

## 9.3 Vehicle Operating Cost

### 9.3.1 Introduction

All the transport projects are evaluated in terms of investment efficiency measured by ratio of cost and road users' benefit. Road users' benefit is measured by the saving in road users' cost, which is composed of;

- Vehicle Operating Cost (VOC)
- Time Cost (TC)

This section traces these two road user' cost in depth. Figures of VOC (Running Cost related) are compiled into unit cost per 1000 Km, and VOC (Fixed Cost related) are shown by a unit cost per hour.

### 9.3.2 Roles and Principles of Up-Dating Vehicle Operating Cost

Vehicle operating cost (VOC) plays a role in two major fields; first it provides the solid base to calculate the project's benefit. In other word, it is employed to measure how much the master plan contribute to the national economy in terms of saving in transport cost. Second, this provides basic data to select the best mode for passenger and freight transportation in theoretical way. In this study, mode selection between taxi and bus for passengers, and more general modal split among all transportation mode adopted this VOC.

Principles of data compiling and presentation are two-holds. First is to keep consistency in cost components and assumptions adopted in estimating VOC in series of transport studies. This can make it possible to compare various VOC figures, and contribute to highlight specific features peculiar to each study which are conducted at different time under different economic circumstance. This is especially significant when economy is under the transition period to more privatized system as today's Egypt experiences.

With a progress of privatisation and market mechanization, some cost components are expected to show drastic shift. For example, fuel price, which are now set at far lower than international price, would show upward shift when price control is de-regulated, and vehicle price would decline at the market without high import taxes. These trend can be observed often under the consistent estimation framework.

Second is to make it easy to trace back the whole calculation process. With this easiness, any study can focus all its efforts on further refinement of calculation frame and up-dating the employed data within the consistent analytical frame.

For this purpose, this study introduced new presentation formats of VOC, both in summary figures and individual sub-items' figures. ENTS II and III have adopted one big sheet containing whole parameters and results, and was suffered from humbleness to trace the whole calculation processes. This required much time and a great effort to review the estimation process and the rationale of various assumptions, and consequently the acceptability of the results.

New formats in this study are designed to improve this weakness of the previous formats and make all the calculation process easier to trace back. This can contribute to modify or refine them without any efforts in the future if necessary.

All these can contribute to make it possible to refine the assumption, methodology, and leave the national property on know-how concerning the transport study within a consistent manner. Building the structure by adding a piecemeal advancement to the prior works is the most efficient way to the greatness. It is a slow and steady way, and also a great cumulative process. By starting from the highly sophisticated level, any economist can contribute to reshape the prior performance and go beyond it.

### 9.3.3 VOC; Kinds and Components

Economic VOC is artificially derived by eliminating all the transfer items from the financial VOC expressed at the market price. All the taxes are reduced from the market price of materials concerned, and subsidies are added to the market price. Thus economic VOC reflects real cost of vehicle consumed in traveling by vehicles and equivalent to marginal productivity of each materials.

Components of VOC are listed below. Overall VOC is divided into two major items; fixed and running cost, both of which are composed of various sub-items.

#### Fixed Cost (time-related)

1. Capital cost (time-related portion)
2. Overhead cost
3. Crew Salaries, and
4. Registration Fee

#### Running Cost (distance-related)

1. Fuel cost
2. Lubricate cost
3. Tyre cost
4. Maintenance cost
5. Overhead cost (distance-related portion)

Running cost is compiled into the unit cost per travel distance (1000 Km), which fixed cost into the cost per running-hour. Difference in unit reflects their charac-

teristics. Running cost generates according to travel distance and the fixed cost generates owing to the vehicle possession and is related to the travel hour rather than travel distance.

These costs are, of course, dependent of road surface conditions as well as road geometric conditions such as radius and gradient. This is directly related with the travel speed. VOC variation according to the road surface is thus coordinated in estimating the travel speed at each segment of the road.

#### 9.3.4 Basic Data

##### 1) General

This section explains basic items which frequently appear in calculation of various sub-items of VOC. Those sub-item are (1) representative vehicle, (2) life of vehicle, (3) annual kilometer of vehicle, and (4) average travel speed.

Basic principle to estimate these figures is kept same as ENTS III. Thus main task falls on examining whether figures in ENTS III should be updated or not. Observation results and interviews with various entities provide the data for this works.

##### 2) Representative Vehicles

This study adopted 12 vehicle categories in total. Of which 6 for passenger transportation, and remaining 6 for freight transportation. Table 9-3-1 shows all representative cars.

Table 9-3-1 Representative Vehicle

Usage	Vehicle Type	Representative Car and Components
(1) For Passenger Transport		
	a. Passenger Car	Fiat 128
	b. Peugeot 504	Peugeot 504
	c. Pick-up Car	Mazda 1600cc
	d. Medium Bus	Nasr
	e. Large Bus	Nasr
	f. Super Deluxe-AC	Nasr
(2) For Freight Transport		
	a. Medium Truck (8 tons)	Nasr 125-13
	b. Heavy Truck (15 tons)	
	c. Semi-trailer (25 tons)	Tractor (13.7 li + Trailer (25 tons)
	d. Truck-trailer (20 tons)	Truck (8 tons) + Trailer (12 tons)
	e. Truck-trailer (30 tons)	Truck (15 tons) + Trailer (15 tons)

No specific change from ENTS III appears in this study. Vehicle type on the list is most prevailing type, and this is justified by the observation results.

However, vehicle selection for inter-city taxi is noteworthy. It is common in Egypt to employ the second-hand Peugeot van for a inter-city taxi since new-car-price is doubled due to high tariff rate. Thus Peugeot referred in this study is defined as a second-hand Peugeot van.

### 3) Life of Vehicle

This is set according to the interview results and annual reports of transportation companies.

Average life of vehicles are set a bit longer than those in ENTS III because of increasing ratios of new cars. Those are 7 years for Peugeot 504, 10 years for all buses, 11 years for semi-trailer (25 ton), 12 years for heavy truck (15 ton) and truck-trailer (30 ton), and 13 years for passenger car, pick-up car, and pick-up trailer (12 ton).

### 4) Annual Kilometric of Vehicle

This is also set according to the interview results and annual reports of transportation companies.

Those are 18,000 Km for passenger car, 30,000 Km for pick-up car, 50,000 Km for heavy truck (15 ton), 55,000 Km for Medium truck (8 tons), 65,000 Km for all truck-trailers, 84,000 Km for Peugeot 504, and 100,000 Km for all buses.

Public transportation mode such as bus and Peugeot 504 are set to travel longer than other vehicles. For instance, large bus runs 5.6 times longer than passenger car.

### 9.3.5 Running Costs

There are 5 items in this "Running Cost"; (1) fuel, (2) lubricating oil, (3) tyre, and (4) maintenance costs, and (5) capital cost (distance-related portion).

#### 1) Fuel

Table 9-3-2 shows price structure of fuel and usage composition by vehicle type.

Three kinds of fuel for vehicles are widely used in Egypt; super gasoline, regular gasoline and solar (diesel). Usage composition among three are employed as a weight to determine the average price of fuel by each type of vehicle. Table 9-3-2 shows the results. There is an apparent tendency that vehicles for passenger transport are apt to use gasoline, and freight vehicles prefer solar.

Table 9-3-2 Price of Fuel  
(unit; L.E./litre)

Items	Gasoline		Solar	Average Price	
	Super	Regular		Econ.	Fina.
A. Fuel Price					
Economic Cost					
Price in Europe	0.798	0.730	0.480		
Transportation	0.239	0.219	0.144		
Economic Price	1.037	0.949	0.624		
Financial Cost	1.000	0.900	0.300		
B. Vehicle Composition by Fuel Type					
Passenger Car	20	80	0	0.967	0.920
Peugeot	20	80	0	0.967	0.920
Pick-up Truck	30	0	70	0.748	0.510
Medium Bus	0	0	100	0.624	0.300
Large Truck	0	0	100	0.624	0.300
Super Deluxe AC Bus	0	0	100	0.624	0.300
Medium Truck ( 8 tons)	0	0	100	0.624	0.300
Heavy Truck (15 tons)	0	0	100	0.624	0.300
Semitrailer (25 tons)	0	0	100	0.624	0.300
Truck-trailer (20 tons)	0	0	100	0.624	0.300
Truck-trailer (30 tons)	0	0	100	0.624	0.300
Trailed Wagon (25 tons)	0	0	100	0.624	0.300

Note; (1) Price of "Super Gasoline" in Europe is US\$241.69/ton,  
"Regular Gasoline" US\$221.13/ton, and "Solar" US143.92/ton.  
(2) Transportation cost from Europe to Egypt is assumed 30% of  
of the fuel price in Europe.  
(3) Foreign exchange rate is 3.3 L.E./US\$.

Source; Misr Petrol Company

Table 9-3-3 Economic and Financial Price of Fuel

Items	Average Fuel	Unit Fuel	Econ	Fina
	Consumption (litter/1000Km)	Consumption (km/litter)	Cost (LE/1000Km)	Cost (LE/1000Km)
Passenger Car	80	12.5	77.33	73.60
Peugeot	90	11.1	87.00	82.80
Pick-up Truck	110	9.1	82.28	56.10
Medium Bus	173	5.8	107.95	51.90
Large Truck	235	4.3	146.64	70.50
Super Deluxe AC Bus	350	2.9	218.40	105.00
Medium Truck ( 8 tons)	165	6.1	102.96	49.50
Heavy Truck (15 tons)	279	3.6	174.10	83.70
Semitrailer (25 tons)	589	1.7	367.54	176.70
Truck-trailer (20 tons)	391	2.6	243.98	117.30
Truck-trailer (30 tons)	713	1.4	444.91	213.90
Trailer w/o Engine	270	3.7	168.48	81.00

The financial and economic costs are tabulated in Table 9-3-3. Market prices of fuel are fixed under the jurisdiction of national law. The latest revision of fuel price was executed in June 1992, which was lifted upward, reflecting the pressure to absorb the rising cost of fuel production. All the price data were collected after this 1992 June revision.

Economic cost is estimated by means of international price since market price of fuel is far lower than the international market price. This means the market price is subsidized by the government without actual government expenditure since Egypt produces crude oil and has facilitated refinery plants in its boundary. The government aims at relieving the household expenditure from the heavy burden.

International price of fuel is quoted from those at Netherlands market in 1992 and transportation cost of fuel to Egypt was added to arrive the economic price of fuel in Egypt. Fuel dealers in Egypt reckon in the interview that this transportation cost is about 30% of the European market price, and this figure was adopted in the study.

## 2) Lubricating Oil

Table 9-3-4 Price of Lubricating Oil and Vehicle Composition by Oil Type

(unit; L.E./kg)

Items	Lubricating Oil		Econ. Cost (LE/1000Km)	Finan. Cost (LE/1000Km)
	First Class	Second Class		
<b>A. Price Composition</b>				
Economic Cost	3.318	2.500		
Financial Cost				
Sales Tax	0.332	0.250		
Market Price	3.650	2.750		
<b>B. Vehicle Composition by Lubricating Oil Type (%)</b>				
Passenger Car	20	80	2.664	2.930
Peugeot	0	100	2.500	2.750
Pick-up Truck	0	100	2.500	2.750
Medium Bus	0	100	2.500	2.750
Large Bus	0	100	2.500	2.750
Deluxe AC Bus	0	100	2.500	2.750
Medium Truck ( 8 tons)	0	100	2.500	2.750
Heavy Truck (15 tons)	0	100	2.500	2.750
Semi-trailer (25 tons)	0	100	2.500	2.750
Truck-trailer (20 tons)	0	100	2.500	2.750
Truck-trailer (30 tons)	0	100	2.500	2.750
Trailed Wagon (25 tons)	0	100	2.500	2.750

Note; "Sales Tax" is set at 10% of "Economic Cost."

Source; Gas Station

Table 9-3-5 Economic and Financial Lubricating Oil Prices  
(unit; kg/1000km)

Items	Lubricating Oil Consumption (LE/1000Km)	Economic Cost (LE/1000Km)	Financial Cost (LE/1000Km)
Passenger Car	2.83	7.54	8.29
Peugeot	3.40	8.50	9.35
Pick-up Truck	3.97	9.93	10.92
Medium Bus	6.95	17.38	19.11
Large Bus	10.67	26.68	29.34
Deluxe AC Bus	15.38	38.45	42.30
Medium Truck	5.00	12.50	13.75
Heavy Truck	9.45	23.63	25.99
Semi-trailer	12.73	31.83	35.01
Truck-trailer (20 ton)	9.45	23.63	25.99
Truck-trailer (30 ton)	12.73	31.83	35.01
Trailed Wagon (25 ton)	9.45	23.63	25.99

Source; ENTS III

Tables 9-3-4 and 9-3-5 show whole calculation procedures. Two kinds of lubricating oil are widely used in Egypt; "First Class" with higher price, and "Second Class" with lower price. Usage composition among vehicles is employed again to get a weighted price of lubricating oil. However, only a few portion (10%) of the passenger car uses first class oil and almost all other vehicles use the low-priced second class oil. This weighting process actually does not have a significant impact on the price setting. The following is a calculation example.

For passenger car:

(First grade lubricant 20% x 3.318LE/lit.+Second grade lubricant 80% x 2.500LE/lit.) = 2.664 LE/lit.

Consumption rate 2.83 Kg/1000Km x 2.664 = 7.54 LE/1000Km

### 3) Tyre

Table 9-3-6 shows whole figures of calculation. This study assumes all the tyres are Egyptian made tyres, and have a unique price. Life of tyre are set same as ENTS III.

Two kinds of tyres are actually put on the market; imported, of which majority are the second-hand and used one, and domestically manufactured tyres. No clear data are available to highlight the share compositions of each category of tyre.

Tyre dealer provides a rough composition share of imported tyres to be a half of all. Price are almost 1.5 times as high as that of domestically manufactured one. In this study, those guesswork seems too rough to rely on and this leave this problem as a mater for further refinement in the

proceeding study on this item.

As for the life length of type, there are no significant improvement in quality of type all over the world since ENTS III was prepared. Thus it was kept same as it was in ENTS III.

Table 9-3-6 Economic and Financial Tyre Prices  
(unit; L.E.)

	Number of Tyre	Economic Price		Sales Tax (10%)	Financial Price Set	Average Travel Distance	Economic Cost (LE/ 1000Km)	Financial Cost (LE/ 1000Km)
		One	Set	Set	Set			
Passenger Car	4	77	309	31	340	30000	10.30	11.33
Peugeot	4	102	409	41	450	40000	10.23	11.25
Pick-up Truck	4	102	409	41	450	30000	13.64	15.00
Medium Bus	6	550	3300	330	3630	65000	50.77	55.85
Large Bus	6	718	4308	431	4739	65000	66.28	72.90
Deluxe-AC Bus	6	718	4308	431	4739	65000	66.28	72.90
Medium Truck (2ax, 8ton)	6	551	3306	331	3637	55000	60.11	66.12
Heavy Truck (3ax, 15ton)	10	718	7180	718	7898	55000	130.55	143.60
Semitrailer (25 tons)	14	608	8512	851	9363	65000	130.95	144.05
Truck-trailer (20 tons)	14	551	7714	771	8485	65000	118.68	130.54
Truck-trailer (30 tons)	18	718	12924	1292	14216	65000	198.83	218.71
Trailed Wagon (25 tons)	14	608	8512	851	9363	55000	154.76	170.24

Note; (1) Sales Tax is 10% for all kinds of tyre.

Source; Tyre Shop

#### 4) Maintenance Costs

##### (1) Parts

Table 9-3-7 Maintenance Cost; Parts

Items	Vehicle Price with Tyre (L.E.)		Parts Cost (%) of New Car	Part Cost (L.E./year)		Annual Maintenance Cost; Travel Parts (L.E./1000km) Distance (km/year)	Annual Maintenance Cost; Travel Parts (L.E./1000km)	
	Economic	Financial	Economic	Financial	Economic		Financial	
Passenger Car	19825	25900	0.10	20	26	18000	1.10	1.44
Peugeot	42473	80000	0.10	42	80	84000	0.51	0.95
Pick-up Truck	32062	40000	0.11	35	44	30000	1.18	1.47
Medium Bus	144513	152700	0.14	202	214	100000	2.02	2.14
Large Bus	227132	240000	0.11	250	264	100000	2.50	2.64
Deluxe AC Bus	528000	700000	0.07	370	490	100000	3.70	4.90
Medium Truck	73581	83000	0.09	66	75	55000	1.20	1.36
Heavy Truck	103900	130000	0.07	73	91	50000	1.45	1.82
Semi-trailer	134271	168000	0.07	94	118	65000	1.45	1.81
Truck-trailer (20 tons)	92951	116300	0.08	74	93	65000	1.14	1.43
Truck-trailer (30 tons)	131074	164000	0.07	92	115	65000	1.41	1.77
Trailed Wagon (25 tons)	31155	35143	0.07	22	25	50000	0.44	0.49

Note; "Sales Tax" is set at 10% of "Economic Cost."

Source; Repair Shop



Table 9-3-7 shows summary figures of parts cost. This is set same as in ENTS III with a justification by the results of interview to the various car owners, which are ranging from 0.07% of the new car price for heavy truck, to 0.1% of passenger car. Actual figures turns out to be 91 LE and 26 LE per year respectively. It is remarkably low figures compared with those in European countries and Japan.

## (2) Maintenance Workers' Wage

Table 9-3-8 shows summary figures of worker's wages. This is also obtained by interviewing the workers of repairs.

Table 9-3-8 Maintenance Cost; Wages

Items	Average Wage of Maintenance Worker (L.E./Hour)	Working Hours of Maintenance Work (Hr./1000km)	Maintenance Cost; Wages (L.E./1000km)
Passenger Car	2.50	2.00	5.00
Peugeot	2.50	2.50	6.25
Pick-up Truck	2.50	3.00	7.50
Medium Bus	2.50	15.00	37.50
Large Bus	2.50	15.00	37.50
Deluxe AC Bus	2.50	15.00	37.50
Medium Truck	2.50	12.50	31.25
Heavy Truck	2.50	15.00	37.50
Semi-trailer	2.50	15.00	37.50
Truck-trailer (20 ton)	2.50	15.00	37.50
Truck-trailer (30 ton)	2.50	15.00	37.50
Trailed Wagon (25 ton)	2.50	15.00	37.50

Source; Repair Shop

## 5) Capital Cost (distance-related portion)

Table 9-3-9 shows capital cost figures. This capital cost is composed of two parts; distance related-portion and time-related distance. Total capital cost is divided into two part by composition ratios.

Composition of distance related-portion are set 50% for passenger car and Peugeot 504, 70% for pick-up car, all the trucks and trailers. 85% are set for all buses (medium, large and super deluxe-AC).

Table 9-3-9 Capital Cost

Vehicle Type	Vehicle Price (L.E.)		Average Residual Vehicle Value o		Annual Capital Cost (LE/year)					
	Econo.	Finan.	Life Vehicle (year)	(% of Veh. Depre. Cost)	Economic			Financial		
					Depre.	Interes	Total	Depre.	Interes	Total
					Depre.	Interes	Total	Depre.	Interes	Total
Passenger Car	19825	25900	13	10%	1373	1308	2681	1793	1339	3132
Peugeot 504	15927	30000	7	10%	2048	1051	3099	3857	1551	5408
Pick-up Car	32062	40000	13	10%	2220	2116	4336	2769	2068	4837
Medium Bus	144513	152700	10	10%	13006	9538	22544	13743	7895	21638
Large Bus	227132	240000	10	10%	20442	14991	35433	21600	12408	34008
Super Deluxe-AC	528000	700000	10	10%	47520	34848	82368	63000	36190	99190
Medium Truck ( 8 tons	73581	83000	16	10%	4139	4856	8995	4669	4291	8960
Heavy Truck (15 tons	103900	130000	12	10%	7793	6857	14650	9750	6721	16471
Semi-trailer (25 tons	134271	168000	11	10%	10986	8862	19848	13745	8686	22431
Truck-trailer (20 tons	92951	116300	13	10%	6435	6135	12570	8052	6013	14064
Truck-trailer (30 tons	131074	164000	12	10%	9831	8651	18481	12300	8479	20779
Trailed Wagon (25 tons	31155	35143	11	10%	2549	2056	4605	2875	1817	4692

Vehicle Type	Depreciation Component		Capital Cost							
	Dist. Port.	Time Port.	Economic				Financial			
			Depre. Dist.	Time Relat.	Interes	Total	Depre. Dist.	Time Relat.	Interes	Total
	(%)	(%)	(LE/1000Km)	(LE/Hr)	(LE/Hr)	(LE/Hr)	(LE/1000Km)	(LE/Hr)	(LE/Hr)	(LE/Hr)
Passenger Car	0.50	0.50	38.125	1.144	2.181	3.325	49.808	1.494	2.232	3.726
Peugeot 504	0.50	0.50	12.189	0.609	0.626	1.235	22.959	1.148	0.923	2.071
Pick-up Car	0.70	0.30	51.792	1.110	3.527	4.637	64.615	1.385	3.447	4.831
Medium Bus	0.85	0.15	110.552	0.975	4.769	5.744	116.816	1.031	3.947	4.978
Large Bus	0.85	0.15	173.756	1.533	7.495	9.028	183.600	1.620	6.204	7.824
Super Deluxe-AC	0.85	0.15	403.920	3.564	17.424	20.988	535.500	4.725	18.095	22.820
Medium Truck ( 8 tons	0.70	0.30	52.677	1.129	4.415	5.544	59.420	1.273	3.901	5.174
Heavy Truck (15 tons	0.70	0.30	109.095	2.338	6.857	9.195	136.500	2.925	6.721	9.646
Semi-trailer (25 tons	0.70	0.30	118.309	2.535	6.817	9.352	148.028	3.172	6.681	9.853
Truck-trailer (20 tons	0.70	0.30	69.301	1.485	4.719	6.204	86.709	1.858	4.625	6.483
Truck-trailer (30 tons	0.70	0.30	105.867	2.269	6.655	8.923	132.462	2.838	6.522	9.361
Trailed Wagon (25 tons	0.70	0.30	27.451	0.588	1.582	2.170	30.965	0.664	1.398	2.061

9.3.6 Fixed Costs

This "Fixed Cost" is composed of (1) capital cost, (2) overhead cost, (3) crew salaries, and (4) registration fee. This cost is fixed, and does not vary according to travel distance an speed. In short, this can be called a kind of "Property Possession Fee."

## 1) Capital Cost

Table 9-3-9 also shows the capital cost (time-related cost). This is defined as annual depreciation cost of vehicle. It is assumed that the value of vehicle itself gradually decreases and all its value is depreciated with negligible residual value at the end of the life. This annual loss is counted as a capital cost of the vehicle.

This is composed of two factors; time-related portion and distance-related portion. Distinction is done by multiplying percentage to total capital cost.

In calculating capital cost, a depreciation function, which is shown in the note of Table 9-3-9, is employed four variables. Those are;

- initial price of vehicle (excluding tyre's price)
- residual value of vehicle
- average life of vehicle
- interest rate of capital

Table 9-3-9 shows initial price of new vehicle. Financial price is equivalent to its market price including sales tax. Economic price is derived from reducing sales tax and tariff from the market price. In this reduction process, "Sales Tax" is 10% of CIF price for all vehicles. "Tariff" rate varies for vehicle type. However, it is noteworthy that tariff for "Parts of Knock-down Car" is reduced with a proportion of 75%.

Residual value is set 10% of new vehicle. With less residual value than this level, vehicle does not function as a transportation means at all.

Average life of vehicle is set according to the interview to the drivers and car dealers in Cairo. Figures are a bit longer than those in ENTS III, reflecting gradual the growing share of new car.

As for the interest rate, estimation of economic and financial costs employed different figures form each other. In estimating the economic value of capital depreciation, opportunity cost of capital was quoted from the World Bank's figure for Egypt (12%).

As for the financial value, real rate of interest was adopted to evaluate the depreciation cost. Vehicle operating cost (VOC) analysis proceeded on the constant price base, and thus it is necessary to adjust a nominal rate of interest in order to reduce the risk-hedge margin against the general price increase. Nominal rate of interest (=17.5%) is reduced by the inflation rate (9.2%, Consumer Price Index; 1991 Dec.- 1992 Dec.), and arrived at the real rate of interest (= 17.5%-9.2% = approximately 8%).

## 2) Overhead

Table 9-3-10 shows summary figures of overhead cost calculation.

Table 9-3-10 Overhead Cost

Vehicles	Overhead Cost		Annual	Annual	Unit Overhead Cost	
			Travel	Travel	(L.E./hour)	
			Distance	Time		
	Economic	Financial	(km/year)	(hr/year)	Economic	Financial
	(L.E./year)					
Passenger Car	150.00	150.00	18000	600	0.250	0.250
Peugeot	580.00	580.00	84000	1680	0.345	0.345
Pick-up Car	440.00	440.00	30000	600	0.733	0.733
Medium Bus	15726.28	15726.28	100000	2000	7.863	7.863
Large Bus	20992.64	20992.64	100000	2000	10.496	10.496
Super Deluxe-AC	46356.91	46356.91	100000	2000	23.178	23.178
	(L.E./1000km)					
Medium Truck ( 8 tons)	155.23	178.86	55000	1100	7.762	8.943
Heavy Truck (15 tons)	257.85	311.59	50000	1000	12.893	15.580
Semi-trailer (25 tons)	344.90	357.00	65000	1300	17.245	17.850
Truck-trailer (20 tons)	249.21	248.85	65000	1300	12.461	12.442
Truck-trailer (30 tons)	351.18	359.21	65000	1300	17.559	17.961
Trailed Wagon (25 tons)	142.54	137.13	50000	1000	7.127	6.857

Note; Figures in ENTS III are up-dated.  
Detail procedures are explained in the text.

As for buses and trucks, data of overhead were quoted from the annual report of bus and truck companies. Overhead cost was obtained by dividing the salaries of bus and truck operators into the administrative cost. Those ratio vary from 0.34 (bus companies) to 0.42 (truck companies), an lowest limit of 0.35 was adopted in this study.

Other figures are up-dated by multiplying the 1983 figures in ENTS III with the price escalation figures during the period.

## 3) Crew Salaries

Table 9-3-11 shows the summary figures of crew salaries. This data are collected through the interview to the actual operators and their employees. Some vehicle carries plural number of operators, and thus their number are also surveyed as well as the amount of salaries. Average monthly wage of a driver was set at 330 LE for taxi, 370 LE for pick-up, and 600 LE for bus and truck for one vehicle as a whole,

Table 9-3-11 Crew Salaries

Vehicles	Number of Cr		Salaries			Yearly Salaries (L.E./yea)	Annual Travel Time (hr/year)	Yearly Wage (L.E./Year)	Crew Salaries (L.E./hour)	
	(person/veh)		(L.E./month)		Total				Econ	Fina
	Driver	Ass	Driver	Ass	Total					
Passenger Car	-	-	-	-	0	0	600	0	0.000	0.000
Peugeot	1	0	350	-	350	4200	1680	4200	2.500	2.500
Pick-up Car	1	0	350	-	350	4200	600	4200	7.000	7.000
Medium Bus	1	1	333	200	533	6396	2000	6396	3.198	3.198
Large Bus	1	1	450	200	650	7800	2000	7800	3.900	3.900
Super Deluxe-AC	1	1	720	250	970	11640	2000	11640	5.820	5.820
Medium Truck ( 8 tons)	1	1	450	250	700	8400	1100	8400	7.636	7.636
Heavy Truck (15 tons)	1	1	450	250	700	8400	1000	8400	8.400	8.400
Semi-trailer (25 tons)	1	1	600	350	950	11400	1300	11400	8.769	8.769
Truck-trailer (20 tons)	1	1	450	350	800	9600	1300	9600	7.385	7.385
Truck-trailer (30 tons)	1	1	600	350	950	11400	1300	11400	8.769	8.769
Triled Wagon (25 tons)	0	0	150		150	1800	1000	1800	1.800	1.800

Source; Interview to the drivers.

#### 4) Registration Fee

##### (1) License Fee

vehicle licensing fee and other charges are imposed on the vehicles by the law, and their rate were surveyed at various offices responsible for traffic administration. Those are shown in Table 9-3-12.

##### (2) Obligatory Insurance

Is regulated in Egypt that the vehicle owners have to insure their vehicle against damage and/or traffic accident. Amount of annual premium is tabulated according to the vehicle size in Table 9-3-12.

#### 9.3.7 Vehicle Operating Cost

Summary table of running costs and fixed costs are tabulated in Table 9-3-13. These figures are adopted in evaluating the projects.

Table 9-3-12 Registration Fees  
(unit; L.E./year, 1992 prices)

	Principal Tax		Board Tax	Board Using Tax	Radio Tax	Commercial Profit Tax		Development Tax
	G.E.	S.E.				G.E.	S.E.	
Private car								
-1300cc	18.00	46.00	15.30	0.40	1.40			23.00
1300-1500cc	18.00	46.00	15.30	0.40	1.40			25.00
Taxi								
-5 seats	15.00		20.00	0.40	1.40	25.00		
6 seats	18.00		20.00	0.40	1.40	30.00		
7 seats	21.00		20.00	0.40	1.40	30.00		
Bus								
42 seats		319.50	20.00	0.40				30.00
50 seats		373.50	20.00	0.40				30.00
52 seats		387.00	20.00	0.40				30.00
Truck & Lorry								
- 1 ton	10.00	10.00	20.00	0.40	1.40	60.00		65.00
- 2 tons	15.00	30.00	20.00	0.40	1.40	20.00		20.00
- 8 tons		400.00	20.00	0.40				80.00
-15 tons		750.00	20.00	0.40				150.00
Semi-trailer (25 tons)								
-Tractor (13.7 litter)		137.00	20.00	0.40				250.00
-Trailed Wagon 25 tons		62.50	10.25	0.40				
Trailed Wagon (12 tons)		62.50	10.25	0.40				
Trailed Wagon (15 tons)		62.50	10.25	0.40				
	Stamp Tax		Form Fees		Obligatory Insurance	Total		
	G.E.	S.E.	G.E.	S.E.		G.E.	S.E.	
Private car								
-1300cc	1.00	1.00	5.15	9.15	26.55		90.80	
1300-1500cc	1.00	1.00	5.15	9.15	26.55		92.80	
Taxi								
-5 seats	1.00		5.15		32.80		100.75	
6 seats	1.00		5.15		38.05		114.00	
>=7 seats	1.00		5.15		43.30		122.25	
Bus								
42 seats		1.00		9.15	115.70		495.75	
50 seats		1.00		9.15	164.70		598.75	
52 seats		1.00		9.15	178.15		625.70	
Truck & Lorry								
- 1 ton	1.00	1.00	5.15	9.15	47.25	145.20	154.20	
- 2 tons	1.00	1.00	5.15	9.15	63.00	125.95	144.95	
- 8 tons		1.00		9.15	135.00		645.55	
-15 tons		1.00		9.15	219.00		1149.55	
Semi-trailer (25 tons)							825.95	
-Tractor (13.7 litter)		1.00		9.15	335.25		752.80	
-Trailed Wagon 25 tons							73.15	
Trailed Wagon (12 tons)							73.15	
Trailed Wagon (15 tons)							73.15	

Notes : GE means gasoline engine and SE means solar(diesel) engine

: fee for Form 251 of GE and for Form 51 of SE

Source: Central and Local Traffic Departments and TPA, August 1992

Table 9-3-13 Summary of VOC

(1) Economic Cost

Vehicle Type	Fixed Cost (Time-related)			(unit; L.E./hour)			Total
	Capital Overhead	Crew Salaries	Registration License	Fee	Insurance		
Passenger Car	3.33	0.25	0.00	-	-		3.58
Peugeot 504	1.24	0.35	2.50	-	-		4.09
Pick-up Car	4.64	0.73	7.00	-	-		12.37
Medium Bus	5.74	7.86	3.20	-	-		16.80
Large Bus	9.03	10.50	3.90	-	-		23.43
Super Deluxe-AC	20.99	23.18	5.82	-	-		49.99
Medium Truck (8 tons)	5.54	7.76	7.64	-	-		20.94
Heavy Truck (15 tons)	9.20	12.89	8.40	-	-		30.49
Semi-trailer (25 tons)	9.35	17.25	8.77	-	-		35.37
Truck-trailer (20 tons)	6.20	12.46	7.39	-	-		26.05
Truck-trailer (30 tons)	8.90	17.56	8.77	-	-		35.23
Trailed Wagon (25 tons)	2.20	7.13	1.80	-	-		11.13

	Running Cost (Distance-related)					(unit; L.E./1000km)		Total
	Fuel	Lubricating Oil	Tyres	Maintenance Parts	Fee Wages	Capital Dist. rel'd		
Passenger Car	77.33	7.54	10.30	1.10	5.00	38.13	139.40	
Peugeot 504	87.00	8.50	10.23	0.51	6.25	12.19	124.68	
Pick-up Car	82.28	9.93	13.64	1.18	7.50	51.79	166.32	
Medium Bus	107.95	17.38	50.77	2.02	37.50	110.55	326.17	
Large Bus	146.64	26.68	66.28	2.50	37.50	173.76	453.36	
Super Deluxe-AC	218.40	38.45	66.28	3.70	37.50	403.92	768.25	
Medium Truck (8 tons)	102.96	12.50	60.11	1.20	31.25	52.68	260.70	
Heavy Truck (15 tons)	174.10	23.63	130.55	1.45	37.50	109.10	476.33	
Semi-trailer (25 tons)	367.54	31.83	130.95	1.45	37.50	118.31	687.58	
Truck-trailer (20 tons)	243.98	23.63	118.68	1.14	37.50	69.30	494.23	
Truck-trailer (30 tons)	444.91	31.83	198.83	1.41	37.50	105.87	820.35	
Trailed Wagon (25 tons)	168.48	23.63	154.76	0.44	37.50	27.45	412.26	

(2) Financial Cost

Vehicle Type	Fixed Cost (Time-related)			(unit; L.E./hour)			Total
	Capital Overhead	Crew Salaries	Registration License	Fee	Insurance		
Passenger Car	3.73	0.25	0.00	0.11	0.04		4.13
Peugeot 504	2.07	0.35	2.50	0.05	0.03		4.99
Pick-up Car	4.83	0.73	7.00	0.16	0.08		12.81
Medium Bus	4.98	7.86	3.20	0.19	0.06		16.29
Large Bus	7.82	10.50	3.90	0.22	0.09		22.53
Super Deluxe-AC	22.82	23.18	5.82	0.19	0.06		52.07
Medium Truck (8 tons)	5.17	8.94	7.64	0.46	0.12		22.90
Heavy Truck (15 tons)	9.65	15.58	8.40	0.93	0.22		34.27
Semi-trailer (25 tons)	9.85	17.85	8.77	0.38	0.26		37.02
Truck-trailer (20 tons)	6.48	12.44	7.39	0.45	0.10		27.25
Truck-trailer (30 tons)	9.36	17.96	8.77	0.77	0.17		36.15
Trailed Wagon (25 tons)	2.06	6.86	1.80	0.06	0.00		10.72

	Running Cost (Distance-related)					(unit; L.E./1000km)		Total
	Fuel	Lubricating Oil	Tyres	Maintenance Parts	Fee Wages	Capital Dist. rel'd		
Passenger Car	73.60	8.29	11.33	1.44	5.00	49.81	149.47	
Peugeot 504	82.80	9.35	11.25	0.95	6.25	22.96	133.56	
Pick-up Car	56.10	10.92	15.00	1.47	7.50	64.62	155.61	
Medium Bus	51.90	19.11	55.85	2.14	37.50	116.82	283.32	
Large Bus	70.50	29.34	72.90	2.64	37.50	183.60	396.48	
Super Deluxe-AC	105.00	42.30	72.90	4.90	37.50	535.50	798.10	
Medium Truck (8 tons)	49.50	13.75	66.12	1.36	31.25	59.42	221.40	
Heavy Truck (15 tons)	83.70	25.99	143.60	1.82	37.50	136.50	429.11	
Semi-trailer (25 tons)	176.70	35.01	144.05	1.81	37.50	148.03	543.10	
Truck-trailer (20 tons)	117.30	25.99	130.54	1.43	37.50	86.71	399.47	
Truck-trailer (30 tons)	213.90	35.01	218.71	1.77	37.50	132.46	639.35	
Trailed Wagon (25 tons)	81.00	25.99	170.24	0.49	37.50	30.97	346.19	

## 9.4 Time Value

### 1) Time Value

Time value is adopted to price the saving of travel time attributable to the road project. This calculation assumes that the saved travel time can be put into the further economic activities and it generates additional production, increasing the labour productivity. In other word, this is to measure how much the government would loss an possible additional production without the projects.

Estimated time value are 2.83 and 1.15 LE/Hr for an owner of passenger car and non-owner respectively.

Figure for the passenger owner is 2.6 times as high as that in 1988, measured in the Study on the Greater Cairo Transport, registering 20.8% growth per annum. This shows that the income level of passenger car owner increased so rapidly that it exceeds the real GDP growth during the same period. This trend is also observed on the figure for no-owner. It registered high growth figure of 23.5% per annum.

This reflects a nation-wide spread economic growth, affecting equally both the urban and rural. It was no yet enough to eradicate absolutely low income group of the massive rural households. Trend of time value follows the general principle that the income gap between rural and urban is not yet narrowed but level itself is lifted upwards.

As for the trucks, time value of its 5 types are set at 3.88, 3.88, 5.27, 3.88 and 5.27 LE/Hour for Medium Truck (8ton), Heavy Truck (15ton), Semi-Trailer (25ton), Truck Trailer (20ton), and Truck Trailer (30ton) respectively.

Egyptian government had seldom adopted a saving of travel time for the benefit of infrastructure projects. This may be attributable to disguised unemployment or under-employment. It assumes that the saving of travel time would never be converted into actual additional working hours, resulting in no incremental growth of production.

### 2) Estimation Method

#### (1) Passenger Car User

Average income of passenger car user is obtained by the Study Team through the interview to the passenger car users, which is 481 LE per month. This is divided by total working hours of 169.8 hours per month. This figure is set by excluding national holidays from 365 days.

Average working hour per month

$$= (7 \text{ Hours/day} \times 365 \text{ dayx/year} \times 6/7 \text{ working days per week} \\ - 17 \text{ national holidays/year}) / 365 \text{ days/year}$$



x 30 days/months  
= 5.66 hours/day x 30 days/month  
= 169.8 hours/month

(2) Public Mode Passenger

This is obtained by dividing average family income of public mode users by average working hours. The former was provided by the Team's interview survey. The former is set at 195 LE per month. Average working hour is set as same as that of passenger car user.

(3) Truck

All figures are obtained in a defferent way from that of passenger car owner and public car user. Time value of trucks are directly driven by dividing the crew's salary by the working hour of 180 hours per month (= 7 hours x 30 days x 6/7 woring days a week).

## 9.5 Present Travel Cost of Passenger

Table 9-5-1 shows the estimated present travel cost of passenger in terms of pass.-Km. The passengers in vehicles were calculated based on the VOC calculation and the passenger occupancies from the road side OD survey. The bus passengers were weighed by service frequency to reach to the average. The travel costs of rail passenger were referred from the Study of Transportation Economic, 1991, and weighed by the passenger-Km records by class.

Table 9-5-1 Present Passenger Travel Cost

Mode	Composition		Financial Cost		Economic Cost	
	Occupancy (%)	(Psn)	(LE/Km/Veh)	(LE/Km/Psn)	(LE/Km/Veh)	(LE/Km/Psn)
Pass.Car	100.0	2.70	0.2180	0.0809	0.1990	0.0737
Taxi	100.0	5.59	0.2170	0.0388	0.2170	0.0345
Bus	100.0	30.52	1.0823	0.0355	1.1225	0.0368
Normal Bus	76.3		0.8470		0.9220	
Super DX-AC	23.7		1.8400		1.7600	
Rail	100.0			0.0236		0.0242
Class I (AC)	8.2			0.1007		0.1036
Class II (AC)	6.6			0.0701		0.0720
Class II (w/o AC)	5.6			0.0448		0.0458
Class III	79.6			0.0103		0.0106

The costs in the Table 9-5-1 are shown in terms of Person-Km, however most of the present tariff systems consist of fixed and variable portions, so that they can not compare as they are. Table 9-5-2 shows the comparison of the present fare and the financial costs at the distance of 200Km, applying the regression equations shown in Sec. 9.1. The tariff of rail is calculated in the both cases of standard tariff and practical tariff with the effect of discount. In all the public passenger modes, the present fares exceed the financial costs, mainly because of the deference of depreciation period and interest rates.

Table 9-5-2 Comparison of Present Tariff and Cost

Modes	Tariff(LE/Psn)	Cost(LE/Psn)
Bus	6.684	7.092
Taxi	6.760	7.754
Rail(Practical)	3.787	4.720
(Standard)	4.622	4.720

## 9.6 Present Freight Cost

### 9.6.1 Truck Freight Cost

The financial and economic truck freight costs were calculated based on VOC calculation and the present loading conditions observed at the road side OD survey. Table 9-6-1 shows the composition of various truck type by commodity. Bulk cargoes have the tendency to the heavier truck type.

Table 9-6-1 Truck Type Composition by Commodity  
UNIT: %

COMMO- DITY	Pick- up	Truck 8t	Truck 15t	Semi Trailer	Full Trailer 20t	Full Trailer 30t
0 EMPTY	0.0	84.3	2.3	5.5	4.9	3.0
1 COIL	0.0	0.0	0.0	0.0	0.0	0.0
2 PETR	0.0	58.7	3.5	18.5	8.1	11.2
3 NGAS	0.0	0.0	0.0	0.0	0.0	0.0
4 CEMT	0.0	44.1	3.8	16.1	31.5	4.5
5 CMAT	0.0	71.0	4.6	12.0	10.8	1.7
6 PHOS	0.0	100.0	0.0	0.0	0.0	0.0
7 IORE	0.0	50.9	2.6	18.7	10.4	17.4
8 COAL	0.0	75.0	2.8	8.3	2.8	11.1
9 MNRL	0.0	57.4	3.0	8.8	20.9	9.8
10 WHET	0.0	58.2	1.8	16.1	8.6	15.4
11 CERE	0.0	72.6	1.9	12.0	10.9	2.7
12 FRUT	0.0	96.7	1.8	0.8	0.4	0.3
13 SCAN	0.0	80.2	7.7	1.1	8.8	2.2
14 FCRP	0.0	90.0	0.8	5.8	0.8	2.5
15 LSTK	0.0	96.9	0.8	1.5	0.6	0.2
16 APRD	0.0	94.8	1.1	1.8	1.1	1.2
17 AGPR	0.0	89.7	1.3	5.2	2.2	1.6
18 SGAR	0.0	45.9	3.7	11.0	36.7	2.8
19 FATS	0.0	58.7	3.8	20.2	7.7	9.6
20 AFED	0.1	86.6	2.5	7.0	3.4	0.4
21 BVRG	0.0	84.5	4.1	7.2	4.1	0.0
22 OFOD	0.0	89.1	1.8	4.2	2.8	2.1
23 CHEM	0.0	80.6	2.5	8.2	5.0	3.7
24 MTAL	0.0	77.7	2.6	8.0	5.6	6.1
25 TXTL	0.2	89.2	0.7	5.6	2.0	2.4
26 FTLZ	0.0	75.6	2.2	9.5	9.5	3.2
27 PULP	0.0	77.9	3.6	10.9	5.9	1.7
28 LUMB	0.0	89.6	1.8	4.2	2.2	2.2
29 MANU	0.0	89.6	1.6	3.8	1.8	3.2
30 MIXC	0.0	87.4	1.4	4.0	3.6	3.6
AVERAGE	0.0	83.2	2.4	6.3	5.3	2.9

The freight costs in terms of LE/ton-Km were calculated for each of truck type and commodity applying actual average loading weight and empty rate, which represents the actual

turn round and other factors to affect the costs, therefore the costs calculated in this procedure are practical costs and can be reduced if loading or operation condition can be improved. VOC is composed of fixed and variable cost portions therefore representative freights at a distance of 200Km were calculated and converted to a cost per ton-Km.

Table 9-6-2 shows the resulted financial costs and economic costs in Table 9-6-3. Weighed averages by vehicle composition for each commodity are shown at the last column. In general, such bulk cargoes as petroleum products, cement and sugar show the lower costs because of adoption of heavier and more economy vehicles. The freight of most of industrial commodities have higher transport costs than mining or agricultural products.

Table 9-6-2 Financial Cost of Truck Freight

Commodity	Financial (LE/1000/TON-KM)						Weighed Average
	Pick-up	Truck 8t	Truck 15t	Semi Trailer	Full Trailer 20t	Full Trailer 30t	
1 COIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2 PETR	0.00	723.80	83.25	58.74	34.01	54.23	447.59
3 NGAS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4 CEMT	0.00	572.55	85.33	45.64	26.65	50.58	273.68
5 CMAT	184.56	608.91	116.36	54.32	32.89	66.31	448.59
6 PHOS	0.00	518.39	0.00	0.00	0.00	0.00	518.39
7 IORE	0.00	871.84	132.98	52.24	35.08	54.93	469.95
8 COAL	0.00	1,278.71	53.89	61.39	22.45	57.39	972.64
9 MNRL	0.00	1,065.59	53.89	49.11	28.60	50.39	628.87
10 WHET	0.00	913.36	73.14	44.97	30.44	51.40	550.50
11 CERE	0.00	892.12	89.82	47.77	27.97	55.89	659.40
12 FRUT	0.00	1,475.43	208.97	101.46	35.49	104.90	1,431.91
13 SCAN	0.00	983.62	92.25	40.92	24.53	34.13	799.51
14 FCRP	0.00	1,370.04	1,023.95	115.82	112.25	89.50	1,251.50
15 LSTK	0.00	2,131.18	319.98	161.54	94.52	63.99	2,071.12
16 APRD	0.00	1,918.06	292.56	74.86	36.50	74.84	1,824.52
17 AGPR	0.00	1,009.50	159.99	59.60	43.59	56.63	912.55
18 SGAR	0.00	710.39	89.04	50.52	25.44	27.40	344.79
19 FATS	0.00	752.18	58.51	59.89	36.95	61.23	464.26
20 AFED	19.43	959.03	319.98	49.11	29.54	61.83	843.07
21 BVRG	0.00	852.47	146.28	75.32	28.06	0.00	733.27
22 OFOD	0.00	1,278.71	157.53	65.30	37.57	83.10	1,147.48
23 CHEM	0.00	1,420.78	222.60	59.31	33.51	67.00	1,160.32
24 MTAL	0.00	1,036.79	121.90	59.31	35.21	67.00	819.13
25 TXTL	33.56	1,826.72	186.17	91.62	71.84	130.59	1,639.57
26 FTLZ	0.00	1,009.50	113.77	51.58	25.08	45.54	774.76
27 PULP	0.00	1,667.88	103.43	74.41	57.56	61.83	1,316.10
28 LUMB	0.00	1,475.43	393.83	59.89	37.11	83.65	1,334.53
29 MANU	0.00	1,918.06	152.83	95.17	60.27	92.74	1,728.78
30 MIXC	0.00	1,370.04	123.37	93.01	37.89	84.75	1,207.67

Table 9-6-3 Economic Cost of Truck Freight

Commodity	Economic (LE/1000/TON-KM)						
	Pick-up	Truck 8t	Truck 15t	Semi Trailer	Full Trailer 20t	Full Trailer 30t	Weighted Average
1 COIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2 PTRR	0.00	731.76	81.93	64.67	36.99	61.46	454.37
3 NGAS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4 CEMT	0.00	578.85	83.98	50.24	28.98	57.33	278.19
5 CMAT	186.24	615.61	114.52	59.80	35.77	75.16	454.37
6 PHOS	0.00	524.10	0.00	0.00	0.00	0.00	524.10
7 IORE	0.00	881.43	130.88	57.51	38.15	62.25	477.36
8 COAL	0.00	1,292.77	53.04	67.58	24.41	65.05	984.59
9 MNRL	0.00	1,077.31	53.04	54.06	31.10	57.11	637.20
10 WHET	0.00	923.41	71.99	49.51	33.10	58.25	558.33
11 CERE	0.00	901.93	88.40	52.59	30.42	63.34	667.53
12 FRUT	0.00	1,491.66	205.67	111.69	38.60	118.89	1,447.68
13 SCAN	0.00	994.44	90.79	45.05	26.68	38.68	808.41
14 FCRP	0.00	1,385.11	1007.79	127.50	122.07	101.43	1,265.99
15 LSTK	0.00	2,154.62	314.94	177.83	102.80	72.53	2,094.10
16 APRD	0.00	1,939.16	287.94	82.41	39.70	84.83	1,844.77
17 AGPR	0.00	1,020.61	157.47	65.61	47.41	64.18	922.99
18 SGAR	0.00	718.21	87.63	55.62	27.67	31.06	349.80
19 FATS	0.00	760.45	57.59	65.93	40.19	69.40	471.33
20 AFED	19.60	969.58	314.94	54.06	32.12	70.07	852.55
21 BVRG	0.00	861.85	143.97	82.91	30.52	0.00	741.75
22 OFOD	0.00	1,292.77	155.05	71.89	40.86	94.19	1,160.57
23 CHEM	0.00	1,436.41	219.09	65.29	36.44	75.94	1,173.81
24 WTAL	0.00	1,048.19	119.98	65.29	38.30	75.94	829.13
25 TXTL	33.86	1,846.82	183.24	100.86	78.13	148.01	1,658.51
26 FTLZ	0.00	1,020.61	111.98	56.79	27.28	51.62	784.01
27 PULP	0.00	1,686.22	101.80	81.91	62.60	70.07	1,331.59
28 LUMB	0.00	1,491.66	387.61	65.93	40.36	94.80	1,349.53
29 MANU	0.00	1,939.16	150.42	104.77	65.54	105.11	1,748.50
30 MIXC	0.00	1,385.11	121.42	102.39	41.21	96.06	1,221.72

9.6.2 Rail Freight Cost

Rail and waterway freight costs were calculated in the past various studies as Study of Transportation Economic, 1991 and Block Train Traffic of ENR, 1989. They mostly adopted the approaches to calculate the cost when a train or a barge will transport a commodity to their capacity with practical turn round and with the recorded expenditure in ENR. In practical, there are many factors to influence the transportation costs besides those applied in these studies, such as total annual demand, demand by line, etc., and will be difficult to discuss into further detail than these studies, therefore the Study will refer the results of these studies with some review, if necessary.

The calculated costs are expressed by ton-Km in the former one and y ton according to the transport distance in the later. Table 9-6-4 shows the economic costs by commodity. In the case of wheat transport, the rail cost is in the range of 30-70 LE/1000, and only the costs of bulk commodities in 20t full trailer can be compared with these costs.

Table 9-6-4 Rail Economic Cost

Unit:LE/t

Dist(Km)	Block Train		Transportation Economic				Unit Train	Mixed Train
	Wheat	Cement	Wheat	Coke/Coal	Iron Ore	Unit Train		
Unit Cost(LE/1000Km.ton)			48.035	35.433	30.375	22.849	44.377	
50	3.492	7.286	2.402	1.772	1.519	1.142	2.219	
100	4.888	9.491	4.804	3.543	3.038	2.285	4.438	
150	6.284	11.696	7.205	5.315	4.556	3.427	6.657	
200	7.680	13.901	9.607	7.087	6.075	4.570	8.875	
250	9.076	16.106	12.009	8.858	7.594	5.712	11.094	
300	10.472	18.311	14.411	10.630	9.113	6.855	13.313	
400	13.264	22.711	19.214	14.173	12.150	9.140	17.751	
500	16.056	27.131	24.018	17.717	15.188	11.425	22.189	
600	18.848	31.542	28.821	21.260	18.225	13.709	26.626	

### 9.6.3 Waterway Freight Cost

Table 9-6-5 shows the calculation results of waterway freight costs. The costs of waterway are always lower than that of rail except for Unit Train, however the transport costs do not include the cost of loading and unloading or depreciated cost of loading facilities, which at present is carried out by customers responsibility.

Table 9-6-5 Waterway Economic Cost

Unit:LE/t

Dist(Km)	Transportation Economic		
	Block Train	Twinship	Self-Propelled
Unit Cost(LE/1000tKm):		30.35	38.71
50	3.252	1.518	1.936
100	4.509	3.035	3.871
150	5.766	4.553	5.807
200	7.024	6.070	7.742
250	8.281	7.588	9.678

## CHAPTER 10 TRANSPORTATION-RELATED ORGANIZATION AND INSTITUTION

### 10.1 Transportation Administrative Organization

#### 10.1.1 General

Many governmental organizations are concerned to administer transportation service and infrastructure in Egypt (Table 10-1-1). Amongst others, the Ministry of Transport (MOT) has an overall role for the administration and management of inland transport, covering road, railway and waterway.

Table 10-1-1 Organizations related to Transportation in Egypt

Sector	Administration and Operation Body	
<b>Infrastructure</b>		
Highway		RBA/MOT, MODANC, MOLG
Railway		ENR/MOT, NAT/MOT
Sea-port		PA/MOMT, SCA
River-Port		RTA/MOT
Inland Waterway		RTA/MOT
Airport		AA/MOCA
Pipeline		PPC/MPMW
<b>Transportation</b>		
Passenger	Road Transp.	CTD/MOI, MPBS, Priv. Companies
Transpot	Railway	ENR/MOT
	Airway	EA/MOCA
Freight Transport	Road Transp.	CTD/MOI, MPBS, Priv. Companies
	Railway	ENR/MOT
	Waterway	MPBS, Private Companies
	Pipeline	PPC/MPMW

#### Abbreviations:

AA	Airport Authority
CTD	Central Traffic Department
EA	Egyptian Airline
ENR	Egyptian National Railway
MOCA	Ministry of Civil Aviation
MODANC	Ministry of Development and New Communities
MOI	Ministry of Interior
MOLG	Ministry of Local Government
MOMT	Ministries of maritime Transport
MOT	Ministry of Transport
MPMW	Ministry of Petroleum and Mineral Wealth
NAT	National Authority for Tunnels
PA	Port Authorities
PPC	Petroleum Pipeline Company
RBA	Roads and Bridges Authority
RTA	River Transport Authority
SCA	Suez Canal Authority

Formerly MOT was responsible also to maritime transport and air-transport, but currently, the former is under the jurisdiction of the Ministry of Maritime Transport (MOMT) and the latter of the Ministry of Civil Aviation (MOCA). Pipeline transport is managed by the Petroleum Pipeline Company (PPC) under the control of the Ministry of Petroleum and Mineral Wealth (MPMW).

Inter city trunk roads and bridges are constructed and maintained by the Roads and Bridge Authority (RBA) of MOT and urban roads and local road by each Governorate. Some roads are developed by the Ministry of Development and New Communities (MODANC) and after completion, they are transferred to RBA or Governorates.

Railway is constructed, maintained and operated by the Egyptian National Railway (ENR), which is semi-autonomous body under the control of MOT. Underground railway is developed by the National Authority of Tunnels (NAT) of MOT and after completion, is operated by ENR.

All river ports and inland waterway transport is under the jurisdiction of the River Transport Authority (RTA) of MOT, while the Port Authorities of MOMT are responsible to the development and management of sea ports.

Road traffic control is done by the Traffic Police of the Central Traffic Department (CTD) under the Ministry of Interior (MOI). Road transport services for passengers are supplied mainly by the four public bus companies and privately operated taxis. The public bus companies were formerly controlled directly by the River and Land Transport Authority (RLTA) of MOT, but in April of 1992, RLTA was transformed as the River and Land Transport Holding Company (RLTHC) under the newly set-up Ministry of Public Business Sector (MPBS). Now, the public bus companies are affiliates of RLTHC.

Airports are managed by the Airport Authorities of MOCA and air transport services are offered by the Egyptian Airline (EA) and several private companies.

Inland waterway transport is operated mostly by the private sector and partly by two public companies which are affiliates of RLTHC.

#### 10.1.2 Organization of the Ministry of Transport (MOT)

The role of the Ministry of Transport is defined in the Presidential Decree No. 2714 for 1966, as follows:

The Ministry of Transport is responsible for searching, improving, and developing the general policy for effective transport means, in both the private and public sectors in accordance with the objective of the Economic



Development Plan within the General National Policy, especially on the following points;

- (1) To organize transport works through implementation of transport projects and the supervision and control of these projects to gain their maximum efficiencies.
- (2) To develop the national economy by executing the projects or establishing the companies or co-operatives engaged in the transport sector or the businesses connected with the sector or that serve any of its purpose.
- (3) To study and prepare the economic development plan within the framework of the Ministry's responsibilities, and develop and modify the plan within both the private and public sectors and plan the work program so as to reach the desired target and study the means to increase the productive efficiency.
- (4) To make the economic and legislative studies and recommend the laws within the Ministry's responsibilities.
- (5) To pursue the project works financially and technically in the fields of the Ministry's responsibilities to improve performance and increase efficiency.

In order to fulfill the duties described above, the Ministry is organized as shown in Fig. 10-1-1, currently composed of the six Authorities and ENR. TPA and NIT are the Authorities directly connected with the Minister, in charge of planning and training, respectively, while the others are of more autonomous nature.

RBA responsible for roads and road transport, RTA for inland waterway, ENR for railway are planning, constructing, maintaining their infrastructures, and servicing and managing each transport mode. NAT is the Authority established for the construction of the Cairo Metro Line (subway line) and the constructed lines are operated by ENR. ENR and the Public Construction Companies under RBA belong to the "economic sector" because of their income generating nature, while the other Authorities are called the "service sector".

### 10.1.3 Organization and Function of TPA

#### 1) General Function

The Transport Planning Authority (TPA) was established under MOT in accordance with the Presidential Decree No. 41 for 1972, taking the following roles.

- (1) to set up a comprehensive transport planning for inland transport
- (2) to plan inland transport project on the basis of technical and economical aspects in general

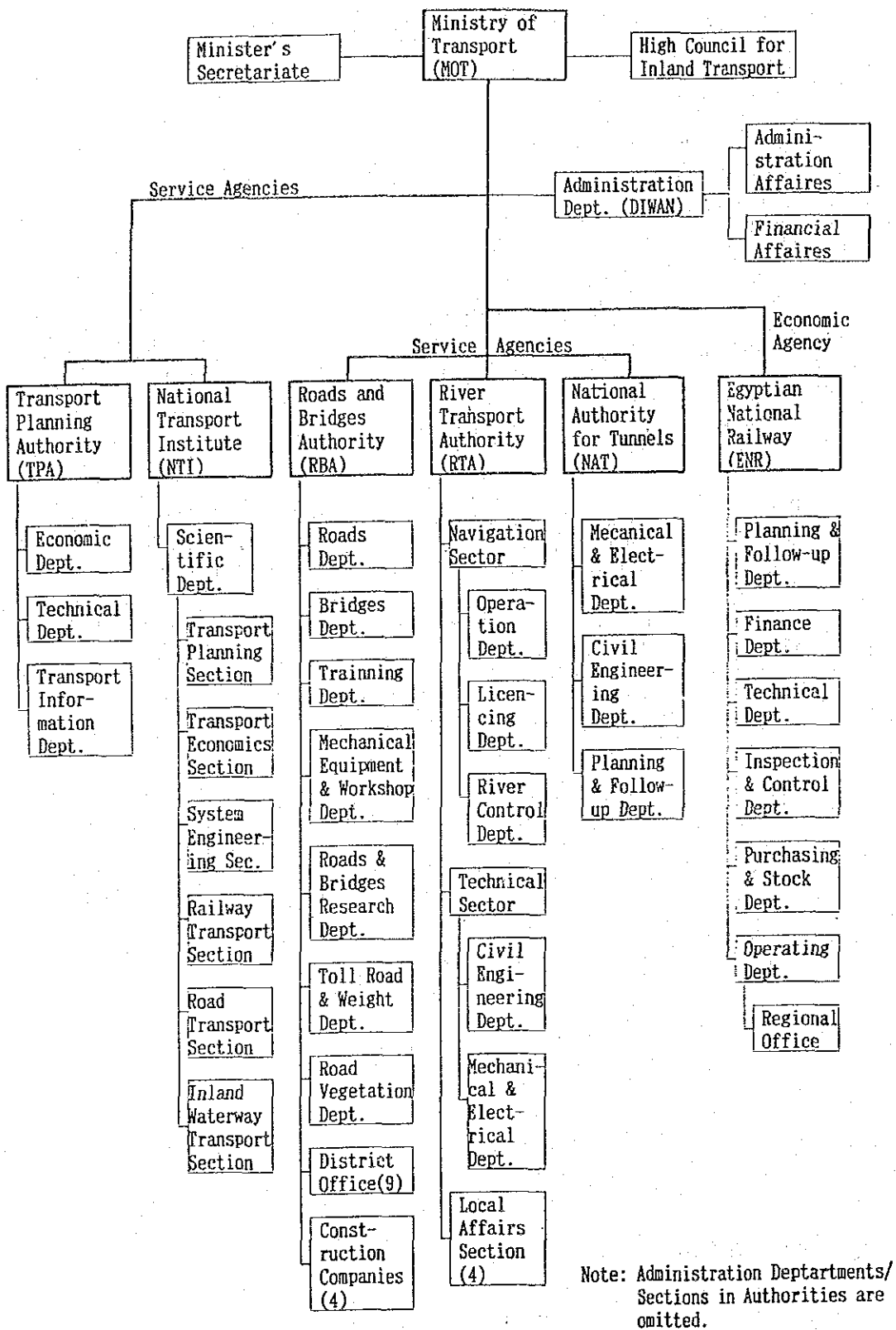


Fig. 10-1-1 Organization of Ministry of Transport (MOT)

- (3) to prepare the executive plan for the execution of envisaged projects related to the various authorities belonging to MOP
- (4) to coordinate planning and execution of projects in the transport sector related to MOP
- (5) to study and review projects of the transport sector related to MOT to ensure consideration and incorporation within the overall plan for inland transport projects
- (6) to assist in studies of the transport sub-sector in technical and economic aspects and/or modify, complete any studies prepared by the various MOT sectors
- (7) to carry out studies regarding economical utilization and technical efficiency of mode of transport
- (8) to provide technical and economical research for upgrading of the transport sector and transport projects as well as to supervise planning process and the respective execution of transport projects assigned to the authority.

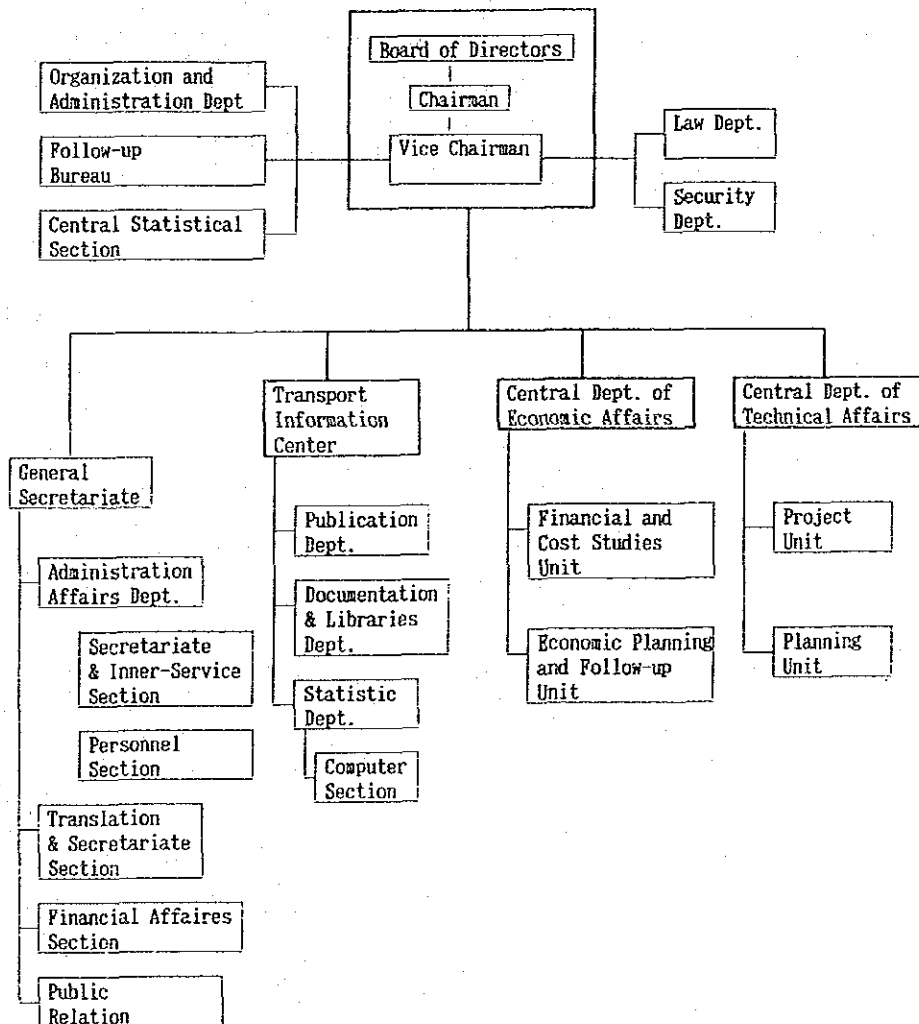


Fig. 10-1-2 Organization of the Transport Planning Authority

## 2) Organization

Current organization of TPA is presented in Fig. 10-1-2. Top decision-making entity is the Board of Directors which is chaired by the Minister of Transport. The Board of Directors is composed of the following representatives;

- (1) Minister of Transport (Chairman)
- (2) Deputy Chairman
- (3) Heads of authorities supervised by MOT
- (4) Under-secretary of MOT
- (5) Under-secretary of MOP
- (6) Under-secretary of MOF
- (7) Under-secretary of MOPW
- (8) Counselor of State Council
- (9) Director of Economic Affairs, TPA
- (10) Director of Technical Affairs, TPA
- (11) 5 members experienced in transport affairs, appointed by the Chairman for a two year term

Under the managerial group, there are two main departments; Central Department of Economic Affairs and Central Department of Technical Affairs. Their duties and responsibilities are as follows. (as for TIC, see 10.3.2)

### A. Central Department of Economic Affairs

#### Financial and Cost Unit

- (1) to carry out studies related to the transport sector of inland transport
- (2) to review project costs and executes analyses of balance sheets of public agencies belonging to MOT
- (3) review budgets and organizational structure of agencies of MOT in order to achieve maximum economic efficiency

#### Economic Planning and Follow-up Unit

- (1) to carry out studies related to the general program for transport with the objective to coordinate project plans and projects of the different transport sectors in order to achieve the economic and social targets of national development plans
- (2) to collect statistics and carry out economic studies and researches

### B. Central Department of Technical Affairs

#### Planning Unit

- (1) to study plans for various transport sector projects

- (2) to coordinate priorities to determine specifications of mode of transport
- (3) to follow departments in transport methods and technology
- (4) to provide technical assistance to transport sector agencies
- (5) collect data and information required for technical researches

Project Unit

- (1) to carry out both feasibility and technical studies for either new projects to be improved
- (2) to assist in compilation of studies being submitted to TPA by the various transport sub-sectors
- (3) to coordinate interacting activities of the transport sub-sectors by researches and models
- (4) to review project costs in collaboration with the Central Department of Economic Affairs

3) Manpower

Currently, TPA holds 130 personnel in total, out of which professional staff experienced in transportation planning /economics are 45 persons, as shown in Table 10-1-2. Five persons are in managerial position such as a under-secretary and directors. Three persons are now abroad for studying and 20 persons are in the grade three, with less than eight years of experience.

Table 10-1-2 Staff in TPA as of August, 1992

Department	Total No.	Professionality		by Grade		
		Engineer	Economist	1	2	3
Technical Dept.	14	14	0	3	2	9
Economic Dept.	23	0	23	10	8	5
TIC	8	0	8	2	0	6
<b>Total</b>	<b>45</b>	<b>14</b>	<b>31</b>	<b>15</b>	<b>10</b>	<b>20</b>

Grade: 1 : Over 14 years experience  
 2 : 8-14 years experience  
 3 : Less than 8 years experience

10.1.4 Public Transport Companies

In the period of the late 1950's to the 1960's, many public companies were set up in productive and service sectors, to establish and boost the national economy. In transportation sector, four bus companies, five trucking companies, two shipping companies, one bus-repair company and four construction companies were established according to the respective law and decree, under the control of MOT.

The government had been directing the public companies concerning budget, marketing, export, finance, and regulations until the law No. 60 was issued in the year 1971, aiming at a partial liberalization, where the Government had a limited role for planning, follow-up and evaluation without interference to the implementation program.

Through the economic and financial crisis in the 1980's, a change in development strategy was emerging and the Government began to implement comprehensive economic reform program. The main objective of the program is to reduce the financial deficit of the Government by curtailing or reducing the Government's intervention in the areas where markets can function properly, refrain from undertaking commercial activities, maintaining an active role only in the areas where market failure prevails. The program contains various components, public sector reform, domestic price liberalization and private sector reform.

in this line, with the purpose of accelerating privatization of public companies, holding companies were established under the new Ministry of Public Business Sector, according to the law No.203 issued in the year 1991. and twelve public companies under MOT with the exception of four construction companies were transferred under the control of the Land Transport and Waterway Holding Company.

By the law No. 203, the complete liberalization was ensured where the holding companies have the role to sell all or some share to reduce the share of the holding companies and the public sector banks to be less than 51% of the capital.

The holding companies also have the duties to rearrange the financial structure and to direct the losing companies including allocation a portion of the holding company's revenues in this aspect and to carry out procedures to maximize profits and rationalize costs. In addition to this, the holding companies have the right to establish companies, to buy and sell shares, and to issue the financing bonds for investment programs and to all the requirements to increase the investment value and profits.

In addition, the last legislation aimed to realize the equality between both public and private companies, under the principle that there is no deprivation to the public business sector companies of any advantages, and not to add any burdens to keep the equality between the public business sector companies and shareholder companies which are submissive to the law No. 159 of the year 1981. This also included cancellation for the profit share of the Nasr Social Bank and cancellation of the 5% that was allocated to buy governmental bonds, in addition to establish personal rights in profit (not to be less than 10% and not to exceed the annual wages).

To satisfy administration flexibility, it was decided to cancel the unified personal regulations and to give the companies the right to decide personal regulations in participation with the general union and approved by the Minister of Public Business Sector, taking into account that wages and profits are to be linked to production.

The public companies are now in preparation for privatization by reassessment of their assets. The Government intends to complete the privatization program within four to five years.

## 10.2 Budget of MOT in the Current Five Year Plan

### 10.2.1 Budget for Transport Sector

The Second Five Year Plan ended in March of 1992 originally planned the total investment of LE 27,816.5 million which was equivalent to US\$ 12,643.9 million at the exchange rate of LE 2.2 per one US dollar then. If converting it into the 1991/92 price using the GDP deflator, The total investment amount was LE 58,971.0 million.

The Ministry of Planning (MOP) announced the third Five Year Plan (FY 1992/93-96/97) in April of 1992, targeting at LE 64,659.7 million (US\$ 19,475.8 million) of total investment. This means 10 % increase of the previous plan in real term and 1.54 times in US dollar (Table 10-2-1).(\*)

\* For the purpose of comparison, budgets to the public companies recently transferred to MPBS are not included in the amount of the previous plan.

Table 10-2-1 Investment Budget Allocation to Transport Sector in the third Five Year Plan  
(Million LE)

Sector	2nd 5-Yr Plan(1987-92)		3rd 5-Yr plan (1993-1997)	3rd/2nd
	at 1987 price	at 1992 price		
Total Investment of 5-Year Plan for all Sectors	27,816.5 (100.0)	58,971.0 (100.0)	64,659.7 (100.0)	1.1
Transport Sector				
MOT	1,143.6	2,424.4	4,372.1	1.8
MOMT	191.3	405.6	393.7	1.0
MOCA	338.0	716.6	1,166.3	1.6
Total	1,672.9 ( 6.0)	3,546.5 ( 6.0)	5,932.1 ( 9.2)	1.7

Source: 2nd and 3rd Five Year Plan

Note: MOT: Ministry of Transport

    MOMT: Ministry of Maritime Transport

    MOCA: Ministry of Civil Aviation

Totaling the investment amounts allocated to the three Ministries of Transport, Maritime Transport and Civil Aviation, the current Plan allocated to the transport sector, the sum of LE 5,382.2 million, 8.3% of the total, with 3.2 point increase above 6% in the previous Plan.

Comparing with the second Five Year Plan, the investment amount of MOP under the current plan increases 1.8 times, while that of MOCA 1.6 times and MOT remains almost in the same level. Total of the three Ministries represents 1.5



times.

Distribution among the three Ministries shows 79% for MOT, 7% for MMT and 14% for MOCA, respectively.

### 10.2.2 Investment Allocation in MOT

The allocation of investment budget among the Authorities in MOP under the Third Five Year Plan is presented in Table 10-2-2 and Fig. 10-2-1. Total investment expenditure of MOP amounts to LE 4.4 billion of which the major part (53%) is allocated for construction followed by 23% for rolling stock acquisition and 17% for purchase of equipment and machinery.

Total amount for the service sector including the Administration Department (Diwan) accounts for LE 1.8 billion, ENR for LE 2.5 million and LE 7.5 million for the road construction companies. In the service sector, 25% of the total is allocated to RBA, 65% to NAT and 7% to RTA, respectively.

Table 10-2-2 Budget Allocation of MOP in the third Five Year Plan

Fund Application	Service Agencies						Total	Egyptian Const- National ruction Railway Companies		MOT Total
	TPA	NTI	RBA	RTA	NAT	DIWAN				
<b>1 Tangible Assets</b>										
Land Purchase	0	0	0	0	0	0	0	0	0	0
Land Reclaim/Prepare	0	0	0	0	0	0	0	0	0	0
Residential Buildings	0	0	0	0	0	0	0	2,500	0	2,500
Non-Resid. Buildings	0	0	2,200	0	14,790	0	16,990	0	0	16,990
Construction	0	80	440,300	51,600	737,250	0	1,229,230	1,097,300	0	2,326,530
Machinery/Equipment	0	70	1,000	75,900	240,427	0	317,397	397,700	47,500	762,597
Tools	0	0	0	0	0	0	0	0	0	0
Vehicles(Goods)	0	0	500	0	84,662	0	85,162	885,500	27,500	998,162
Vehicles(Personnel)	0	50	0	0	300	60	410	0	0	410
Furniture/Off. Supply	500	100	500	0	100	178	1,378	0	0	1,378
Water/Animal Resources	0	0	0	0	0	0	0	0	0	0
Tax	0	0	0	0	0	0	0	111,000	0	111,000
<b>Sub-total</b>	<b>500</b>	<b>300</b>	<b>444,500</b>	<b>127,500</b>	<b>1,077,529</b>	<b>238</b>	<b>1,650,567</b>	<b>2,494,000</b>	<b>75,000</b>	<b>4,219,567</b>
<b>2 Deferred Expenses</b>	<b>47,500</b>	<b>400</b>	<b>0</b>	<b>0</b>	<b>98,671</b>	<b>0</b>	<b>146,571</b>	<b>6,000</b>	<b>0</b>	<b>152,571</b>
<b>3 Total Application of Funds</b>	<b>48,000</b>	<b>700</b>	<b>444,500</b>	<b>127,500</b>	<b>1,176,200</b>	<b>238</b>	<b>1,797,138</b>	<b>2,500,000</b>	<b>75,000</b>	<b>4,372,138</b>

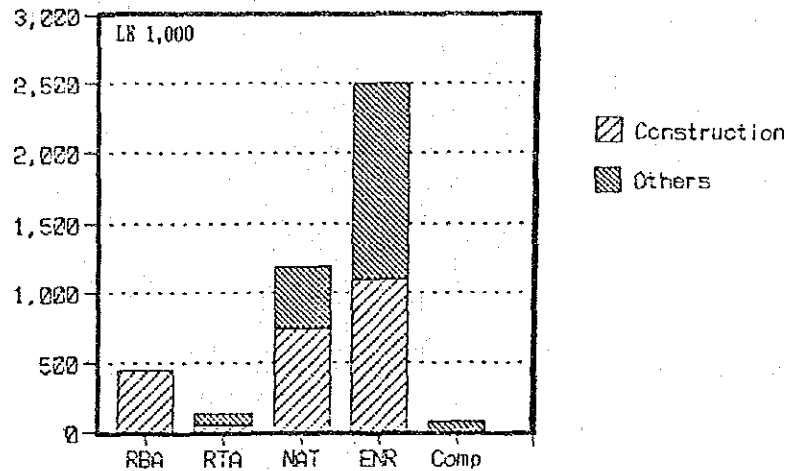


Fig. 10-2-1 Budget Allocation of MOT in the third Five Year Plan

In the third Five Year Plan, the projects shown in Table 10-2-3 are scheduled as MOP projects. Large scale projects (over LE 100 million) of which the sites are specified are as follows:

	million LE
- Construction of new road between Cairo - Asyut, 525 Km	106.0
- Widening of waterway of Damietta branch	109.0
- 2nd Subway line between El Tahrir - Shubra el Kheima	1,077.0
- Improvement of Signals in Giza - Beni Suef	120.5
- Development of Helwan - El Marg line	250.0
- Widening of Kabarri - Saloon line	175.0
- Signal electrification of Beni Suef- El Minya	150.0
- Increase of Power Capacity of Luxor - Aswan	120.0

Table 10-2-3 Inland Transport Projects in the third Five Year Plan (1)

Sq. Project No.	Project Code	Project Name	Status Completion =C New Project=N	Project Cost(1,000 LE)		
				Domestic	Foreign	Total
(1) ROAD AND BRIDGE AUTHORITY (RBA)						
1	100400	Renewal & atrenthening weak bridges	N	5,000	0	5,000
2	200500	Increasing current network capacity, Cairo-Fayoum Road L=89Km	C	11,700	0	11,700
3	200600	Increase of current network capacity, Kafr el Dawar - Alexisandria L=45Km	C	4,000	0	4,000
4	200700	Benha - Aga Road L=61Km	C	17,000	0	17,000
5	200800	Widening & Strengthening of Safer Road	C			

Table 10-2-3 Inland Transport Projects in the third Five Year Plan (2)

Sq. Project No.	Code	Project Name	Status Completion =C New Project=N	Project Cost(1,000 LE)		
				Domestic	Foreign	Total
6	200900	Bridges of Mansoura, Faraskour and Luxour	C	56,000	0	56,000
7	301000	Developing efficiency	N	4,200	0	4,200
8	301100	Widening of roads in Belbiss, Zagazig, Simbelaween, Mansoura L=81Km	N	28,000	0	28,000
9	301200	Renewal, widening and up-grading by grade separation L=25Km	N	1,200	0	1,200
10	301300	Widening & improvement of branch rd. L=30Km	N	5,000	0	5,000
11	301400	Widening & improvement of Berket el Sabaa - Kafr el Zayat Highway L=54Km	N	10,100	0	10,100
12	301500	Widening & improvement of Badari Rd. - Faw - Nawawera L=30Km	N	4,100	0	4,100
13	301600	Widening & improvement of Gamalia - San el Hagar - El Hessenia L=42Km	N	10,000	0	10,000
14	301700	Construction of new road Cairo - Asuit L=525Km	N	46,000	60,000	106,000
15	301800	Construction of new road El Dakahlia - Farafera L=200Km	N	16,000	0	16,000
16	301900	Construction of new road Bahr el Abd - El Makhazen L=101Km	N	15,000	0	15,000
17	302000	Construction of new road El Owaynat - Abu Simbel - Aswan L=200Km	N	18,000	0	18,000
18	302100	Construction of new connections in eastern road of Beni Suef - Minya L=40Km	N	9,000	0	9,000
19	302200	Construction of new bridges on River Nile Asuit - Zefta	N	61,750	3,250	65,000
20	302300	Construction of new elevated bridges Asuit - Kafr el Zayat	N	20,000	0	20,000
Total				342,050	63,250	405,300
(2) RIVER TRANSPORT AUTHORITY (RTA)						
1	302400	Construction of new terminals with loading & unloading facilities	C	600	0	600
2	302500	Improvement of Cairo - Aswan Route	C	4,000	0	4,000
3	302600	Improvement of El Rayah el Beheri & Nubaria Canal	C	10,000	0	10,000
4	302700	Development of Port Said - Mataria route	C	1,000	0	1,000
5	302800	Widening of Damietta Branch	C	94,950	14,000	108,950
6	302900	Navigation aid and wireless equipments	C	2,950	0	2,950
Total				113,500	14,000	127,500

Table 10-2-3 Inland Transport Projects in the third Five Year Plan (3)

Sq. Project No.	Project Code	Project Name	Status Completion =C New Project=N	Project Cost(1,000 LE)		
				Domestic	Foreign	Total
<b>(3) NATIONAL AUTHORITY FOR TUNNELS (NAT)</b>						
1	203100	Completion of Helwan - El Marg Line	C	20,678	78,560	99,238
2	203200	2nd underground Line between El Tahrir - Shubra el Kheima	N	420,062	656,900	1,076,962
Total				440,740	735,460	1,176,200
<b>(4) EGYPTIAN NATIONAL RAILWAY (ENR)</b>						
1	103300	Renewal of existing lines	N	175,000	325,000	500,000
2	103400	Renewal of existing stations	N	208,000	0	208,000
3	103500	Renewal of rolling stock	N	80,000	620,000	700,000
4	103600	Renewal of El Wahat el Baharia line	N	25,000	0	25,000
5	203700	Improvement of signals of Arab el Raml - Alexandria line	C	5,600	12,700	18,300
6	203800	Improvement of signals of Cairo-Qalueb line	C	1,500	0	1,500
7	203900	Improvement of signals in Giza-Beni Suef	C	48,500	72,000	120,500
8	204000	Improvement of signals in Imbaba - Ityay el Baroud	C	2,500	0	2,500
9	204100	Improvement of signals in Damietta-Zagazig	C	4,000	0	4,000
10	204200	Improvement of signals in Shebeen el Kanatar	C	2,000	0	2,000
11	304300	Installment of control/safety system	C	30,000	105,000	135,000
12	304400	Development of Helwan - El Marg line	N	230,000	20,000	250,000
13	304500	Widening of El Kaharri - Saloon line	N	125,000	50,000	175,000
14	304600	Signal electrification of Beni Suef-El Minya	N	41,800	108,200	150,000
15	304700	Development of workshops	N	25,000	10,000	35,000
16	304800	Development of Workshop for signals	N	1,200	2,000	3,200
17	304900	Increase of power capacity of Luxor-Aswan	N	81,000	39,000	120,000
18	305000	Increase of power capacity of Qalueb-Minuf-Tanta Line	N	29,000	21,000	50,000
Total				1,115,100	1,384,900	2,500,000

### 10.2.3 Financial Resources for MOT Projects

Financing to the MOT projects is planned as presented in Table 10-2-4, which shows that the internal funds account only for 16% and the rest will be procured from external resources, mostly from the National Investment Bank (NIB).

NIB was established by the Government in order to encourage investment activity by lending loans to private and also public entities at the interest rate lower than usual commercial loan (recently raised from 4% to 9%). While private and public business companies have to repay principals together with interests, the NIB loan made by the Governmental Authorities in the service sector are repaid by the Ministry of Finance through the Central Bank of Egypt. In

this respect, NIB loans to the Authorities of MOT have the same nature as the Government finance.

Main financial resources of the Government are the sovereign revenue (income taxes, import duties and consumer taxes) which account for 40 to 60 % of the total revenue, capital revenue and grants. The shortage is covered by domestic and foreign borrowings.

Foreign currency portion of the investment amount under the current Five Year Plan account to 52% in MOT average. While RBA and RTA show rather low rate, NAT and ENR need foreign currency more than half of the total.

Table 10-2-4 Financial Sources of MOT Projects in the third Five Year Plan

Financial Resources	Service Agencies							Egyptian National Railway	Const- ruction Companies	MOT Total
	TPA	NTI	RBA	RTA	NAT	DIWAN	Total			
<b>1 Internal Resources</b>										
Total	0	0	0	0	423,500	0	423,500	0	75,000	498,500
Foreign-Covered	0	0	0	0	211,000	0	211,000	0	0	211,000
<b>2 External Resources</b>										
Grant/Aid -Domestic	0	0	0	0	0	0	0	0	0	0
Grant/Aid -Foreign	0	0	0	0	0	0	0	0	0	0
NIB Loan -Domestic	20,000	700	381,250	113,500	178,240	238	693,928	1,115,100	0	1,809,028
NIB Loan -Foreign	28,000	0	3,250	14,000	345,900	0	391,150	908,100	0	1,299,250
Other Loan -Domestic	0	0	0	0	150,000	0	150,000	45,000	0	195,000
Other Loan -Foreign	0	0	60,000	0	78,560	0	138,560	281,800	0	420,360
Facilities -Domestic	0	0	0	0	0	0	0	0	0	0
Facilities -Foreign	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	150,000	0	150,000
<b>3 Total Funding</b>										
Domestic	20,000	700	381,250	113,500	440,740	238	956,428	1,115,100	75,000	2,146,528
Foreign Cash	0	0	3,250	14,000	656,900	0	702,150	1,058,100	0	1,760,250
Foreign Non-Cash	28,000	0	60,000	0	78,560	0	138,560	326,800	0	465,360
<b>Total</b>	<b>48,000</b>	<b>700</b>	<b>444,500</b>	<b>127,500</b>	<b>1,176,200</b>	<b>238</b>	<b>1,797,138</b>	<b>2,500,000</b>	<b>75,000</b>	<b>4,372,138</b>

## 10.3 Institutional System for Transportation Administration

### 10.3.1 Planning and Budgeting System

#### 1) Long-Term Transport Plan

TPA was the executing agency of all ENTS (Phase I to III). In every case, a study team was composed by foreign and local consulting firms and counterpart staff of TPA. In the final stage of the study, the draft reports were reviewed by the related agencies and finalized with modifications based on their comments. ENTS I was financed by USAID, ENTS II by the World Bank and ENTS III by local funds.

After completion of the studies, no procedure for authorization was taken to make them official plans. In this respect, the nature of ENTS is not completely clear, on the point if the policies and projects recommended in the final reports are official ones and supported by all the related agencies or not.

However, the studies of ENTS I to III have been undoubtedly influential, directly or indirectly, reflecting on the policies and projects of MOT, then forth. Also, their demand forecast results and other outputs are occasionally referred to in other studies.

#### 2) Five Year Plan

The central agency for preparing the Five Year Plan is the Ministry of Planning (MOP) and the Minister of MOP is of the ultimate responsibility. Beside MOP, many agencies are concerned; the Ministry of Finance (MOF), the Ministry of Economic and Foreign Trade (MOEFT), the National Investment Bank (NIB), CAPMAS and the National Economic Research Institute (NERI), and other Ministries, as shown in Fig. 10-3-1. This process was stated in law No.70 for 1973.

In a ministry level, each department prepares the first draft plan (project list) according to the instruction of the authority which the department belongs to. Each authority collects and coordinates the projects and submits them to the Board of Directors where further necessary modification and adjustment are made and with the Minister's approval, the plan is submitted to MOP.

MOP elaborates the total plan based on the ministries' and governorates' plans with the cooperation of MOEFT and MOP's affiliates - CAPMAS and NERI - and also with consultation of MOF and NIB to adjust the plan to the financial constraints.

After passing the Board of Governors, the plan is assessed and approved by the Cabinet and finally endorsed by the Peoples Assembly.

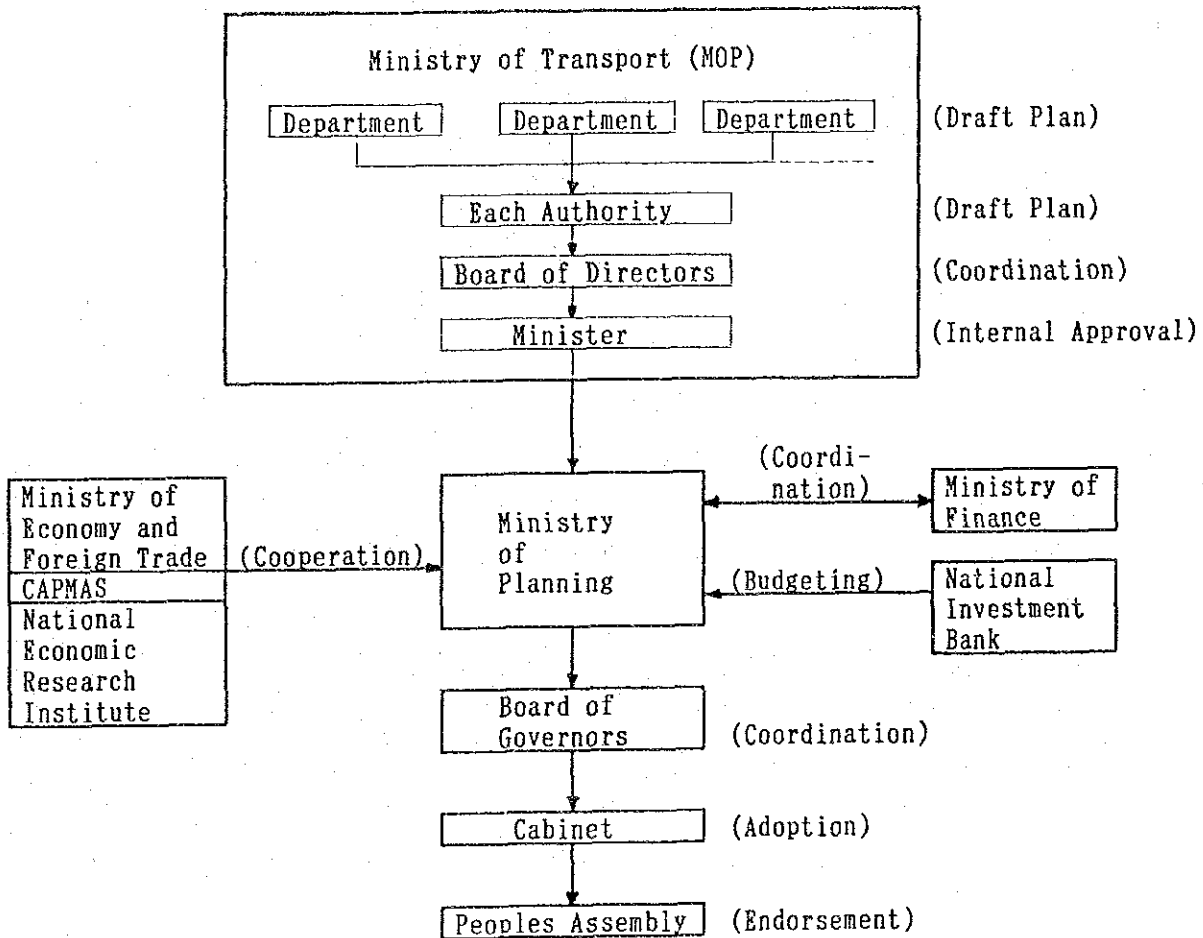


Fig.10-3-1 Planning Process of Five Year Plan

As shown above, the process for developing the Five Year Plan seems in principle to be "bottom up" approach. This approach is adopted in most countries and in general, it enables to listen to the voices in the "bottom" and collect projects to cope with today's issues. On the other hand, it tends to results in a set of mere "desire lists" which lack consistency among transport sectors and strategies to attain the long-term goals, unless there exists a strong and effective function for coordination in the ministry as well as in MOP.

### 3) Annual Budget

The annual budget is set out, following almost the same process as the Five Year Plan. The Ministry of Finance (MOF) plays the central role to prepare the annual budget, according to the following schedule:

<u>Month</u>	
9 - 10	MOF estimates the next year revenue and presents the guideline for budget formation to each ministry and local authority.
11	MOF sends the "Mansur" (detail budgeting manual) to the ministries and governorates, and request them to start the project list preparation.
Late-12	In each ministry, authorities submit their draft budget to the Board of Directors.
Mid-2	Each ministry submits the budget request to MOF and the investment budget request to MOP.
3 - 4	After repetitive negotiation with each ministry, MOF sets up a draft of overall budget plan and it is reviewed in the Board of Governors and in the Ministers Committee for Policy and Planning.
5 - 6	Approved by the Cabinet and endorsed by the Peoples Assembly.

### 10.3.2 Transport Information System

#### 1) Transport Information Center (TIC) of TPA/MOP

The ENTS I completed in 1977 pointed out the importance of the nation-wide transport data-bank in Egypt, and the ENTS II in 1981 proposed the detail structure of the data bank to be developed. At the same time, the Presidential Decree No.627 for 1981 was promulgated, declaring to establish a information and documentation center in each governmental organization. In 1985, the Transport Planning Authority (TPA) in MOT proposed to the Board of Directors, to establish the Transport Information Center (TIC) and in the same year, it was set up in TPA.

The main function of TIC is to develop and maintain the Transport Sector Information System (TSIS). This TSIS aims at connecting the Authorities of MOT and the related companies with TIC by a Wide Area Network, to collect and provide information on line. This system is developed in three phases.

Phase	Activity
Phase I (1976 - 1989)	
	- Preparing the master plan of TSIS
	- Starting the operation of the system, as a pilot project, connecting with selected eight units with TIC, using telephone line and modems
Phase II (1991 - 1993)	
	- Completion of the physical structure and system configuration
	- Application of the system
	- Training of the staff
Phase III (not determined)	
	- Integration and connection with other national and international information centers



TIC has completed the Phase I and just started Phase II. Until now, the TIC's activity is limited to dealing with the information inside MOT, however it has a plan to expand its scope in the future. Its information providing service has not started yet.

The data bank (TSIS) is designed with six categories of information; (1) Traffic and Operation (2) Fleet (3) Infrastructure (4) Finance (5) Plan and Investment and (6) Labor Affairs. All the related data are to be collected from the Authorities and the Companies. Presently TIC has no idea to create any data through a survey of its own.

Besides the TSIS, TIC is developing another information system for "Handling and Transporting Imported Goods" which is planned to complete by the end of 1992. This system aims:

- a. to establish an integrated information system to provide information concerning imports from ports to storages in the country.
- b. to coordinate the arrival program of cargo liner and tramp vessels and their distribution in different ports all year round, in order to realize the optimum use of port facilities.
- c. to prepare programs of transportation of imported goods from ports to the final destinations, providing optimum allocation among three modes ( railway, road transport and inland waterways ) to achieve the least transport cost.
- d. to coordinate between the transport and storage sector.

## 2) Road Transport Information

### (1) Road Inventory

ENTS I recommended to develop a road inventory of Egypt, with a proposed format. The first overall road inventory was made in 1979, in connection with the field survey of ENTS II, covering total road extension of 11,100 Km. Since then, the nine District Offices have made annual revision of the inventory in each district, based on the field investigation on new road constructions, improvements and deteriorations and reported to the head-quarter office, where the Road Design Section under the Road Operation Department keeps and utilizes the inventory as a basic information for preparation of the road improvement program.

In Egypt, inter-city trunk roads are under the jurisdiction of RBA/MOP, while urban roads inside cities are of the Governorates. Some long-span bridges even on locally administered roads are maintained by RBA. Mainly due to this complex system of jurisdictional demarcations, the roads registered in the inventory do not compose a complete network. Moreover, some incorrect and inconsistent data are observed in it, probably due to an insufficiency in proper

and complete instruction to the local staff.

## (2) Road Traffic Information

The nation-wide OD matrices for passengers and freight are available only in the years when ENTS I, II and III were carried out. They are elaborated based on existing statistics and sample OD surveys at selected points.

As for traffic volume, a permanent traffic count system has developed according to the recommendation of ENTS II. Currently, there are 14 primary stations and 44 secondary stations distributed in the country. The primary stations are facilitated with automatic traffic counters which enable to obtain 24 hours data all the year round. At these 14 stations, traffic volumes are counted manually every three months by type of vehicles and using the results, automatically counted data are classified to vehicle-type categories. The secondary stations are supplement to the primary ones, making seasonal surveys every three months. These traffic data are managed in the Road Design Section under the Road Operating Department and used as a basic information for road design works.

## (3) Vehicle Fleet Data

All vehicles, in principle, have to be registered to the Central Registration Office of the Central Traffic Department (CTD) under MOI, renewing every year. This registered vehicle information is reported to CTD and processed there. The CTD data do not include such vehicles as; temporary imported vehicles (with white plate for foreigners and blue plate for Egyptians), vehicles owned by military and the Government (with silver plate), and vehicles of Police and Governorates (with dark blue plate).

CAPMAS makes vehicle statistics every year, based on the CTD data classifying by items of ownership, vehicle type, make, capacity and age. The CAPMAS data are available with two years time lag.

## 3) Railway Transport Data

The Financial Department of ENR is mainly responsible to develop and maintain transport data of ENR's performance. As to freight transport, main target clients are bulk cargo consigners and the Financial Department is in charge of making negotiation and contracts with them. Thus, contract data are accumulated in the computer of the Department. They are processed and tabulated monthly, according to items of type of commodity, volume, tariff and origin and destination stations.

Station-to-station OD data file is made also for ENR passengers every month. However, reliability of the data is rather

low, due to insufficient data check and improper treatment of passengers who buy tickets in train.

#### 4) Inland Water Transport Data

All ships operated in the rivers and canals in Egypt are obligatorily inspected by and registered to the RTA/MOT, renewing every three years. The Statistical Department of RTA develops a ship statistic every year, based on the registration record.

During 1987-89, RTA developed the "River Transport Data System (RTDS)" with a technical cooperation of Holland. For the purpose of obtaining input data to the system, six gate locks are selected; El Mairu, Boulin, El Canater, Asyut, Naga Hamadi and Esna, where every ships passing the locks are inquired concerning:

- 1 Type of fleet
- 2 License No. of fleet
- 3 Commodity type and volume, and
- 4 Origin and destination port.

Using RTDS, these data are processed into a consistent database, excluding duplicated data. Ships not passing the locks, moving in between the locks, (of which cargoes are called "extra flow") are estimated based on the monthly report of shipping companies. Monthly river transport statistics made by RTDS are available since 1990.

#### 10.3.3 Vehicle Import Regulation and Import Duties

##### 1) Import Regulation

Importation of vehicles to Egypt is regulated by a series of Decrees, No.1036 for 1978 by the Minister of Commerce, Nos 6 for 1985, 333 for 1986 and 59 for 1988 by the Minister of Economy and Trade. The main points are summarized below.

##### (1) Importation Rules of Riding Cars

Riding cars are of the commodities whose importation is prohibited for trading, or for personal or private use (Serial No.180 of the Decree No.333 for 1986). However, the Egyptians working or delegated abroad are excepted from this prohibition according the following conditions:

1. The residence abroad shall be for a period of one year, or nine months provided that the worker abroad shall obtain his annual leaves for a period of three months.
2. The Egyptian individual shall only import one car each four years.
3. The age of importer shall not be less than 18 years.
4. A period not more than two years ( apart from the year of model) should have been elapsed on the year of the

car model up till its shipping date to one of the ports of Arab Republic of Egypt.

5. The motor should not be operated by gas oil.
6. Disposal of the car is prohibited for a period of two years from the date of its temporary or final release.
7. Release of riding cars from Port Said Free zone shall be allowed for the citizens of this city, according to the previous conditions, and provided that the citizen is working therein for a period not less than one year; and that the car model is of the same year release.
8. The customs shall release one riding car only each four years for the resident foreigner, for personal use, as well as the fulfillment of the conditions mentioned above from (3) to (6).

## (2) Importation Rules of Trucks

The custom shall directly release the means of transport for private usage of the following bodies:

- a. Branches of foreign companies
- b. Tourist transport office after the approval of the Ministry of Tourism
- c. Contractors provided presenting the card of contractors
- d. Drivers according to the kind of license

The medium size (pick-ups) trucks of the drivers working abroad shall be treated on their final return - as the riding cars of the workers abroad.

The private sector working in the field of industry, and provided entry in the Industry Register, as well as the owners of private farms whose possession is not less than ten feddans - shall be allowed to import trucks to the amount of one truck each three years, together with being bound by what is stated in the decree of the Minister of Economy, and Foreign Trade No. 6 for 1985.

- e. Private sector school
- f. Branches of foreign schools
- g. Offices and societies for transporting personnel of private sector, public sector and the government
- h. Offices and societies for the transport of dead persons
- i. trucks owned by the public authorities and public sector which were used abroad in their projects.

## 2) Import Duties

According to the present customs tariff table, the following tariff rates are applied to imported vehicles and parts.

Table 10-3-1 Import Duties of Vehicles

Classification	Import Duties(%)
a) For the transport of persons:	
1. Ambulances or hearses	10
2. Of caravan type for housing and camping	160
3. Buses, micro-buses, trolley-buses and the like	30
4. Passenger cars:	
i) With internal combustion piston engines:	
1- Up to 1000 cc	60
2- More than 1000 Up to 1300 cc	85
3- More than 1300 Up to 1600 cc	110
4- More than 1600 Up to 2000 cc	135
5- More than 2000 cc	160
ii) Other (including. rotary engines)	160
5. Pickup cars of double cabin	50
6. Jeep cars of military type, with/without canvas cover	85
b) For transport of goods and materials	20
c) Parts and accessories of the motor vehicles above	
1. For tractors ( not of motor vehicle type )	10
2. Other:	
1- Framed glass for motor vehicles	30
2- Radiators	30
3- Other	20

#### 10.3.4 Licensing for Transport Business

Except for vehicle registration and driving license, there is no particular legislative constraints to start transport business and any persons and companies can enter the market freely, while the public transport companies are regulated by laws and decrees.

##### 1) Road Transport

Every vehicle used for road transport service has to be inspected by and registered to the registration office of the Central Traffic Department and the registration must be renewed every year.

In case of trucks for freight, the maximum axle loads allowed by law are 10 tons for a single axle, 16 tons for a tandem axle. However, there is no effective enforcement of these limits.

##### 2) Water Transport

Every vessel operated in the rivers and canals for passenger and freight transport has to be inspected by and registered to the River Transport Authority of MOT, every three year.

Vessels are inspected on the points of hull structures and

equipments ( especially on sewage treatment system ), insurance subscription and qualification of crews.



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