4	Nissan	WCQ 9250	1	4	2000	2.0	280	90
4	BMW	WBS 9829	2	3	2000	2.3	420	45
4	Suzuki	WBW 5846	2	3	1300	1.8	140	80
4	Honda	WCB 3666	2	3	1500	3.2	420	85
4	Daihatsu	WBT 5416	3	3	1000	3.0	280	35

Table RESULTS OF EXHAUST GAS AT IDLING FROM MOTOR VEHICLES

Car Type	Car Name	Plate Number	Ages	Fuel Type	Capa. (cc)	CO (%)	HC (PPM)	NOx (PPM)
4	Jeep	WQ 8411	3	3	1800	1.3	280	40
4	Mitsubishi	WBS 7557	3	3	2400	0.7	0	85
4	Nissan	KT 5717	5	3	1300	6.4	700	120
4	Ford	JBN 813	5	3	1500	4.9	140	80
4	Nissan	WBH 1603	6	3	1300	5.0	280	70
4	Toyota	WAY 2921	7	3	1300	1.6	280	75
4	M. Benz	BCC 6968	8	3	2300	7.5	420	55
4	Honda	WAS 9331	8	3	1600	3.9	140	65
4	Nissan	MT 6030	8	4	2000	1.1	140	50
4	Nissan	BCD 110	8	4	1300	0.5	140	220
4	BMW	WBA 9877	8	3	2000	1.0	0	85
4	Nissan	MQ 38	9	3	1500	11.8	1540	5
4	M. Benz	ABB 9368	9	3	2300	4.4	280	65
4	Saab	WAQ 1955	9	3	2000	0.4	140	65
4	Volvo	WAG 2366	10	4	2000	9.4	700	20
4	Mitsubishi	WAC 7828	10	3	1600	4.8	140	95
4	Mazda	BBT 8162	10	4	1500	5.4	420	15
4	Nissan	WAB 8234	10	4	1800	0.3	280	60
4	Toyota	NS 5288	11	3	1800	0.9	280	85
4	Audi	BBN 566	11	3	2100	1.4	280	80
4	Mitsubishi	BBL 5960	12	3	1600	8.5	280	45
4	Mazda	PAD 784	12	3	1300	3.8	280	35
4	M. Benz	WM 8533	13	3	2000	10.7	840	5
4	Nissan	WP 5701	14	3	1600	3.3	420	55
4	Mazda	BAT 3146	15	3	1000	6.0	560	45
** Passenger Car (Others) / Gasoline **						3.8	364	70
4	Nissan	BCD 110	8	5	1300	2.2	420	110
** Passenger Car (Others) / LPG **						2.2	420	110
5	Nissan	WCP 7237	0	1	1500	0.0	0	90
5	Ford	JCF 8144	1	1	2000	0.0	0	125
5	Ford	JCF 6125	1	1	2000	0.0	0	110
5	Ford	WCF 9994	1	1	2000	0.0	0	155
5	M. Benz	BBU 5752	10	1	2400	0.1	0	105
** Van / Diesel Oil **						0.0	0	117
5	Mitsubishi	WCT 3556	0	3	1600	5.6	140	80
5	Mitsubishi	WCM 7113	1	3	1400	3.2	140	80
5	Daihatsu	WBW 9034	2	3	1000	1.7	420	65
5	Ford	DS 8606	2	3	1400	6.2	420	70
5	Nissan	WCG 5249	2	3	1600	5.7	280	55
5	Toyota	WBW 9236	2	3	1500	2.1	140	60
5	Datsun	WBG 8923	2	3	1500	4.4	2100	30
5	Nissan	WBV 8108	2	3	1500	1.1	140	125
5	Nissan	WCJ 7384	2	3	1500	8.3	140	50
5	Toyota	WBX 1055	2	4	1500	0.5	0	85
5	Nissan	BDA 4926	2	3	1500	10.3	280	35
5	Nissan	WCJ 2989	2	4	1500	7.4	280	60
5	Nissan	WBT 8565	3	3	1200	4.2	280	105
5	Nissan	BCS 3279	3	3	1400	8.2	280	55

Table RESULTS OF EXHAUST GAS AT IDLING FROM MOTOR VEHICLES

Car Type	Car Name	Plate Number	Ages	Fuel Type	Capa. (cc)	CO (%)	HC (PPM)	NOx (PPM)
5	Toyota	NAA 1458	4	4	1500	1.7	140	130
5	Datsun	WBJ 679	4	3	1200	3.8	280	80
5	Nissan	WBM 4685	4	3	1500	4.2	140	55
5	Nissan	WCP 3935	4	4	1500	6.8	280	40
5	Nissan	BCQ 8165	5	3	1500	9.8	280	40
5	Nissan	BCM 2432	6	3	1500	0.4	1260	100
5	Datsun	CAA 1071	6	3	1500	6.5	1120	25
5	Toyota	WBE 4081	6	3	1800	2.9	140	80
5	Nissan	BCJ 3181	6	3	1500	2.2	280	45
5	Nissan	BCN 5350	6	3	1300	5.3	420	75
5	Daihatsu	WAY 2803	7	3	850	0.5	700	100
5	Mitsubishi	WBM 5356	8	3	1600	10.4	700	20
5	Datsun	WAU 2533	9	3	1500	2.1	140	65
** Van / Gasoline **						4.6	404	67
6	Daihatsu	WCT 6360	0	1	2785	0.1	0	195
6	Mitsubishi	BDD 3926	1	1	2000	0.0	280	135
6	Toyota	WCH 4483	1	1	2400	0.0	140	160
6	Daihatsu	WCP 2163	1	1	2765	0.0	0	150
6	Daihatsu	WCJ 6004	1	1	2765	0.0	0	125
6	Daihatsu	WCS 763	1	1	1300	0.6	0	140
6	Daihatsu	ACB 5531	1	1	2600	0.0	280	150
6	Isuzu	WCU 2641	1	1	1500	0.0	0	170
6	Daihatsu	WBN 5383	2	1	2500	0.0	0	105
6	Toyota	WCB 8195	2	1	2400	0.0	0	195
6	Daihatsu	WBW 6618	3	1	1500	0.0	0	265
6	Isuzu	BCU 2799	3	1	2000	0.0	0	190
6	Toyota	WCM 7772	3	1	2400	0.0	0	130
6	Daihatsu	BCW 1203	4	1	2200	0.0	0	150
6	Ford	JBU 8839	5	1	2450	0.1	0	105
6	Ford	KU 5396	7	1	2600	0.0	0	125
6	Ford	BCF 3848	7	1	2400	0.1	0	145
6	Ford	BCD 421	8	1	1600	0.1	0	105
6	M. Benz	WAP 2842	9	1	2000	0.1	0	95
** Small Truck / Diesel Oil **						0.1	37	149
6	Toyota	WCG 6693	1	4	1500	6.6	420	50
6	Nissan	WCE 6409	1	3	1600	8.8	980	25
6	Toyota	WCQ 5837	1	4	1800	3.8	140	65
6	Nissan	WCK 6664	1	3	2000	1.4	140	60
6	Toyota	WCS 9437	1	3	1800	1.8	140	70
6	Toyota	WCR 9939	1	3	1500	0.4	140	75
6	Nissan	WBM 1879	3	3	1600	4.9	420	20
6	Toyota	WAN 9803	6	3	1500	10.2	560	25
6	Nissan	WR 7319	7	3	1500	8.5	560	30
6	Toyota	WAN 7120	8	3	1500	1.4	420	55
6	Nissan	WAA 5743	10	3	1500	2.2	140	70
6	Toyota	WAE 4404	11	4	1600	10.7	700	10
** Small Truck / Diesel Oil **						5.1	397	46

Table RESULTS OF EXHAUST GAS AT IDLING FROM MOTOR VEHICLES

Car Type	Car Name	Plate Number	Ages	Fuel Type	Capa. (cc)	CO (%)	HC (PPM)	NOx (PPM)
7	M. Benz	WCH 3709	1	1	4500	0.1	0	220
7	Volvo	WCL 1794	1	1	4000	0.1	0	280
7	Hino	NAE 8192	2	1	3000	0.0	0	145
7	M. Benz	JCC 8406	2	1	4500	0.0	0	200
7	Renaut	BCW 6155	3	1	4000	0.0	0	285
7	M. Benz	WBU 1871	3	1	4500	0.1	0	110
7	Isuzu	WBK 608	3	1	4000	0.0	0	130
7	Mitsubishi	BDF 8930	4	1	2000	0.0	0	110
7	Hino	MF 2559	6	1	3000	0.0	0	150
7	Tata	PBS 6059	6	1	4000	0.0	0	170
7	Nissan	WAT 2322	7	1	4000	0.0	0	200
7	M. Benz	BDD 622	7	1	4500	0.1	0	140
7	Tata	PAD 2817	10	1	-	0.0	0	180
7	Tata	JBM 2558	10	1	-	0.1	0	75
7	Tata	WAB 6458	10	1	-	0.0	0	130
7	Isuzu	BBP 6197	11	1	4000	0.0	0	280
7	Tata	NP 5176	11	1	-	0.1	0	100
7	M. Benz	WP 2573	12	1	4500	0.1	0	175
** Large Truck / Diesel Oil **						0.0	0	171
8	M. Benz	WCU 480	0	1	2000	0.0	0	145
8	M. Benz	WCR 4269	0	1	2000	0.1	0	105
8	M. Benz	WCR 5476	0	1	2200	0.0	0	115
8	M. Benz	WCJ 4420	1	1	2200	0.0	0	130
8	M. Benz	BDF 7856	1	1	2200	0.1	0	145
8	M. Benz	WCA 2417	2	1	2400	0.4	140	100
8	M. Benz	WCC 3395	2	1	2000	0.0	0	110
8	M. Benz	WCR 5439	2	1	2000	0.1	0	225
8	M. Benz	WBV 1571	2	1	2000	0.2	0	80
8	M. Benz	WBN 8481	4	1	2000	0.1	0	75
8	M. Benz	WBL 9074	5	1	2000	0.1	140	70
8	M. Benz	WCD 9918	5	1	2000	0.1	0	105
8	M. Benz	WBC 7295	5	1	2000	0.0	0	95
8	M. Benz	WBH 5169	6	1	2000	0.1	0	115
8	M. Benz	WBH 5171	6	1	2000	0.0	0	100
8	M. Benz	WBH 5170	6	1	2000	0.1	0	80
8	M. Benz	WBH 5167	7	1	3000	0.0	0	80
8	M. Benz	WBH 5164	8	1	2000	0.0	0	90
8	M. Benz	BW 874	12	1	2200	0.0	0	80
8	M. Benz	WH 1945	16	1	2200	0.1	0	80
** Mini Bus / Diesel Oil **						0.1	14	106
9	Hino	WCN 3257	1	1	-	0.0	0	190
9	Hino	WAS 1159	4	1	-	0.1	0	125
9	M. Benz	WCJ 4420	5	1	-	0.1	0	35
9	Hino	WBU 7904	5	1	-	0.1	0	140
9	Isuzu	WBK 3981	5	1	-	0.0	140	100
9	Isuzu	WBJ 4018	6	1	-	0.0	0	235
9	Hino	WAW 6314	8	1	-	0.0	0	215
9	Nissan	BBY 9604	8	1	-	0.0	0	255
9	Tata	WY 3094	10	1	-	0.1	0	350
9	Hino	WAS 59	10	1	-	0.1	0	140
9	M. Benz	BAC 8395	12	1	-	0.1	0	65

Table RESULTS OF EXHAUST GAS AT IDLING FROM MOTOR VEHICLES

Car Type	Car Name	Plate Number	Ages	Fuel Type	Capa. (cc)	CO (%)	HC (PPM)	NOx (PPM)
9	M. Benz	WD 4380	12	1	-	0.1	0	120
9	Leyland	WR 4108	13	1	-	0.0	0	250
9	Hino	WS 4470	13	1	-	0.0	0	115
9	M. Benz	BAD 1428	15	1	-	0.1	0	230
** Standard Bus / Diesel Oil **						0.1	9	171

- Legend
- Vehicle Type
- 1 : Motor Cycle
 - 2 : Taxi
 - 3 : Passenger Car (Proton)
 - 4 : Other Passenger Car
 - 5 : Van
 - 6 : Small Truck
 - 7 : Large Truck
 - 8 : Mini Bus
 - 9 : Standard Bus
- Fuel Type
- 1 : Diesel Oil
 - 2 : Regular Gasoline
 - 3 : Premium Gasoline
 - 4 : Unlead Gasoline
 - 5 : LPG

3.2.5 O.D. Zone and Trip Generation in 1992

Traffic Zone Plan

Zone Code			Zone Name
A	B	C	
1 KUALA LUMPUR	1 CPA	1	Dewan Bandaraya
		2	Bukit Nanas, Bukit Bintang
		3	Pasar Besar, Jln. Sultan
		4	Jln. Raja Laut, General Hospital, Jln. Raja Muda
		5	Ampang Complex, Padang Race Track
		6	Pudu
		7	Jln. Loke Yew, Choo Cheng Khay
		8	Stadium Merdeka, Jln. Dato Onn
		9	Selangor Club, Lake Garden
2 KEPONG	10	10	Sentul, Taman Segambut
		11	Kg. Chubadak, Kg. Batu Muda, Kg. Batu, Taman Kok Lian
		12	Taman Kok Doh, Kg. Batu Delima, Kepong Bahru, Taman Kepong
		13	Jinjang Utara, Kepong North, Kg. Kepong, Kepong
		14	Bukit Tunku, Kg. Segambut
		15	Taman Bukit Maluri, South of Taman Bukit Maluri
3 SETAPAK	16	16	Taman Tasik Titiwangsa
		17	Kg. Puah, Taman Ibu Kota, Taman Bunga Raya
		18	Taman Air Panas, Setapak Jaya, Wangsa Maju, South of Wangsa Maju
		19	UTM, Kg. Datuk keramat
4 AMPANG	20	20	Taman U-Thant, Padang Polo Kelab, Padang Golf Kelab
		21	Taman Maluri, South of Taman Maluri
5 Cheras	22	22	Pudu Hulu, Kg. Cheras Baru
		23	Taman Cheras
		24	Taman Ikan Emas
		25	Taman Ikan Emas
		26	Bandar Tun Razak
		27	Bandar Tun Razak
		28	Taman Mutiara Barat
		29	Taman Batu Cheras
		30	Sungei Besi
		31	East of Sungei Besi
		6 OUG	32
33	Salak South, TUDM		
34	Kg. Pantai		
35	Taman Desa		
36	Kg. Melayu		
37	Kg. Melayu		
38	Taman Sri Petaling		
39	Taman Sri Petaling		
40	Taman Gembira		
41	Taman Gembira		
42	Taman OUG		
43	Taman OUG		
44	Bukit Jalil East		
45	Bukit Jalil West		

Table Traffic Zone Plan

Zone Code				
A	B	C	Zone Name	
1	6	46	Bukit Jalil West	
	7	47	Taman Duta	
	DAMANSARA	48	Taman Tun Dr. Ismail	
		49	Taman Bandaraya, Taman Bangsar, Taman Bukit Pantai, Brickfield	
		50	University Malaya	
2	8	51	Batu Arang	
GOMBAK	GOMBAK	52	Rawang	
	WEST	53	Kg. Kundang, Kuang	
		54	Kg. Sg. Tua, Sri Gombak, Hulu Gombak	
		55	Batu, Taman Desa Jaya, Bandar Baru Selayang	
	9	56	Taman Melewar, Setapak	
	GOMBAK	57	Kg. Hulu Klang Dalam, Kg. Hulu Klang, Taman Keramat	
	EAST			
3	10	58	Ampang	
HULU	HULU	59	Ampang	
LANGAT	LANGAT	60	Hulu Langat	
	NORTH	61	Cheras	
	11	62	Bandar Baru Bangi	
	HULU	63	Bandar Baru Bangi	
	LANGAT	64	Kajang	
	SOUTH	65	Bangi	
		66	Hulu Semenyih	
		67	Kg. Sg. Purun	
		68	Semenyih	
		69	Beranang	
4	12	70	S11, S12, S52	
PETALING	PETALING	71	S13, S16, S17	
	JAYA	72	S14, S20, S21, S22, S51a	
		73	S5, S6, S7, S8, S9, S10, S52	
		74	S1, S2, S3, S4, S18, S51	
		75	Jalan Klang Lama	
		76	SS20, SS21	
		77	S19, SS2, SS22, SS23, SS24, SS25	
		78	SS1, SS3, SS8, SS9	
		79	SS4, SS5, SS6, SS7, SS11	
	13	80	Batu Tiga North	
SHAH ALAM		81	Government	
		82	ITM	
		83	Shah Alam New Town	
		84	Shah Alam New Town	
		85	Shah Alam New Town	
		86	Batu Tiga South	
		87	HICOM	
		88	Shah Alam New Town	
		89	Shah Alam New Town	
		90	Shah Alam New Town	

Table Traffic Zone Plan

Zone Code			Zone Name		
A	B	C			
4	13	91	Shah Alam New Town		
		92	Shah Alam New Town		
	PETALING SOUTH	14	93	SS12, SS13, SS14	
			94	SS16, SS17, SS18, SS19	
			95	Damansara	
			96	Puchong	
			97	Puchong	
			98	Puchong	
			99	Puchong	
			100	Serdang	
PETALING NORTH	15	101	Bukit Raja		
		102	Sungai Buloh, Kg.Bukit Lanjan		
		103	Kg.Subang		
		104	Subang Airport		
		105	South of Subang Airport		
5 KLANG	16 KLANG CENTRAL	106	Klang North Town Center		
		107	Klang North Town Center		
		108	Klang North Town Center		
		109	Klang South Town Center		
		110	Klang South Town Center		
		111	Klang South Town Center		
		112	Kg.Telok Gadong Besar		
		113	Kg.Telok Gadong Besar		
		114	Kg.Telok Gadong Besar		
		115	Kg.Tokong Pulau		
		116	Port Klang Town Center		
		117	South Port		
		KLANG SOUTH	17	118	Kg.Jawa
				119	Kg.Jawa
				120	Kg.Bahru Batu Lima
				121	Kg.Tokong Gong
				122	Pulau Lumut
KLANG NORTH	18	123	Kapar		
		124	Meru		
		125	Kg.Batu Empat		
		126	Kg.Batu Belah		
		127	Kg.Batu Belah		
		128	Klang North Port		
		129	North Port		

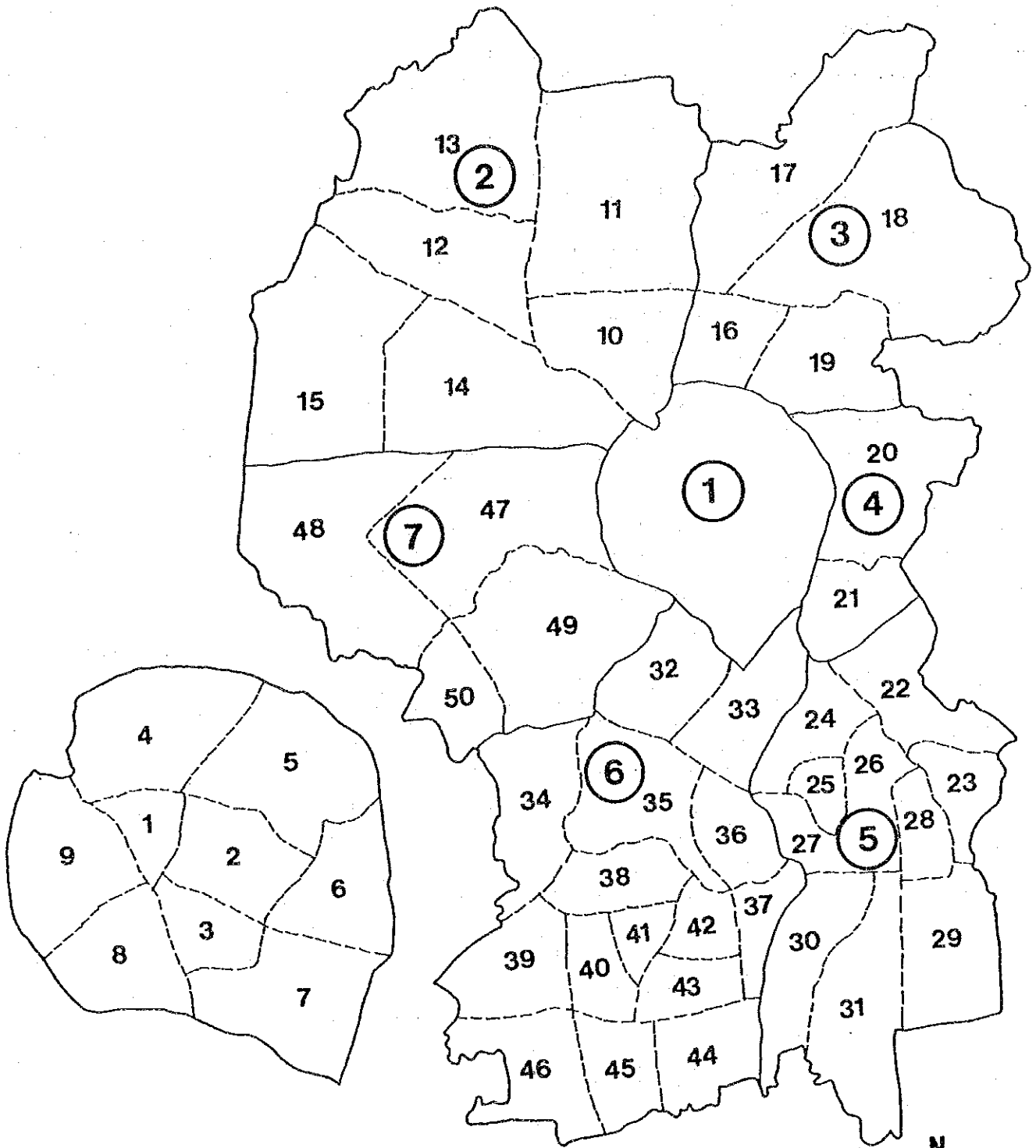


FIGURE : TRAFFIC ZONE PLAN (KUALA LUMPUR PLANNING ZONE B&C)



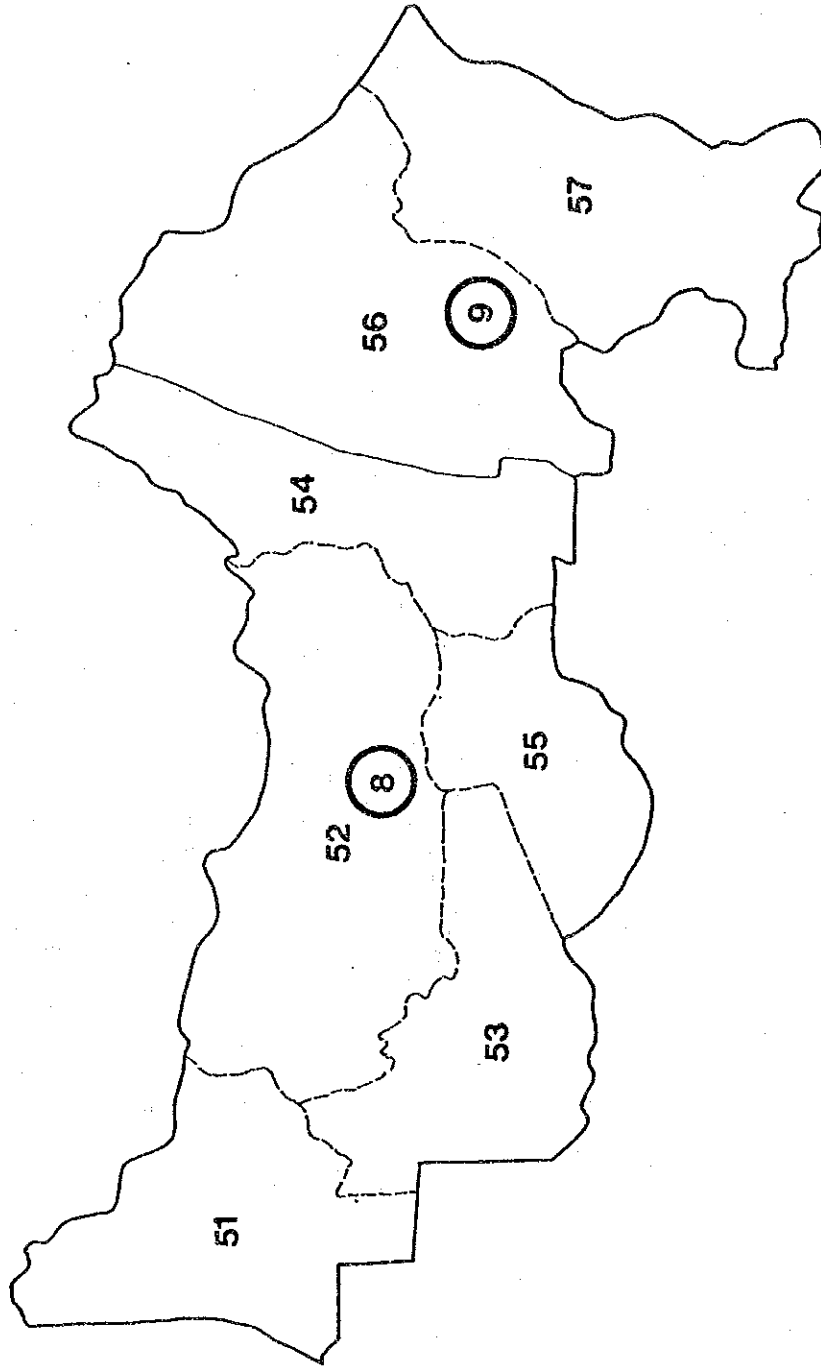


FIGURE : TRAFFIC ZONE PLAN (GOMBAK DISTRICT PLANNING ZONE B&C)

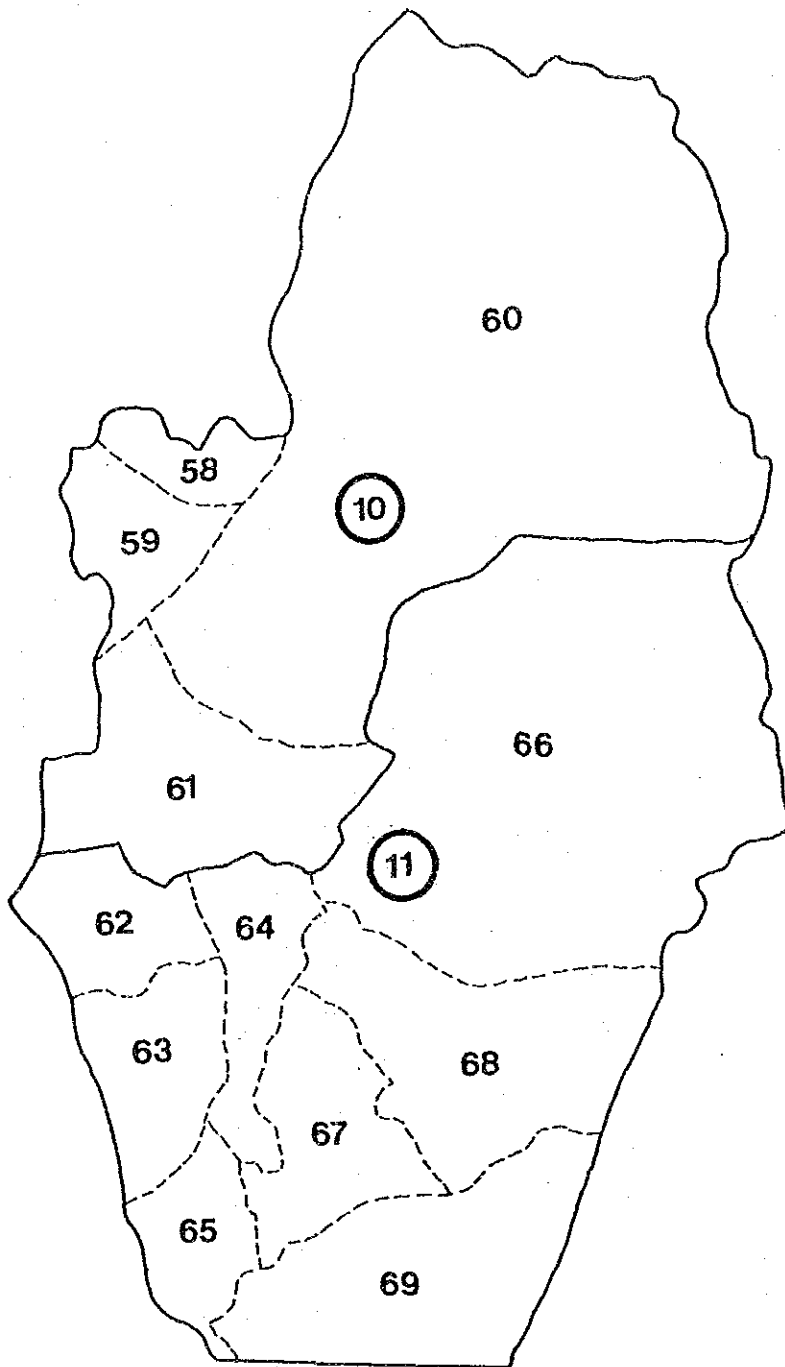


FIGURE : TRAFFIC ZONE PLAN (HULU LANGAT DISTRICT PLANNING ZONE B&C)

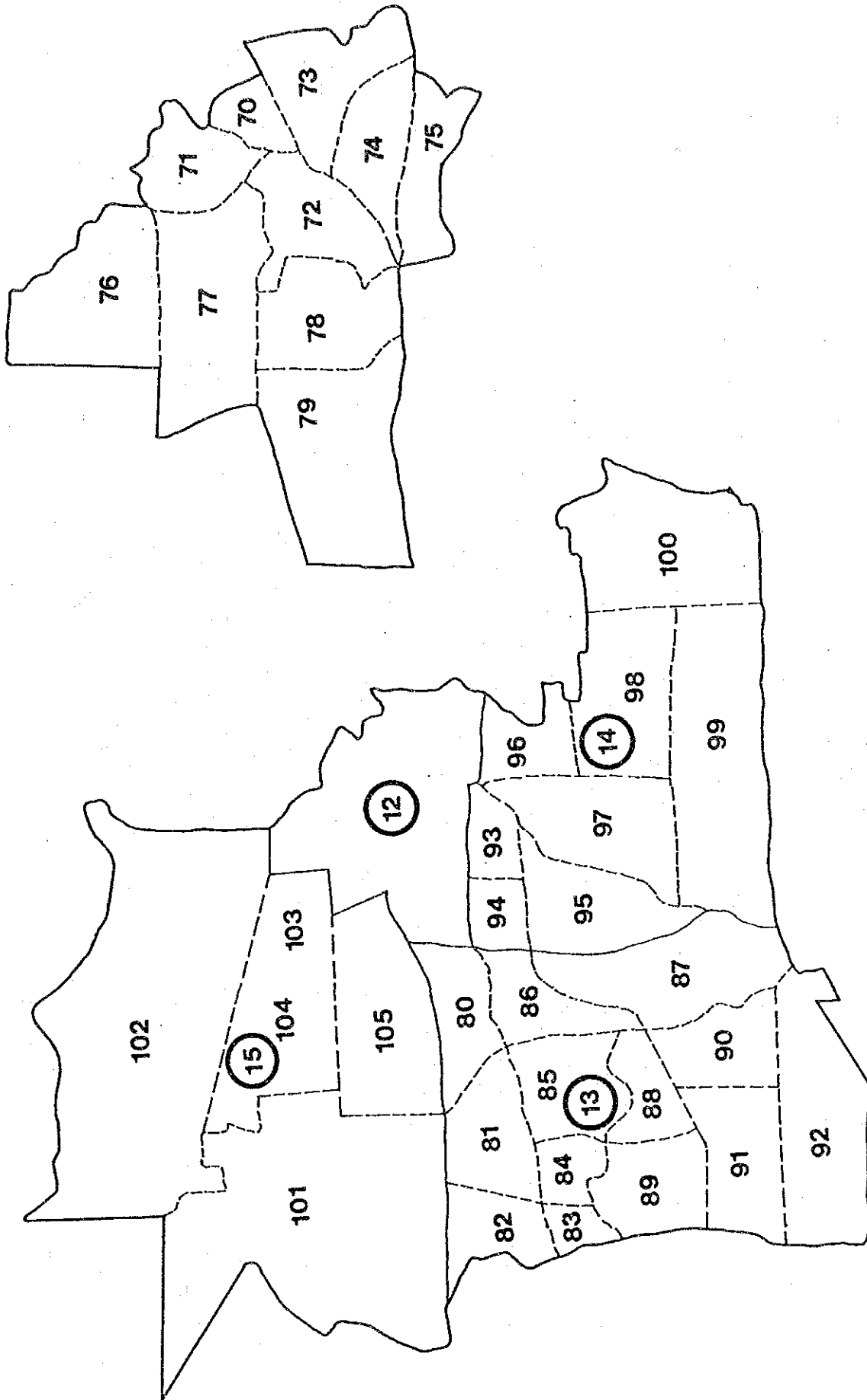


FIGURE : TRAFFIC ZONE PLAN (PETALING DISTRICT PLANNING ZONE B&C)

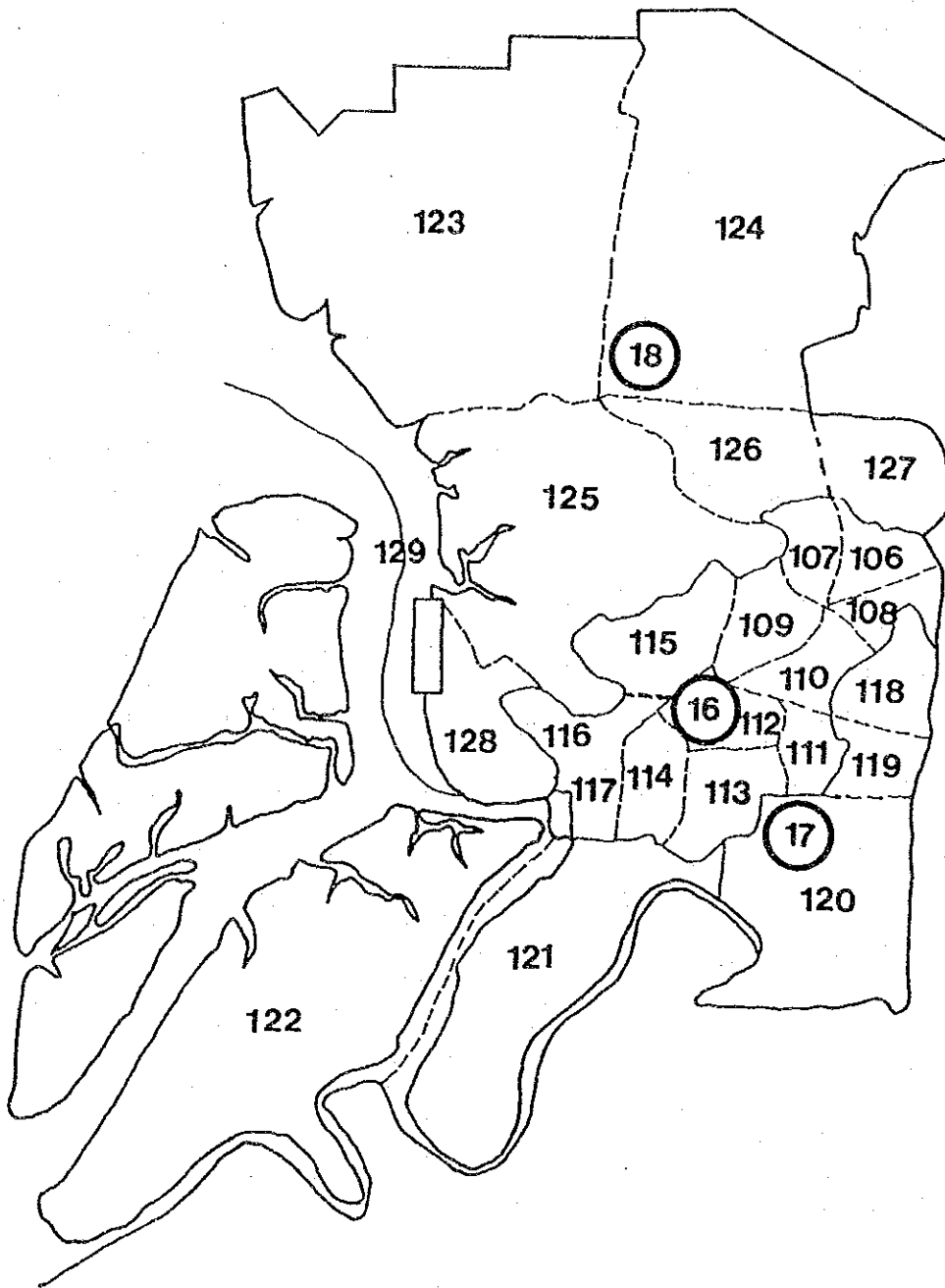


FIGURE : TRAFFIC ZONE PLAN (KLANG DISTRICT PLANNING ZONE B&C)

Table Vehicle Trip by C zone in 1992 (Weekday)

Zone Code	Psaenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
1 #	44,057	3,660	2,107	135	19,149	1,661	8,743	336	74,056	5,792
2 #	61,732	6,198	2,872	327	25,257	2,725	11,746	510	101,607	9,760
3 #	33,211	2,018	1,521	130	12,629	954	6,034	77	53,395	3,179
4 #	58,474	24,967	3,297	1,144	21,929	14,242	13,882	1,820	97,582	42,173
5 #	57,147	7,884	2,639	417	24,997	3,834	11,074	710	95,857	12,845
6 #	47,765	13,128	1,648	993	20,742	7,128	10,421	545	80,576	21,794
7 #	32,833	4,509	925	762	15,899	3,819	2,583	3	52,240	9,093
8 #	20,421	804	1,034	25	8,519	345	2,938	7	32,912	1,181
9 #	19,649	794	983	34	8,279	352	2,950	7	31,861	1,187
10 #	44,014	6,101	2,481	285	19,962	4,622	17,360	895	83,817	11,903
11 #	31,487	6,622	1,700	460	14,824	4,382	8,519	263	56,530	11,727
12 #	27,135	7,950	1,670	420	13,741	5,330	13,618	859	56,164	14,559
13 #	28,305	6,138	1,279	513	12,337	4,396	10,254	496	52,175	11,543
14 #	21,779	3,709	1,156	145	9,487	2,353	6,797	451	39,219	6,658
15 #	42,822	15,626	1,769	1,099	16,462	8,891	16,416	0	77,469	25,616
16 #	13,568	1,332	834	82	6,558	995	4,300	54	25,260	2,463
17 #	25,941	6,404	1,539	424	12,735	4,183	9,380	1,241	49,595	12,252
18 #	63,452	12,594	2,549	931	24,085	8,545	17,621	4,459	107,707	26,529
19 #	31,063	6,695	1,547	422	12,392	4,950	6,584	510	51,586	12,577
20 #	33,925	4,170	1,854	255	16,878	2,782	6,997	219	59,654	7,426
21 #	27,232	1,938	1,519	85	13,853	1,534	7,603	267	50,207	3,824
22 #	16,377	2,465	916	145	8,699	1,744	4,942	130	30,934	4,484
23 #	10,044	715	624	24	5,550	506	2,726	38	18,944	1,283
24 #	19,195	819	1,041	36	8,592	498	4,262	108	33,090	1,461
25 #	12,374	320	693	15	5,599	195	2,711	42	21,377	572
26 #	14,702	460	827	13	6,627	280	3,243	60	25,399	813
27 #	14,702	460	827	13	6,627	280	3,243	60	25,399	813
28 #	19,934	889	1,110	26	8,914	540	4,446	116	34,404	1,571
29 #	21,555	5,419	1,361	251	8,764	2,979	3,315	774	34,995	9,423
30 #	22,410	3,393	907	407	10,574	2,443	6,803	0	40,694	6,243
31 #	11,263	623	722	25	5,726	449	2,913	0	20,624	1,097
32 #	9,419	1,893	568	148	5,691	1,352	2,341	0	18,019	3,393
33 #	18,438	3,898	943	239	10,704	2,882	15,493	466	45,578	7,485
34 #	14,744	3,207	586	388	9,217	2,381	1,679	375	26,226	6,351
35 #	18,396	3,613	1,208	129	8,925	2,485	6,651	274	35,180	6,501
36 #	13,802	1,659	590	170	7,091	1,331	6,551	549	28,034	3,709
37 #	8,322	653	483	59	4,192	449	1,828	34	14,825	1,195
38 #	14,125	298	864	11	7,304	216	2,490	21	24,783	546
39 #	10,706	168	653	14	5,552	121	1,872	12	18,783	315
40 #	12,769	241	773	15	6,611	175	2,242	17	22,395	448
41 #	7,202	75	471	3	3,750	54	1,246	5	12,669	137
42 #	13,442	269	833	7	6,950	195	2,364	19	23,589	490
43 #	12,769	241	789	7	6,611	175	2,242	17	22,411	440
44 #	24,368	791	1,328	51	11,767	582	5,747	117	43,210	1,541
45 #	27,595	1,034	1,587	20	13,259	760	6,529	153	48,970	1,967
46 #	17,739	404	1,017	13	8,654	297	4,157	60	31,567	774
47 #	60,799	8,887	2,987	270	24,794	3,999	13,142	2,480	101,722	15,636
48 #	24,823	6,427	1,508	262	8,469	3,097	6,136	117	40,936	9,903
49 #	48,744	7,884	2,622	388	19,675	4,302	11,627	916	82,668	13,490
50 #	14,975	379	899	21	6,432	223	2,485	37	24,791	660
51 *	4,907	694	351	29	2,243	592	2,449	0	9,950	1,315
52 *	56,146	10,363	2,030	918	18,274	6,904	13,459	6,420	89,909	24,605
53 *	12,956	4,011	438	450	5,763	3,257	4,208	0	23,365	7,718
54 *	94,494	31,102	2,870	2,717	27,968	20,407	21,121	3,437	146,453	57,663
55 *	38,646	13,203	2,019	808	15,191	9,376	9,257	413	65,113	23,800
56 *	17,540	5,436	770	461	6,081	3,725	3,448	260	27,839	9,882
57 *	34,265	17,549	1,772	1,162	14,412	10,751	10,322	1,931	60,771	31,393
58 *	36,632	5,677	2,135	278	16,894	4,285	6,065	492	61,726	10,732
59 *	26,939	2,523	1,652	83	13,165	1,904	4,265	218	46,021	4,728
60 *	8,792	1,574	569	75	2,438	1,202	1,524	303	13,323	3,154
61 *	24,111	4,627	1,439	222	9,726	3,415	5,854	329	41,130	8,593
62 *	35,582	1,087	1,959	39	15,091	850	6,807	433	59,439	2,409
63 *	95,431	13,322	5,547	574	33,645	9,709	15,413	4,077	150,036	27,682
64 *	30,228	946	1,686	57	12,511	639	5,245	241	49,670	1,883
65 *	11,658	1,656	770	68	3,969	1,048	3,005	223	19,402	2,995
66 *	1,745	144	136	4	529	161	591	432	3,001	741
67 *	3,896	68	224	3	2,000	49	1,746	36	7,866	156
68 *	16,359	1,470	954	54	7,836	845	4,116	227	29,265	2,596
69 *	10,291	385	608	18	4,686	304	4,015	215	19,600	922
70 #	6,344	904	504	22	2,949	398	1,928	41	11,725	1,365
71 #	20,030	3,438	1,154	149	9,927	1,972	11,059	309	42,170	5,868
72 #	29,055	5,299	1,600	299	14,018	3,055	13,074	719	57,747	9,372
73 #	54,721	13,178	3,109	547	22,761	6,434	14,773	1,183	95,364	21,342
74 #	28,099	1,977	1,481	84	14,350	1,167	11,857	375	55,787	3,603
75 #	29,480	2,617	1,672	124	14,742	1,778	9,086	214	54,980	4,733

Table Vehicle Trip by C zone in 1992 (Weekday)

Zone Code	Psaenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
76 #	15,402	3,532	979	194	5,931	1,934	3,692	58	26,004	5,718
77 #	30,680	7,474	1,933	320	12,442	4,303	10,089	500	55,144	12,597
78 #	28,071	5,531	1,751	229	13,063	3,561	11,948	569	54,833	9,890
79 #	7,925	2,409	569	120	3,668	1,277	2,119	144	14,281	3,950
80 #	7,142	60	459	3	2,752	37	655	1	11,008	101
81 #	71,745	7,630	3,692	237	24,442	3,924	14,529	617	114,408	12,408
82 #	13,604	214	776	8	5,257	133	1,556	7	21,193	362
83 #	4,933	38	300	5	2,825	32	726	2	8,784	77
84 #	17,596	381	896	25	8,553	415	9,005	341	36,050	1,162
85 #	38,776	2,631	2,010	195	19,629	2,498	13,972	904	74,387	6,228
86 #	7,828	60	428	3	4,915	79	5,495	120	18,666	262
87 #	32,445	1,178	1,727	47	17,070	1,298	15,096	1,078	66,338	3,601
88 #	26,032	944	1,489	55	13,290	906	3,286	0	44,097	1,905
89 #	25,701	867	1,438	41	12,554	820	3,875	0	43,568	1,728
90 #	20,884	580	1,180	26	9,218	550	3,295	0	34,577	1,156
91 #	34,070	1,219	1,684	24	13,350	934	9,760	0	58,864	2,177
92 *	1,946	5	167	1	1,188	4	0	0	3,301	10
93 #	25,841	1,843	1,320	100	11,472	1,106	7,250	236	45,883	3,285
94 #	25,841	1,843	1,320	100	11,472	1,106	7,250	236	45,883	3,285
95 #	1,576	3	112	0	827	0	573	0	3,088	3
96 #	5,325	195	407	7	2,982	181	1,216	27	9,930	410
97 #	7,217	381	525	15	3,952	355	1,651	53	13,345	804
98 #	6,275	280	465	12	3,483	260	1,429	39	11,652	591
99 *	2,217	31	191	10	1,268	29	492	4	4,168	74
100 *	30,505	5,681	862	748	11,215	5,398	9,392	614	51,974	12,441
101 *	3,479	710	329	22	1,550	429	908	271	6,266	1,432
102 *	20,216	4,131	1,048	281	8,283	3,158	4,450	418	33,997	7,988
103 *	5,849	140	374	5	3,346	151	1,372	30	10,941	326
104 *	20,088	1,467	954	28	7,485	544	7,034	347	35,561	2,386
105 *	2,551	443	221	15	1,564	288	137	747	4,473	1,493
106 *	14,227	546	814	26	7,255	411	3,483	48	25,779	1,031
107 *	27,723	1,810	1,478	48	13,266	1,096	6,539	179	49,006	3,133
108 *	13,780	491	828	32	6,683	322	2,005	15	23,296	860
109 *	26,671	1,596	1,387	60	13,366	1,100	5,131	78	46,555	2,834
110 *	20,300	715	1,038	23	10,072	439	3,968	46	35,378	1,223
111 *	13,841	318	696	16	6,906	195	2,663	20	24,106	549
112 *	8,306	134	503	13	4,351	118	1,661	15	14,821	280
113 *	11,456	263	680	25	5,946	232	2,293	29	20,375	549
114 *	13,003	344	787	21	6,719	303	2,618	37	23,127	705
115 *	18,725	3,970	1,160	233	8,281	3,372	2,945	392	31,111	7,967
116 *	38,091	3,313	1,963	179	15,293	2,283	9,022	526	64,369	6,301
117 *	3,007	214	114	6	2,498	88	4,500	271	10,119	579
118 *	9,935	543	666	26	5,777	471	990	5	17,368	1,045
119 *	4,525	100	319	8	2,703	87	424	1	7,971	196
120 *	2,968	28	199	2	1,753	25	1,135	8	6,055	63
121 *	5,566	127	358	6	3,339	149	1,598	15	10,861	297
122 *	7,566	216	465	8	3,208	215	2,030	26	13,269	465
123 *	8,935	1,778	638	77	3,602	1,333	3,167	145	16,342	3,333
124 *	38,076	7,330	2,266	392	11,778	7,061	6,689	2,718	58,809	17,501
125 *	25,073	3,462	1,618	204	13,735	2,289	4,178	24	44,604	5,979
126 *	5,487	64	356	2	3,644	82	3,890	21	13,377	169
127 *	1,864	7	158	1	1,251	9	1,310	2	4,583	19
128 *	12,040	297	700	7	7,009	371	8,987	113	28,736	788
129 *	5,086	388	247	8	3,381	158	3,637	96	12,351	650

Table Vehicle Trip by C zone in 1992 (Sunday)

Zone Code	Psaenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
1 #	35,113	2,917	1,544	99	10,456	907	4,520	174	51,633	4,097
2 #	49,203	4,939	2,104	240	13,791	1,488	6,075	263	71,173	6,930
3 #	26,471	1,608	1,115	95	6,895	521	3,120	40	37,601	2,264
4 #	46,603	19,899	2,417	839	11,973	7,776	7,178	941	68,171	29,455
5 #	45,545	6,284	1,934	306	13,649	2,093	5,725	367	66,853	9,050
6 #	38,069	10,463	1,208	728	11,325	3,892	5,387	282	55,989	15,365
7 #	26,167	3,594	678	559	8,681	2,085	1,334	2	36,860	6,240
8 #	16,274	641	757	19	4,652	188	1,517	4	23,200	852
9 #	15,660	633	720	25	4,520	192	1,525	4	22,425	854
10 #	35,078	4,863	1,818	209	10,899	2,524	8,976	462	56,771	8,058
11 #	25,095	5,278	1,246	337	8,092	2,393	4,404	136	38,837	8,144
12 #	21,625	6,337	1,226	307	7,503	2,910	7,041	444	37,395	9,998
13 #	22,559	4,892	938	376	6,737	2,400	5,301	257	35,535	7,925
14 #	17,358	2,956	849	106	5,180	1,285	3,514	233	26,901	4,580
15 #	34,130	12,454	1,295	806	8,986	4,855	8,487	0	52,898	18,115
16 #	10,813	1,062	611	60	3,579	544	2,223	28	17,226	1,694
17 #	20,675	5,104	1,127	311	6,953	2,284	4,851	641	33,606	8,360
18 #	50,572	10,037	1,869	682	13,151	4,665	9,111	2,305	74,703	17,689
19 #	24,757	5,336	1,133	310	6,768	2,702	3,405	263	36,063	8,611
20 #	27,038	3,324	1,359	187	9,216	1,519	3,615	114	41,228	5,144
21 #	21,703	1,545	1,114	62	7,565	837	3,931	138	34,313	2,582
22 #	13,053	1,964	671	106	4,751	952	2,555	67	21,030	3,039
23 #	8,005	570	459	17	3,030	276	1,409	20	12,903	883
24 #	15,297	653	764	26	4,691	272	2,205	55	22,957	1,006
25 #	9,862	255	507	11	3,058	106	1,401	22	14,828	394
26 #	11,718	367	606	10	3,619	153	1,676	31	17,619	561
27 #	11,718	367	606	10	3,619	153	1,676	31	17,619	561
28 #	15,888	708	811	20	4,867	295	2,298	60	23,864	1,083
29 #	17,178	4,319	998	184	4,786	1,626	1,715	400	24,677	6,529
30 #	17,862	2,704	665	298	5,773	1,334	3,516	0	27,816	4,336
31 #	8,975	497	530	18	3,125	245	1,507	0	14,137	760
32 #	7,505	1,509	418	108	3,108	738	1,210	0	12,241	2,355
33 #	14,694	3,107	693	175	5,844	1,574	8,010	241	29,241	5,097
34 #	11,752	2,556	428	285	5,033	1,300	868	194	18,081	4,335
35 #	14,663	2,879	884	95	4,873	1,357	3,438	142	23,858	4,473
36 #	11,001	1,322	434	124	3,871	727	3,387	284	18,693	2,457
37 #	6,631	521	354	43	2,289	245	947	17	10,221	826
38 #	11,257	238	633	8	3,988	118	1,287	11	17,165	375
39 #	8,532	134	479	10	3,032	66	968	6	13,011	216
40 #	10,177	192	567	11	3,610	96	1,159	9	15,513	308
41 #	5,739	60	346	2	2,048	29	644	3	8,777	94
42 #	10,714	214	610	5	3,796	106	1,222	10	16,342	335
43 #	10,177	192	579	5	3,610	96	1,159	9	15,525	302
44 #	19,422	630	972	38	6,424	318	2,970	61	29,788	1,047
45 #	21,993	824	1,162	15	7,239	415	3,376	79	33,770	1,333
46 #	14,138	322	744	10	4,725	162	2,149	31	21,756	525
47 #	48,456	7,083	2,189	198	13,537	2,184	6,795	1,282	70,977	10,747
48 #	19,783	5,123	1,105	192	4,624	1,691	3,173	60	28,685	7,066
49 #	38,849	6,284	1,921	285	10,742	2,349	6,011	474	57,523	9,392
50 #	11,936	302	660	15	3,511	122	1,283	20	17,390	459
51 *	4,457	630	287	23	1,398	370	1,092	0	7,234	1,023
52 *	50,980	9,410	1,654	748	11,403	4,308	6,004	2,863	70,041	17,329
53 *	11,765	3,642	357	367	3,598	2,032	1,876	0	17,596	6,041
54 *	85,800	28,241	2,341	2,214	17,452	12,734	9,420	1,533	115,013	44,722
55 *	35,092	11,988	1,645	659	9,480	5,850	4,130	184	50,347	18,681
56 *	15,926	4,936	627	376	3,796	2,324	1,537	116	21,886	7,752
57 *	31,114	15,934	1,442	948	8,992	6,709	4,604	861	46,152	24,452
58 *	33,260	5,155	1,740	227	10,541	2,674	2,706	219	48,247	8,275
59 *	24,460	2,291	1,348	67	8,215	1,188	1,903	97	35,926	3,643
60 *	7,984	1,429	464	61	1,523	750	680	135	10,651	2,375
61 *	21,894	4,201	1,174	180	6,067	2,132	2,610	147	31,745	6,660
62 *	32,308	987	1,599	31	9,416	531	3,036	193	46,359	1,742
63 *	86,652	12,096	4,522	467	20,994	6,059	6,875	1,818	119,043	20,440
64 *	27,447	859	1,375	46	7,806	399	2,338	108	38,966	1,412
65 *	10,585	1,504	627	56	2,477	654	1,340	99	15,029	2,313
66 *	1,584	131	109	4	331	100	263	193	2,287	428
67 *	3,537	62	182	3	1,247	31	778	16	5,744	112
68 *	14,855	1,334	777	44	4,890	527	1,836	101	22,358	2,006
69 *	9,344	350	494	15	2,925	189	1,790	96	14,553	650
70 #	5,056	721	369	16	1,611	217	997	21	8,033	975
71 #	15,964	2,740	846	109	5,420	1,077	5,717	160	27,947	4,086
72 #	23,158	4,223	1,170	220	7,654	1,668	6,759	372	38,741	6,483
73 #	43,612	10,503	2,278	401	12,428	3,513	7,637	612	65,955	15,029
74 #	22,396	1,575	1,087	61	7,836	637	6,129	194	37,448	2,467
75 #	23,495	2,086	1,226	91	8,049	971	4,696	111	37,466	3,259

Table Vehicle Trip by C zone in 1992 (Sunday)

Zone Code	Psaenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
76 #	12,275	2,815	719	142	3,238	1,056	1,909	30	18,141	4,043
77 #	24,452	5,957	1,418	234	6,792	2,350	5,215	259	37,877	8,800
78 #	22,372	4,408	1,283	168	7,133	1,944	6,178	294	36,966	6,814
79 #	6,316	1,920	418	88	2,003	697	1,097	74	9,834	2,779
80 #	5,692	48	336	2	1,503	20	337	1	7,868	71
81 #	57,181	6,081	2,707	174	13,344	2,143	7,510	319	80,742	8,717
82 #	10,843	170	569	6	2,872	72	806	3	15,090	251
83 #	3,932	30	219	4	1,542	18	376	1	6,069	53
84 #	14,023	304	655	19	4,669	227	4,656	176	24,003	726
85 #	30,905	2,097	1,473	143	10,717	1,364	7,222	468	50,317	4,072
86 #	6,238	48	314	2	2,684	43	2,842	62	12,078	155
87 #	25,858	939	1,267	34	9,322	708	7,806	557	44,253	2,238
88 #	20,748	752	1,092	40	7,256	495	1,700	0	30,796	1,287
89 #	20,484	691	1,054	30	6,854	448	2,003	0	30,395	1,169
90 #	16,645	462	865	19	5,033	300	1,703	0	24,246	781
91 #	27,153	972	1,236	17	7,289	510	5,045	0	40,723	1,499
92 *	1,769	4	135	1	740	3	0	0	2,644	8
93 #	20,595	1,469	966	74	6,263	604	3,748	122	31,572	2,269
94 #	20,595	1,469	966	74	6,263	604	3,748	122	31,572	2,269
95 #	1,256	3	83	0	451	0	296	0	2,086	3
96 #	4,245	155	298	5	1,627	99	628	14	6,798	273
97 #	5,752	304	385	11	2,157	194	854	27	9,148	536
98 #	5,001	223	342	8	1,901	142	739	20	7,983	393
99 *	2,011	29	155	8	792	18	219	2	3,177	57
100 *	27,696	5,159	701	610	6,999	3,368	4,189	274	39,585	9,411
101 *	3,160	644	268	18	966	268	404	121	4,798	1,051
102 *	18,357	3,751	854	229	5,168	1,971	1,985	186	26,364	6,137
103 *	5,311	127	305	4	2,088	94	611	14	8,315	239
104 *	18,240	1,332	780	22	4,670	340	3,136	155	26,826	1,849
105 *	2,316	402	179	13	976	180	61	333	3,532	928
106 *	12,917	496	661	22	4,526	257	1,555	21	19,659	796
107 *	25,174	1,643	1,205	39	8,278	684	2,915	80	37,572	2,446
108 *	12,512	446	675	26	4,170	201	893	7	18,250	680
109 *	24,215	1,450	1,129	49	8,338	687	2,288	35	35,970	2,221
110 *	18,433	649	845	19	6,284	274	1,772	20	27,334	962
111 *	12,566	289	567	13	4,309	122	1,188	9	18,630	433
112 *	7,541	122	409	11	2,714	74	740	7	11,404	214
113 *	10,402	239	555	20	3,710	145	1,023	13	15,690	417
114 *	11,807	312	642	17	4,193	189	1,167	17	17,809	535
115 *	17,001	3,605	946	190	5,168	2,104	1,313	175	24,428	6,074
116 *	34,585	3,009	1,599	146	9,544	1,424	4,023	235	49,751	4,814
117 *	2,728	195	93	5	1,559	55	2,006	121	6,386	376
118 *	9,021	493	543	21	3,605	294	443	2	13,612	810
119 *	4,111	90	261	6	1,687	54	188	1	6,247	151
120 *	2,697	25	164	1	1,093	16	507	3	4,461	45
121 *	5,055	115	291	5	2,084	93	712	7	8,142	220
122 *	6,870	196	378	7	2,001	134	907	11	10,156	348
123 *	8,114	1,614	522	62	2,250	831	1,412	65	12,298	2,572
124 *	34,572	6,656	1,845	320	7,350	4,406	2,983	1,212	46,750	12,594
125 *	22,768	3,143	1,316	167	8,572	1,428	1,862	11	34,518	4,749
126 *	4,982	58	289	2	2,273	51	1,736	9	9,280	120
127 *	1,693	6	129	1	779	6	584	1	3,185	14
128 *	10,934	269	570	6	4,373	232	4,007	51	19,884	558
129 *	4,618	352	202	6	2,109	99	1,624	42	8,553	499

Table Vehicle Trip by C zone in 2005 (Weekday)

Zone Code	Passenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
1 #	81,418	6,763	3,980	256	29,412	2,552	16,097	618	130,907	10,189
2 #	114,083	11,453	5,428	618	38,795	4,186	21,626	938	179,932	17,195
3 #	61,375	3,729	2,877	245	19,397	1,466	11,111	141	94,760	5,581
4 #	108,061	46,139	6,233	2,162	33,683	21,876	25,558	3,350	173,535	73,527
5 #	105,607	14,570	4,986	789	38,396	5,889	20,387	1,307	169,376	22,555
6 #	88,271	24,260	3,117	1,876	31,861	10,948	19,186	1,003	142,435	38,087
7 #	60,676	8,332	1,748	1,441	24,421	5,866	4,753	6	91,598	15,645
8 #	37,737	1,486	1,952	48	13,086	530	5,408	13	58,183	2,077
9 #	36,310	1,468	1,855	65	12,715	541	5,432	13	56,312	2,087
10 #	81,337	11,275	4,687	539	30,661	7,100	31,962	1,647	148,647	20,561
11 #	58,187	12,238	3,213	869	22,768	6,731	15,684	484	99,852	20,322
12 #	50,143	14,692	3,159	793	21,105	8,187	25,072	1,581	99,479	25,253
13 #	52,308	11,343	2,417	970	18,948	6,753	18,876	914	92,549	19,980
14 #	40,247	6,854	2,186	274	14,573	3,614	12,513	830	69,519	11,572
15 #	79,136	28,877	3,341	2,078	25,284	13,657	30,223	0	137,984	44,612
16 #	25,072	2,462	1,576	155	10,072	1,529	7,917	99	44,637	4,245
17 #	47,938	11,835	2,907	802	19,562	6,425	17,268	2,285	87,675	21,347
18 #	117,260	23,273	4,818	1,759	36,995	13,125	32,441	8,209	191,514	46,366
19 #	57,403	12,373	2,924	798	19,034	7,603	12,123	938	91,484	21,712
20 #	62,694	7,706	3,504	482	25,925	4,273	12,879	404	105,002	12,865
21 #	50,323	3,582	2,873	160	21,279	2,356	13,998	491	88,473	6,589
22 #	30,265	4,555	1,730	274	13,362	2,679	9,097	240	54,454	7,748
23 #	18,563	1,321	1,181	45	8,524	777	5,018	70	33,286	2,213
24 #	35,473	1,513	1,969	68	13,197	765	7,847	198	58,486	2,544
25 #	22,868	591	1,310	28	8,602	299	4,992	77	37,772	995
26 #	27,169	851	1,563	25	10,180	430	5,968	111	44,880	1,417
27 #	27,169	851	1,563	25	10,180	430	5,968	111	44,880	1,417
28 #	36,840	1,642	2,097	50	13,691	830	8,184	214	60,812	2,736
29 #	39,833	10,014	2,571	475	13,460	4,576	6,102	1,425	61,966	16,490
30 #	41,414	6,270	1,713	769	16,241	3,753	12,523	0	71,891	10,792
31 #	20,812	1,152	1,365	47	8,795	689	5,363	0	36,335	1,888
32 #	17,404	3,499	1,075	279	8,741	2,077	4,310	0	31,530	5,855
33 #	34,072	7,204	1,785	451	16,442	4,427	28,525	857	80,824	12,939
34 #	27,249	5,926	1,107	734	14,157	3,657	3,089	691	45,602	11,008
35 #	33,998	6,676	2,283	244	13,708	3,817	12,243	505	62,232	11,242
36 #	25,508	3,065	1,116	321	10,891	2,045	12,060	1,011	49,575	6,442
37 #	15,378	1,207	913	111	6,440	689	3,367	62	26,098	2,069
38 #	26,104	551	1,631	21	11,218	332	4,584	39	43,537	943
39 #	19,784	310	1,236	26	8,528	186	3,447	22	32,995	544
40 #	23,596	446	1,463	28	10,155	269	4,128	31	39,342	774
41 #	13,310	138	890	6	5,759	83	2,293	10	22,252	237
42 #	24,842	497	1,571	14	10,676	299	4,353	35	41,442	845
43 #	23,596	446	1,493	13	10,155	269	4,128	31	39,372	759
44 #	45,032	1,462	2,508	97	18,073	894	10,580	216	76,193	2,669
45 #	50,996	1,910	2,999	38	20,366	1,167	12,020	282	86,381	3,397
46 #	32,783	746	1,922	24	13,293	456	7,655	110	55,653	1,336
47 #	112,356	16,423	5,644	511	38,085	6,142	24,196	4,565	180,281	27,641
48 #	45,872	11,878	2,850	495	13,008	4,757	11,297	215	73,027	17,345
49 #	90,079	14,570	4,954	734	30,220	6,608	21,405	1,687	146,658	23,599
50 #	27,675	700	1,700	39	9,878	343	4,574	69	43,827	1,151
51 *	9,068	1,283	665	54	3,443	910	4,509	0	17,685	2,247
52 *	103,758	19,151	3,835	1,735	28,070	10,604	24,780	11,819	160,443	43,309
53 *	23,943	7,413	830	850	8,854	5,002	7,746	0	41,373	13,265
54 *	174,624	57,477	5,426	5,135	42,959	31,345	38,883	6,328	261,892	100,285
55 *	71,418	24,399	3,815	1,528	23,334	14,401	17,044	760	115,611	41,088
56 *	32,415	10,045	1,454	872	9,342	5,721	6,348	479	49,559	17,117
57 *	63,323	32,430	3,348	2,197	22,136	16,514	19,003	3,555	107,810	54,696
58 *	67,693	10,492	4,035	526	25,948	6,582	11,166	905	108,842	18,505
59 *	49,783	4,663	3,124	156	20,221	2,925	7,851	402	80,979	8,146
60 *	16,247	2,909	1,076	141	3,746	1,846	2,805	558	23,874	5,454
61 *	44,557	8,551	2,720	419	14,937	5,246	10,776	606	72,990	14,822
62 *	65,755	2,009	3,705	73	23,179	1,306	12,532	797	105,171	4,185
63 *	176,356	24,619	10,486	1,084	51,678	14,913	28,377	7,505	266,897	48,121
64 *	55,859	1,749	3,188	107	19,215	982	9,655	444	87,917	3,282
65 *	21,542	3,061	1,455	129	6,095	1,610	5,532	410	34,624	5,210
66 *	3,223	267	256	8	813	247	1,087	796	5,379	1,318
67 *	7,201	125	423	6	3,073	75	3,214	67	13,911	273
68 *	30,233	2,716	1,800	103	12,035	1,298	7,579	417	51,647	4,534
69 *	19,016	712	1,148	34	7,197	467	7,393	395	34,754	1,608
70 #	11,724	1,671	954	41	4,531	611	3,550	75	20,759	2,398
71 #	37,014	6,354	2,182	281	15,249	3,029	20,359	569	74,804	10,233
72 #	53,692	9,793	3,021	566	21,530	4,693	24,069	1,324	102,312	16,376
73 #	101,124	24,353	5,877	1,033	34,960	9,883	27,198	2,177	169,159	37,446
74 #	51,927	3,653	2,801	158	22,043	1,792	21,826	691	98,597	6,294
75 #	54,478	4,837	3,160	235	22,644	2,731	16,727	394	97,009	8,197

Table Vehicle Trip by C zone in 2005 (Weekday)

Zone Code	Passenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
76 #	28,460	6,528	1,851	367	9,111	2,970	6,796	107	46,218	9,972
77 #	56,696	13,812	3,653	605	19,112	6,609	18,574	921	98,035	21,947
78 #	51,876	10,221	3,309	433	20,066	5,469	21,998	1,047	97,249	17,170
79 #	14,645	4,452	1,078	226	5,635	1,961	3,903	265	25,261	6,904
80 #	13,201	110	866	6	4,227	57	1,207	1	19,501	174
81 #	132,583	14,101	6,981	447	37,541	6,028	26,749	1,135	203,854	21,711
82 #	25,142	395	1,466	15	8,075	204	2,866	12	37,549	626
83 #	9,116	70	567	9	4,340	49	1,338	3	15,361	131
84 #	32,517	704	1,691	48	13,139	637	16,579	627	63,926	2,016
85 #	71,660	4,862	3,798	369	30,150	3,837	25,721	1,665	131,329	10,733
86 #	14,467	110	808	6	7,550	121	10,118	220	32,943	457
87 #	59,958	2,177	3,266	88	26,221	1,993	27,792	1,985	117,237	6,243
88 #	48,108	1,744	2,814	104	20,412	1,392	6,051	0	77,385	3,240
89 #	47,495	1,602	2,716	78	19,282	1,260	7,134	0	76,627	2,940
90 #	38,595	1,071	2,230	49	14,159	845	6,066	0	61,050	1,965
91 #	62,961	2,253	3,184	45	20,504	1,435	17,967	0	104,616	3,733
92 *	3,598	9	317	1	1,824	6	0	0	5,739	16
93 #	47,754	3,406	2,495	189	17,621	1,699	13,347	435	81,217	5,729
94 #	47,754	3,406	2,495	189	17,621	1,699	13,347	435	81,217	5,729
95 #	2,913	6	212	0	1,271	0	1,054	0	5,450	6
96 #	9,842	360	769	13	4,581	278	2,238	50	17,430	701
97 #	13,336	705	993	28	6,071	545	3,039	97	23,439	1,375
98 #	11,594	518	880	22	5,348	409	2,632	71	20,454	1,011
99 *	4,094	58	360	19	1,948	44	904	8	7,306	129
100 *	56,371	10,499	1,629	1,413	17,227	8,291	17,290	1,131	92,517	21,334
101 *	6,429	1,312	621	42	2,381	659	1,672	499	11,103	2,512
102 *	37,361	7,634	1,981	531	12,723	4,851	8,193	770	60,258	13,786
103 *	10,811	258	705	10	5,139	232	2,525	56	19,180	556
104 *	37,122	2,711	1,805	52	11,496	836	12,950	638	63,373	4,237
105 *	4,715	818	416	29	2,402	443	254	1,375	7,787	2,665
106 *	26,290	1,009	1,536	50	11,145	631	6,414	88	45,385	1,778
107 *	51,235	3,344	2,793	91	20,376	1,684	12,039	329	86,443	5,448
108 *	25,466	907	1,566	60	10,264	495	3,691	28	40,987	1,490
109 *	49,286	2,950	2,619	114	20,529	1,690	9,446	144	81,880	4,898
110 *	37,514	1,322	1,960	44	15,471	674	7,308	84	62,253	2,124
111 *	25,576	588	1,316	30	10,606	300	4,903	37	42,401	955
112 *	15,349	248	950	25	6,682	182	3,059	27	26,040	482
113 *	21,171	486	1,286	47	9,131	357	4,222	53	35,810	943
114 *	24,030	635	1,488	39	10,319	466	4,818	69	40,655	1,209
115 *	34,602	7,337	2,192	441	12,720	5,179	5,423	721	54,937	13,678
116 *	70,392	6,123	3,711	338	23,489	3,507	16,611	968	114,203	10,936
117 *	5,555	396	214	12	3,838	135	8,285	499	17,892	1,042
118 *	18,361	1,003	1,259	49	8,874	723	1,822	10	30,316	1,785
119 *	8,364	184	603	15	4,153	133	780	2	13,900	334
120 *	5,485	52	378	3	2,693	38	2,090	14	10,646	107
121 *	10,288	234	677	11	5,129	229	2,941	28	19,035	502
122 *	13,980	400	877	16	4,927	330	3,738	48	23,522	794
123 *	16,513	3,285	1,207	145	5,534	2,047	5,830	267	29,084	5,744
124 *	70,364	13,546	4,282	741	18,092	10,845	12,315	5,003	105,053	30,135
125 *	46,338	6,397	3,056	386	21,097	3,516	7,691	44	78,182	10,343
126 *	10,139	118	672	4	5,597	126	7,163	38	23,571	286
127 *	3,444	13	301	1	1,921	14	2,410	4	8,076	32
128 *	22,250	549	1,322	14	10,766	570	16,546	208	50,884	1,341
129 *	9,399	717	466	15	5,193	243	6,696	176	21,754	1,151

Table Vehicle Trip by C zone in 2005 (Sunday)

Zone Code	Passenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
1 #	64,891	5,390	2,917	188	16,060	1,393	8,322	320	92,190	7,291
2 #	90,925	9,128	3,979	453	21,182	2,286	11,181	485	127,267	12,352
3 #	48,916	2,972	2,108	180	10,592	800	5,745	73	67,361	4,025
4 #	86,124	36,773	4,569	1,585	18,391	11,944	13,214	1,732	122,298	52,034
5 #	84,169	11,612	3,655	578	20,965	3,215	10,539	676	119,328	16,081
6 #	70,352	19,335	2,285	1,375	17,395	5,978	9,918	519	99,950	27,207
7 #	48,358	6,641	1,282	1,056	13,333	3,203	2,457	3	65,430	10,903
8 #	30,077	1,184	1,431	35	7,145	289	2,795	7	41,448	1,515
9 #	28,939	1,170	1,359	48	6,943	295	2,807	7	40,048	1,520
10 #	64,826	8,986	3,436	395	16,741	3,877	16,525	851	101,528	14,109
11 #	46,374	9,754	2,355	637	12,431	3,675	8,109	250	69,269	14,316
12 #	39,963	11,710	2,316	581	11,524	4,470	12,963	817	66,766	17,578
13 #	41,690	9,040	1,772	711	10,346	3,687	9,758	473	63,566	13,911
14 #	32,076	5,463	1,602	201	7,958	1,973	6,469	429	48,105	8,066
15 #	63,072	23,015	2,449	1,523	13,804	7,457	15,626	0	94,951	31,995
16 #	19,983	1,962	1,154	114	5,499	835	4,093	51	30,729	2,962
17 #	38,207	9,432	2,130	588	10,681	3,508	8,929	1,181	59,947	14,709
18 #	93,455	18,549	3,532	1,289	20,200	7,166	16,772	4,244	133,959	31,248
19 #	45,751	9,861	2,143	585	10,393	4,151	6,267	485	64,554	15,082
20 #	49,967	6,142	2,570	353	14,155	2,333	6,658	209	73,350	9,037
21 #	40,107	2,855	2,107	117	11,619	1,286	7,236	254	61,069	4,512
22 #	24,122	3,630	1,268	201	7,296	1,463	4,703	124	37,389	5,418
23 #	14,794	1,053	866	33	4,655	424	2,595	36	22,910	1,546
24 #	28,271	1,206	1,443	50	7,205	418	4,058	102	40,977	1,776
25 #	18,226	471	959	21	4,697	163	2,580	40	26,462	695
26 #	21,654	678	1,146	18	5,558	235	3,086	57	31,444	988
27 #	21,654	678	1,146	18	5,558	235	3,086	57	31,444	988
28 #	29,361	1,309	1,536	37	7,476	453	4,230	111	42,603	1,910
29 #	31,747	7,981	1,885	348	7,350	2,498	3,155	737	44,137	11,564
30 #	33,008	4,997	1,255	564	8,868	2,049	6,474	0	49,605	7,610
31 #	16,587	918	1,001	34	4,802	376	2,773	0	25,163	1,328
32 #	13,870	2,789	787	205	4,773	1,134	2,229	0	21,659	4,128
33 #	27,154	5,742	1,308	331	8,978	2,417	14,748	443	52,188	8,933
34 #	21,718	4,723	811	538	7,730	1,997	1,597	357	31,856	7,615
35 #	27,096	5,321	1,673	179	7,485	2,084	6,329	261	42,583	7,845
36 #	20,330	2,443	819	235	5,945	1,117	6,235	523	33,329	4,318
37 #	12,256	962	670	81	3,517	376	1,741	32	18,184	1,451
38 #	20,805	439	1,196	15	6,126	181	2,371	20	30,498	655
39 #	15,768	247	906	19	4,655	102	1,783	11	23,112	379
40 #	18,807	355	1,071	21	5,545	147	2,134	16	27,557	539
41 #	10,608	110	653	4	3,145	45	1,186	5	15,592	164
42 #	19,799	396	1,152	10	5,830	163	2,251	18	29,032	587
43 #	18,807	355	1,093	10	5,545	147	2,134	16	27,579	528
44 #	35,891	1,165	1,839	71	9,868	488	5,469	112	53,067	1,836
45 #	40,645	1,522	2,198	28	11,120	637	6,214	146	60,177	2,333
46 #	26,127	595	1,408	18	7,258	249	3,957	57	38,750	919
47 #	89,548	13,089	4,136	375	20,794	3,354	12,510	2,360	126,988	19,178
48 #	36,560	9,467	2,089	363	7,103	2,597	5,840	111	51,592	12,538
49 #	71,794	11,612	3,632	538	16,500	3,608	11,067	872	102,993	16,630
50 #	22,057	558	1,246	29	5,394	187	2,364	36	31,061	810
51 *	8,234	1,165	542	44	2,148	568	2,011	0	12,935	1,777
52 *	94,213	17,389	3,125	1,414	17,515	6,617	11,053	5,271	125,906	30,691
53 *	21,741	6,731	676	693	5,526	3,121	3,454	0	31,397	10,545
54 *	158,559	52,189	4,423	4,185	26,807	19,559	17,342	2,822	207,131	78,755
55 *	64,849	22,154	3,110	1,245	14,561	8,986	7,602	339	90,122	32,724
56 *	29,432	9,121	1,184	711	5,829	3,570	2,830	214	39,275	13,616
57 *	57,498	29,446	2,728	1,791	13,812	10,305	8,474	1,586	82,512	43,128
58 *	61,464	9,527	3,288	429	16,192	4,107	4,980	404	85,924	14,467
59 *	45,203	4,234	2,547	127	12,618	1,825	3,502	179	63,870	6,365
60 *	14,753	2,641	877	115	2,338	1,152	1,251	249	19,219	4,157
61 *	40,459	7,764	2,217	341	9,320	3,274	4,807	270	56,803	11,649
62 *	59,706	1,824	3,021	59	14,463	815	5,590	355	82,780	3,053
63 *	160,131	22,354	8,547	883	32,247	9,306	12,656	3,347	213,581	35,890
64 *	50,721	1,588	2,599	87	11,990	613	4,306	198	69,616	2,486
65 *	19,561	2,779	1,186	105	3,803	1,005	2,467	183	27,017	4,072
66 *	2,928	242	208	7	507	154	485	355	4,128	758
67 *	6,538	114	344	5	1,917	47	1,433	30	10,232	196
68 *	27,452	2,466	1,467	84	7,510	810	3,380	186	39,809	3,546
69 *	17,268	646	935	28	4,492	291	3,297	176	25,992	1,141
70 #	9,344	1,332	699	30	2,473	334	1,835	39	14,351	1,735
71 #	29,501	5,064	1,599	206	8,326	1,654	10,526	294	49,952	7,218
72 #	42,793	7,805	2,214	415	11,756	2,562	12,443	685	69,206	11,467
73 #	80,596	19,409	4,308	757	19,088	5,396	14,061	1,126	118,053	26,688
74 #	41,387	2,911	2,053	116	12,037	978	11,284	357	66,761	4,362
75 #	43,419	3,855	2,316	172	12,364	1,491	8,647	204	66,746	5,722

Table Vehicle Trip by C zone in 2005 (Sunday)

Zone Code	Psaenger Car		Bus		Motor Cycle		Trucks		Total	
	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai	Nai-Gai	Nai-Nai
76 #	22,682	5,203	1,357	269	4,974	1,622	3,514	55	32,527	7,149
77 #	45,187	11,008	2,679	443	10,434	3,609	9,603	476	67,903	15,536
78 #	41,345	8,146	2,426	317	10,956	2,986	11,373	541	66,100	11,990
79 #	11,673	3,548	790	166	3,076	1,071	2,018	137	17,557	4,922
80 #	10,521	88	636	4	2,308	31	623	1	14,088	124
81 #	105,669	11,238	5,117	328	20,498	3,291	13,828	587	145,112	15,444
82 #	20,038	315	1,075	11	4,410	111	1,483	6	27,006	443
83 #	7,265	56	415	7	2,369	27	691	2	10,740	92
84 #	25,916	561	1,240	35	7,173	348	8,572	324	42,901	1,268
85 #	57,113	3,875	2,785	270	16,462	2,095	13,297	861	89,657	7,101
86 #	11,529	88	593	4	4,122	66	5,231	114	21,475	272
87 #	47,786	1,735	2,393	65	14,317	1,088	14,369	1,026	78,865	3,914
88 #	38,342	1,390	2,063	76	11,145	760	3,129	0	54,679	2,226
89 #	37,854	1,277	1,991	57	10,527	688	3,688	0	54,060	2,022
90 #	30,759	854	1,634	36	7,731	461	3,136	0	43,260	1,351
91 #	50,180	1,796	2,334	33	11,194	784	9,289	0	72,997	2,613
92 *	3,267	8	258	1	1,138	4	0	0	4,663	13
93 #	38,059	2,715	1,828	139	9,620	928	6,900	225	56,407	4,007
94 #	38,059	2,715	1,828	139	9,620	928	6,900	225	56,407	4,007
95 #	2,322	5	156	0	694	0	545	0	3,717	5
96 #	7,844	287	563	10	2,500	152	1,157	26	12,064	475
97 #	10,629	562	727	21	3,314	298	1,572	50	16,242	931
98 #	9,240	413	645	16	2,921	218	1,360	37	14,166	684
99 *	3,717	53	294	15	1,217	27	402	4	5,630	99
100 *	51,185	9,533	1,327	1,152	10,749	5,174	7,712	504	70,973	16,363
101 *	5,838	1,191	507	34	1,486	411	744	223	8,575	1,859
102 *	33,923	6,932	1,614	433	7,939	3,027	3,655	343	47,131	10,735
103 *	9,817	234	575	8	3,206	145	1,126	25	14,724	412
104 *	33,706	2,462	1,472	42	7,173	522	5,775	285	48,126	3,311
105 *	4,281	743	338	24	1,500	276	113	613	6,232	1,656
106 *	23,872	916	1,251	41	6,954	394	2,861	39	34,938	1,390
107 *	46,522	3,036	2,277	74	12,714	1,051	5,368	147	66,881	4,308
108 *	23,122	824	1,276	49	6,405	309	1,647	12	32,450	1,194
109 *	44,751	2,679	2,134	93	12,809	1,055	4,213	64	63,907	3,891
110 *	34,063	1,200	1,597	36	9,653	421	3,261	37	48,574	1,694
111 *	23,222	534	1,074	24	6,619	187	2,185	17	33,100	762
112 *	13,937	225	775	20	4,168	114	1,365	12	20,245	371
113 *	19,224	441	1,049	38	5,698	223	1,883	24	27,854	726
114 *	21,818	577	1,212	32	6,439	291	2,149	31	31,618	931
115 *	31,418	6,662	1,788	359	7,937	3,232	2,417	322	43,560	10,575
116 *	63,916	5,560	3,025	275	14,658	2,188	7,408	432	89,007	8,455
117 *	5,043	360	174	10	2,395	84	3,694	223	11,306	677
118 *	16,671	911	1,026	40	5,538	451	814	4	24,049	1,406
119 *	7,595	167	492	12	2,591	83	348	1	11,026	263
120 *	4,981	47	309	2	1,680	24	933	6	7,903	79
121 *	9,343	212	552	9	3,200	143	1,313	12	14,408	376
122 *	12,694	363	715	13	3,074	206	1,668	21	18,151	603
123 *	14,994	2,983	984	118	3,454	1,277	2,600	119	22,032	4,497
124 *	63,890	12,300	3,490	604	11,290	6,767	5,493	2,231	84,163	21,902
125 *	42,076	5,808	2,490	315	13,165	2,194	3,429	20	61,160	8,337
126 *	9,207	107	548	3	3,491	79	3,195	17	16,441	206
127 *	3,127	12	245	1	1,198	9	1,075	2	5,645	24
128 *	20,204	498	1,079	11	6,717	356	7,379	93	35,379	958
129 *	8,534	651	380	12	3,240	152	2,988	78	15,142	893

3.2.6 Existing Traffic Data

As for the existing traffic data, there is traffic census data. Traffic census is carried out by the District Public Works Department(JKR), coordinated by the Highway Planning Unit(HPU). This census have been conducted since 1967. Survey stations are at expressway, national road and provincial road. Its system covers whole country.

The result in Kelang Valley Region and information are shown in as follows.

STATE : SELANGOR

TABLE B : DISTRIBUTION OF SURVEY STATIONS ACCORDING TO THEIR RESPECTIVE JKR DISTRICTS.

DISTRICT	NUMBER OF CENSUS STATIONS			
	TYPE 0	TYPE 1	TYPE 3	TOTAL
Hulu Langat	2	3	8	13
Kelang	0	5	6	11
Petaling	2	2	6	10
Gombak	1	1	2	4

STATE : WILAYAH PERSEKUTUAN

TABLE W : DISTRIBUTION OF SURVEY STATIONS ACCORDING TO THEIR RESPECTIVE JKR DISTRICTS.

DISTRICT	NUMBER OF CENSUS STATIONS			
	TYPE 0	TYPE 1	TYPE 3	TOTAL
Wilayah Persekutuan	1	3	2	6

FIGURE B : TRAFFIC CENSUS STATIONS

PERAK

SELANGOR

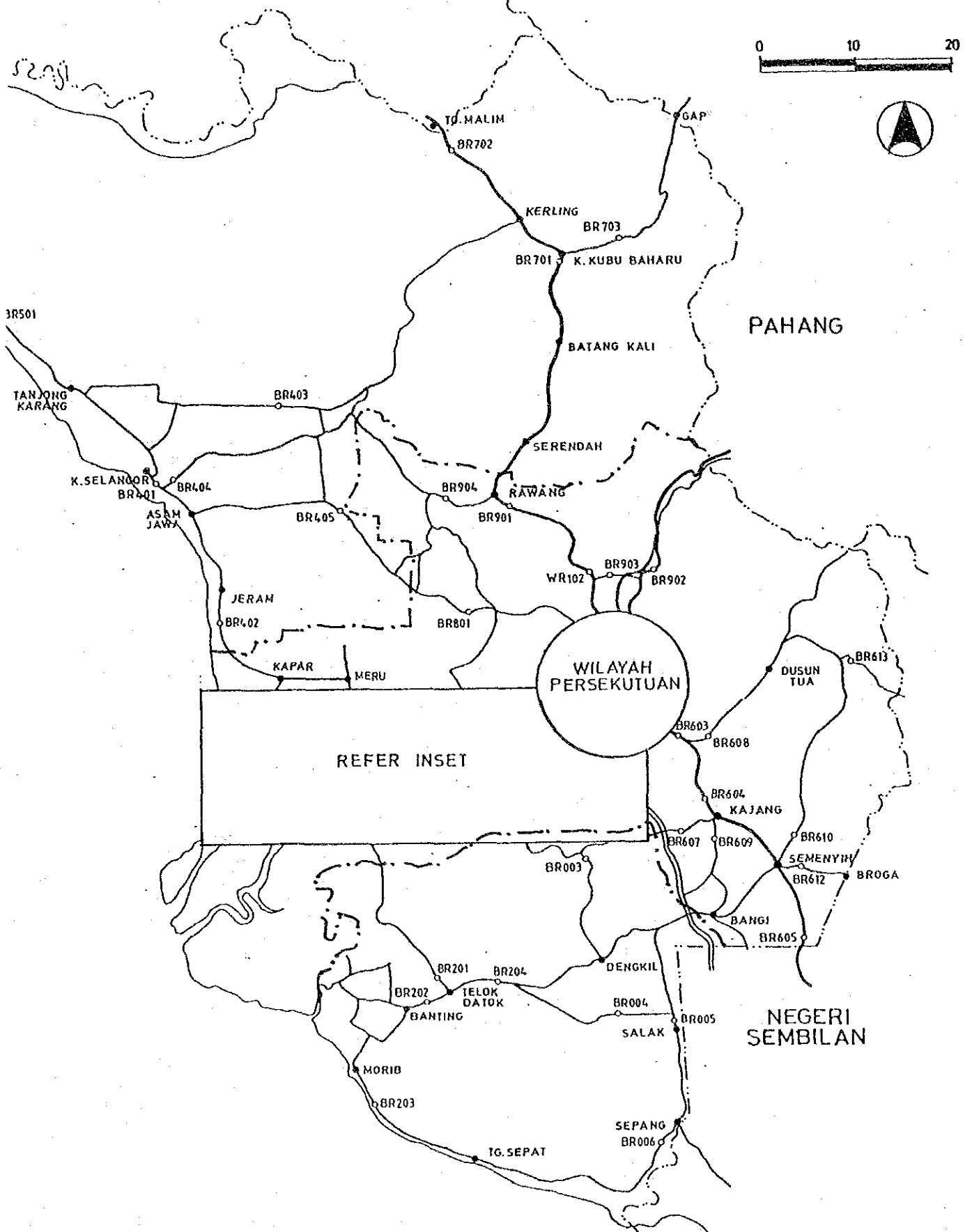
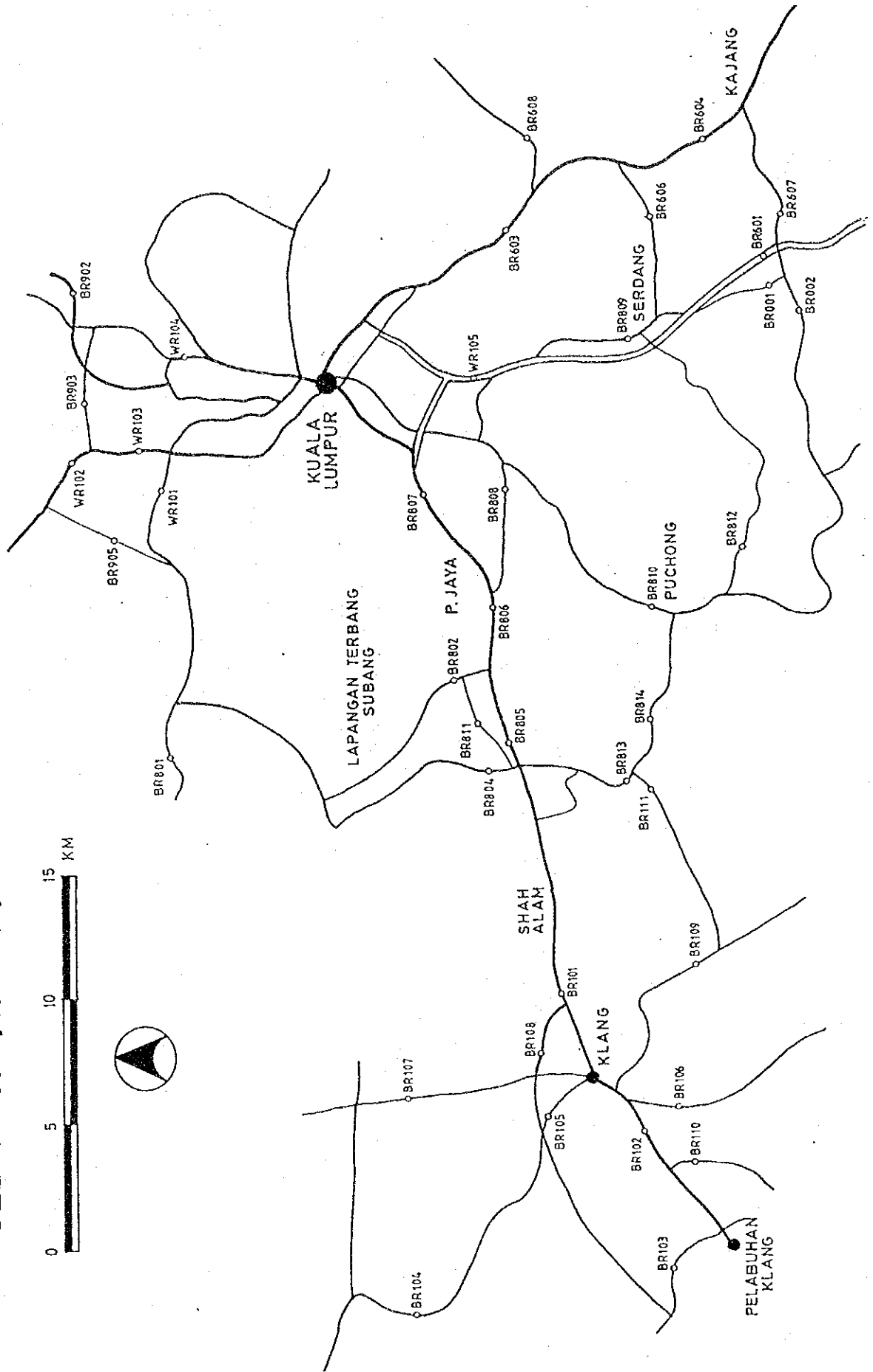


FIGURE : TRAFFIC CENSUS STATIONS

SELANGOR (INSET)



LOCATION DESCRIPTION FOR TRAFFIC CENSUS STATION

Station Number (Old)	Survey Road (New) Type	Old No.	Old Ms	Km	Description Of Locations
DISTRICT : HULU LANGAT					
OO27	BR603	0	1	8.5	13.7 Kuala Lumpur-Cheras
SE02	BR601	0	-	22.0	35.4 Kuala Lumpur-Seremban expressway
OO28	BR604	1	1	13.5	21.7 Kuala Lumpur-Kajang
OO29	BR605	1	1	26.0	41.9 Kuala Lumpur-Seremban
SE03	BR602	1	-	1.8	2.9 Selangor/N.Sembilan boundary-Kuala Lumpur along expressway
D14R	BR607	3	B11	17.0	27.4 Kuala Lumpur-Simpang Serdang-Kajang
D17R	BR609	3	B17	17.0	27.4 Kuala Lumpur-Kajang-Telok Datok
OD12	BR608	3	B52	10.0	16.1 Kuala Lumpur-Cheras-Kampong Ulu Lui
OD18	BR610	3	B19	22.0	35.4 Kuala Lumpur-Ulu Semenyih
OD19	BR612	3	B34	22.0	35.4 Kuala Lumpur-Semenyih-Broga
OD20	BR611	3	B18	21.0	33.8 Kuala Lumpur-Semenyih-Bangi (1 mile from Semenyih)
OD37	BR606	3	B50	-	- Kuala Lumpur-Balakong-Serdang
OD38	BR613	3	B32	-	- Kajang-Genting Peras-Jelebu
DISTRICT : KELANG					
OD11	BR107	1	B1	3.0	4.8 Klang-Meru
OF18	BR105	1	5	2.0	3.2 Klang-Kuala Selangor
OF19	BR106	1	5	4.0	6.4 Klang-Telok Datok
OO71	BR102	1	2	2.2	3.5 Klang-Port Klang (Jalan Watson)
OO83	BR108	1	20	0.0	0.0 300 meters fr junction Federal Highway-North Klang Straits Bypass
O71A	BR103	3	2	1.5	2.4 Jalan Pelabohan-near North Port
OD10	BR111	3	B12	18.0	29.0 Kuala Lumpur-Puchong-Kampong Batu Enam (Jalan Bukit Kuning)
OD25	BR109	3	B3	23.0	37.0 Kuala Lumpur-Kampong Batu Enam-Klang Jalan Kebun
OD26	BR110	3	B10	1.5	2.4 Langat Road-Pandamaran (Pandamaran Road)
OD32	BR104	3	5	8.0	12.9 Klang-Kuala Selangor
OO72	BR101	3	2	18.5	29.8 Kuala Lumpur-Klang
OO73	BR805	0	2	12.2	19.6 Kuala Lumpur-Klang (opposite Batu Tiga police station)
DISTRICT : PETALING					
OO74	BR807	0	2	5.0	8.1 Kuala Lumpur-Petaling Jaya (Federal H'way-180m. east of EPF blg)
O73A	BR802	1	15	11.0	17.7 Kuala Lumpur-Subang Airport
O74A	BR806	1	2	7.5	12.1 Kuala Lumpur-Klang
D28R	BR809	3	B13	10.0	16.1 Kuala Lumpur-Sungai Besi (Sungai Besi Road)
OD05	BR801	3	54	14.0	22.5 Kuala Lumpur-Kuala Selangor
OD07	BR808	3	B14	6.0	9.7 Kuala Lumpur-Klang (6th mile old Klang Road)
OD08	BR810	3	B11	12.0	19.3 Puchong-Petaling
OD09	BR803	3	B7	20.5	33.0 Kuala Lumpur-Batu Tiga-Puchong
OD27	BR804	3	B9	1.0	1.6 Batu Tiga-Damansara Road
D27A	BR811	3	-	-	- Jalan Bt. 3 (Sebelah Balai Polis Bt. 3)
D08A	BR812	3	B16	14.0	22.5 Kuala Lumpur-Puchong (km 12 ke Sri Kembangan/km 4 ke Puchong)
D09R	BR813	3	B7	-	- km 9.5 Kuala Lumpur-Puchong-Shah Alam
D10A	BR814	3	B7	-	- km 11.0 Kuala Lumpur-Puchong-Shah Alam
DISTRICT : GOMBAK					
O76A	BR902	0	2	9.1	14.7 Kuala Lumpur-Karak Highway
OO24	BR901	1	1	16.0	25.8 Kuala Lumpur-Rawang-Tanjong Malim
D06R	BR903	3	B22	8.0	12.9 Jalan Silang Batu Caves
OD29	BR904	3	B27	23.0	37.0 Kuala Lumpur-Rawang-Rantau Panjang (K.Selangor-Rawang Road)
D05A	BR905	3	-	-	- Dihadapan Rumah FRIM (Persimpangan Selayang/Kepong)

**16-HOUR TRAFFIC COMPOSITION BY VEHICLE TYPE
OCTOBER 1990**

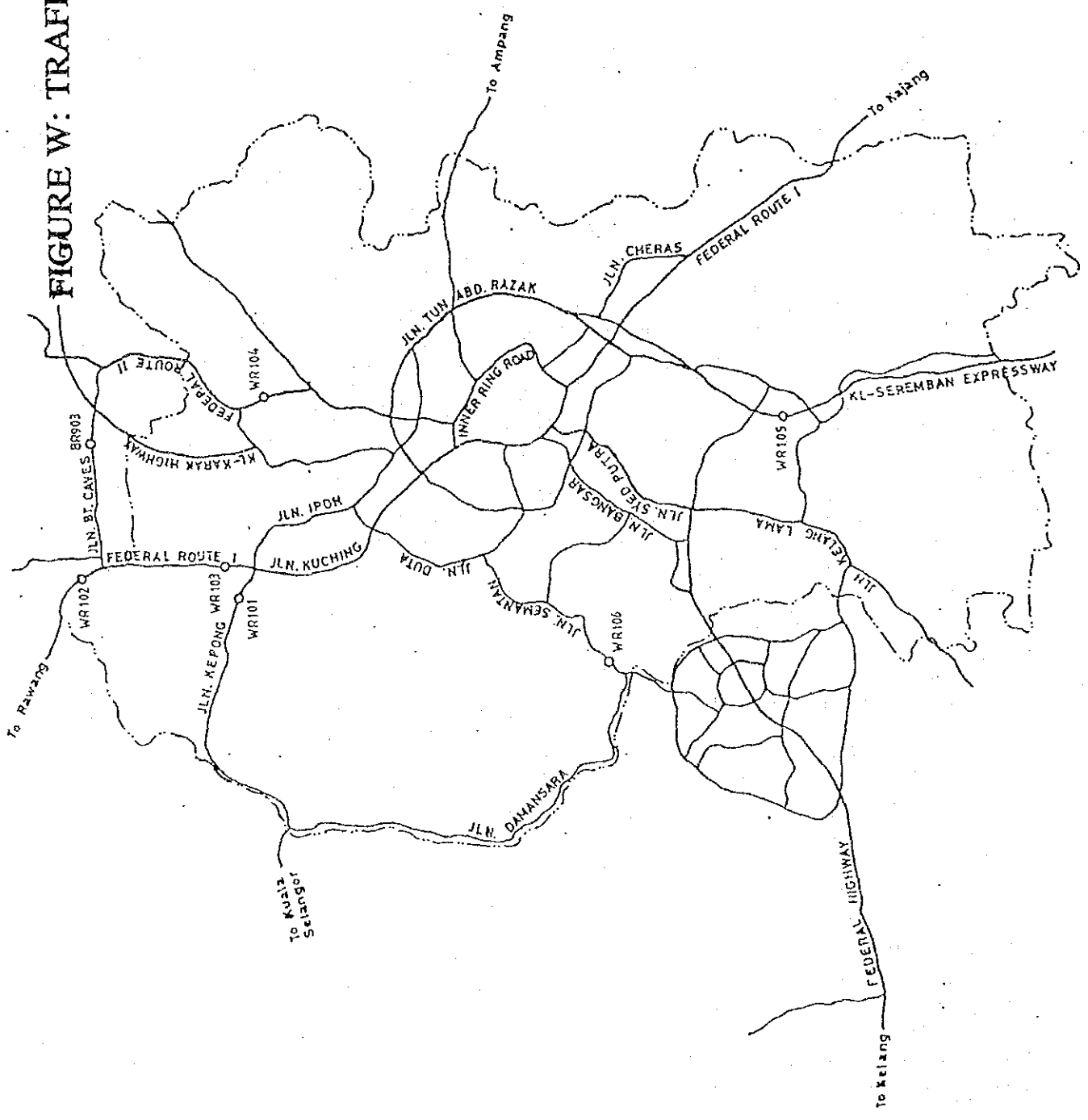
Station Number		16-Hours Traffic	Peak Hr Traffic (Period)	Percentage Vehicle Composition						
(Old)	(New)				Cars & Taxis	S.Vans & Utilities	Medium Lorries	Heavy Lorries	Buses	M'cycles	Heavy Vehicles
DISTRICT : HULU LANGAT											
OO27	(BR603)	54216	4850	(700 - 800)	52.1	14.1	8.3	1.9	1.7	21.9	11.9
SE02	(BR601)	43147	3987	(1800 - 1900)	61.6	9.5	9.3	4.1	2.1	13.4	15.5
OO28	(BR604)	33337	2933	(1700 - 1800)	57.1	10.6	7.0	1.0	2.4	21.9	10.4
OO29	(BR605)	7450	662	(1700 - 1800)	47.7	10.7	10.0	2.9	3.3	25.4	16.2
SE03	(BR602)	27353	3869	(1800 - 1900)	57.3	10.6	10.3	6.0	2.8	12.9	19.1
D14R	(BR607)	22167	2487	(700 - 800)	53.8	10.5	8.2	2.1	1.0	24.5	11.3
D17R	(BR609)	14362	1213	(1800 - 1900)	45.1	9.3	5.7	0.9	3.1	35.9	9.7
OD12	(BR608)	15010	1138	(700 - 800)	37.9	18.7	11.4	0.5	2.6	29.0	14.5
OD18	(BR610)	4760	479	(700 - 800)	30.8	10.6	14.6	1.2	1.9	40.9	17.7
OD19	(BR612)	3200	297	(1000 - 1100)	30.1	9.6	20.5	2.3	2.2	35.3	25.0
OD20	(BR611)	3025	315	(1400 - 1500)	32.0	12.7	7.6	5.0	4.3	38.4	16.9
OD37	(BR606)	21007	2407	(1200 - 1300)	49.6	14.7	8.2	2.1	1.3	24.1	11.6
OD38	(BR613)	134	24	(700 - 800)	20.9	11.2	1.5	2.2	1.5	62.7	5.2
DISTRICT : KELANG											
OD11	(BR107)	19468	2402	(700 - 800)	41.2	8.2	8.7	1.9	1.5	38.5	12.1
OF18	(BR105)	28030	3145	(1700 - 1800)	47.4	8.6	10.3	2.2	2.2	29.3	14.7
OF19	(BR106)	12320	1189	(1700 - 1800)	47.9	11.0	9.9	2.9	2.5	25.8	15.3
OO71	(BR102)	30783	2495	(1800 - 1900)	52.5	9.7	6.4	0.4	3.3	27.7	10.1
OO83	(BR108)	20346	2096	(1200 - 1300)	39.0	7.6	8.7	16.2	0.3	28.1	25.2
O71A	(BR103)	28978	3772	(700 - 800)	34.4	7.6	9.3	7.5	1.5	39.7	18.3
OD10	(BR111)	15272	1876	(700 - 800)	42.1	11.9	14.3	3.1	1.4	27.3	18.8
OD25	(BR109)	11564	1202	(700 - 800)	43.4	11.6	8.2	2.1	2.3	32.3	12.6
OD26	(BR110)	10773	1024	(800 - 900)	37.1	8.6	10.3	6.2	1.5	36.4	18.0
OD32	(BR104)	12377	1606	(700 - 800)	39.7	10.4	10.8	5.6	3.1	30.5	19.5
OO72	(BR101)	52833	7061	(1200 - 1300)	64.4	11.7	3.9	2.0	1.9	16.1	7.8
DISTRICT : PETALING											
OO73	(BR805)	108233	10894	(700 - 800)	60.5	9.5	7.1	3.3	1.6	18.0	12.0
OO74	(BR807)	294597	26012	(1700 - 1800)	78.2	5.2	3.0	1.0	1.5	11.0	5.5
O73A	(BR802)	41681	3432	(700 - 800)	71.5	11.6	3.5	0.5	1.1	11.8	5.1
O74A	(BR806)	180843	16591	(700 - 800)	68.7	9.6	4.3	1.5	1.6	14.3	7.4
D28R	(BR809)	19696	2085	(1700 - 1800)	40.0	14.2	17.9	1.2	2.2	24.4	21.3
OD05	(BR801)	22373	2576	(700 - 800)	39.5	13.2	10.1	1.4	1.7	34.1	13.2
OD07	(BR808)	96663	9523	(700 - 800)	62.1	10.5	6.0	0.4	2.1	18.8	8.5
OD08	(BR810)	10781	1380	(700 - 800)	32.1	11.2	24.9	2.1	2.8	26.9	29.8
OD09	(BR803)	8321	1002	(1700 - 1800)	50.2	9.9	8.4	2.3	2.4	26.7	13.1
OD27	(BR804)	6712	708	(700 - 800)	38.5	14.0	12.5	7.1	1.4	26.5	21.0
D27A	(BR811)	10256	1808	(1700 - 1800)	75.3	8.3	2.7	1.2	0.2	12.4	4.1
D08A	(BR812)	6513	771	(700 - 800)	31.3	12.6	37.1	4.4	0.6	14.0	42.1
D09R	(BR813)	16698	1398	(700 - 800)	30.5	15.7	26.0	6.0	1.6	20.2	33.6
D10A	(BR814)	13612	1242	(1500 - 1600)	35.3	13.5	24.1	7.3	1.6	18.3	33.0
D10A	(BR814)	11053	1227	(0700 - 0800)	44.9	12.8	16.0	3.1	2.0	21.3	21.1
D08A	(BR812)	4450	449	(1700 - 1800)	34.2	14.8	20.6	4.6	0.4	25.4	25.6
D27A	(BR811)	12785	4684	(0700 - 0800)	77.7	7.7	2.5	1.2	0.5	10.4	4.2
DISTRICT : GOMBAK											
O76A	(BR902)	14666	1327	(1500 - 1600)	59.2	13.8	9.4	8.3	4.0	5.4	21.7
OO24	(BR901)	26008	2169	(1700 - 1800)	47.6	15.3	13.5	7.2	3.3	13.0	24.0
D06R	(BR903)	37122	3108	(800 - 900)	46.2	13.3	15.6	5.1	1.8	18.1	22.5
OD29	(BR904)	2946	288	(700 - 800)	31.3	11.6	23.8	5.0	2.1	26.2	30.9
D05A	(BR905)	21106	2365	(700 - 800)	51.2	13.7	12.9	1.8	0.4	20.0	15.1

ANNUAL GROWTH RATE AND TRAFFIC VOLUME 1981-1990
16-HOUR TRAFFIC VOLUME BOTH DIRECTIONS

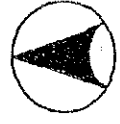
Station Number (Old)	Station Number (New)	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Normal Growth (%/Yr)	Correlati
DISTRICT : HULU LANGAT													
OO27	(BR603)	23711	24939	27982	29999	34741	33178	38758	42358	44923	53077	8.97	0.99
SE02	(BR601)	22026	23261	22576	24227	23764	30929	31366	33384	40074	44487	8.28	0.95
OO28	(BR604)	19565	20310	22378	23335	23973	24669	26538	31554	32009	31952	6.08	0.98
OO29	(BR605)	4937	5760	6141	6944	6666	6571	7215	7895	7438	7421	4.22	0.89
SE03	(BR602)	16245	16211	15995	16685	18832	17913	17007	20664	23766	26255	5.15	0.88
D14R	(BR607)	-	-	-	10255	12857	17107	22140	18472	21081	24835	14.21	0.91
D17R	(BR609)	-	-	-	7484	9405	11123	9993	11309	12623	13619	8.95	0.93
OD12	(BR608)	4273	4504	6091	6343	7739	8494	8097	7939	7266	14007	10.31	0.88
OD18	(BR610)	2253	2369	3350	4297	3440	3668	4869	4942	5269	4632	9.16	0.88
OD19	(BR612)	2589	1399	2679	2543	2179	2691	3802	3331	2405	2764	4.26	0.48
OD20	(BR611)	5395	2785	1749	2363	1984	3302	3075	3120	2559	2884	*	*
OD37	(BR606)	-	-	-	6013	9091	6893	8439	10560	15242	19324	19.39	0.92
OD38	(BR613)	-	-	-	-	387	357	450	174	185	164	*	*
DISTRICT : KELANG													
OD11	(BR107)	9859	10294	10528	10888	11256	13491	13802	16818	18279	19153	8.35	0.97
OF18	(BR105)	29725	25046	25023	22340	19053	18383	18441	20476	21633	25550	*	*
OF19	(BR106)	21874	22938	25592	25353	10573	11099	11247	12934	14422	12962	*	*
OO71	(BR102)	48567	59395	41871	48556	40682	31627	32826	29173	25253	34206	*	*
OO83	(BR108)	-	-	-	10788	10852	11205	14003	15495	19454	19811	12.57	0.97
O71A	(BR103)	15182	13072	14010	22597	14136	17696	17151	13415	15179	27354	3.41	0.42
OD10	(BR111)	2374	3031	2416	4114	6838	6786	6917	8660	8834	14760	21.31	0.96
OD25	(BR109)	5229	5515	5797	6002	9906	7492	6970	7736	8900	11239	7.45	0.84
OD26	(BR110)	10502	13056	11230	18667	14897	6532	7492	10257	10159	11834	*	*
OD32	(BR104)	7889	6933	7317	8524	8794	9565	9549	10520	11946	12949	6.58	0.95
OO72	(BR101)	49057	48359	46622	55012	49979	36593	29854	42445	33300	52586	*	*
DISTRICT : PETALING													
OO73	(BR805)	57319	60122	63528	76492	82950	74628	83352	101451	92415	108233	7.04	0.95
OO74	(BR807)	223914	212363	218988	255930	216959	225165	251454	241571	223613	275573	1.65	0.58
O73A	(BR802)	20157	22479	27641	30930	34695	34537	37171	34318	25317	39372	5.28	0.69
O74A	(BR806)	78785	81779	98400	206781	134370	156410	139648	132650	195049	193132	9.27	0.76
D28R	(BR809)	-	-	-	15383	13383	14118	16927	16112	17985	20135	5.62	0.84
OD05	(BR801)	9229	9934	10892	10620	11909	14023	13419	20940	18822	19083	9.61	0.94
OD07	(BR808)	51555	48782	56403	70531	62265	64451	57124	54428	63950	81413	3.22	0.63
OD08	(BR810)	7733	7511	5310	5572	7237	7341	6222	8687	11192	11494	5.71	0.65
OD09	(BR803)	3238	3960	4867	6008	6915	6081	6130	6546	6682	7741	8.15	0.87
OD27	(BR804)	4338	4637	4603	4301	4843	4573	10112	6516	7014	6712	6.94	0.72
D27A	(BR811)	-	-	-	-	-	-	-	-	12785	11100	-	-
D08A	(BR812)	-	-	-	-	-	-	-	-	4675	6618	-	-
D09R	(BR813)	-	-	-	-	-	-	-	-	14629	15533	-	-
D10A	(BR814)	-	-	-	-	-	-	-	-	11714	13612	-	-
DISTRICT : GOMBAK													
O76A	(BR902)	7074	7675	8810	9424	9511	10428	10428	12194	12234	14263	7.28	0.98
OO24	(BR901)	15279	11571	14490	15404	21502	28927	22030	19943	19570	24573	6.84	0.72
D06R	(BR903)	-	-	-	23411	17273	25373	33018	32920	34162	36435	11.12	0.84
OD29	(BR904)	2278	2081	2590	4471	2772	2043	2746	2344	2335	2814	0.27	0.04
D05A	(BR905)	-	-	-	-	-	-	-	-	11294	21106	-	-

Note: * The trend of growth cannot be satisfactorily ascertained. Examination of detail data is necessary.

FIGURE W: TRAFFIC CENSUS STATIONS



WILAYAH
PERSEKUTUAN



LOCATION DESCRIPTION FOR TRAFFIC CENSUS STATION

Station Number (Old)	Survey Road (New)	Road Type	Old No.	Km Ms	Description Of Locations
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DISTRICT : WILAYAH PERSEKUTUAN

OO25	WR102	0	1	7.5	12.1	Kuala Lumpur-Ipoh
OF17	WR101	1	54	5.5	8.9	Kuala Lumpur-Kuala Selangor (Jalan Kepong)
OO26	WR103	1	1	5.0	8.1	Kuala Lumpur-Ipoh
SE1R	WR105	1	-	5.0	8.1	Kuala Lumpur-Seremban Expressway
OD35	WR106	3	-	5.0	8.1	Kuala Lumpur-Petaling Jaya (Old Damansara road)
OO75	WR104	3	68	3.8	6.1	Kuala Lumpur-Bentong (after town council boundary at J. Gombak)

16-HOUR TRAFFIC COMPOSITION BY VEHICLE TYPE OCTOBER 1990

Station Number (Old)	Survey Road (New)	16-Hours Traffic	Peak Hr Traffic (Period)	Percentage Vehicle Composition						
					Cars & Taxis	S.Vans & Utilities	Medium Lorries	Heavy Lorries	Buses	M'cycles	Heavy Vehicles
DISTRICT : WILAYAH PERSEKUTUAN											
OO25	(WR102)	74367	6237	(700 - 800)	56.0	9.8	9.2	2.3	2.2	20.5	13.7
OF17	(WR101)	80988	6139	(1700 - 1800)	57.4	8.8	7.9	0.7	2.9	22.3	11.5
OO26	(WR103)	96361	10123	(700 - 800)	53.8	10.9	8.8	2.7	2.4	21.5	13.9
SE1R	(WR105)	75814	6538	(700 - 800)	65.6	7.5	8.4	2.1	1.2	15.2	11.7
OD35	(WR106)	89514	10135	(1600 - 1700)	77.4	5.4	1.8	0.1	0.7	14.6	2.6
OO75	(WR104)	51718	3890	(1700 - 1800)	55.4	7.4	4.2	0.5	3.4	29.2	8.1

ANNUAL GROWTH RATE AND TRAFFIC VOLUME 1981-1990 16-HOUR TRAFFIC VOLUME BOTH DIRECTIONS

Station Number (Old)	Survey Road (New)	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Normal Growth (%/Yr)	Correlation
DISTRICT : WILAYAH PERSEKUTUAN													
OO25	(WR102)	28082	34861	40444	51616	49239	53422	53982	58155	58403	73084	9.02	0.94
OF17	(WR101)	54255	67663	71371	68364	65647	69761	69738	76649	75374	81434	3.01	0.82
OO26	(WR103)	43109	50472	60645	64738	66338	77738	81093	88779	79760	92810	8.10	0.95
SE1R	(WR105)	-	-	-	43723	49199	56016	52719	60663	66731	74489	8.51	0.97
OD35	(WR106)	40904	44026	49880	53505	75807	68519	66215	64935	41987	71334	4.04	0.51
OO75	(WR104)	33451	34923	38758	47354	42964	41810	41260	45756	47502	52436	4.07	0.86

NOTES TO USERS

1. Biannual traffic censuses have been conducted since 1967. These censuses are usually carried out on normal days (public holidays and school vacations are avoided) in the months of March/April and October by the respective District Public Works Department (JKR) staff, coordinated by the Highway Planning Unit (HPU). The census duration varies according to the census type as follows:-

Type 0 :	7-day, 24-hour manual counting.
Type 1 :	7-day, 16-hour (0600 - 2200 hr) manual counting.
Type 3 :	1-day, 16-hour (0600 - 2200 hr) manual count.

Directional counts are carried out in every census.

For classified counts, the vehicles are grouped as follows:-

Class 1 :	Motorcars and taxis
Class 2 :	Small vans and utility vehicles (2-axle light vehicles)
Class 3 :	Medium weight lorries and large vans (2-axle heavy vehicles)
Class 4 :	Heavy lorries (3-axle or more, including miscellaneous construction vehicles)
Class 5 :	Buses
Class 6 :	Motorcycles and scooters

"HEAVY VEHICLES" as a group includes vehicles in classes 3, 4 and 5.

2. All censuses are carried out manually and recorded hourly on site on Form JKRP 10 (see Appendix A). The results are summarised on Form (BPJ)JKR 335 (see Appendix B) and returned to HPU for processing.
3. The following are the basis and assumptions used for the capacity analysis:-
 - (i) The analysis of capacity is based on Highway Capacity Manual (Special Report 209, 1985) for single 2-lane and dual multi-lane carriageway. The **"Computed Road Capacity"** is the service flow rate at Level Of Service E.
 - (ii) For single 2-lane highway, the computation is based on general terrain segment with the following assumptions:-

(a)	Directional split	=	55/45
(b)	Percentage of "No Passing Zone":		
	Level Terrain	=	Independent
	Rolling Terrain	=	20 %
	Mountainous Terrain	=	40 %

Exceptions :

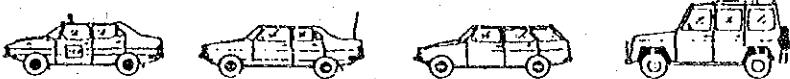
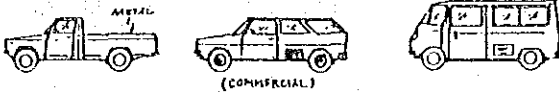


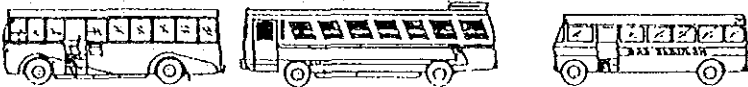
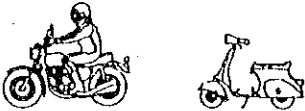
Kuala Lumpur-Karak Highway	=	60 %
East-West Highway	=	60 %
Tapah - Cameron Highlands	=	80 %

- (c) Peak Hour Factor (PHF) - The default values in Tables 8-3 of the Highway Capacity Manual are adopted.
- (d) The heavy vehicle adjustment factor F_{HV} has been amended by omitting the recreational vehicle element and including a motorcycle element. The equivalent passenger car unit for motorcycles published by the Transport And Road Research Laboratory, United Kingdom, is adopted, i.e. 1.0 on rural and 0.75 on urban roads.
- (iii) For multi-lane highway capacity computation, the following modifications are made:-
- (a) The adjustment factor for highway type and environment (F_E) which mainly allows for rural and suburban conditions is omitted since the road of interest will be rural.
- (b) The driver population factor (F_P) which differentiates between regular and non-regular users is omitted and the driver population is considered to fall into regular user category.
- (c) The heavy vehicle adjustment factor (F_{HV}) is as (ii)(e) above.
- (iv) The traffic growth rate is based on the calculation of compound "normal" traffic growth in terms of percentage growth of total traffic per year by the Method Of Least Square Regression Analysis of traffic flow data of immediate past ten years (1981 - 1990). Extrapolation based on this rate is used for the Capacity Year computation. (Capacity Year means the year at which the forecast traffic volume equals the computed road capacity). Users are advised to use these computed growth rates with caution.

4. In the **"SUMMARY OF ANALYSIS"**:-

- (i) the information listed under **"Improvement Undertaken"** and **"Remarks"** are based on the March 1991 Quarterly Progress Report published by JKR.
- (ii) **V/C** is the ratio of **Current Flow Rate** to the **Computed Road Capacity** at Level Of Service E.
- (iii) the **"Average Width"** in "foot" and **"Distance"** in "milestone" are based on 1974 Road Inventory undertaken by KAMPSAX and updated by JKR.
- (iv) the unit for the **"Current Flow Rate"** and **"Computed Road Capacity"** is in "vehicles per hour" (veh/hr).
- (v) the **"Current Flow Rate"** is derived from the October 1990 traffic census data.

VEHICLE CLASSIFICATION

<p>Motor cars & Taxis</p>	
<p style="text-align: center;">1</p>	
<p>Small Vans & Utilities (Light 2-axes)</p>	
<p style="text-align: center;">2</p>	
<p>Lorries & Large Vans (Heavy 2-axes)</p>	
<p style="text-align: center;">3</p>	
<p>Lorries with 3 axes (Heavy 3-axes & above)</p>	
<p style="text-align: center;">4</p>	
<p>Buses</p>	
<p style="text-align: center;">5</p>	
<p>Motorcycles & Scooters</p>	
<p style="text-align: center;">6</p>	