

THE EFFECT OF BUS LANE ON TRAVEL TIME OF OTHER MODES USING FLOATING CAR METHOD

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Abstract : This paper highlights the application of travel time and delay study to gain the performance of before and after studies in the evaluation of traffic operation improvements that reduce travel time. Floating Car technique was applied to determine the travel time and stop time along the selected sections where bus lane scheme was implemented favourably. A site survey was conducted along Jalan Parlimen – Jalan Tun Perak for two consecutive days during the morning peak hours from 7 am to 9 am and evening peak hours from 5 pm to 7 pm. From the results of before and after implementation of bus lane travel time during morning peak, the mean travel time for before executing bus lane was 17.8 min and the mean travel time for after implementing bus lane was increased by 24.6 min. The corresponding travel times for six runs after implementing bus lane during evening peak was greater and the mean travel time had indicated a significant difference that was 19.7 min.

Key Words : Travel Time, Travel Time Study, Floating Car Method, Bus Lane, Urban Traffic Corrective Measure

1. INTRODUCTION

Traffic congestion is a common phenomenon experience nowadays in most developing cities. It accrues mainly due to the increase in travel made by personal vehicles while road space does not extend accordingly. In short, the term '*supply does not equate with demand*' can illustrate distinctly the above issue. This is due to road building has not been able to keep up with the rapid growth of vehicular traffic. Furthermore, changes in land-use pattern and activities in Kuala Lumpur have encouraged a less centrally-oriented model of travel that directly decreased the demand for public transport. Thus, this situation deteriorates the quality of bus operation and services.

Public transport such as conventional stage bus may be considered as a mode that utilizes road space efficiently as it can carry more passengers per roadway space compared to cars. In addition, innovative and sustainable facilities that cater for bus priority such as bus lane, bus way or bus actuated signal system are principally to improve bus services in terms of reliability, frequency, convenience, comfort and safety. Motorcyclists and pedestrian are most at risk in terms of casualties per passenger km but this marks that journey by cycling or foot is much shorter than be mechanized transport. However, whether measured by km or per passenger trip, travel by bus is much safer than by private car. This reflects the high standards of safety expected for public transport operators, and compelling reason for encouraging the use of public transport (Gerber & Hoel, 1994). One approach to promote the shift of mode from cars to buses is by giving priority to buses over other vehicles such as allocating special

facilities and by exempting buses from general traffic restriction which are detrimental to bus operation. Generally, the creation of special public transport lane is primarily aimed at improving the services provided to users while local bus lanes are particularly to solve localized problems where buses are usually allowed to pass bottlenecks in the road network. In the vicinity of Kuala Lumpur, bus lane is used solely by bus and taxi. With such advantages it is hoped to attract more commuters to use them during working days especially during peak hours and even weekends for recreational and shopping purposes; hence assist in minimizing traffic delay as well as reducing traffic congestion within Kuala Lumpur. It is expected that the bus journey time will be shortened at the consumption of the other types of vehicle in the available lanes.

2. STUDY APPROACH

The study was done purposely to examine on the performance of after the implementation of the exclusive bus lane in 1997. The study on the proposed exclusive bus lane was initiated in May 1995 and this was followed by another study with a particular view on the effect of bus lane on travel time of other modes being carried out in May 2000. A visual observation and an initial site inspection was first performed so as to experience the traffic conditions along Jalan Parlimen – Jalan Tun Perak. This route with the highest population in Malaysia of 1,350,792 (*Population Distribution by Local Authorities Areas and Mukims, 2002*) is located in the typical urbanized area and furnished completely with the common public facilities like shop houses, parking lots, bank, hotels, offices, petrol stations, bus stops, exhibition center, public transportation system, cinemas and shopping complexes. Jalan Parlimen – Jalan Tun Perak is composed of Jalan Parlimen – Jalan Dang Wangi, Jalan Sultan Ismail – Jalan Putra, Jalan Putra – Jalan Ipoh., Jalan Ipoh – Jalan Tuanku Abdul Rahman, Jalan Sultan Ismail – Jalan Dang Wangi and Jalan Dang Wangi – Jalan Tun Perak.

The travel times were characterized by recording the average linking travel times for both Northbound and Southbound areas during peak periods. Travel time can be defined as the time required to travel the entire street segment at a single pass, with the accumulated time in seconds recorded at the end of each direction of preferred streets. The travel time study is useful in the evaluation of traffic movement and amount of time to travel within an area or along selected routes. It reflects the travel conditions during the peak hours where traffic movements are the heaviest and also the delay studies which give good indication of level of service and identify problem locations that require special attention for further improvements of the overall traffic flow along the route. Travel times are usually done in reasonable good weather.

The information relating to selected streets and the existing exclusive bus lane were collected from the present street inventory which were available at the Kuala Lumpur City Hall (KLCH) and the Road Transport Department (RTD). Buses were noted to be the main traffic using all lanes including the segregated bus lane along Jalan Putra – Jalan Ipoh. Even though Jalan Ipoh – Jalan Tuanku Abdul Rahman had been widened, this route section had severely contributed into a mixed traffic problem and a weaving manoeuvre onto Jalan Chow Kit that eventually resulted in significant traffic congestion.

The study technique undertaken for conducting the travel time and delay studies is the Floating Car technique which requires a test vehicle to traverse along the test route section that allows the car to “float” along with the traffic. As the driver of the test vehicle “floats”

along the section, time is recorded and then the average time is computed as the test is repeated at six runs. A common field sheet is used to record the data as the test vehicle drive past the beginning point where time readings are taken at the predetermined control points to indicate the passing of these points. Total time is then recorded at the end of the route section. It was accomplished for two consecutive days during peak period. The measurement of travel times should avoid the Public Holidays and School Holidays in order to reflect the actual traffic trend. Two time periods were used for analyses reasons. The field work was performed from 7 am to 9 am for morning peak hours while the evening peak hours was conducted from 5 pm to 7 pm. These periods were chosen due to the extremely congested faced by this route especially at Jalan Tuanku Abdul Rahman-Jalan Tun Perak as shown in Appendices 7 and 8. Unfortunately, some traffic were found to be misusing the exclusive bus lane as clearly illustrated in Appendices 5 and 6. Delayed time was not specifically identified by cause, and hence, the overall route travel time included driving time plus stop and delay time. To ensure consistency in the results, all steps taken during the previous study were also being employed in the after implementation of bus lane study.

2.1 Features and Advantages of Bus Lane

As shown in Figure 1, the bus lane is indicated by a continuous yellow line or broken line marked with "BAS/TEKSI SAHAJA" meant for buses and taxis only. The broken yellow line allows buses and taxis to leave or enter the bus lane or other traffic to cross the bus lane. The continuous yellow line is mandatory for buses and taxis to keep in the bus lane which other vehicles are not allowed to enter. Operation period for bus lane daily is between six in the morning to eight in the evening except on Sundays and Public Holidays. The feasibility of the bus lane scheme should conform to the criteria as listed in Table 1.

The bus lane will definitely improve passengers comfort and reduce risks of accidents and conflicts with the general traffic. According to (D Che Mat Nawi, 2000), the bus lane generally contributed in time saving of the bus operation and service about 30%. This obviously does increase the commercial speeds and number of runs with smoother driving and yet save the consumption of fuel. In fact, sufficiently bold overall policy of giving priority to public transport encourage driver to transfer from private vehicles to public transport is the only real way of energy- environment saving.

Table 1. Criteria for Implementation of Bus Lane

- Should benefit to the community and have a reasonable cost benefit ratio
- Drivers must have good understanding of the bus lane scheme
- Must be reasonably easy to enforce
- Should not increase accident potential
- Should minimize any detriment of the environment
- Should minimize adverse affect on pedestrians and frontages (including loading to shops and other premises) on the adjacent environment
- Should where possible, assist the flow of other traffic
- Should not subject to undue delay in implementation
- Should have an economic life
- Should give a significant advantage on a bus
- Should not seriously reduce traffic capacity or cause secondary congestion by developing excessive queues

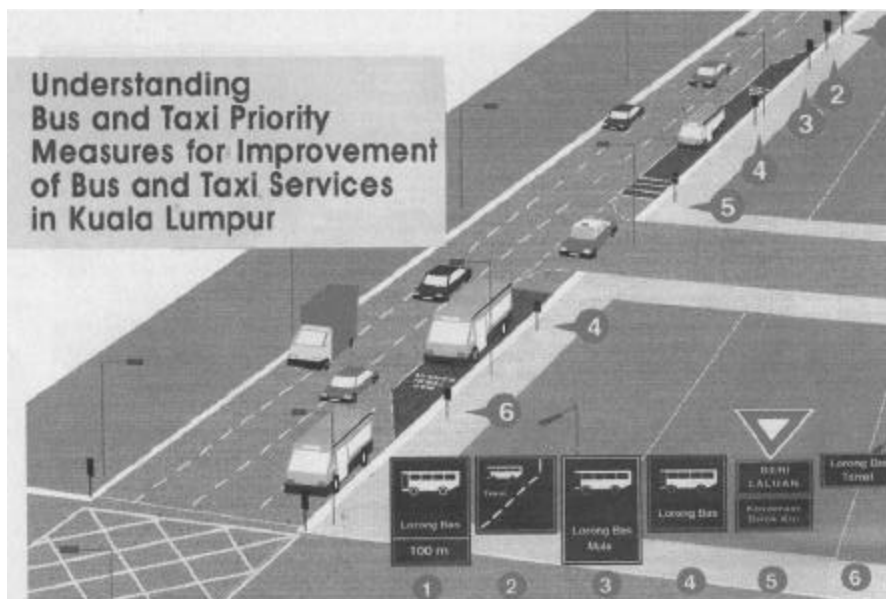


Figure 1. Bus and Taxi Priority Measures

3.OUTCOME OF STUDY

The travel time results for the previous research (before the implementation of the special bus lane) are indicated in Appendices 1 and 2 while the study after the implementation of the exclusive bus lane results are depicted distinctly in Appendices 3 and 4. Figure 2 illustrates the location of the exclusive bus lane in the city center of Kuala Lumpur.

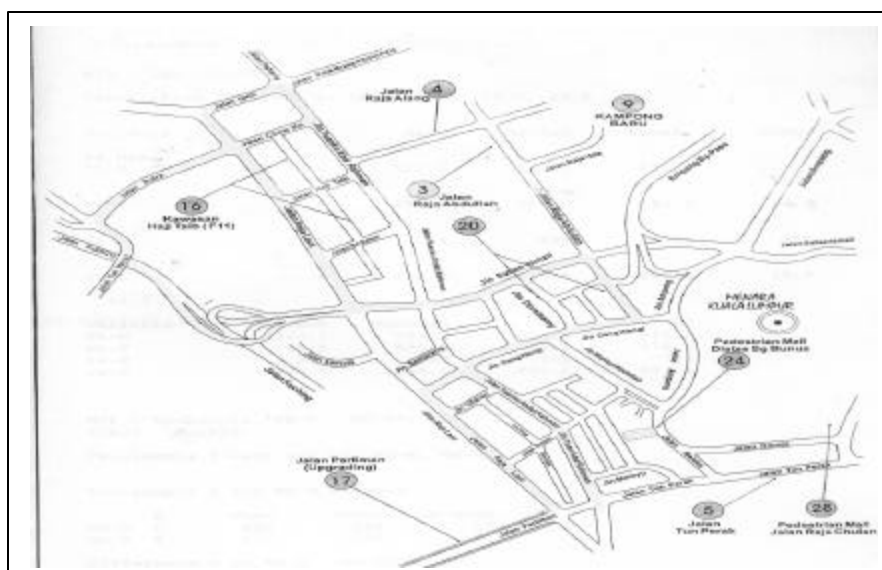


Figure 2. Location of Exclusive Bus Lane

The survey results were compared with the results of the earlier study. The mean travel time for before executing bus lane during morning peak hours was 17.8 min and after the usage of bus lane this value was increased to 24.6 min (refer to Table 2). The distance from Jalan Parlimen to Jalan Tun Perak is 9 km and this route section was meant for first, second and third runs. Fourth, fifth and sixth runs also took place at Jalan Parlimen - Jalan Tun Perak but the total length was 11 km. From Table 3, the performance of before and after study during evening peak hours resulted in satisfactory level where 19.7 min was a significant difference for the mean travel time. It was mainly as a result of monitoring the prevailing traffic by the traffic police and an immediate increased in road capacity (Appendices 7 and 8).

Table 2. Travel Time for Morning Peak Hours

Run No.	1	2	3	4	5	6	Total	Mean
Before Implementation (1995) (minutes)	10.5	12.92	14.35	35.7	16.4	16.75	106.62	17.70
After Implementation (2002) (minutes)	14.31	21.63	23.8	33.45	29.15	25.27	147.61	24.60
Mean Travel Time								+6.9

Table 3. Travel Time for Evening Peak Hours

Run No.	1	2	3	4	5	6	Total	Mean
Before Implementation (1995) (minutes)	14.25	11.83	13.67	14.72	28.2	22.78	105.45	17.58
After Implementation (2002) (minutes)	34.83	36.58	37.52	49.65	36.15	28.87	223.6	37.27
Mean Travel Time								+19.68

Before introducing the bus lane, the corresponding travel times for six runs were only in the range of 10 to 30 min (Table 3). These six runs were also held along Jalan Parlimen - Jalan Tun Perak with first, second and third runs covered the distance of 9 km whereas the next three runs done at the length of 11 km. Figures 3 and 4 show the car traveling time of Before and After Study for both peak hours.

For statistical analysis, appropriate statistical software, Minitab with the application of normal distribution method was used. The before and after studies analyses are designed to assess the effectiveness of any suggestive traffic improvements in the related areas.

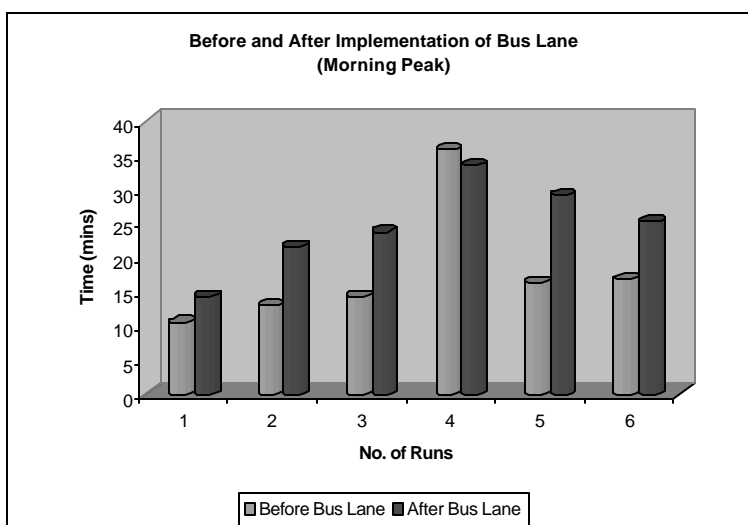


Figure 3. Before and After Study of Car Traveling Time (Morning Peak)

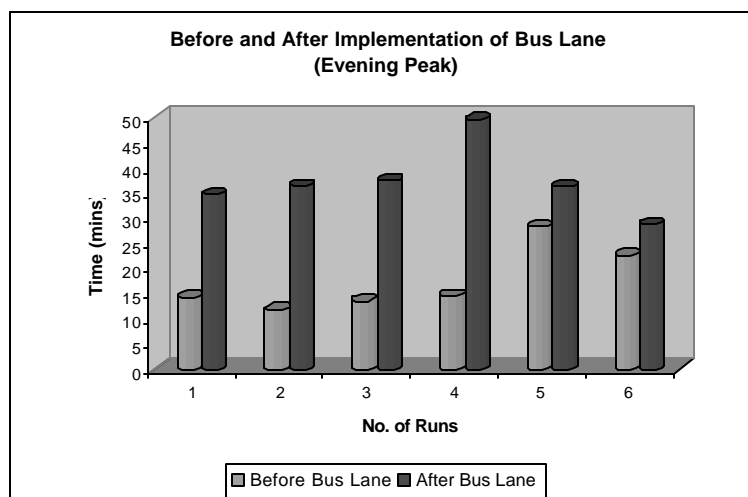


Figure 4. Before and After Study of Car Traveling Time (Evening Peak)

4. CONCLUSIONS AND RECOMMENDATIONS

After the implementation of bus lane, the hypotheses test indicated that the effect of bus lane on the other vehicles was greater for both periods. Travel time of other modes of transport was significantly affected (longer travel time) with the existence of segregated bus lane. However, the bus service and operation had been vitally improved. Perhaps by proposing either a road widening or lanes arrangement and a relevant signing and markings finally all these will help to tremendously lessen the occurrence of the traffic congestion and a mix traffic problem as well as alternatively enhance the safety features of the related junctions along the studied routes.

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APPENDICES

Travel Time Study Using Floating Car Method during Morning Peak Hours (May 1995)

Time Period : 7:00 – 9:00; Weather : Fine

Intersection	Time Arrive	Run No. 1			Link TTime	Run No. 2			Time Arrive	Run No. 3			Link TTime
		Time Depart	Time Taken			Time Depart	Time Taken			Time Depart	Time Taken		
<i>Northbound</i>													
Jln Parlimen	7:08:00								7:38:00				8:04:00
				200				115					114
Jln Dang Wangi	7:10:20	7:11:20	60		7:19:10	7:39:55	45		8:05:54	8:05:00	0		
				25				114					86
Jln Sultan Ismail	7:11:45	7:11:45	0		7:40:56	7:41:09	53		8:07:20	8:07:55	35		
				25				61					79
Jln Putra	7:12:10	7:12:10	0		7:42:30	7:42:50	20		8:08:39	8:08:39	0		
				70				55					46
Jln. Raja Laut/Jln Ipoh	7:13:20	7:13:20	0		7:43:45	7:43:45	0		8:09:12	8:09:25	13		
<i>Southbound</i>													
				70				65					120
Jln Ipoh, TAR	7:14:30	7:14:30	0		7:44:20	7:44:50	30		8:11:20	8:11:52	32		
				40				20					28
Jln Chow Kit	7:15:10	7:15:10	0		7:10:10	7:45:10	0		8:12:20	8:12:20	0		
				30				40					40
Jln Sri Amar	7:15:40	7:15:40	0		7:45:50	7:45:50	0		8:11:00	8:11:00	0		
				30				80					115
Jln. Sultan Ismail	7:16:00	7:16:10	0		7:16:30	7:47:10	40		8:14:00	8:14:55	55		
				46				105					65
Jln. Dang Wangi	7:16:40	7:16:56	16		7:48:10	7:48:55	45		8:15:29	8:16:00	31		
				96				120					164
Jln. Tun Perak	7:18:10	7:18:30	20		7:50:30	7:50:55	25		8:18:25	8:18:48	23		

Intersection	Time Arrive	Run No. 4			Link Tlme	Time Arrive	Run No. 5			Time Arrive	Run No. 6			Link Tlme
		Time Depart	Time Taken				Time Depart	Time Taken			Time Depart	Time Taken		
<i>Northbound</i>														
Jln Parlimen	8:27:00					9:11:00					9:34:00			
				234					168					180
Jln Dang Wangi	8:30:21	8:30:54	33	141	9:13:10	9:18:48	38	107	9:36:15	9:37:00	45			165
Jln Sultan Ismail	8:31:50	8:33:15	85	62	9:14:27	9:15:35	68	70	9:37:39	9:39:00	81			120
Jln Putra	8:34:17	8:34:17	0	51	9:16:45	9:16:45	0	19	9:40:00	9:40:00	0			44
Jln. Raja Laut/Jln. Ipoh	8:34:51	8:35:08	17	124	9:17:04	9:17:04	0	114	9:40:25	9:40:44	19			122
Jln. Ipoh/Jln Tun Razak	8:36:05	8:37:02	67		9:17:42	9:18:58	16		9:41:27	9:42:50	83			
<i>Southbound</i>														
Jln Ipoh, Tun Razak	8:42:00					9:22:00					9:46:00			
				160				85						64
Jln Ipoh/ Raja Laut	8:43:38	8:44:40	62	336	9:23:12	9:23:47	35	29	9:46:40	9:47:04	24			50
Jln Ipoh/Jln. TAR	8:48:50	8:50:16	86	107	9:24:16	9:24:16	0	17	9:47:30	9:47:30	0			26
Jln. Chow Kit	8:52:03	8:52:03	0	433	9:24:33	9:24:35	0	43	9:47:56	9:47:56	0			54
Jln. Sri Amar	8:56:00	8:59:16	156	344	9:25:16	9:25:16	0	146	9:48:50	9:48:50	0			34
Jln Sultan Ismail	9:03:27	9:05:00	93	42	9:25:36	9:28:42	186	71	9:49:24	9:49:24	0			45
Jln Dang Wangi	9:05:42	9:07:30	22	108	9:29:20	9:29:39	33	115	9:50:09	9:50:09	0			101
Jln Tun Perak	9:07:08	0:07:30	22		9:31:26	9:31:48	22		9:51:27	9:51:50	23			

Travel Time Study Using Floating Car Method during Evening Peak Hours (May 1995)

Time Period : 5:00 – 7:00; Weather : Fine

Intersection	Run No. 1				Run No. 2				Run No. 3			
	Time Arrive	Time Depart	Time Taken	Link TIme	Time Arrive	Time Depart	Time Taken	Link TIme	Time Arrive	Time Depart	Time Taken	Link TIme
<i>Northbound</i>												
Jln Parlimen	5:11:50				5:26:00				5:40:00			
				108				90				65
Jln Dang Wangi	5:12:01	5:12:48	47		5:27:20	5:27:30	10		5:40:45	5:41:00	20	
				109				98				110
Jln Sultan Ismail	5:13:33	5:14:05	32		5:28:25	5:29:09	66		5:42:08	5:42:55	47	
				62				70				106
Jln Putra	5:15:54	5:15:54	0		5:30:47	5:30:47	0		5:44:41	5:44:41	0	
				111				25				51
Jln. Raja Laut/Jln Ipoh	5:17:02	5:17:45	43		5:31:12	5:31:12	0		5:45:32	5:45:32	0	
<i>Southbound</i>												
				65				33				55
Jln Ipoh/Jln. TAR	5:18:07	5:18:50	43		5:31:45	5:31:45	0		5:46:00	5:46:27	27	
				18				20				16
Jln. Chow Kit	5:19:08	5:19:08	0		5:32:05	5:32:05	0		5:46:43	5:46:43	0	
				34				34				60
Jln. Sri Amar	5:19:42	5:19:42	0		5:32:39	5:32:39	0		5:47:43	5:47:43	0	
				107				99				155
Jln Sultan Ismail	5:20:00	5:21:29	79		5:33:06	5:34:18	72		5:48:43	5:50:18	95	
				57				46				53
Jln Dang Wangi	5:22:16	5:22:26	10		5:35:04	5:35:04	0		5:51:11	5:51:11	0	
				169				166				149
Jln Tun Perak	5:24:53	5:25:15	22		5:37:30	5:37:50	20		5:53:27	5:53:40	13	
Intersection	Run No. 4				Run No. 5				Run No. 6			

	Time Arrive	Time Depart	Time Taken	Link Tlme	Time Arrive	Time Depart	Time Taken	Link Tlme	Time Arrive	Time Depart	Time Taken	Link Tlme
<i>Northbound</i>												
Jln Parlimen	5:56:00				6:21:00				6:34:00			
Jln Dang Wangi	5:57:02	5:57:02	0	62	6:22:00	6:22:40	40	100	6:43:56	6:44:00	44	100
Jln Sultan Ismail	5:57:49	5:59:00	71	122	6:23:09	6:23:35	26	55	6:45:32	6:47:00	88	140
Jln Putra	9:00:26	6:00:26	0	86	6:25:06	6:25:06	0	991	6:47:17	6:48:00	43	60
Jln. Raja Laut/Jln. Ipoh	6:00:55	6:00:05	0	29	6:25:40	6:25:45	5	39	6:48:50	6:48:50	0	50
Jln. Ipoh/Jln Tun Razak	6:01:39	6:02:21	42	86	6:26:40	6:27:10	30	85	6:49:37	6:50:48	71	118
<i>Southbound</i>												
Jln Ipoh, Tun Razak	6:09::00				6:34:00				6:54:00			
Jln Ipoh/ Raja Laut	6:10:06	6:10:47	41	160	6:34:35	6:35:18	18	85	6:54:54	6:55:27	33	87
Jln Ipoh/Jln. TAR	6:11:24	6:11:38	14	51	6:35:51	6:36:05	14	52	6:56:01	5:56:18	17	51
Jln. Chow Kit	6:12:06	6:12:06	0	28	6:36:35	6:36:35	0	30	6:56:39	6:56:39	0	19
Jln. Sri Amar	6:12:38	6:12:38	0	32	6:37:07	6:37:07	0	32	6:57:30	6:57:30	0	51
Jln Sultan Ismail	6:13:03	6:14:04	61	86	6:37:07	6:37:40	12	33	6:57:53	6:57:53	0	23
Jln Dang Wangi	6:14:59	6:15:52	53	108	6:38:39	6:38:39	0	58	6:58:42	6:59:23	41	90
Jln Tun Perak	6:16:45	6:17:18	33	88	6:40:42	6:41:02	20	144	7:01:12	7:01:31	19	128

Travel Time Study Using Floating Car Method during Morning Peak Hours (May 2002)

Time Period : 7:00 – 9:00; Weather : Fine

Intersection	Time Arrive	Run No. 1			Link Tlme	Time Arrive	Run No. 2			Time Arrive	Run No. 3			Link Tlme
		Time Depart	Time Taken				Time Depart	Time Taken			Time Depart	Time Taken		
<i>Northbound</i>														
Jln Parlimen	7:00:65				7:17:37					7:41:17				
Jln Dang Wangi	7:01:52	7:01:52	0	47	7:19:35	7:19:35	0	118	7:44:21	7:44:23	0		186	
Jln Sultan Ismail	7:03:06	7:03:19	13	87	7:20:57	7:20:57	0	62	7:45:50	7:47:37	107		194	
Jln Putra	7:07:55	7:07:55	0	276	7:26:30	7:26:30	0	333			0		466	
Jln. Raja Laut/Jln Ipoh	7:08:17	7:08:45	28	50	7:27:11	7:27:53	42	83	7:55:23	7:55:23			76	
<i>Southbound</i>														
Jln Ipoh/Jln. TAR	7:09:23	7:09:35	12	50	7:28:24	7:28:45	21	52	7:57:11	7:57:11	12		44	
Jln. Chow Kit	7:10:06	7:10:37	31	62	7:30:31	7:30:35	4	110	7:57:57	7:58:09	12		46	
Jln. Sri Amar	7:11:29	7:11:29	0	52	7:32:55	7:32:55	0	140	7:58:47	7:59:30	43		81	
Jln Sultan Ismail	7:12:25	7:12:25	0	56	7:33:26	7:34:19	53	84	8:00:04	8:00:22	18		52	
Jln Dang Wangi	7:13:29	7:13:35	6	70	7:36:17	7:36:30	13	131	8:02:07	8:02:16	9		114	
Jln Tun Perak	7:14:41	7:15:24	22	109	7:38:07	7:39:35	88	185	8:04:11	8:05:05	54		169	
Intersection	Time Arrive	Run No. 4			Link Tlme	Time Arrive	Run No. 5			Time Arrive	Run No. 6			Link Tlme
		Time Depart	Time Taken				Time Depart	Time Taken			Time Depart	Time Taken		

<i>Northbound</i>												
Jln Parlimen	8:08:43				8:50:00				9:24:26			
Jln Dang Wangi	8:14:09	8:14:09	0	326	8:55:05	8:55:05	\0	305	9:27:47	9:27:47	0	201
Jln Sultan Ismail	8:16:34	8:17:53	74	224	8:56:55	8:57:34	39	149	9:29:25	9:30:06	41	139
Jln Putra	8:26:45	8:27:14	29	561	9:04:52	9:04:52	0	438	9:36:13	9:36:13	0	367
Jln. Raja Laut/Jln. Ipoh	8:27:59	8:28:33	34	79	9:07:08	9:07:41	33	169	9:36:47	9:37:51	64	98
Jln. Ipoh/Jln Tun Razak	8:29:09	8:30:53	104	140	9:08:49	9:09:44	55	123	9:39:17	9:39:36	19	105
<i>Southbound</i>												
Jln Ipoh, Tun Razak	8:34:31				9:14:00				9:42:19			
Jln Ipoh/ Raja Laut	8:36:03	8:36:33	30	160	9:14:17	9:14:46	29	85	9:43:23	9:43:50	27	87
Jln Ipoh/Jln. TAR	8:37:07	8:37:07	0	34	9:15:49	9:16:00	11	74	9:44:53	9:45:12	19	82
Jln. Chow Kit	8:37:58	8:37:58	0	51	9:16:20	9:16:40	20	40	9:45:48	9:46:15	27	63
Jln. Sri Amar	8:38:27	8:38:27	0	29	9:17:52	9:17:52	0	72	9:47:03	9:47:23	20	68
Jln Sultan Ismail	8:38:45	8:42:38	233	251	9:18:37	9:20:05	88	133	9:48:09	9:48:31	22	68
Jln Dang Wangi	8:43:28	8:43:28	0	50	9:21:54	9:22:07	13	122	9:50:08	9:50:20	12	109
Jln Tun Perak	8:44:49	8:45:48	59	140	9:23:25	9:23:25	0	78	9:52:33	9:53:33	60	193

Travel Time Study Using Floating Car Method during Evening Peak Hours (May 2002)

Time Period : 5:00 – 7:00; Weather : Fine

Intersection	Time Arrive	Run No. 1			Link Time	Time Arrive	Run No. 2			Time Arrive	Run No. 3			Link Time
		Time Depart	Time Taken	Link Time			Time Depart	Time Taken	Link Time		Time Depart	Time Taken	Link Time	
<i>Northbound</i>														
Jln Parlimen	5:03:09				5:43:00					6:21:00				
Jln Dang Wangi	5:07:29	5:07:29	0	260	5:46:49	5:46:49	0	239	6:26:40	6:26:40	0	184		
Jln Sultan Ismail	5:09:03	5:09:52	49	23	5:52:06	5:54:12	126	433	6:28:45	6:29:06	21	266		
Jln Putra	5:24:22	5:24:22	0	870	6:07:20	6:08:14	74	362	6:38:20	6:38:32	17	571		
Jln. Raja Laut/Jln Ipoh	5:25:10	5:26:31	81	129	6:09:08	6:09:31	23	57	6:42:24	6:43:50	86	313		
<i>Southbound</i>														
Jln Ipoh/Jln. TAR	5:27:05	5:18:15	40	74	6:10:06	6:10:06	0	35	6:45:00	6:45:24	24	94		
Jln. Chow Kit	5:28:24	5:28:24	0	39	6:11:31	6:11:31	0	85	6:46:06	6:46:06	0	42		
Jln. Sri Amar	5:29:38	5:29:38	0	74	6:11:35	6:12:06	31	35	6:46:52	6:46:52	0	46		
Jln Sultan Ismail	5:30:49	5:34:14	205	286	6:12:36	6:15:10	154	184	6:49:03	6:55:00	357	411		
Jln Dang Wangi	5:36:58	5:36:58	0	164	6:16:55	6:16:55	0	105	6:56:37	6:56:37	0	97		
Jln Tun Perak	5:39:15	5:39:49	34	171	6:19:14	6:19:35	21	160	6:58:43	6:59:07	25	150		
Intersection	Time Arrive	Run No. 4			Time Arrive	Run No. 5			Time Arrive	Run No. 6			Link Time	
		Time Depart	Time Taken	Link Time		Time Depart	Time Taken	Link Time		Time Depart	Time Taken	Link Time		
<i>Northbound</i>														

Jln Parlimen	7:02:00				7:58:00				8:39:00			
				313				130				149
Jln Dang Wangi	7:07:13	7:07:13	0	291	8:00:10	8:00:10	0	550	8:41:29	8:41:29	0	336
Jln Sultan Ismail	7:11:34	7:12:04	30	626	8:08:12	8:09:20	68	687	8:45:03	8:47:05	122	395
Jln Putra	7:22:30	7:22:30	0	295	8:20:47	8:20:47	0	122	8:53:40	8:53:40	0	64
Jln. Raja Laut/Jln. Ipoh	7:27:25	7:27:25	0	118	8:21:21	8:22:49	88	121	8:54:21	8:54:44	23	206
Jln. Ipoh/Jln Tun Razak	7:28:42	7:29:23	41		8:24:09	8:24:50	41		8:56:46	8:58:10	74	
<i>Southbound</i>												
Jln Ipoh, Tun Razak	7:34:13			160	8:27:00			85	9:00:00			105
Jln Ipoh/ Raja Laut	7:36:19	7:36:19	0	84	8:27:03	8:27:15	12	107	9:01:45	9:01:45	0	30
Jln Ipoh/Jln. TAR	7:26:36	7:37:43	667	145	8:28:24	8:29:32	38	32	9:02:15	9:02:15	0	54
Jln. Chow Kit	7:38:32	7:39:12	40	164	8:29:34	8:29:34	0	57	9:03:09	9:03:09	0	12
Jln. Sri Amar	7:41:58	7:41:58	0	145	8:30:16	8:30:31	15	50	9:03:21	9:03:21	0	54
Jln Sultan Ismail	7:43:26	7:44:23	0	84	8:31:21	8:31:21	0	131	9:04:15	9:04:15	0	96
Jln Dang Wangi	7:46:46	7:46:59	13	588	8:33:20	8:33:32	12	167	9:05:51	9:05:51	0	231
Jln Tun Perak	7:55:07	7:56:47	100		8:35:14	8:36:19	65		9:08:01	9:09:00	59	