FIGURE 4.5
ANNUAL COSTS –JEEPNEY

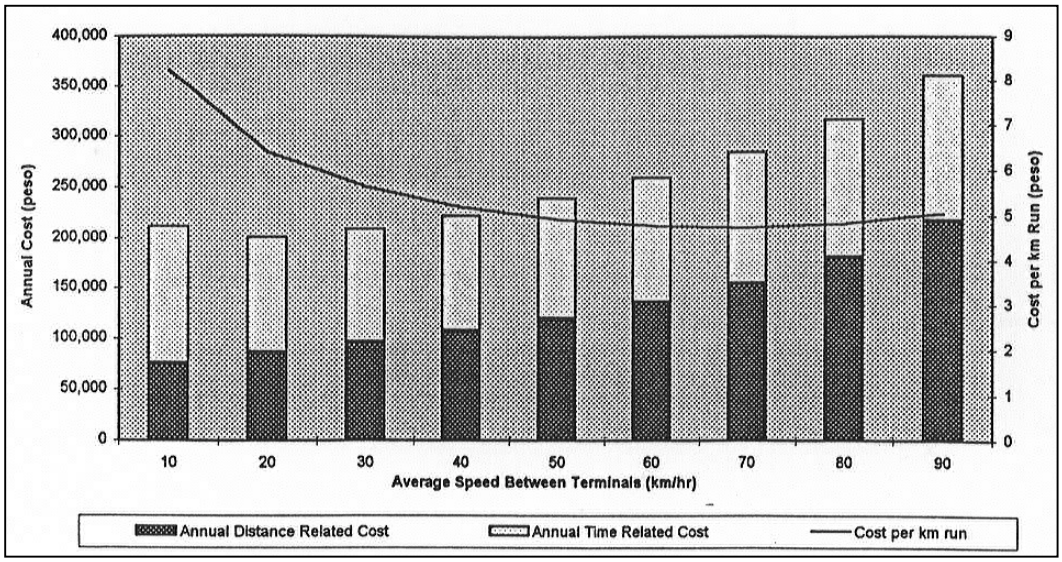

FIGURE 4.6
ANNUAL COSTS – NEW BUS

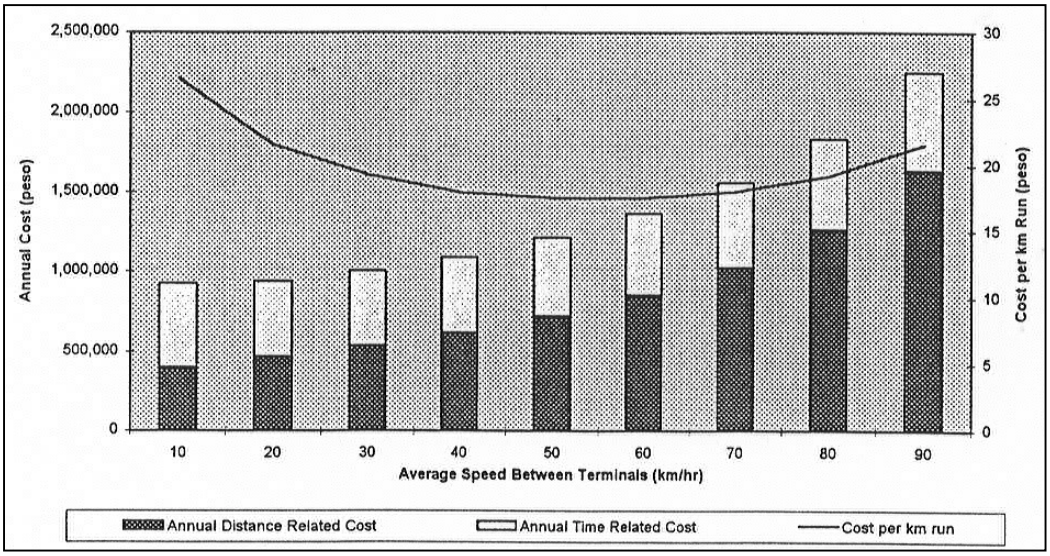

FIGURE 4.7
COSTS – RECONDITIONED BUS

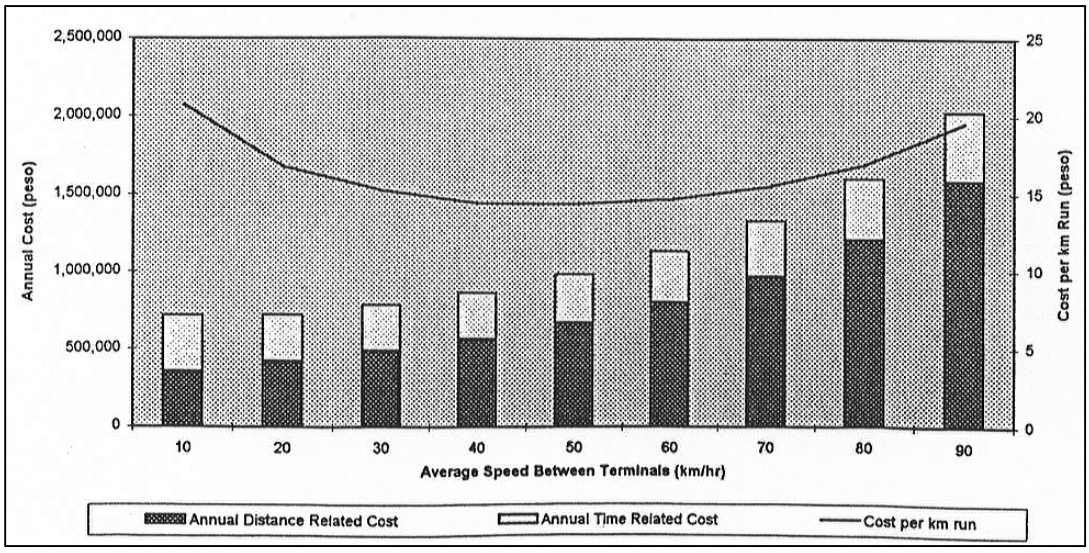

TABLE 4.2
PERCENTAGE OF DISTANCE-RELATED COSTS THAT ARE INCURRED FOR FUEL

Average Speed (km./hr.)	Jeepney	New Bus	Reconditioned Bus
10	34.8	22.2	24.8
20	32.5	20.3	22.5
30	30.6	18.8	20.7
40	29.4	18.1	19.7
50	28.8	17.7	19.0
60	29.1	18.2	19.4
70	30.1	19.3	20.2
80	31.8	20.5	21.2
90	33.3	20.9	21.5

It can be seen that fuel accounts for about 1/3 of the distance-related costs (including distance-related depreciation) of jeepney, and between 1/5 and 1/4 of these costs for bus. Fuel comprises a higher percentage of reconditioned bus costs as, while these have been assumed to have higher maintenance costs per km. run, the distance-related depreciation charge is calculated on a much lower capital cost (see Tables 4.4 and 4.5).

Other features of Figures 4.5 to 4.7 are as follows:

- The relatively high proportion of standing costs (light bar) in jeepney costs—the base DPWH utilization assumptions reflecting the tendency for jeepneys to spend a lot of time at terminals between runs, either waiting for a full load or waiting for their turn at the head of the queue (see Figure 4.1);

- Lower distance-related cost for reconditioned bus, as well as lower standing cost—the lower depreciation charge per 1,000 km. outweighs the higher maintenance cost assumed; and

- An increase in total cost as speed falls below 20 km./hr.—the increase in crew cost with the greater hours of use needed to achieve the assumed vehicle km. outweighs the combined effect of the decrease in distance-related cost per 1,000 km. at the lower speed and the reduction in km. run.

To further investigate the latter phenomenon, and to generate detailed costs for speeds below 10 km./hr. (which are not output by the VOCM), total cost estimates at 1 km./hr. intervals were generated for speeds from 1 to 20 km./hr. For speeds below 10 km./hr., the distance-related cost at 10 km./hr. was used as the relationships in VOCM will not accurately produce cost estimates below that speed. This reflects reality in Manila, where low average speed between terminals results from a combination of movement at reasonable speed punctuated by periods of standing at traffic signals or at stopping places while trying to attract more custom (and incurring only standing cost).

TABLE 4.3
VEHICLE UTILIZATION AND ANNUAL OPERATING COST AT LOW SPEED - JEEPNEY

Vehicle Cost To Be Depreciated Over Time 52,928
Annual Interest Charge 27,244
Crew Cost per Hour 26.88
Overheads as % of All Other Costs 5%
(10% on 50% of the fleet)

Average Speed	Distance Related Costs		Time Related Costs				Total Cost		
	'000 km. run	Annual Cost	Lifetime (yrs)	Dep'n/ year	Hours of Use	Annual Cost	Per year	Per km. run	Per hour run
3	21.71	64,320	13.17	4,018	8,014	262,217	326,538	15.04	14.11
4	22.29	66,013	12.92	4,096	6,367	215,919	281,932	12.65	50.60
5	22.86	67,706	12.69	4,172	5,388	188,435	256,141	11.21	56.03
6	23.43	69,398	12.46	4,247	4,741	170,359	239,757	10.23	61.40
7	24.00	71,091	12.25	4,321	4,286	157,657	228,748	9.53	66.72
8	24.57	72,784	12.05	4,394	3,949	148,314	221,098	9.00	71.00
9	25.14	74,476	11.85	4,466	3,692	141,211	215,687	8.58	77.21
10	25.71	76,169	11.67	4,537	3,490	135,674	211,843	8.24	82.38
11	26.29	77,322	11.49	4,607	3,328	131,249	208,572	7.93	87.28
12	26.86	78,452	11.32	4,676	3,197	127,678	206,130	7.68	92.10
13	27.43	79,558	11.16	4,744	3,089	124,763	204,321	7.45	96.84
14	28.00	80.641	11.00	4,812	3,000	122,362	203,003	7.25	101.50
15	28.57	81,701	10.85	4,878	2,925	120,373	202,074	7.07	106.09
16	29.14	82,737	10.71	4,944	2,862	118,718	201,454	6.91	110.60
17	29.71	83,749	10.57	5,009	2,809	117,337	201,086	6.77	115.04
18	30.29	84,738	10.43	5,073	2,764	116,185	200,923	6.63	119.42
19	30.86	85,704	10..31	5,136	2,726	115,225	200,929	6.51	123.72
20	31.43	86,646	10.18	5,198	2,694	114,428	201,074	6.40	127.96

TABLE 4.4
VEHICLE UTILIZATION AND ANNUAL OPERATING COST AT LOW SPEED – NEW BUS

Vehicle Cost To Be Depreciated Over Time 365,614
Annual Interest Charge 189,197
Crew Cost per Hour 54.88
Overheads as % of All Other Costs 5%

Average Speed	Distance Related Costs		Time Related Costs				Total Cost		
	'000 km. run	Annual Cost	Lifetime (yrs)	Dep'n/ year	Hours of Use	Annual Cost	Per year	Per km. run	Per hour run
5	31.11	347,028	17.86	20,474	6,870	680,092	1,027,120	33.01	165.07
6	32.00	356,943	17.50	20,892	6,000	629,000	985,943	30.81	184.60
7	32.89	366,858	17. 16	21,303	5,384	593,233	960,091	29.19	204.34
8	33.78	376,773	16.84	21,708	4,926	567,041	943,814	27.94	223.50
9	34.67	386,688	16.54	22,107	4,574	547,231	933,919	26.94	242.46
10	35.56	396,603	16.25	22,499	4,296	531,885	928,488	26.11	261.14
11	36.44	404,086	15.98	22,886	4,072	519,541	923,627	25.34	278.78
12	37.33	411,450	15.71	23,266	3,889	509,619	921,069	24.67	296.06
13	38.22	418,695	15.47	23,641	3,736	501,554	920,250	24.08	312.99
14	39.11	425,822	15.23	24,010	3,608	494,946	920,768	23.54	329.59
15	40.00	432,830	15.00	24,374	3,500	489,499	922,329	23.06	345.87
16	40.89	439.719	14.78	24,733	3,407	484,993	924,712	22.62	361.84
17	41.78	446,490	14.57	25,086	3,328	481,258	927,748	22.21	377.51
18	42.67	453,142	14.38	25,434	3,259	478,163	931,305	21.83	392.89
19	43.56	459,675	14.18	25,777	3,200	475,605	935,280	21.47	407.99
20	44.44	466,090	14.00	26 ,115	3,148	473,500	939,590	21.14	422.82

TABLE 4.5
VEHICLE UTILIZATION AND ANNUAL OPERATING COST AT LOW SPEED – RECONDITIONED BUS

Vehicle Cost To Be Depreciated Over Time 95,150
Annual Interest Charge 51,835
Crew Cost per Hour 54.88
Overheads as % of All Other Costs 5%

Average Speed	Distance Related Costs		Time Related Costs				Total Cost		
	'000 km. run	Annual Cost	Lifetime (yrs)	Dep'n/ year	Hours of Use	Annual Cost	Per year	Per km. run	Per hour run
5	31.11	310,201	10.71	8,881	6,870	512,558	822,759	26.45	132.23
6	32.00	319,064	10.50	9,062	6,000	461,101	780,165	24.38	146.28
7	32.89	327,927	10.30	9,240	5,384	424,972	752,899	22.89	160.25
8	33.78	336,790	10.11	9,416	4,926	398,423	735,213	21.77	174.13
9	34.67	345,653	9.92	9,589	4,574	378,259	723,912	20.88	187.94
10	35.56	354,516	9.75	9,759	4,296	362,563	717,079	20.17	201.68
11	36.44	361,475	9.59	9,927	4,072	349,927	711,402	19.52	214.72
12	37.33	368,341	9.43	10,092	3,889	339,718	708,059	18.97	227.59
13	38.22	375,114	9.28	10,254	3,736	331,372	706,487	18.48	240.29
14	39.11	381,795	9.14	10,414	3,608	324,489	706,284	18.06	252.82
15	40.00	388,382	9.00	10,572	3,500	318,774	707,156	17.68	265.18
16	40.89	375,114	8.87	10,728	3,407	314,005	708,882	17.34	277.39
17	41.78	381,795	8.74	10,881	3,328	310,013	711,292	17.03	289.44
18	42.67	388,382	8.63	11,032	3,259	306,667	714,255	16.74	301.33
19	43.56	413,804	8.51	11,181	3,200	303,863	717,667	16.48	313.06
20	44.44	419,927	8.40	11,327	3,148	301,518	721,445	16.23	324.65

These estimates are presented in Tables 4.3 (Jeepney), 4.4 (New Bus) and 4.5 (Reconditioned Bus). The presentation is limited to the practical range of speeds (above 3 km. for Jeepney, above 5 km./hr. for Bus). The tables also show the utilization assumptions involved in the total cost estimates and present the costs summarized as peso per km. and hour run.

The costs are also presented graphically in Figures 4.8 (Jeepney), 4.9 (New Bus) and 4.10 (Reconditioned Bus). Again stacked bars are used to display the annual costs segregated into distance-related and time-related costs (left hand scale) and a curve to show the cost per vehicle km. run (left hand scale). The horizontal bars relate to potential revenue, discussed further in Section 4.3 below.

4.3 Potential Revenues and Financial Viability -- Theory

Tariff scales for most public transport operations in the Philippines are regulated by LTFRB. After a long period in which fares have declined in real terms (and even in nominal terms, as decreases in the dollar cost of diesel, combined with changes in the peso-dollar exchange rate, led to lower fuel prices and a downward revision of the permitted tariffs in the late 1980s), the scales have recently been increased.

Figure 4.11 compares the permitted fare for a 10 km. trip by bus or jeepney with that charged by LRT Line 1, with all fares converted to 1985 price levels using the Metro Manila Consumer Price Index as a deflator. It can be seen from this that, although the December 1996 and October 1997 tariff revisions increased fares for the first time in six years, tariffs are still lower in real terms than any time prior to July 1993, and are only 2/3 of their value immediately following the January 1986 revision.

The figure also shows that bus and jeepney fares for the same trip are similar (up to November 1988, they were identical). For a number of years, the tariff structure has comprised a minimum (boarding) charge for trips of up to 4 km., with an additional (marginal rate) charge for every km. after the 4^{th}.

The boarding charge has historically been between three and four times the marginal rate. The fare, in peso/km., thus approximates the marginal rate for all trips over 3 km. Bus and jeepney revenues, therefore, rise per passenger km. and, at any given load factor, per vehicle km. As can be seen from the figures presented in Section 4.2, the operator's costs, particularly in congested urban conditions, rise largely with the passage of time.

The curves in Figures 4.5 to 4.10 show how cost per vehicle km. rises as average speed falls over the whole range of speeds likely to be encountered by urban public transport. Figures 4.8 to 4.10 also show a horizontal line representing the marginal rate per passenger km. factored by the number of seats on the vehicle (18 for Jeepney, 60 for Bus). The horizontal line, thus, represents the maximum rate at which income can accrue to the vehicle operator under normal operating circumstances.

On this basis, jeepney operation will be profitable at average speeds above 9 km./hr., for new bus operation at speeds above 7 km./hr., and for reconditioned bus operation at any speed, provided the vehicle is fully loaded throughout the journey. In practice, load factors seldom reach 100%, and much of urban jeepney operation is at an average speed of less than 9 km./hr.

The curves in Figures 4.12 (Jeepney), 4.13 (New Bus) and 4.14 (Reconditioned Bus) show cost per hour run (from Tables 4.3 to 4.5) and revenue/hr. curves based on 100%, 75% and 50% load factors. These confirm the "break-even" points with 100% loading indicated in Figures 4.8 to 4.10, and also show that:

- Jeepney operation at a 75 % load factor is profitable at speeds above 20 km./hr.;
- Jeepney operation with a 50% load factor is never profitable;
- New Bus operations at 75% load factor become profitable at speeds above 17 km./hr.;
- Reconditioned bus operation is profitable above 8 km./hr. at 75 % load factor; and
- Reconditioned bus operations at 50% load factor may be profitable at high speeds, possibly above 30 km./hr.

While these findings confirm that financial viability is possible for bus and jeepeney operations, the likelihood of any of the required combinations of circumstances occurring in Metro Manila, with the possible exception of high enough load factors and speeds for reconditioned bus, are fairly low.

4.4 Potential Revenues and Financial Viability - On-Street Practice

The above theoretical conclusion that there are limited circumstances under which bus or jeepney services could be profitable in Metro Manila contrasts with the high (and increasing) number of vehicles registered to provide services in, to or from the NCR. This indicates that operators have found ways of closing the gap between costs and adequate revenues, by:

- Increasing revenue per unit of vehicle output;
- Decreasing costs; or
- Both.

Observation of on-street public transport and analysis of MMUTIS bus and jeepney survey data has indicated a number of ways in which operators are achieving this.

4.4.1 Increasing Revenue

The principle ways in which bus operators can obtain higher income per passenger km. than that indicated in Section 4.3 is by offering value-added (premium) services– i.e., airconditioned (AC) and express–which are less regulated than ordinary bus services.

FIGURE 4.8
ANNUAL COSTS AT LOW SPEEDS – JEEPNEY

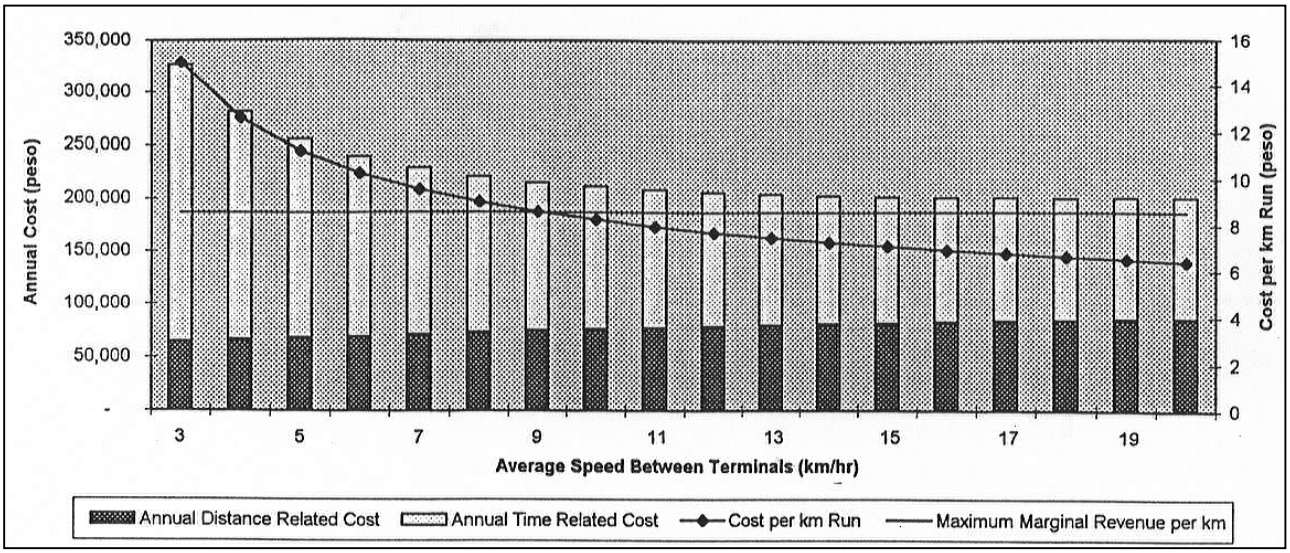

FIGURE 4.9
ANNUAL COSTS AT LOW SPEEDS – NEW BUS

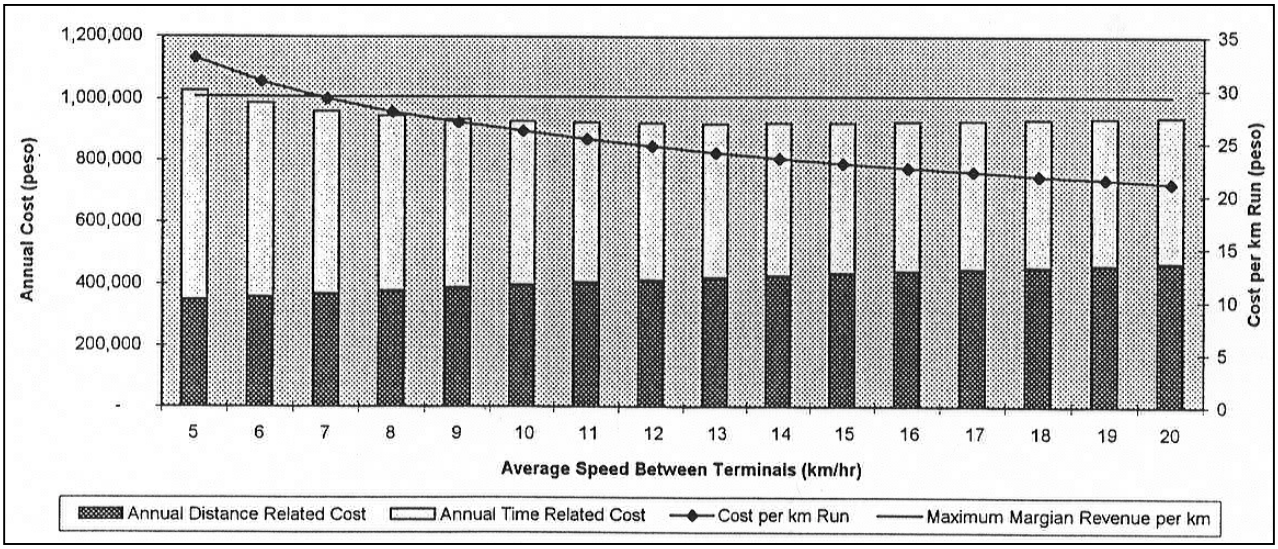

FIGURE 4.10
ANNUAL COSTS AT LOW SPEEDS – RE-CONDITIONED BUS

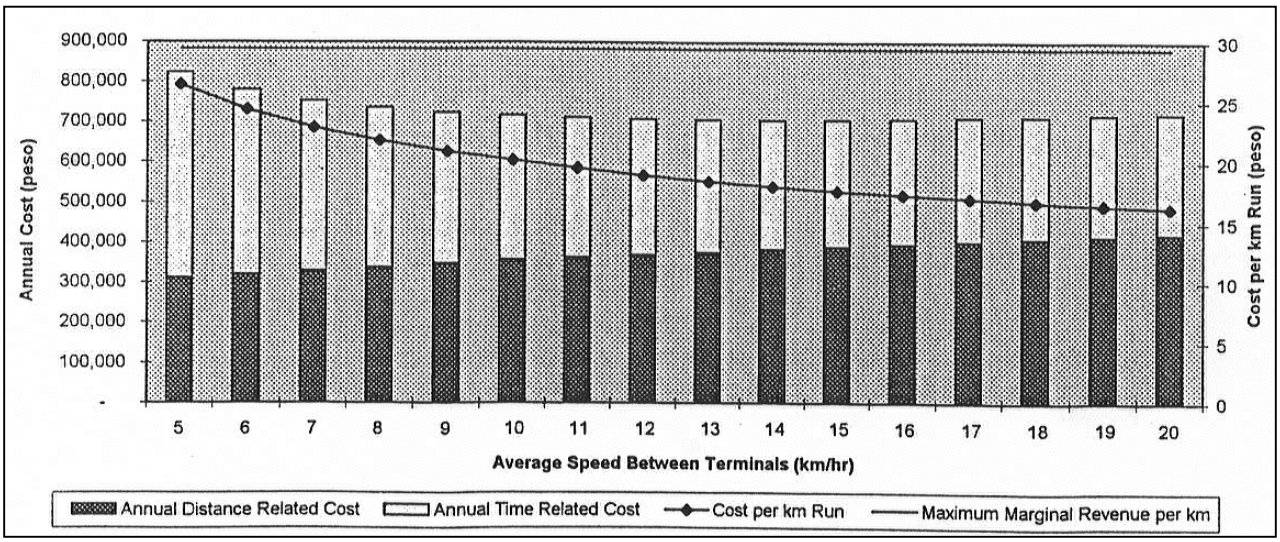

FIGURE 4.11
PUBLIC TRANSPORT FARES
REAL (1985 PESOS, MMCPI DEFLATOR), 10KM TRIP