

CHAPTER IV

ROAD USER BENEFITS AND HIGHWAY COSTS

Savings in Road User Costs

Once operating costs of vehicles have been established, savings can be determined. Over the tunnel road, savings accruing to each of the six types of vehicles can be derived by subtracting the total operating cost for each of the six types of vehicles over the tunnel road from the operating costs for each of the corresponding six types of vehicles over existing highway 1, as shown in Table 13. Similarly, savings in vehicle operating costs over Klang Gates road are given in Table 14.

Annual savings for each type of vehicle will have to be calculated for the total number of vehicles in each category or class, for example, savings accruing to one 5-ton truck have to be calculated for all 5-ton trucks each year. The same calculation has to be done for 3-ton trucks, vans, buses, cars and taxis. Table 15 shows the annual savings accruing to each of the six types of vehicles operating on the tunnel road and Table 16 shows the annual savings over Klang Gates road.

For each of the two proposed highways, the annual savings from all the six types of vehicles when added together, will make up the gross annual savings in vehicle operating cost or road user cost. These will have to be reduced to annual net savings by deducting the annual highway costs. But before highway costs can be deducted, they have first to be calculated.

Highway Costs - Construction, Maintenance, Resurfacing,

Estimates of the cost per mile associated with highway improvements have been obtained from the Selangor State Engineer. These are calculated for the four roads under analysis. No construction costs will be considered for the two existing highways since they have already been incurred. (The analysis is only

TABLE 13

ANNUAL SAVINGS IN VEHICLE OPERATING COST - COMPARING
EXISTING HIGHWAY I WITH TUNNEL ROAD

Type of Vehicle	Operating Cost on Existing Highway I (cents)	Operating Cost on Tunnel Road (cents)	Annual Savings in Vehicle Operating Cost (cents)
5-ton trucks	788.92	387.00	401.92
8-ton trucks	1128.61	530.78	597.83
Vans	356.87	148.59	208.28
Buses	965.82	473.76	492.06
Cars	304.67	137.79	166.88
Taxis	356.87	148.59	208.28

TABLE 14

ANNUAL SAVINGS IN VEHICLE OPERATING COST - COMPARING
EXISTING HIGHWAY II WITH KLANG GATES ROAD

Type of Vehicle	Operating Cost on Existing Highway II (cents)	Operating Cost on Klang Gates Road (cents)	Annual Savings in Vehicle Operating Cost (cents)
5-ton trucks	2904.44	1376.94	1527.50
8-ton trucks	3911.69	1933.09	1978.60
Vans	1205.07	537.43	667.59
Buses	3410.90	1694.22	1716.68
Cars	1011.58	481.68	529.90
Taxis	1205.07	537.48	667.59

TABLE 15

ANNUAL SAVINGS IN OPERATING COST BY TYPE OF VEHICLE - TUSSEL ROAD

Year	5-ton trucks \$	3-ton trucks \$	Vans \$	Buses \$	Cars \$	Taxis \$
1960	1,230,260	550,645	21,517	384,093	599,161	64,063
1967	1,660,501	727,164	20,447	593,040	792,155	84,617
1968	2,151,573	901,165	37,620	673,123	1,047,631	111,932
1969	2,647,757	1,273,211	60,065	699,943	1,365,950	142,189
1970	3,771,373	1,660,144	65,990	1,179,917	1,639,774	156,269
1971	4,917,330	2,284,204	77,480	2,593,443	2,443,957	209,900
1972	6,024,925	2,912,233	115,970	2,672,035	3,225,935	344,634
1973	6,739,076	3,067,593	131,717	2,747,783	4,229,547	467,238
1974	11,065,503	5,269,560	214,024	3,649,013	5,661,460	606,661
1975	15,491,721	6,374,258	276,940	4,649,673	7,574,940	696,940

TABLE 16

ANNUAL SAVINGS IN OPERATING COST BY TYPE OF VEHICLE - KANG GATES ROAD

Year	5-ton trucks \$	8-ton trucks \$	Vans \$	Busco \$	Cars \$	Taxis \$
1966	3,316,520	1,200,143	49,249	1,006,165	1,209,339	159,026
1967	4,304,658	1,705,952	65,243	1,449,100	1,704,505	209,670
1968	5,630,116	2,205,740	85,367	1,917,523	2,201,675	277,770
1969	7,675,024	2,927,645	114,231	2,437,327	2,905,450	367,647
1970	10,106,704	3,955,391	151,275	3,209,247	3,942,445	459,673
1971	13,471,003	5,241,730	209,450	4,457,575	5,237,276	645,155
1972	17,666,513	6,940,542	255,750	5,800,240	6,943,635	855,356
1973	23,603,285	9,215,691	332,543	7,639,769	9,211,633	1,104,403
1974	31,447,376	12,034,512	467,222	10,309,643	12,745,500	1,564,060
1975	41,741,020	16,269,351	621,404	14,604,561	16,235,523	1,969,976

concerned with costs that will have to be incurred in the future, not costs that have already been incurred). Only the continuing costs such as cost of maintenance and resurfacing will be taken into account. However, for the two proposed highways, construction costs will be included because these have not been incurred yet and will be only if the proposals are accepted.

Highway costs have been calculated on an annual basis (except for construction costs) for all the four roads in Table 17. It must be pointed out that resurfacing usually takes place only once in 12 years. However, for our purpose, the annual cost of resurfacing has to be determined. This is done by spreading cost of resurfacing (which is \$130,000 a mile) over 12 years and then calculating it for the entire length of the road. It will be noticed that the maintenance cost per mile of the two existing highways is less than that of the two proposed highways. This is because the new roads would be wider by 4 feet and therefore would cost more to upkeep them. Resurfacing costs, however, are the same for all four highways despite the difference in width because a thicker layering is required for the existing highways.

Separate highway costs for each of the four roads will not be of much use unless a comparison can be made between the highway cost of the existing road and the highway cost of the proposed road in each of the two projects and the difference in cost derived for each project. From Table 17 it is found that the difference between existing highway I and the tunnel road is \$78,533 per annum and the difference between existing highway II and King Gates road is \$33,534 per annum. This difference shows the additional cost to be incurred over the proposed highways.¹

¹The significance of this difference will be indicated in Chapter V.

HIGHWAY COSTS - COST ESTIMATES, CAPITALIZED, RESCHEDULED

Category Cost	Existing Highway I (12.55 ml)		New Road (0.52 ml)		Existing Highway II (3.76 ml)		Misc. costs (ml) (61.03 ml)	
	cost/ml (c)	Total cost (t)	cost/ml (c)	Total cost (t)	cost/ml (c)	Total cost (t)	cost/ml (c)	Total cost (t)
Construction	-	-	355,000 (for 0.52 ml) (for 0.5 ml)	2,370,000 1,375,000 (for 0.5 ml)	-	-	250,000	7,755,000
Maintenance	4,500	19,500	5,000 (for 0.5 ml) (for 0.5 ml)	5,500 4,000 (for 0.5 ml)	4,500	261,000	6,000	150,000
Resurfacing	130,000 ^b	17,000 ^c	130,000 ^d	97,000 ^e	150,000 ^b	550,200 ^c	130,000 ^b	330,000 ^c
Total capitalized cost		200,300		144,000		824,160		499,000

^a Highway costs are calculated on an annual basis except for construction costs which will be incurred only once in the life of a highway.

^b Resurfacing cost per mile over a period of 12 years.

^c Annual contribution to maintenance over entire period of road. ^d refers to maintenance and resurfacing cost

PROPERTY COSTS - (2017-2018) - BIRMINGHAM, ALABAMA

Category Cost	Existing Highway I (14.75 ml)		New Road (0.53 ml)		Existing Highway II (3.75 ml)		Misc. Other Road (0.00 ml)	
	Cost/ml (1)	Total cost (2)	Cost/ml (3)	Total cost (4)	Cost/ml (5)	Total cost (6)	Cost/ml (7)	Total cost (8)
Construction	-	-	380,000 (for 0.53 ml) 2,000,000 (total) (for 0.53 ml)	2,076,000 (for 0.53 ml) 1,000,000 (for 0.53 ml) 3,076,000	-	-	207,000	7,750,000
Maintenance	6,000	6,000	3,000 (for 0.53 ml) 8,000 (total) 4,000 (for 0.53 ml) 4,000	4,000 (for 0.53 ml)	4,500	241,075	4,000	19,000
Resurfacing	100,000 ^b	17,000 ^c	130,000 ^b	57,000 ^c	150,000 ^b	600,202 ^c	150,000 ^b	330,000 ^c
Total construction cost ^d		200,000		144,000		624,167		409,000

^a Highway costs are calculated on an annual basis except for construction costs which will be incurred only once in the life of a highway.

^b Resurfacing cost per mile over a period of 12 years.

^c Annual contribution to maintaining over entire length of road. ^d refers to maintenance and resurfacing cost