

**URBAN TRANSPORT  
MASTER PLAN STUDY  
FOR THE  
JOHOR BAHRU CONURBATION  
MALAYSIA**

**TECHNICAL REPORT 8  
TRAFFIC ENGINEERING AND  
MANAGEMENT STUDY**

**MARCH 1982**

**JAPAN INTERNATIONAL  
COOPERATION AGENCY**

**GOVERNMENT OF  
MALAYSIA**



ARY

国際協力事業団

18857

JICA LIBRARY



1074649[3]

18857

CONTENTS

PAGE

1.	EXISTING ROAD CONDITIONS .....	3
	1.1 Road Network in Johor Bahru .....	3
	1.2 Width of the Right of Way .....	5
	1.3 Number of Lanes .....	5
	1.4 Pavement .....	6
2.	EXISTING TRAFFIC CONDITIONS .....	7
	2.1 Traffic Volume on Road Network .....	7
	2.2 Turn Movements at Major Intersections .....	12
	2.3 The Fluctuation of Traffic Volume ..	12
	2.4 Traffic Composition .....	22
3.	THE TRAFFIC SIGNALS .....	24
	3.1 The Traffic Signal System .....	24
	3.2 Installation and Operational Characteristics .....	24
4.	TRAFFIC REGULATIONS .....	28
	4.1 Traffic Signs and Road Markings ....	28
	4.2 One-way Streets and Turning Restrictions .....	29
	4.3 Other Traffic Regulations .....	31
5.	TRAFFIC ACCIDENTS .....	32
	5.1 Traffic Accident Statistics .....	32
	5.2 Analysis of Traffic Accidents .....	32
6.	PARKING .....	40

	PAGE
6.1 Introduction .....	40
6.2 Parking Facilities .....	40
6.3 Parking Characteristics .....	42
6.4 Present Supply and Demand of Parking Space .....	44
7. PEDESTRIAN FACILITIES .....	44

<u>LIST OF FIGURES</u>		PAGE
1.1	The Road Network in Johor Bahru .....	4
1.2	Existing Intersection Geometrics .....	8
2.1	Major Traffic Flow in MPJB .....	11
2.2	Turning Movement Flow at Major Intersections .....	13
2.3	The Hourly Fluctuations of Incoming and Coming Traffic Volumes at Major Road Sections in Johor Bahru .....	17
3.1	Existing Signal Locations .....	25
4.1	The Existing One-way System .....	30
6.1	Parking Spaces in the CBD of Johor Bahru .....	41
7.1	The Existing Pedestrian Facilities .....	45

<u>LIST OF TABLES</u>		PAGE
2.1	Traffic Composition of the Selected Road Sections .....	23
3.1	Summary of Signal Inventory .....	26

1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512	1513	1514	1515	1516	1517	1518	1519	1520	1521	1522	1523	1524	1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535	1536	1537	1538	1539	1540	1541	1542	1543	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1557	1558	1559	1560	1561	1562	1563	1564	1565	1566	1567	1568	1569	1570	1571	1572	1573	1574	1575	1576	1577	1578	1579	1580	1581	1582	1583	1584	1585	1586	1587	1588	1589	1590	1591	1592	1593	1594	1595	1596	1597	1598	1599	1600	1601	1602	1603	1604	1605	1606	1607	1608	1609	1610	1611	1612	1613	1614	1615	1616	1617	1618	1619	1620	1621	1622	1623	1624	1625	1626	1627	1628	1629	1630	1631	1632	1633	1634	1635	1636	1637	1638	1639	1640	1641	1642	1643	1644	1645	1646	1647	1648	1649	1650	1651	1652	1653	1654	1655	1656	1657	1658	1659	1660	1661	1662	1663	1664	1665	1666	1667	1668	1669	1670	1671	1672	1673	1674	1675	1676	1677	1678	1679	1680	1681	1682	1683	1684	1685	1686	1687	1688	1689	1690	1691	1692	1693	1694	1695	1696	1697	1698	1699	1700	1701	1702	1703	1704	1705	1706	1707	1708	1709	1710	1711	1712	1713	1714	1715	1716	1717	1718	1719	1720	1721	1722	1723	1724	1725	1726	1727	1728	1729	1730	1731	1732	1733	1734	1735	1736	1737	1738	1739	1740	1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1752	1753	1754	1755	1756	1757	1758	1759	1760	1761	1762	1763	1764	1765	1766	1767	1768	1769	1770	1771	1772	1773	1774	1775	1776	1777	1778	1779	1780	1781	1782	1783	1784	1785	1786	1787	1788	1789	1790	1791	1792	1793	1794	1795	1796	1797	1798	1799	1800	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

## 1. EXISTING ROAD CONDITIONS

### 1.1 ROAD NETWORK IN JOHOR BAHRU

The road network in Johor Bahru is shown in Fig. 1-1.

From the north-west, Federal Route 1 branches into Jalan Skudai, the coastal road which joins Jalan Tun Abdul Razak, also stretching to the causeway. (The latter is Federal Route 1). From the north-east, Jalan Tebrau joins Jalan Tun Abdul Razak at the interchange located at the north of the C.B.D.

To the east, Jalan Pasir Pelangi, Jalan Lumba Kuda and Jalan Bukit Meldrum cross the railway line into the C.B.D. via southern interchange near the causeway.

The road network, which may be conceived as radial in pattern, is irregular as can be seen in the discontinuity of the streets and the frequent occurrence of sharp-angled and T intersections. The geometrics of some major intersections and interchanges illustrated in Fig. 1-2.

There are 3 flyover crossings on Federal Route 1 and a roundabout for traffic dispersal is adopted near the causeway entrance where major streets connect.

Federal Route 1 (Jalan Larkin, Jalan Tun Abdul Razak) and Jalan Tebrau are functionally categorized as Primary Distributors.

The coastal road (Jalan Skudai, Jalan Abu Bakar and Jalan Dr. Ismail), Jalan Lumba Kuda, Jalan Kebun Teh, Jalan Tampoi, Jalan Tasek Utara, Jalan Datin Halima, Jalan Yahya Awal, Jalan Trus and Jalan Wong Ah Fook are categorized as District Distributors.





URBAN TRANSPORT MASTER PLAN STUDY  
FOR THE JOHOR BAHRU CONURBATION MALAYSIA

LEGEND  
 15.2(2) ——— No. of Lanes  
 Right of Way Width

TITLE  
 The Road Network in Johor Bahru

FIG. 1-1  
 MAP NO.

## 1.2. WIDTH OF THE RIGHT OF WAY

The right of way of the primary distributors and district distributors which form the street network ranges from 15m to 57m in width (with existing carriageways ranging in width from 7m to 25m) as illustrated in Fig. 1.1. The figures along the road links denote the width of the right of way of the road links. Most right-of-ways in Johor Bahru fall within 20m, though those of Jalan Tun Abdul Razak, Jalan Lumba Kuda, Jalan Sutera and Jalan Tebrau are more than 30m.

Rights of way ranging from 15 to 20m can at the most accommodate two-lane carriageway, which are the passage ways for cars, footpaths and shoulders which provide spaces for bus stops, bicycle passages as well as for parking.

## 1.3. NUMBER OF LANES

As mentioned in 1.2 above, the number of lanes allocated for the passage of vehicles is mostly 2 lanes except for a few streets, for example, like Jalan Tun Abdul Razak, Jalan Larkin, Wong Ah Fook and so forth.

The figures in bracket along the road links denote the number of lanes of the road links (Fig. 1.1.).

In some intersection approaches, additional lanes for turning to the right are provided, Center markings with broken lines are always drawn, but continuous lines for side markings bordering shoulders which are seen in other countries are seldom seen here.

#### 1.4. PAVEMENT

Most of the main streets inside the city are paved with asphalt concrete. Some minor streets inside the C.B.D. and some roads outside the C.B.D. are paved only on the carriageways, so that vehicles stopped on the carriageway for the right turning often hamper the passage of the following cars because cars are reluctant to use unpaved shoulder.

Drainage channels between pavement and footpaths are mostly covered so that extra pavement spaces are available for traffic. However, open drains which are detrimental to the safe and smooth flow of traffic can be seen in some places.

## 2. EXISTING TRAFFIC CONDITIONS

### 2.1 TRAFFIC VOLUME ON ROAD NETWORK

The Study team conducted several traffic surveys, namely, Cordon line traffic counting survey and screen line traffic counting survey, which are related to O - D survey and turning movement traffic counting survey at major intersections. The study team also compiled the data from JKR traffic census. Summaries of these are included in the Technical Reports.

The 16 hour (6.00 am - 10.00 pm) traffic volume of cars on the road network in Johore Bahru are illustrated in Figure 2.1. These traffic volumes illustrated are mainly taken from those of turning movement traffic counting survey at major intersections in Johore Bahru, supplemented by those from the Cordon line traffic counting survey, screen line traffic counting survey and JKR traffic census.

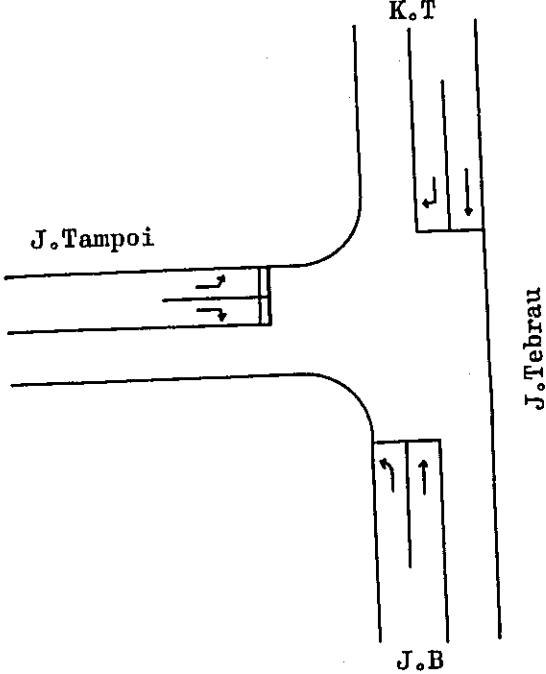
In Johore Bahru, traffic which goes to the C.B.D. from the north-west use Federal Route I and the coastal road which branches from the Federal Route I.

Traffic from the north east to the C.B.D. use Jalan Tebrau, which also collects the traffic originating from the area surrounding it. So, on the section of Jalan Tebrau just before the merging point with the Federal Route I, some 35,323 cars/16 hours were recorded.

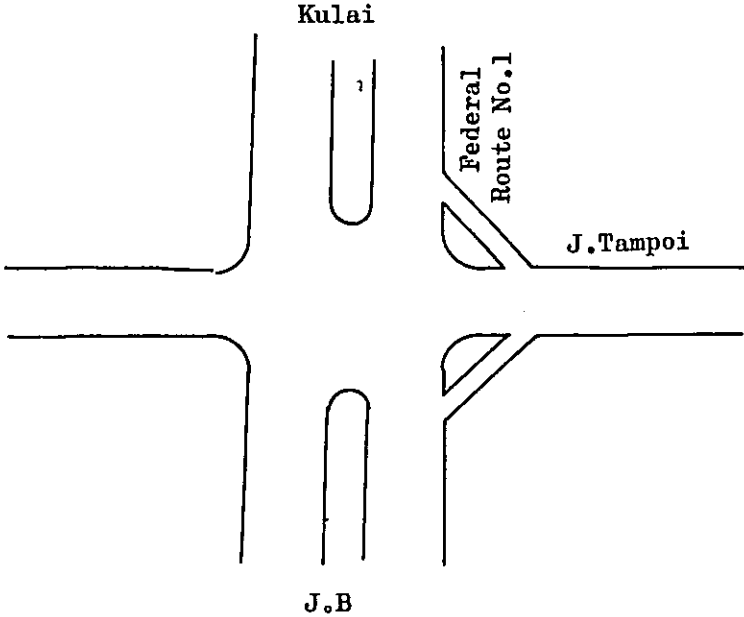
Traffic on Jalan Tun Abdul Razak into which Jalan Tebrau merges, Jalan Lumba Kuda, and the coastal road join in the C.B.D. in front of the Immigration Complex (at the causeway).

Fig. 1-2 Existing Intersection Geometries

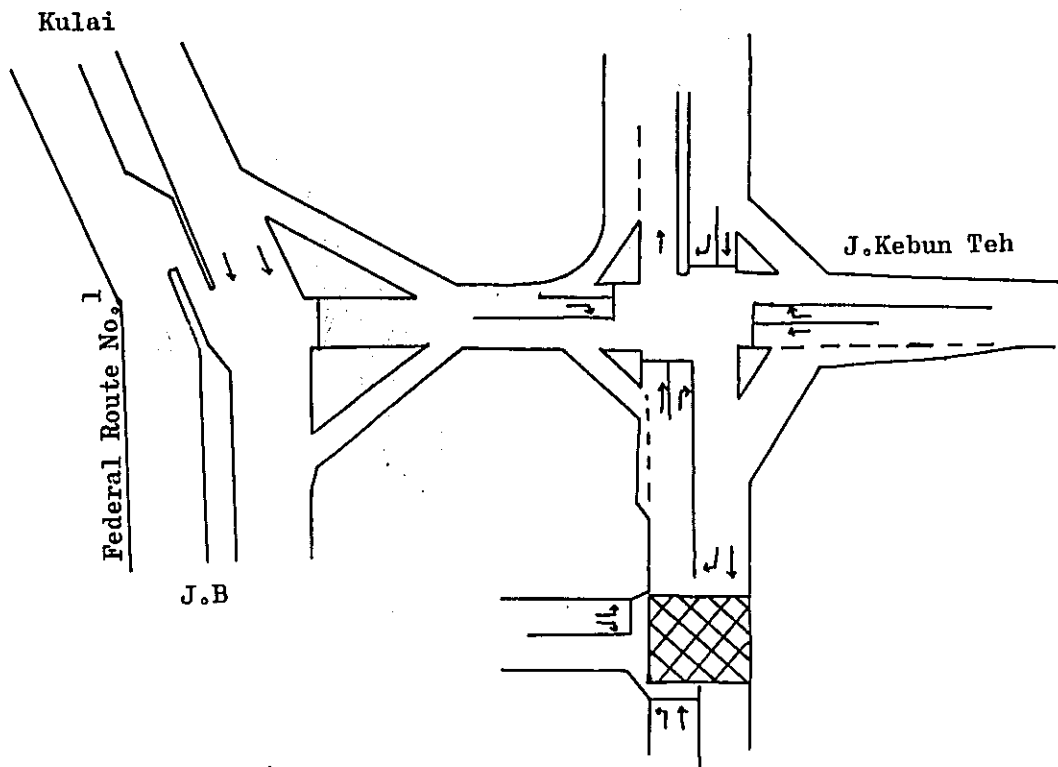
(1) J.Tebrau / J.Tampoi



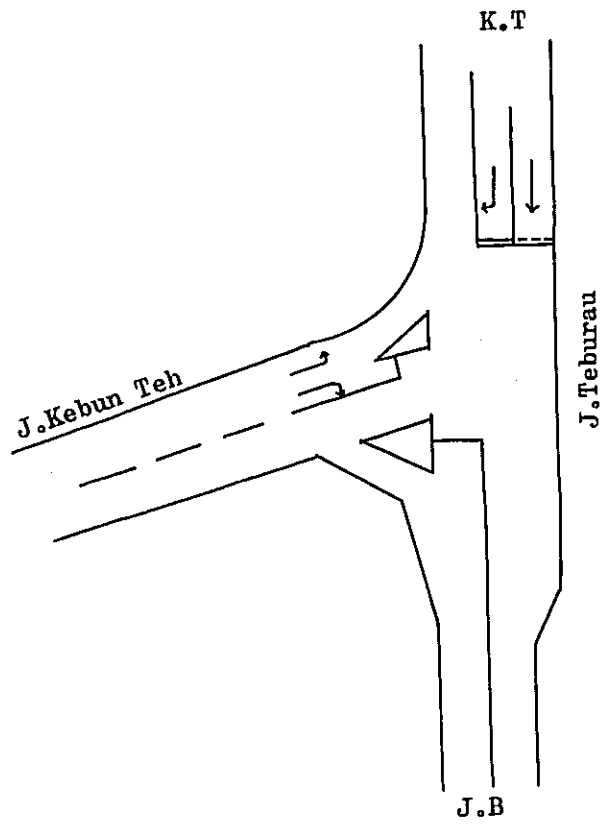
(2) J.Tampoi / Federal Route No. 1



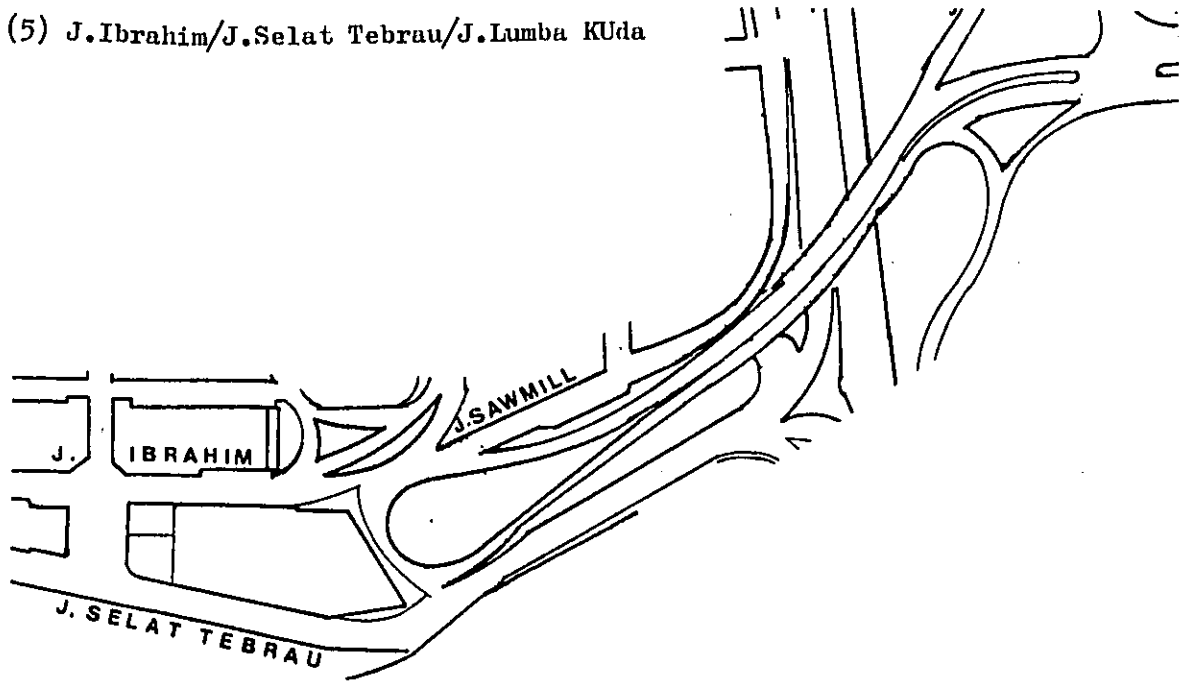
(3) J.Kebun Teh / Federal Route No.1



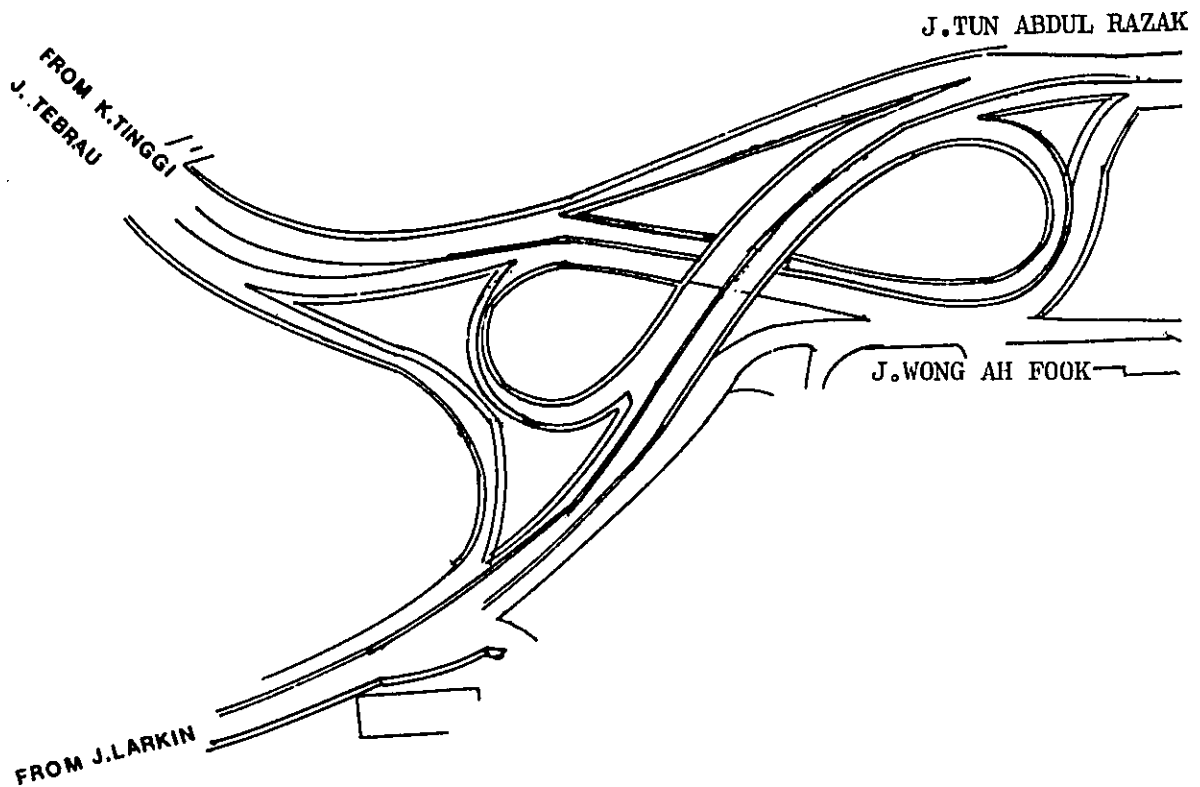
(4) J.Tebrau / J.Kebun Teh



(5) J.Ibrahim/J.Selat Tebrau/J.Lumba KUda



(6) J.Larkin/J.Tebrau/J.Tun Abdul Razak/J.Wong Ah Fook







There, the complicated traffic interchange design, including roundabout type of traffic dispersal and grade separation of Jalan Lumba Kuda has been adopted to cope with the heavy traffic (which is composed of those of the causeway, Jalan Tun Abdul Razak, the coastal road, Jalan Lumba Kuda, and Jalan Wong Ah Fook) However, there still remains a critical bottle neck, especially at the merging point of the circle of Jalan Lumba Kuda.

## 2.2 TURN MOVEMENTS AT MAJOR INTER- SECTIONS

Turn movements at major intersections in Johore Bahru are illustrated in Figure 2.2. Data is obtained from the turning movement survey. The traffic flow in Johore Bahru is now orientated to the C.B.D. because the road network is of radial type.

However, the traffic circulation in C.B.D. is not simple because there exist one way streets, the street network pattern is irregular and diversion of traffic from congested intersections also occurs. So, turning movements at intersections have some specific features which reflect the circulation pattern.

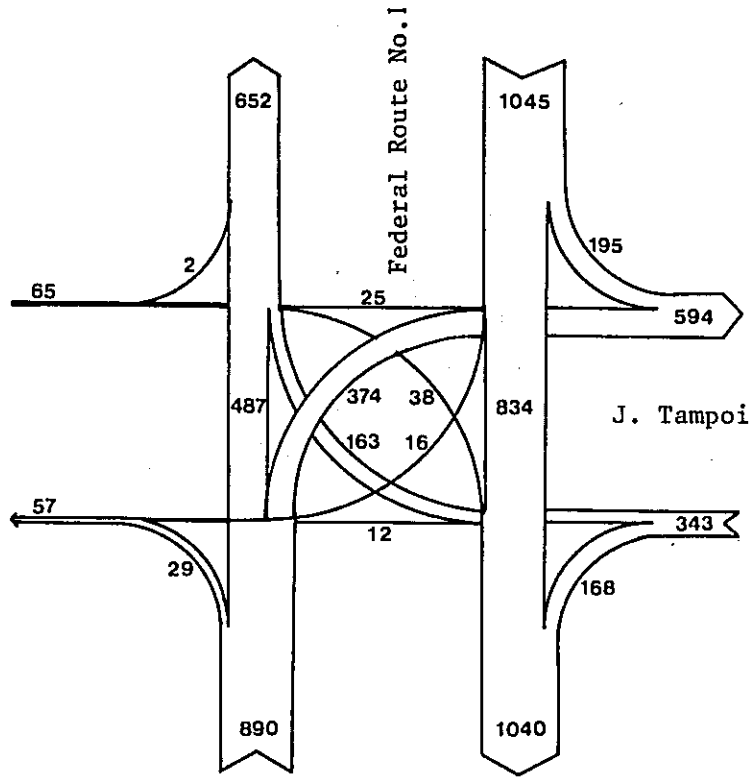
## 2.3 THE FLUCTUATION OF TRAFFIC VOLUME

The hourly fluctuations of incoming and out-going traffic volumes at major road sections in Johore Bahru are illustrated in Figure 2.3. The figures used for the graphs are from the turning movement traffic counting survey at major intersections.

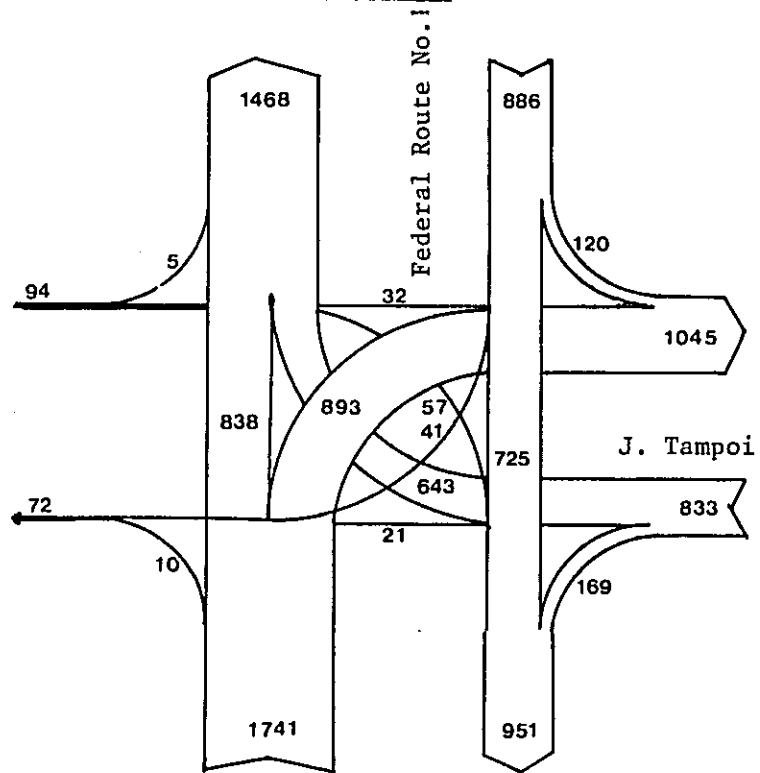
Prominent peaks can be seen on Jalan Tun Abdul Razak, Jalan Tebrau near the C.B.D. and Jalan Lumba Kuda, which are radial roads. And peaks can be found but peak concentrations are not so high on the radial road sections far from the C.B.D. as seen on the Federal Route

**Fig.2.2** TURNING MOVEMENT FLOW AT MAJOR INTERSECTIONS

(1) Federal Route No. 1/Jalan Tampoi

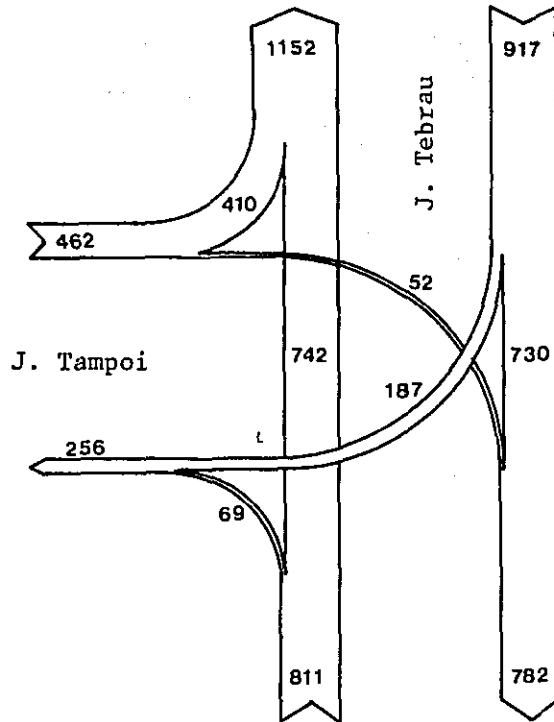


Vehicles (Morning Peak)

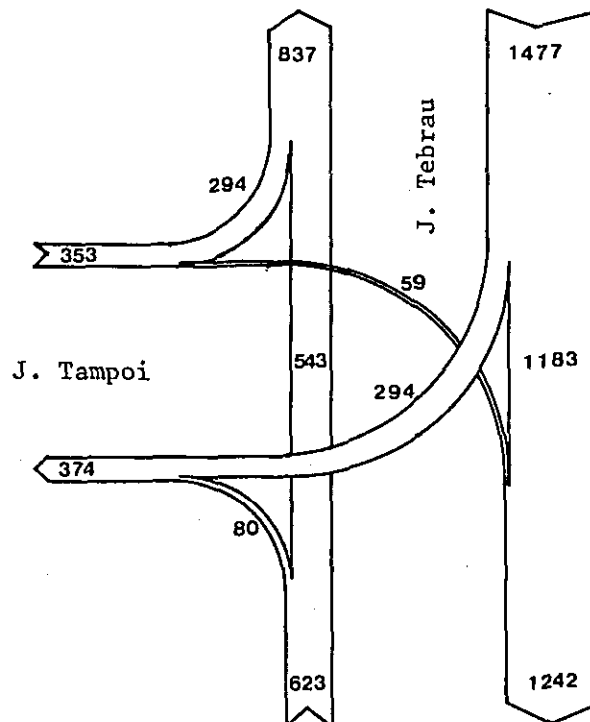


Vehicles (Evening Peak)

(2) Jalan Tebrau/Jalan Tampoi

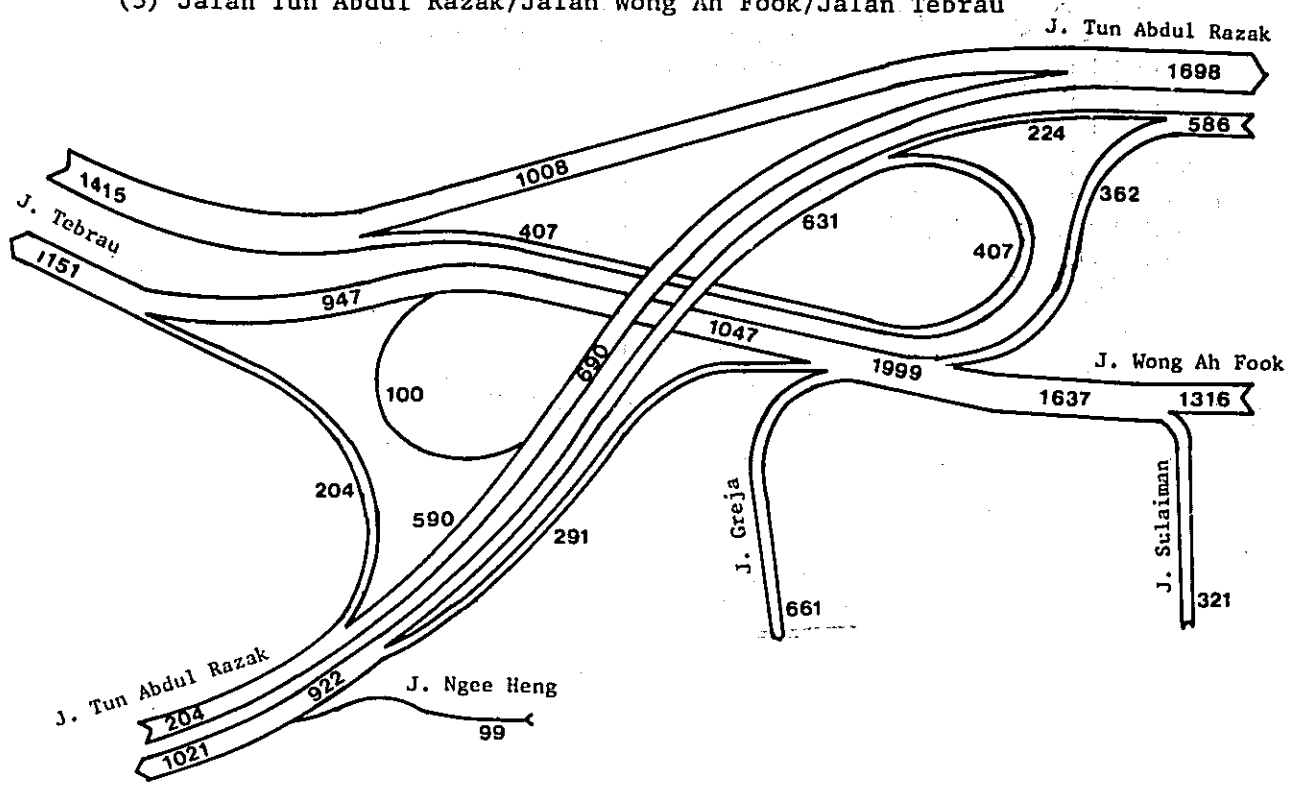


Vehicles (Morning Peak)

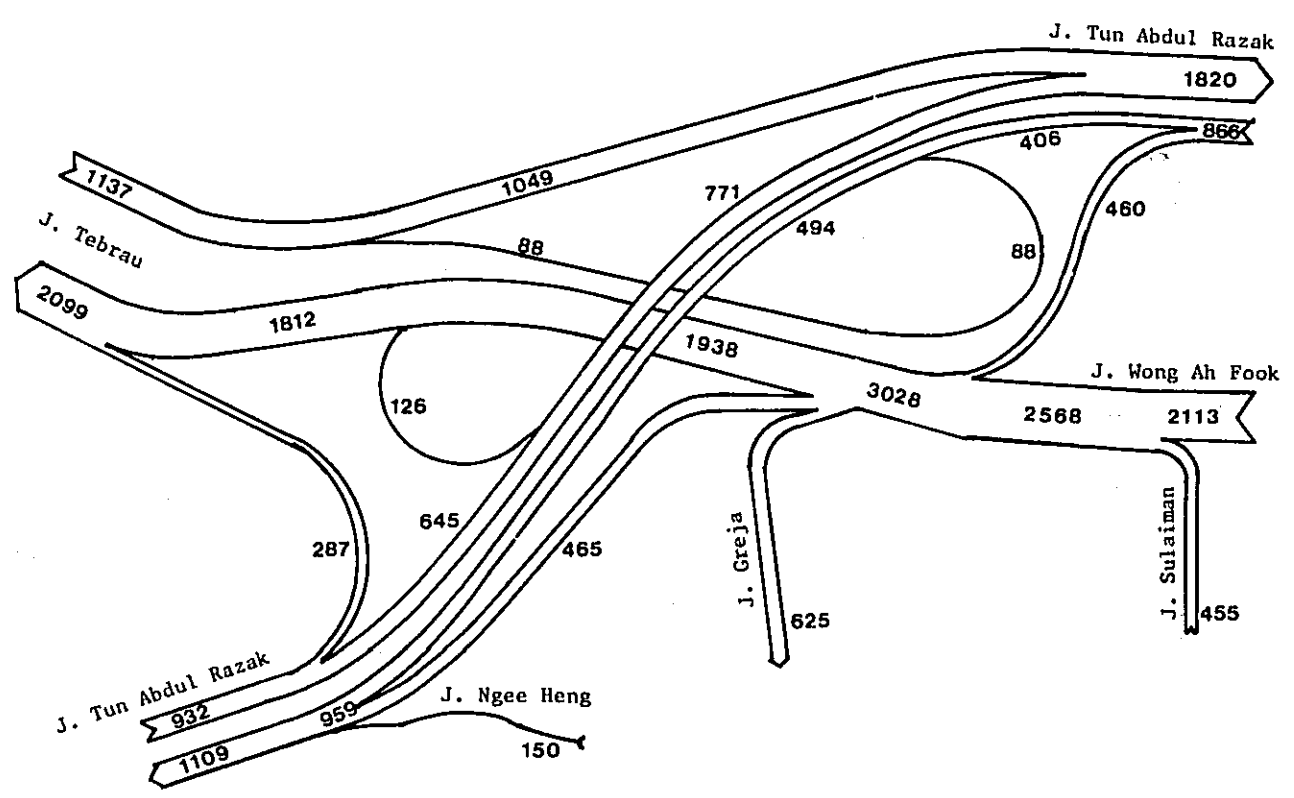


Vehicles (Evening Peak)

(3) Jalan Tun Abdul Razak/Jalan Wong Ah Fook/Jalan Tebrau

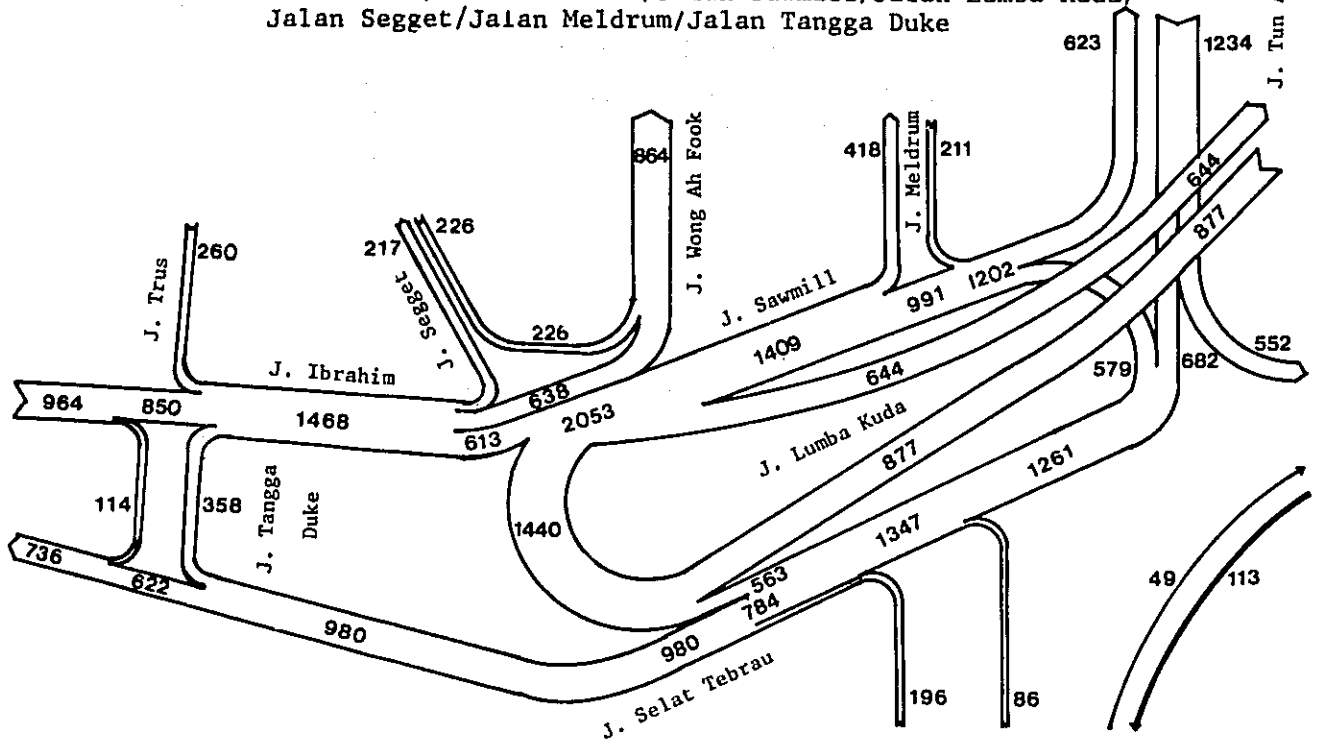


Vehicles (Morning Peak)

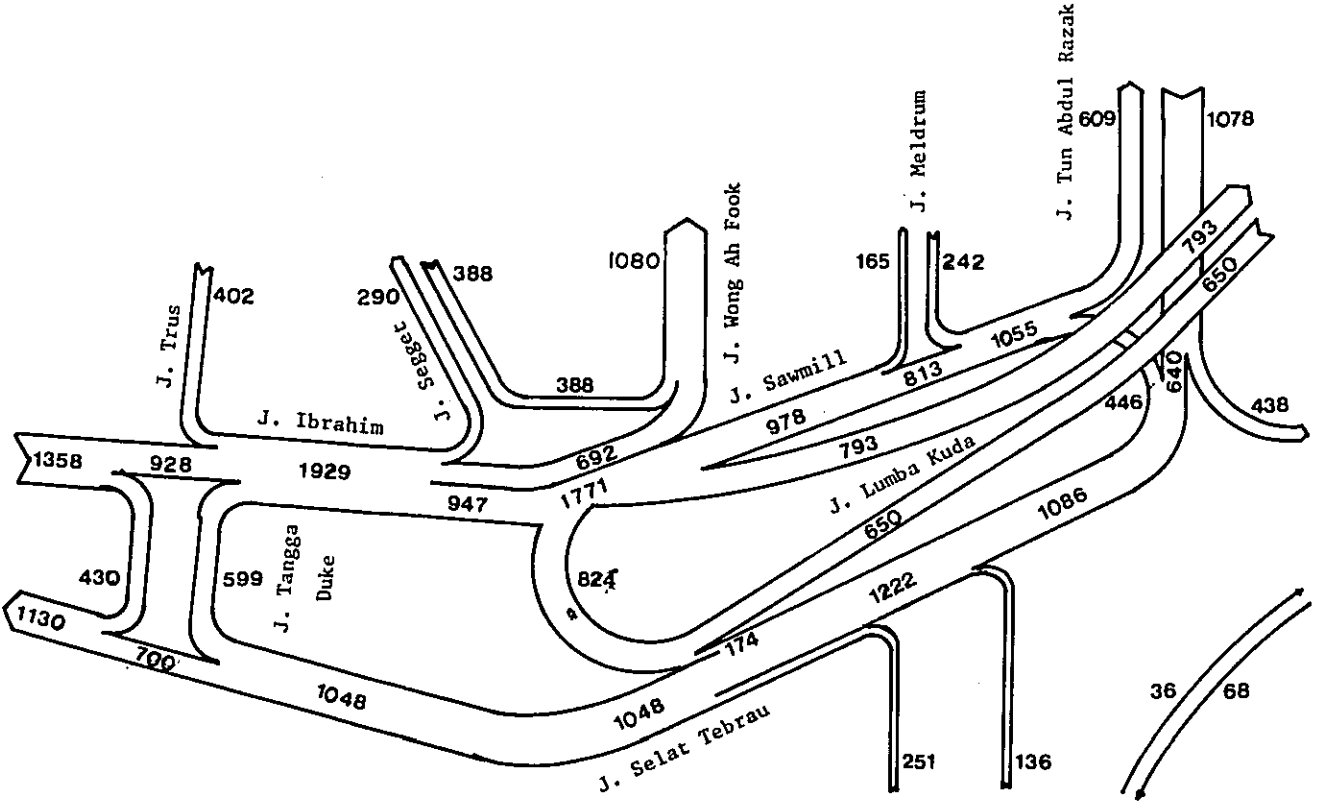


Vehicles (Evening Peak)

(4) Jalan Tun Abdul Razak/Jalan Wong Ah Fook/Jalan Selat Tebrau/  
 Jalan Trus/Jalan Ibrahim/Jalan Sawmill/Jalan Lumba Kuda/  
 Jalan Segget/Jalan Meldrum/Jalan Tangga Duke

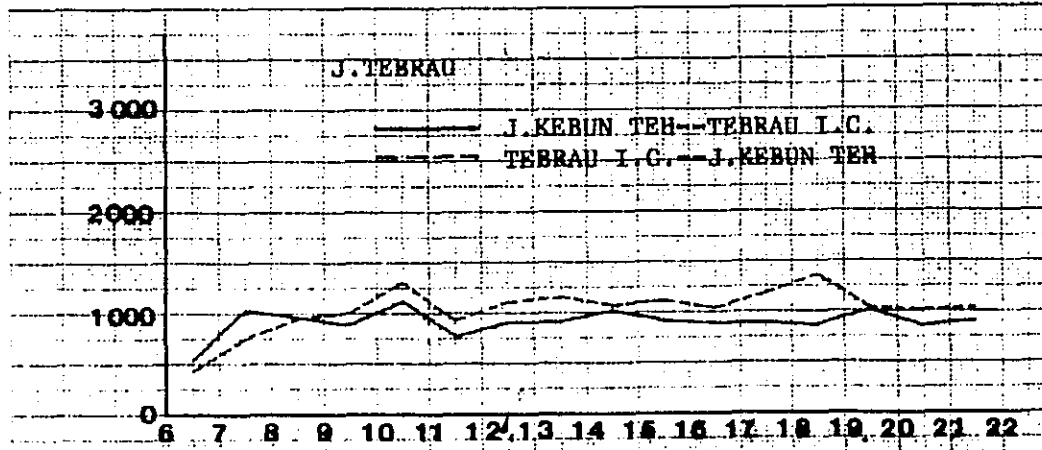
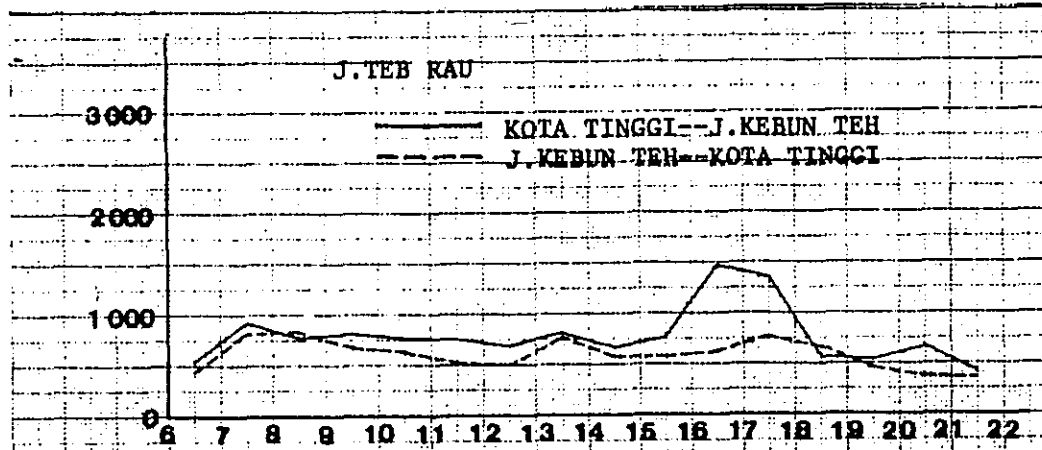
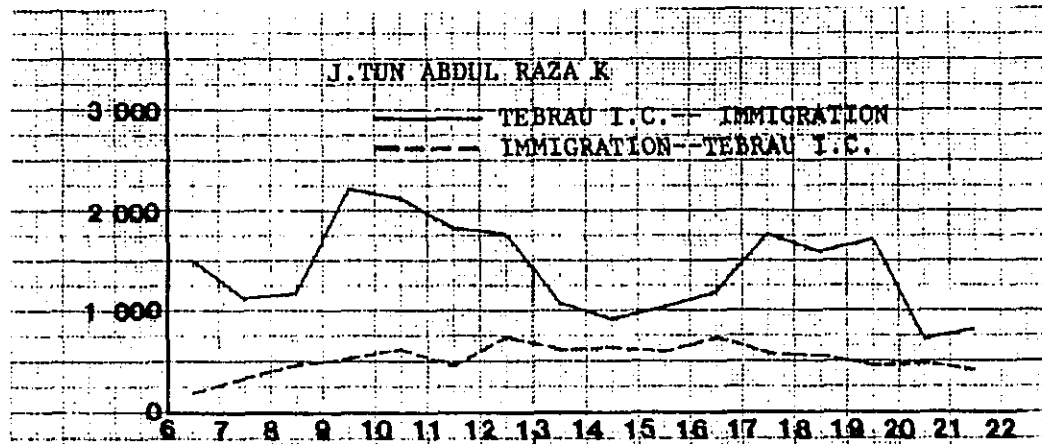
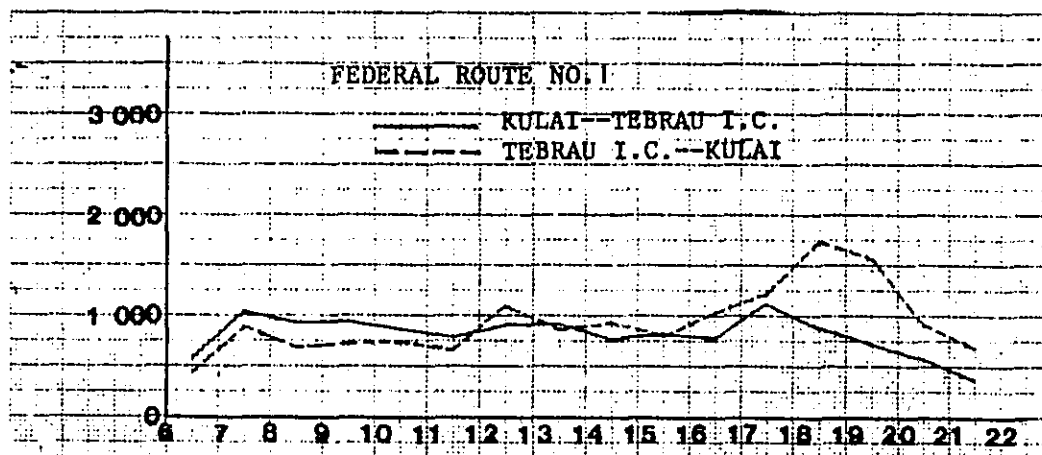


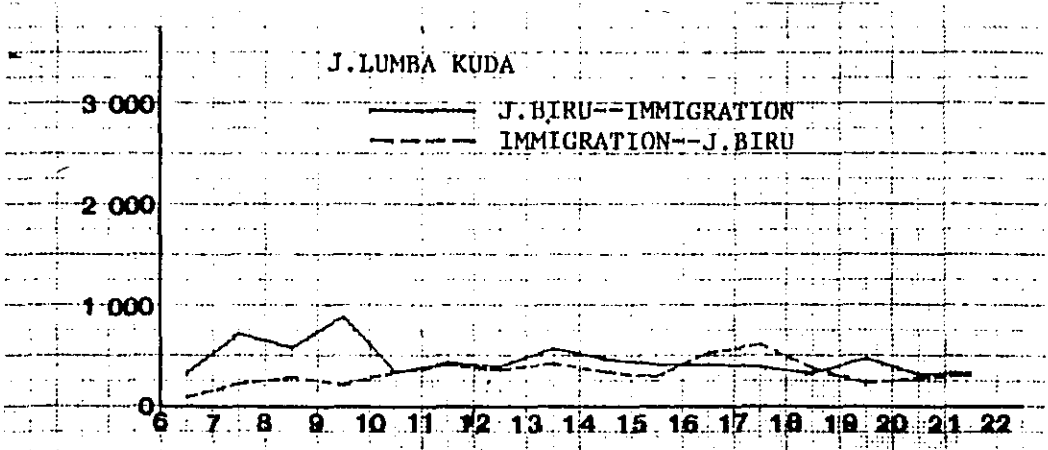
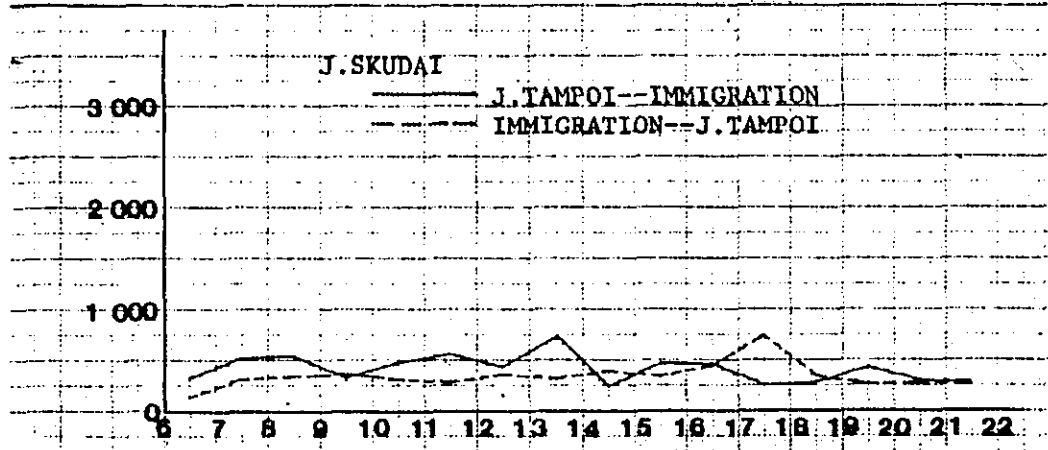
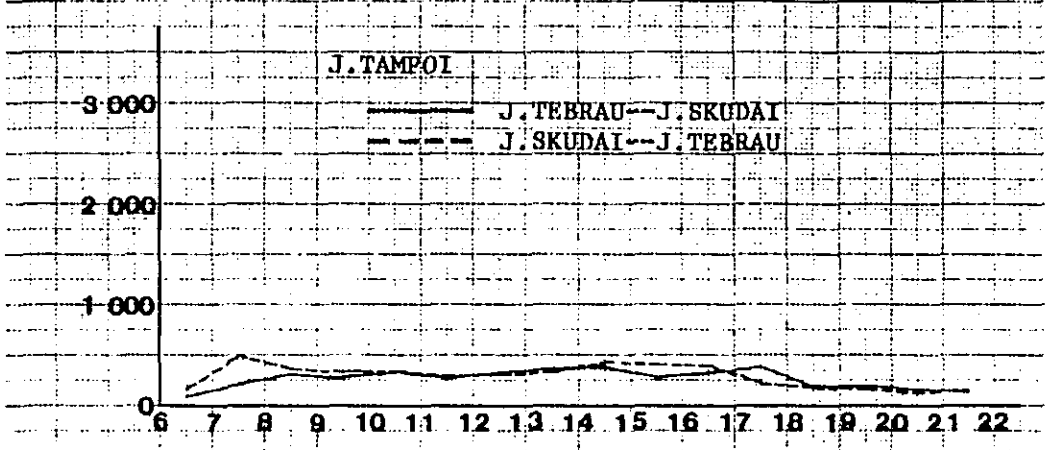
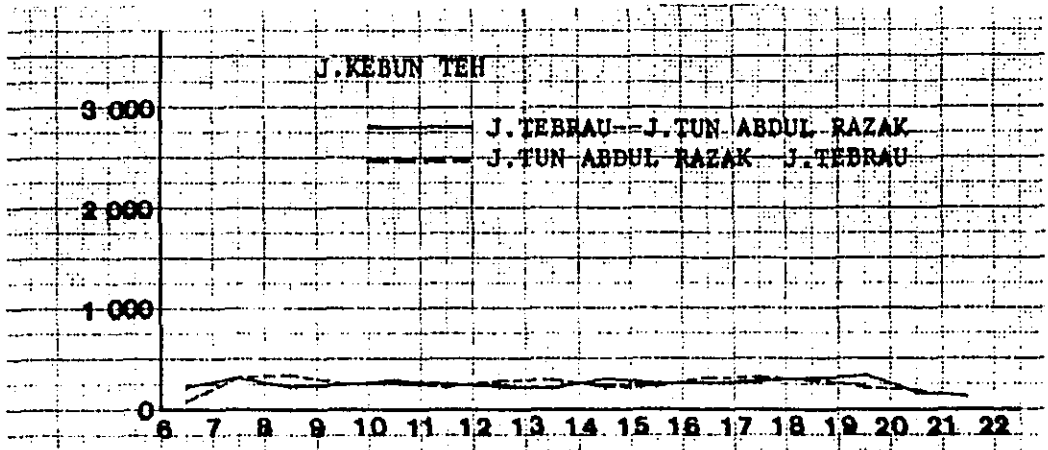
Vehicles (Morning Peak)

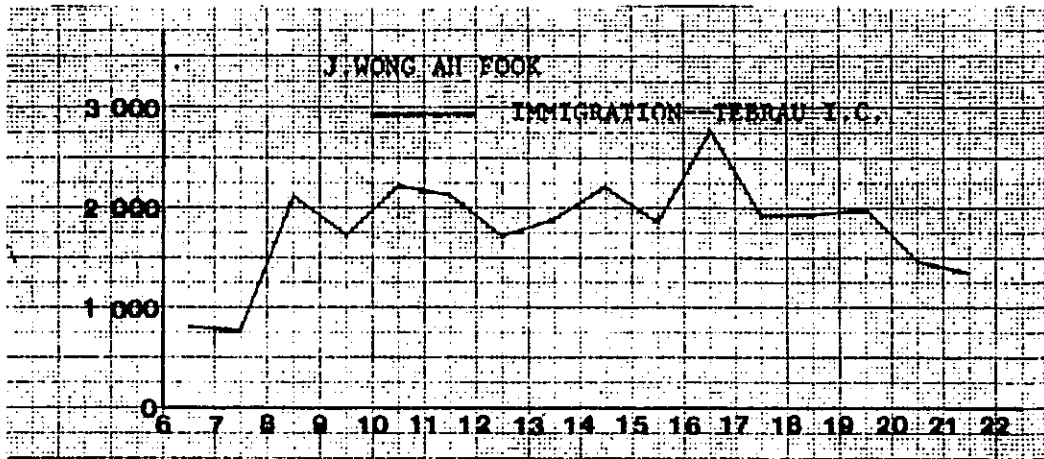


Vehicles (Evening Peak)

-3 The Hourly Fluctuations of Incoming and Coming Traffic Volumes at Major Road Sections in Johor Bahru









I and Jalan Skudai.

Peaks cannot be distinctly found on Jalan Kebun Teh and Jalan Tampoi, which are ring roads.

Morning peaks and evening peak for commuting traffic into C.B.D. are judged to fall between 7.00 am and 8.00 am and between 4.00 pm and 6.00 pm respectively. But observed peak hours do not always correspond to the above assumed peak hours. It is understood that the commuting traffic into C.B.D. is not so high compared with traffic of other purposes.

The observed concentration rates are as follows :-

ROAD NAME	DIRECTION	CONCENTRATION * RATES	PEAK HOUR
Federal Route No.1	Kulai - Tebrau I.C (incoming)	8.6%	17.00-18.00
	Tebrau I.C - Kulai (outgoing)	12.0%	18.00-19.00
J. Tun Abdul Razak	Tebrau I.C - Immigration (incoming)	9.7%	9.00-10.00
	Immigration - Tebrau I.C (outgoing)	8.7%	12.00-13.00
J. Tebrau	Kota Tinggi - J. Kebun Teh (incoming)	11.8%	16.00-17.00
	J. Kebun Teh - Kota Tinggi (outgoing)	8.8%	8.00- 9.00
J. Tebrau	J. Kebun Teh - Tebrau I.C (incoming)	7.7%	10.00-11.00
	Tebrau I.C - J. Kebun Teh (outgoing)	8.3%	18.00-19.00
J. Kebun Teh	J. Tebrau - J. Tun Abdul Razak (incoming)	8.1%	19.00-20.00
	J. Tun Abdul Razak - J. Tebrau (outgoing)	7.1%	8.00- 9.00
J. Tampoi	J. Tebrau - J. Skudai (incoming)	9.2%	17.00-18.00
	J. Skudai - J. Tebrau (outgoing)	10.5%	7.00- 8.00
J. Skudai	J. Tampoi - Immigration (incoming)	11.0%	13.00-14.00
	Immigration - J. Tampoi (outgoing)	13.6%	17.00-18.00
J. Lumba Kuda	J. Biru - Immigration (incoming)	12.0%	9.00-10.00
	Immigration - J. Biru (outgoing)	12.4%	17.00-18.00
J. Wong Ah Fook	Immigration - Tebrau I.C (outgoing)	11.5%	16.00-17.00 (one-way)

\* CR =  $\frac{\text{Traffic Volume of P.H} \times 100}{\text{Traffic Volume of 16 hrs.}}$

#### 2.4 TRAFFIC COMPOSITION

The traffic composition of the selected road sections is tabulated in Table 2.1.

The number of cars predominates, taking up about 60% to 85% of the total traffic volumes (four and more wheeled vehicles) while heavy lorries and buses together contribute to about 2% to 30% of the volumes.

The shares of heavy lorries are prominent on Jalan Tampoi, Jalan Tebrau in suburban area, Jalan Kebun Teh and Jalan Tun Abdul Razak in out-bound direction, with 26.2%, 13.8%, 9.5% and 19.2% respectively.

Table 2.1: TRAFFIC COMPOSITION OF THE SELECTED ROAD SECTIONS

ROAD SECTIONS		CAR (%)	VAN & PICK UP MEDIUM LORRY (%)	BUS (%)	HEAVY LORRY (%)	TOTAL (%)	TOTAL NUMBER
1. Federal Route No. 1	(in)	72.0	16.3	4.0	7.7	100.0	12954
	(out)	68.5	17.8	6.2	7.5	100.0	14510
	(av.)	70.1	17.1	5.2	7.6	100.0	27464
2. J. Tun Abdul Razak	(in)	82.8	6.8	4.4	6.0	100.0	22883
	(out)	69.4	6.1	5.3	19.2	100.0	8412
	(av.)	79.3	6.6	4.6	9.5	100.0	31295
3. J. Tebrau	(in)	67.9	11.1	4.6	16.4	100.0	12536
	(out)	71.6	12.9	4.9	10.6	100.0	9595
	(av.)	69.6	11.9	4.7	13.8	100.0	22131
4. J. Tebrau	(in)	86.1	8.6	2.4	2.9	100.0	14482
	(out)	85.7	8.3	2.5	3.5	100.0	16456
	(av.)	85.8	8.5	2.5	3.2	100.0	30938
5. J. Kebun Teh	(in)	72.8	12.8	4.2	10.2	100.0	4063
	(out)	76.0	12.1	3.1	8.8	100.0	4856
	(av.)	74.5	12.4	3.6	9.5	100.0	8919
6. J. Tampoi	(in)	56.1	13.7	2.9	27.3	100.0	4738
	(out)	58.3	13.4	3.3	25.0	100.0	4247
	(av.)	57.1	13.6	3.1	26.2	100.0	8985
7. J. Skudai	(in)	84.3	8.7	6.3	0.7	100.0	6653
	(out)	83.7	9.2	5.8	1.3	100.0	5470
	(av.)	84.0	8.9	6.1	1.0	100.0	12123
8. J. Lumba Kuda	(in)	87.0	9.0	1.9	2.1	100.0	7355
	(out)	82.8	10.9	2.0	4.3	100.0	5380
	(av.)	85.2	9.8	2.0	3.0	100.0	12735
9. J. Wong Ah Fook	(out)	91.5	6.4	0.9	1.2	100.0	28561

Note: 1. Figures are taken from the "Turning Movement Traffic Counting Survey at Major Intersections".

2. Figures are based on 16 hours (6.00 am. - 10.00 pm.) counts.

### 3. THE TRAFFIC SIGNALS

#### 3.1 THE TRAFFIC SIGNAL SYSTEM

A traffic signal inventory survey was conducted in Johor Bahru. The signal control locations are illustrated in Fig. 3.1, as identified by blackened circles with number. The type of signal control, the name of manufacturers, operational status and intersection type are summarized in Table 3.1.

There are 18 traffic signals operating in Johor Bahru.

Of these signals,

14 are fixed time traffic signals installed at intersections.

3 are pedestrian crossing traffic signals which are actuated by push buttons located at both ends of the pedestrian crossing mid-block or near the intersection.

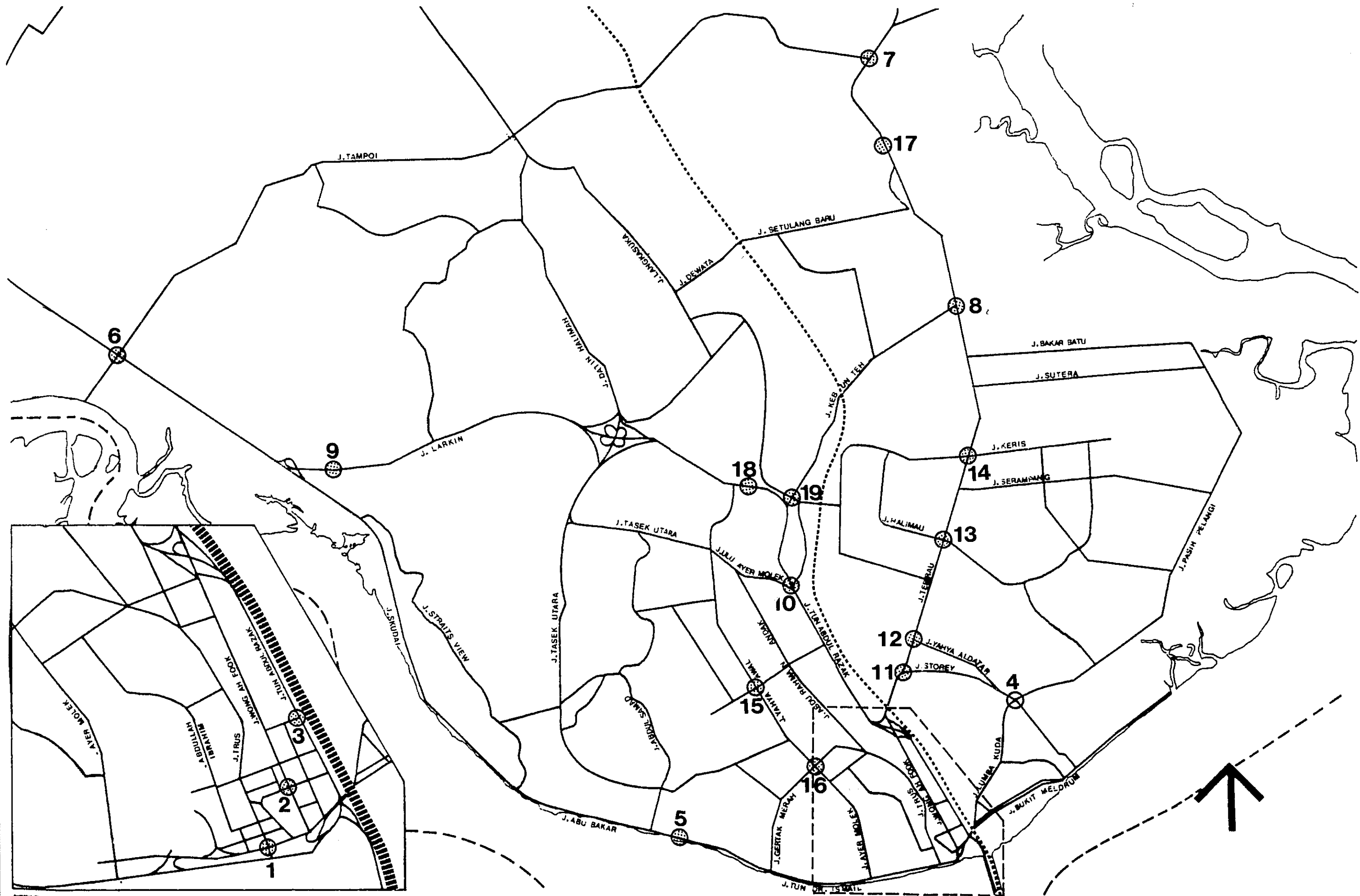
1 is a manually actuated signal which is installed in front of the fire station and is operated only when the fire engines go out or come back.

Most of local controllers, fixed time or actuated, are manufactured by SIEMENS Company.

#### 3.2 INSTALLATION AND OPERATIONAL CHARACTERISTICS

Pedestal type installations and signal heads situated on the near-left and far-right corners of intersections are standard in the C.B.D.

Pedestal type installations located at the near-left corner and mast arms for horizontal overhead displays on the far left



URBAN TRANSPORT MASTER PLAN STUDY  
FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND.  EXISTING

TITLE  
EXISTING SIGNAL LOCATIONS

FIG. 3-1  
MAP NO.

Table 3.1. Summary of signal inventory

Signal location	Type of control	Manufacturer	Operational status cycle (Sec) No of phases		Type of intersection
No.1	Pedestrian actuation	not confirmed	-	-	
No.2	Fixed Time	Siemens	65	2	4 legs
No.3	-ditto-	not confirmed	115	3	T
No.4	-ditto-	Siemens	60	2	4 legs
No.5	Pedestrian Actuation	-ditto-	-	-	
No.6.	Fixed Time	-ditto-	103	3	4 legs
No.7	-ditto-	-ditto-	65	3	T
No.8	-ditto-	-ditto-	95	3	T
No.9	-ditto-	GEC	50	3	T
No.10	-ditto-	not confirmed	123	4	4 legs
No.11	-ditto-	Siemens	68	2	Skewed 4 legs
No.12	-ditto-	-ditto-	73	2	4 legs
No.13	-ditto-	-ditto-	120	4	-ditto-
No.14	-ditto-	-ditto-	107	4	-ditto-
No.15	-ditto-	-ditto-	48	2	-ditto-
No.16	-ditto-	-ditto-	54	2	-ditto-
No.17	Pedestrian Actuation	not confirmed	-	-	
No.18	Manual Actuation	not confirmed	-	-	

corner (or medium left) are usually adopted on the wide arterial streets and the arterial roads outside of the C.B.D. This kind of installation gives good visibility.

Pedestrian signals are installed at the pedestrian crossings with heavy pedestrian demand.

This pedestrian signal shows symbolic walking or standing figures.

This type of display is useful on the pedestrian crossings of intersections where the pedestrian passage is often disturbed by the vehicle movements like left or right turning. However, the number of them is limited.

The signal indications are not coordinated with those of neighboring intersections.

In terms of signal phases, 2 phases are usually adopted at intersections with 4 legs and 3 or 4 phases are adopted at the intersections where right-turning demand is so heavy on some approaches that additional phases for right turners are required.

3 phases are usually adopted for signal control at "T" intersections.

The typical cycle times operated for 2 phase, 3 phase and 4 phase controls at the intersections with 4 legs are about 60 sec., 100 sec., and 115 sec. respectively. And the typical cycle time for 3 phase control at "T" intersections is about 80 sec.

Generally, signals are so well operated and traffic congestions and confusions due to signal operation deficiency



seldom occur. However, burn-out lamps and dirty lenses can still be found. And obsolete lenses and lamps now used have to be replaced by new ones which are widely used in other countries to improve the visibility.

Traffic signal installation and maintenance in Johor Bahru is currently carried out by the Municipal Council, Johor Bahru.

#### 4. TRAFFIC REGULATIONS

##### 4.1 TRAFFIC SIGNS AND ROAD MARKINGS

In order to attain safe, smooth and efficient traffic flow through the application of available traffic engineering methodologies, controls and technologies, traffic signs and markings as well as traffic signals are essential tools which must be consistently applied.

The consistency of the installation and application of traffic signs and markings is extremely necessary. Recognition of this is evident from the Government of Malaysia Gazette on traffic signs (size, colour and type) (Amendment) Rules 1979, which revised the Road Traffic Ordinance 1959, Rule 6 of the Traffic Signs (size, colour and type). In this revision, most of the size, colour and type of the traffic signs were changed into internationally recommended ones which are widely adopted all-over the world.

While signs and markings have for the most part been standardized and properly installed in Johor Bahru, some of them do not comply with the revised rules as mentioned above and some are so dilapidated that they do not function properly. Reflective sheetings

are used for most of signs but some of the old type of signs are not reflectorized.

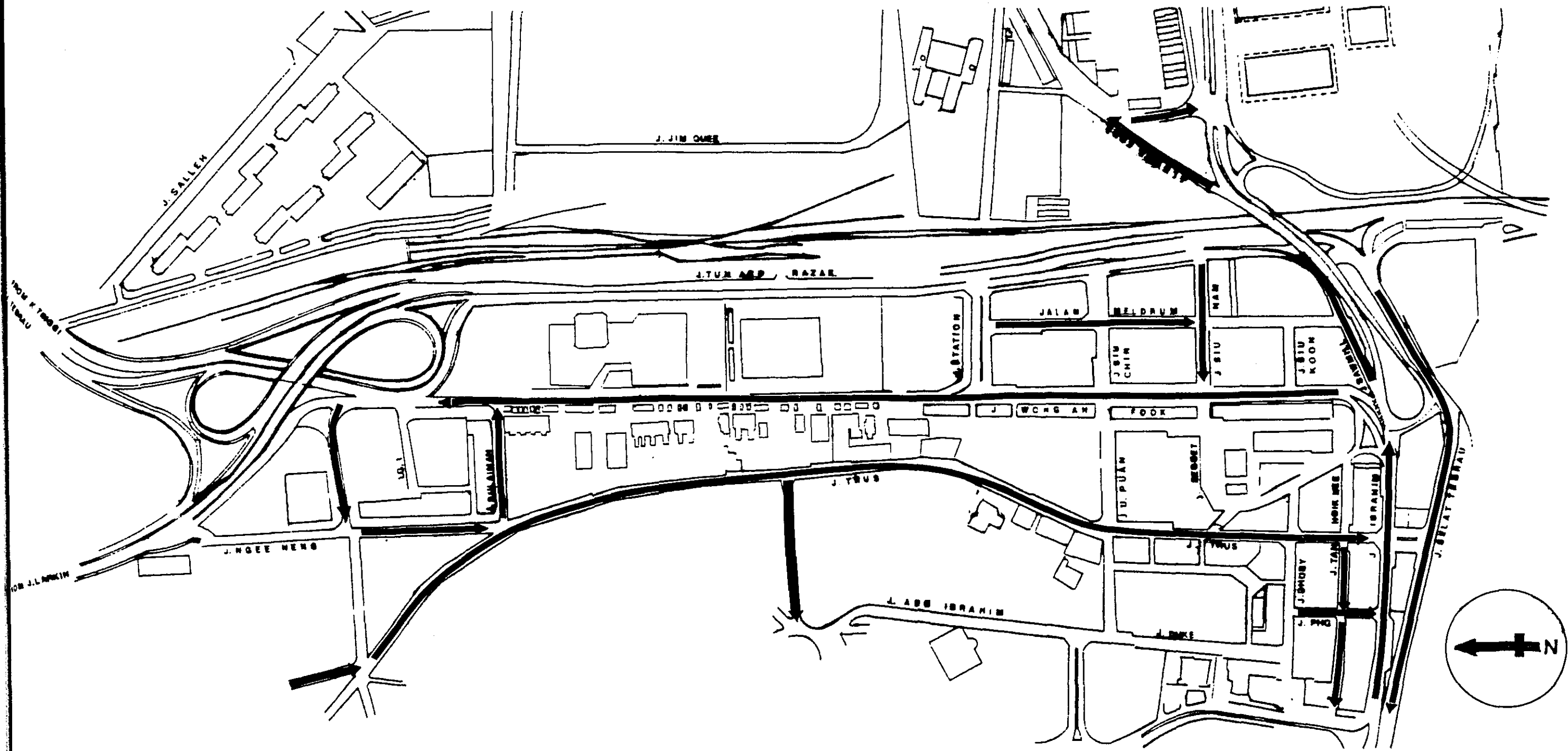
Road markings are also used. Center lines are either dashed (to allow overtaking) or continuous (prohibiting overtaking). Two yellow lines across the road indicate a pedestrian crossing. Lane and stop lines are also used. Arrows are used to indicate straight or turning movements at intersections, and yellow lines at the edge of the pavement indicate parking prohibition.


The black and white tripe marking on the curbs of footpaths or shoulders and channelizing islands are often found. These are effectively functioned for delineating cars as well as reminding of the prohibition of parking.

Some of the markings are too worn out to be clearly visible although they are properly installed. Most of the markings are poorly reflective. Cold paint of ICI standard is usually used and at some sites polymer plastic marking sheetings with aluminium backing have been tried to highten the visibility.

#### 4.2 ONE-WAY STREETS AND TURNING RESTRICTIONS

One-way streets now adopted in the C.B.D. of Johor Bahru are illustrated in Fig. 4.1. The one-ways of Jalan Wong Ah Fook and Jalan Trus seem to be made to facilitate circulation and distribution within the C.B.D. Jalan Selat Tebrau and Jalan Ibrahim are made into a pair of one-way streets to provide higher capacity, thereby easing traffic at the



<b>URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.</b>	<b>LEGEND.</b>  One-way Direction	<b>TITLE.</b> The Existing One-way System	<b>MAP NO.</b>
			<b>FIG.</b> 4-1

Roundabout which is the most critical bottleneck. Other one-way streets are designed either to facilitate circulation or to provide for parking spaces.

Traffic circulation as a result of this one-way system functions well so that there are few heavy congestions which severely retard economic and social activities, although some congestions do occur intermittently.

Turning restrictions are widely adopted especially in the C.B.D. to comply with the one-way circulation system.

#### 4.3 OTHER TRAFFIC REGULATIONS

Parking prohibition, speed limit, no overtaking, taxi-stands, stopping before entering intersections and "Give Way" are major concerns of the traffic regulations imposed in Johor Bahru.

Stop signs before entering intersections are widely adopted on the approaches to the intersection with the circulating roadways likewise designated.

These regulations are for the most part properly applied but regulations are insufficiently applied to bicycles, hawkers and pedestrians.

## 5. Traffic Accidents

### 5.1 Traffic Accident Statistics

The yearly statistics for traffic accident for Johore Bahru District and part of Kota Tinggi District is as shown below:-

Year	No. of Accidents	No. Killed
1975	1403	99
1976	2154	101
1977	1787	118
1978	1808	90
1980	2037	116

Source : Police Traffic Departments

### 5.2 Analysis of Traffic Accidents

An analysis has been made of the traffic accident records from January to December of 1980. The analysis is as shown below:-

#### 1. Accident According to Area

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Urban	892	36
b. Suburban	268	30
c. Rural Area	<u>174</u>	<u>21</u>
Total	<u>1334</u>	<u>277</u>

2. Accident According to Road Geometry

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. <u>Level Road</u>		
i. Straight	655	127
ii. Corner	143	44
iii. Sharp Corner	15	10
iv. Hidden Corner	5	4
v. Round-about	8	1
vi. T/Y Junction	321	22
vii. Bridge	4	3
viii. 4 Junction	157	3
b. <u>Slope</u>		
i. Straight	14	35
ii. Corner	6	22
iii. Sharp Corner	1	3
iv. Hidden Corner	1	1
c. <u>Steep Slope</u>		
i. Straight	3	2
ii. Corner	-	-
iii. Sharp Corner	-	-
iv. Hidden Corner	1	-
Total	<u>1334</u>	<u>277</u>

3. Accident According to Road Management

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Traffic Signals	155	8
b. Police	19	-
c. No Control	1158	267
d. Level Crossing - Gate	-	-
e. Level Crossing without Gate	1	-
f. Pedestrian Crossing with Light Signals	-	-
g. Pedestrian Crossing without Light	1	2
Total	<u>1334</u>	<u>277</u>

4. Accident According to Speed Limit

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. 20 mph	422	27
b. 30 mph	603	42
c. 40 mph	13	-
d. 50 mph	2	1
e. No Speed Limit	<u>294</u>	<u>207</u>
Total	<u>1334</u>	<u>277</u>

5. Accident According to Road Marking

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Divider	153	17
b. Double White Line	50	19
c. Lane Lines	714	152
d. No Line	337	83
e. One Way	<u>80</u>	<u>6</u>
Total	<u>1334</u>	<u>277</u>

6. Accident According to Road Surface

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Paved	1042	159
b. Crusher Run	284	96
c. Laterite	<u>8</u>	<u>22</u>
Total	<u>1334</u>	<u>277</u>

7. Accident According to Road Condition

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Good & Dry	1144	181
b. Good & Wet	153	31
c. Poor & Dry	21	19
d. Poor & Wet	11	29
e. Under Repair	2	3
f. Under Construction	2	2
g. Obstruction without Lights Signal	1	-
h. Flood	1	1
i. Others	<u>1</u>	<u>11</u>
Total	<u>1334</u>	<u>277</u>

8. Accident According to Weather

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Absence of Strong Wind		
i. Clear	1151	193
ii. Foggy	82	26
iii. Drizzling	72	30
iv. Heavy Rain	26	16
b. Strong Wind		
i. Clear	-	5
ii. Foggy	1	3
iii. Drizzling	2	2
iv. Heavy Rain	-	2
Total	<u>1344</u>	<u>277</u>

9. Accident According to Lighting

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Clear Daylight	967	177
b. Poor Daylight	102	49
c. Good Streetlight	172	11
d. Poor Streetlight	43	3
e. Dark	50	37
Total	<u>1344</u>	<u>277</u>

10. Accident According to Time in a Day

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
12 midnight - 1 a.m.	37	3
1 a.m. - 2 a.m.	28	6
2 a.m. - 3 a.m.	12	2
3 a.m. - 4 a.m.	13	3
4 a.m. - 5 a.m.	10	4
5 a.m. - 6 a.m.	19	4
6 a.m. - 7 a.m.	35	9
7 a.m. - 8 a.m.	55	16
8 a.m. - 9 a.m.	79	16
9 a.m. - 10 a.m.	101	17



	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
10 a.m. - 11 a.m.	93	10
11 a.m. - 12 noon	80	17
12 noon - 1 p.m.	101	17
1 p.m. - 2 p.m.	72	27
2 p.m. - 3 p.m.	78	26
3 p.m. - 4 p.m.	70	18
4 p.m. - 5 p.m.	95	23
5 p.m. - 6 p.m.	80	25
6 p.m. - 7 p.m.	69	1
7 p.m. - 8 p.m.	50	13
8 p.m. - 9 p.m.	44	8
9 p.m. - 10 p.m.	39	7
10 p.m. - 11 p.m.	42	4
11 p.m. - 12 midnight	32	1
Total	<u>1344</u>	<u>277</u>

11. Accident According to Day in a Week

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. Sunday	168	40
b. Monday	177	40
c. Tuesday	208	34
d. Wednesday	195	47
e. Thursday	200	44
f. Friday	179	36
g. Saturday	207	36
Total	<u>1344</u>	<u>277</u>

12. Accident According to Months

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
January	120	14
February	119	25
March	87	15
April	125	18
May	110	34
June	134	28
July	103	22
August	116	26
September	119	28
October	109	29
November	94	20
December	98	18
Total	<u>1334</u>	<u>277</u>

13. Accident Analysis/Vehicle Involved

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
a. <u>Individual Vehicle</u>		
i. Car	1288	180
ii. Motorcycle	291	78
iii. Bicycle	25	10
iv. Van	62	15
v. Others	10	5
b. <u>Public Transport</u>		
i. Bus	79	5
ii. School Bus	15	4
iii. Taxi	94	5
iv. School Car	-	-
v. Train	-	-
vi. Trishaw	1	-
vii. Others	5	2

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
<b>c. <u>Business Vehicle</u></b>		
i. Heavy Lorry	186	53
ii. Light Lorry	47	32
iii. Bullock Cart	-	-
iv. Vehicle pulled by hand	-	-
v. Others	1	10
<b>d. <u>Government Vehicle</u></b>		
i. Car	21	9
ii. Lorry	6	4
iii. Bus	1	-
iv. Motorcycle	-	-
v. Others	6	7
<b>e. <u>Police Vehicle</u></b>		
i. Car	5	1
ii. Lorry	-	-
iii. Bus	-	-
iv. Motorcycle	-	-
v. Others	3	-
<b>f. <u>Army Vehicle</u></b>		
i. Car	5	3
ii. Lorry	9	3
iii. Bus	2	-
iv. Motorcycle	-	-
v. Others	2	1
<b>g. <u>Others</u></b>		
i. Pedestrian	186	15
ii. Permanent Structure	116	32
iii. Animal	4	2
iv. Others	<u>278</u>	<u>83</u>
Total	<u><u>2748</u></u>	<u><u>559</u></u>

	<u>Johor Bahru</u>	<u>Kota Tinggi</u>
14. a. Total Accidents	1334	277
b. Total Death	27	16
c. Total Fatally Injured	92	30
d. Total Lightly Injured	304	154
e. Total Casualties	423	200
f. Estimated Damage	\$280,326/=	\$291,620/=

## PARKING

### 6.1 INTRODUCTION

A parking survey was conducted and the findings are described in this section.

In the CBD of Johor Bahru, free parking is generally prohibited except along limited portions of streets and the Municipal Council has marked parking spaces where parking is allowed on one or both sides of streets. A parking charge is imposed by the Municipal Council. At present, parking spaces seem to be considered as insufficient on the whole, even if off-street parking is included.

Jalan Wong Ah Fook and Jalan Segget, are often congested with cars looking for a vacant lot to park or load. This hampers the smooth flow of traffic.

### 6.2 PARKING FACILITIES

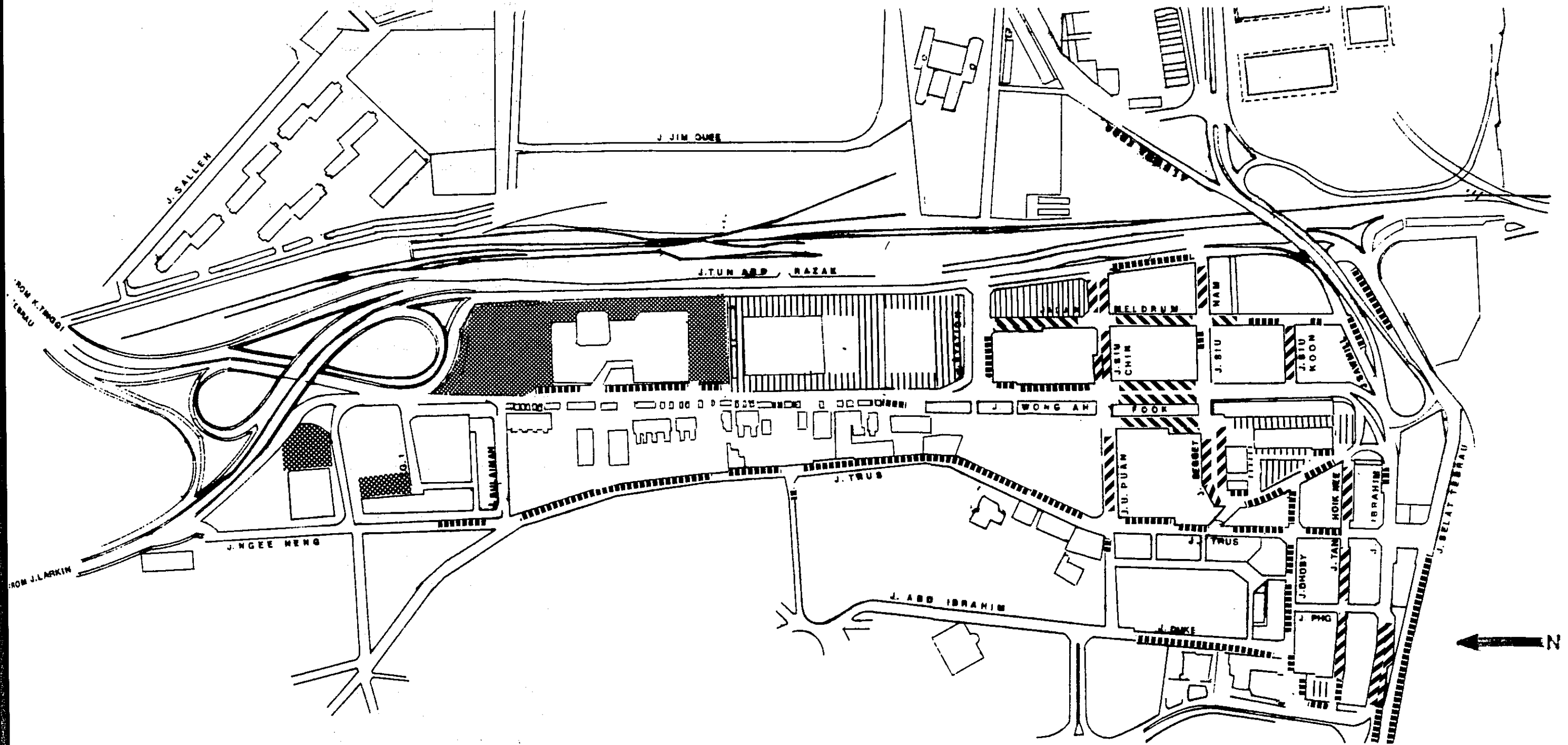
Fig. 6.1 shows the locations of on-street and off-street parking spaces (public or Private) in the CBD of Johor Bahru.

#### (a) On-street parking

Hatched and dotted marks indicate parking lots on both sides and parking lots on one side. The prohibition of parking on both sides is applied to those portions of the streets where traffic concentrate. The potential capacity of on-street parking within the CBD is estimated to be about 770 units for cars and 170 units for motor-cycles from the above.

#### (b) Off-street parking

There are public off-parking spaces and a tax stand along Jalan Segget and private off-street parking spaces in Kompleks Tun Abdul Razak, Restaurant Rakyat, Merlin Tower Hotel, Johor Tower and Orchid Hotel.



<p><b>URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.</b></p>	<p><b>LEGEND.</b></p> <ul style="list-style-type: none"> <li>▄▄▄▄ One Side Parking Lots</li> <li>▨▨▨▨ Both Side Parking Lots</li> <li>▩▩▩▩ Off Street Private Parking Space</li> <li>▧▧▧▧ Off Street Public Parking Space</li> </ul>	<p><b>TITLE.</b></p> <p>Parking Spaces in the C.B.D. of Johor Bahru</p>	<p><b>MAP NO.</b></p> <hr/> <p><b>FIG.</b></p> <p>6-1</p>
--	--	---	---

The capacity of the off-street parking in the CBD is estimated to be of the following:

Public ...	348 units for cars
	37 units for motorcycles
Private ..	764 units for cars
	153 units for motorcycles
Total	1114 units for cars
	190 units for motorcycles

6.3 PARKING CHARACTERISTICS

From the interview survey conducted along Jalan Wong Ah Fook and Jalan Segget and at off-street parking spaces, Kompleks Tun Abdul Razak and JB central market, basic information on parking characteristics were obtained.

The distribution of parking purposes is shown below;

	Percentage (%)	
	Wednesday	Sunday
1. Going to work	16.2	6.5
2. Business engagement	18.4	23.6
3. Shopping/Marketing	26.9	21.3
4. For food/entertainment	5.0	9.1
5. School	0.6	1.3
6. Social visit	5.6	7.4
7. Goods & Freight delivery	10.3	9.1
8. Others	17.0	21.7
TOTAL	106.0	100.0

These figures reflect the wide use of the cars in Johor Bahru for various purposes, although it is some doubt as to why the percentage of business engagement is higher on Sunday when many offices are closed than on Wednesday.

The distribution by walking distances to the destination is shown in the next page.

Walking distance	Percentage (%)	
	Wednesday	Sunday
less than 50 m	79.2	94.8
51 - 100 m	8.9	4.6
101 - 150 m	5.5	0.6
151 - 200 m	3.4	-
201 - 250 m	0.3	-
251 - 300 m	1.4	-
301 - 350 m	0.3	-
over 350 m	1.0	-
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>

Even on Wednesday, about 80% drivers park within 50 m from their destinations.

The duration of parking differs by the purposes of parking. The distribution of the duration of parking by purposes is shown below:

Duration	Purpose (percentage)			
	Going to Work	Business Engagement	Shopping/ Marketing	Delivery of goods
Less than 30min	70.7	50.0	50.0	91.2
31min to 1 hr.	1.6	41.9	15.6	5.9
1 hr. to 3 hrs.	3.2	4.6	33.6	2.9
3 hrs to 5 hrs.	4.8	2.3	0.8	0.0
5 hrs to 8 hrs	1.6	0.0	0.0	0.0
over 8 hrs.	18.6	1.2	0.0	0.0
	100.0	100.0	100.0	100.0

At home, about 58 % of car owners interviewed have garages, but 42 % have to park on vacant land (28%), on the road (12%) and in charged car parks (2%) during the night.



#### 6.4 PRESENT SUPPLY AND DEMAND OF PARKING SPACE

Available on-street parking and public off-street parking spaces are fully occupied during the day time in the CBD, although private off-street parking spaces are available most of time.

Since private off-street parking spaces are still available and the walking distances from parking lots are quite short to the destinations, the shortage of parking supply does not seem to severely retard economic and social activities at this point of time.

However, excess parking cars in certain busy areas (such as along Jalan Segget and Jalan Wong Ah Fook) and near some offices (such as the post office and banks where the demand is highly concentrated in time) cause confusion and congestion. This cannot be neglected as it is.

On-street parking should be minimized to increase road capacity in view of the increased demand expected within the CBD.

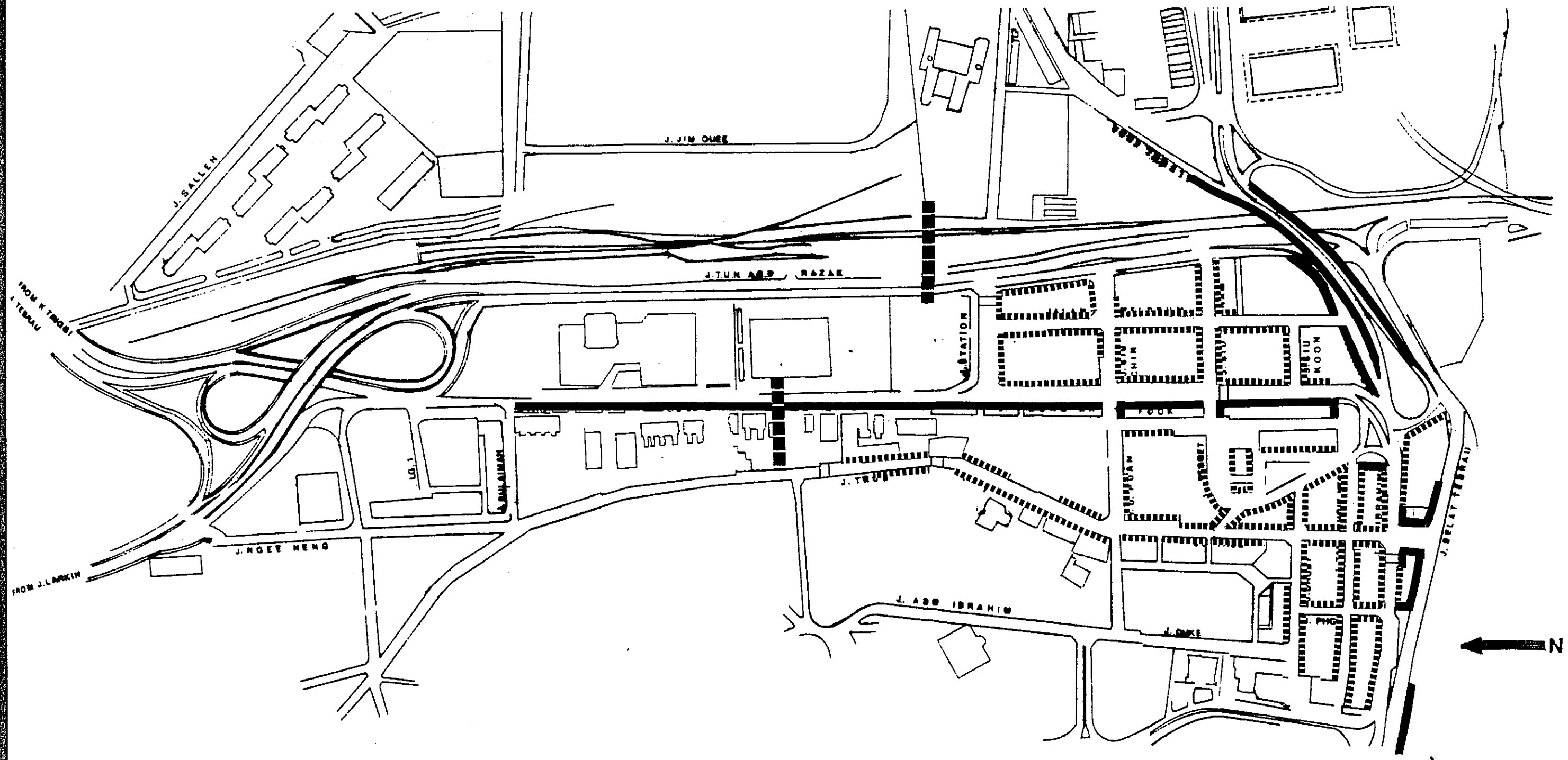
This suggests the necessity of developing off-street parking facilities away from the street, together stricter enforcement of car parking requirements on new developments.

#### 7. PEDESTRIAN FACILITIES

The existing pedestrian facilities in the CBD are illustrated in Fig.7.1

In general, pedestrian facilities are insufficient and some of them are inadequately installed so that pedestrians are often exposed to danger.

There are five-foot ways along the streets in the CBD. Some of them are not wide enough to accommodate heavy pedestrian demand in busy



**URBAN TRANSPORT MASTER PLAN  
STUDY FOR THE JOHOR BAHRU  
CONURBATION, MALAYSIA.**

LEGEND.	
—————	Side-walk
- - - - -	Five-foot way
	Pedestrian crossing
- - - - -	Pedestrian Bridge

TITLE.  
The Existing Pedestrian  
Facilities

MAP NO.  
  
FIG.  
7-1

areas. Some are partly hampered by displayed wares and unloaded goods. There are many changes of level in some areas, thus discouraging pedestrian use.

There are side-walks along Jalan Wong Ah Fook at the channel side. They are not wide enough to accommodate the continuous passage of pedestrians, especially near bus stops. Side walks in the CBD (except along Jalan Wong Ah Fook) are too narrow and are not continuous, such that few pedestrians use them.

Pedestrian crossing with yellow parallel lines are found only at five locations in the CBD. Three of them are at signalized intersections and the other two are installed near schools for school children's crossing.

Pedestrian crossings are insufficient. Pedestrian crossings (if clearly marked) are judged to effectively encourage pedestrians to use them consciously or unconsciously, so that random crossings be reduced. This is especially desired on circulating roadways to reduce pedestrian related accidents.

There are two pedestrian bridges, one of which is between the railway station and low cost flats and the market place over Jalan Tun Abdul Razak and the other one of which is between the market place and Jalan Trus over Jalan Wong Ah Fook. Both pedestrian bridges are well utilized, although many persons are seen to cross the streets even near the bridges. However, bridges are in poor conditions.

