Intercity passenger transport travel in Egypt, performance and problems

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INTRODUCTION

The topic of this paper is Intercity Passenger Transport in Egypt, with emphasis on the impact of research and studies on decisionmaking and policy formulation. This subject is particularly appropriate at this time as we have recently embarked on a nation-wide transport study and some preliminary results are now becoming available. In many cases the results tend to confirm what was already known through observation and intuition, but it will now be possible to quantify and clearly demonstrate the points which previously could be made only qualitatively and through judgment. In other cases the results provide new insights into the many aspects of transportation.

The theme of the paper will centre on the complexity of intercity passenger transport. When viewed superficially the provision of such services perhaps seems conceptually simple, but in fact it is a very complex problem when viewed in the context of the whole society and economy. As will be shown, Egypt should provide a relatively uncomplicated example, but even here the situation is exceedingly complex, with many interdependencies, alternative possibilities and complicating factors. Study and research are thus not only desirable but are absolutely essential if decisionmaking and policy formulation are to be undertaken with reasonable confidence.

The format of the paper will be to first describe the geographical and economic environment within which intercity passenger transport operates in Egypt, then to describe the passenger transport facilities provided and the traffic volumes carried. The many factors involved in decisionmaking and policy formulation will then be discussed and plans for further research and study will be outlined.

It is possible that this paper will raise more questions than answers, but in fact we are making good progress if we can first identify and recognize the major problems and possibilities in a systematic way and define the dimensions and many aspects of the problem. Only then can we proceed to the formulation of rational solutions.

THE ENVIRONMENT

Egypt has a population of about 38 million people and a land area of approximately one million square kilometers. However, almost the whole populations lives within the roughly 35,000 square kilometers of the Nile Valley and Delta. The valley and delta are essentially linear in shape and form natural transportation corridors with relatively flat land throughout. The situation in terms of geography and population density is therefore conducive to the low-cost construction and operation of railway and highway transport for both passengers and freight, with the capacity for freight transport further supplemented by an inland waterway system consisting of the Nile and a number of canals.

The population density in the Nile Valley and Delta is among the highest in the world for areas of comparable size. There is an even higher level of concentration than first appears in that as much as 46 percent of the population lives in urban areas and about 25 percent in the two urban areas of Greater Cairo and Alexandria alone.

With the large urban populations and increasing industrialization there is less subsistence agriculture than in the past but the average per capita income is still relatively low at about U.S. $220 per year. Car ownership is also low at approximately ten cars per thousand persons.

In summary, the situation is well suited to public mass intercity transport with level, natural transport corridors through densely-populated areas connecting large urban areas.

PASSENGER FACILITIES AND TRAFFIC

The major intercity passenger transport facilities consist of the railways and highways. Aviation is not a significant factor in domestic travel in Egypt except for travel associated with tourism.

Railways

Egypt has an extensive rail network with 3,905 route kilometers. In 1975 the system carried 126 million passengers (excluding urban services) and performed over 7,000 million passenger kilometers. The average length of trips is relatively short for intercity rail services at 55 kilometers but this includes branch lines with particularly short trips. Railway passenger capacity is generally adequate with an average load factor of 56 percent on the main and branch lines and passenger traffic has increased fairly consistently since about 1970. However, there is now a shortage of motive power and the policy has been to maintain the passenger service at the expense of a declining freight service.

The railway passenger fleet consists of approximately 1,200 serviceable coaches supplemented by about 350 multiple-unit coaches and 350 diesel railcars, with the first-class coaches being air conditioned and providing a high standard of service.

Highways

The highway system of Egypt consists of approximately 12,000 kilometers of paved roads and 14,000 kilometers of unpaved. Intercity highway transport accounted for about 287 million passengers and 28,000 million passenger kilometers in 1975, with an average length of haul of just under 100 kilometers. This relatively long length of haul is attributable primarily to the high pro-

portion of passenger kilometers performed by taxis on the Cairo-Alexandria route.

The bus fleet in 1974 consisted of approximately 8,700 buses, with about 5,000 for general use and the remainder for special uses such as schools and tourism. Approximately 75 percent of all intercity bus transport is carried out by four Government owned bus companies. The buses have a relatively high average age of almost 7.5 years and tend to be small for intercity buses with an average seating capacity of 36 persons. Capacity is less than adequate with load factors of more than 95 percent.

The limited capacity of the bus fleet and the resulting high load factors has resulted in one of the most notable features of intercity passenger transport in Egypt: the emergence of a substantial intercity taxi fleet. A survey carried out last year indicates that intercity taxis account for about one third of the traffic volume on the main highways and that their average occupancy was more than five persons, excluding driver. The capacity of the taxis is estimated to be slightly more than that of the bus fleet and in 1976 the taxis carried more passengers and performed more passenger kilometers in intercity service that did the buses. In total, taxis accounted for about 42 percent of intercity passenger kilometers, buses for 37 percent and private automobiles for 21 percent.

To summarize to this point, highways account for almost 80 percent of intercity passenger kilometers and railways 20 percent, and 63 percent of the passenger kilometers on the highways are performed by automobiles, either private or taxis. Thus, even in a situation well suited to mass transport and with relatively low incomes, passenger transport tends toward the higher-cost technologies. It is estimated that the economic cost on mainline passenger trains is equivalent to less than one cent (U.S.) per passenger kilometer while the cost by bus is slightly higher when the cost of providing and maintaining roads is included. The cost by intercity taxi is more than double that of buses, and by private automobile about 40 percent higher than by taxi, primarily because of lower vehicle utilization and lower occupancy rates. Apparently, this cost is not the major deciding factor in travellers' decisions. This is further indicated by the fact that the railway passenger tariffs are slightly below the break-even point while the operation of private taxis is apparently profitable, with tariffs somewhat above costs.

Clearly, the task of the analyst is complicated by the fact that, in their selection of methods of transport, passengers consider not only costs but also time, status, comfort, reliability, convenience and other factors, which are often difficult to quantify and which can have greatly different values in the minds of the individual travellers.

The allocation of passenger traffic between road and rail is further complicated in that it cannot be considered in isolation: it must be considered in the context of total traffic, including freight traffic, as this affects both the capacity available for passenger traffic and the costs. Again, there is a somewhat unusual situation in Egypt. There is a temporary shortage of motive power on the railway and for primarily social reasons it has been decided to maintain passenger service as much as possible. As a result, railway freight traffic has declined even though total freight traffic has increased. The inland waterway barge fleet is operating at close to capacity, and the "overflow" traffic has therefore gone almost entirely to highways. Highway capacity is generally adequate to accomodate this traffic, and the vehicle fleet is able to be expanded relatively quickly, but again, it is a question of carrying the traffic by a high-cost rather than a low-cost technology. Highways now carry more than 80 percent of the total freight tonnage, including 85 percent of cereals, 94 percent of sand, gravel, clay and limestone, 93 percent of steel, 98 percent of construction materials and 91 percent of the total tonnage of manufactured fertilizers. Given reasonably efficient rail operation it should be possible to carry such commodities at considerably lower cost by rail than by road. The decision to maintain a given level of passenger service thus has an important impact on freight transport capacity and cost.

This section of the paper, although intended primarily to describe the facilities for intercity passenger transport and the traffic volumes, has already provided some insight into the complexity of the problem. This complexity will become more apparent in the discussion of the factors involved in policy formulation.

FACTORS IN POLICY FORMULATION

In formulating policy regarding intercity passenger transport we should first have one or more objectives in view, but the definition of objectives is itself a difficult task. The mobility of people is not only of economic importance but also affects the whole social fabric of the nation. The prime objective is to have an adequate passenger transport system, but it is difficult to determine what is adequate? A system which meets the requirements at the least real cost to the nation is required. But how is the real cost to be measured? Specialists are far from agreement on these points. In fact, policy formulation generally takes place in an atmosphere of imprecisely defined and often conflicting objectives, which again adds to the complexity of the situation.

Some of the factors to be considered in policy formulation are the same in all countries; some are of greater relevance in developing countries and some are particularly important in Egypt. In considering the various factors, the emphasis will be on the factors which are now of greatest importance to Egypt.

1. A major factor is the appropriate role of the railway in intercity passenger traffic. While railway can be the lowest cost form of intercity passenger service, it is also an efficient carrier of freight, and especially of the bulk commodities which are expected to account for an increasing proportion of the freight traffic in Egypt. There are indications of some degree of preference for intercity travel by highway in Egypt. Under these circumstances perhaps the major role of the railway should be as a carrier of freight, and especially bulk freight. However, the inland waterways can be an even more efficient carrier of bulk freight, and to further complicate the picture, there is considerable excess capacity on the highways so that, in the short and medium term, even the highways can be low-cost freight carriers.

2. As noted previously, incomes in Egypt are relatively low at about U.S. $220 per capita per year. However, the costs of constructing and operating public transport systems are not much lower than in higher income countries, with the major difference being the cost of labour. Even this is offset to some degree by lower labour productivity. Yet, even in high income countries, it is often the case that the passengers are not charged the full cost of providing the services and the services are operated at a loss. Even though railway passenger tariffs, for example, are very low in Egypt, it is socially difficult to impose large increases. We are thus faced with the problem of systems which have costs about the same as those in more developed countries but with much lower revenue possibilities.

3. The land area of Egypt is about one million square kilometers, but only about 35,000 square kilometers, or less than 4 percent, is arable land. There is thus a great deal of population pressure on the land, both for

residence and for agriculture. The use of arable land for transport systems is already a problem, especially in the cases where highway bypasses around urban areas are required. It is now extremely difficult to add to the capacity of the transport system in any way that requires additional right-of-way, unless the capacity can be installed in otherwise unused desert land. This has already been done in some cases, but it is possible only where the points between which added capacity are required can be connected by a desert road or rail line. There are also some indications that, at least in the case of highways, there is a strong preference for roads in the valley or delta and a tendency to avoid desert roads.

4. Egypt, like most countries at this time, is greatly concerned with energy utilization. Even though the country is approximately selfsufficient in oil, its efficient use will allow some export and the earnings of much-needed foreign exchange. The fuel efficiency of the various passenger transport systems is thus very important and must be included in any comparative analysis of the various passenger transport modes and systems.

5. Egypt has become somewhat of a training-ground for the Arab World in that qualified personnel and skilled labour can find employment opportunities in neighbouring countries at much higher pay than is available in Egypt. It is thus often difficult to retain highly-qualified technical and managerial personnel, expecially in the public service where conditions of employment are traditionally less favourable than in the private sector. The degree of technical and managerial skills required is thus a factor in the selection of the appropriate technology. At the same time, employment opportunities must be found for less-skilled workers, and this is also an important factor.

6. Foreign exchange considerations are also important. A number of factors, including the increase in population, reduced surpluses for export, reduced self-sufficiency in food and resulting increased imports, and relatively large defence expenditures have combined to create a difficult balance-of-payments problem. The foreign exchange requirements of the various technological possibilities for intercity passenger transport and the possibility of local manufacture or assembly of equipment or components are thus important considerations.

A number of additional factors could be identified, but these are sufficient to illustrate the main point, which is this: decisionmaking and policy formulation cannot reasonably be based on judgment and intuition, no matter how competent and experienced the people involved. It is simply not possible to weigh all of the factors involved and consistently arrive at rational conclusions by subjective methods alone. It is thus clear that the impact of research and studies on decisionmaking and policy formulation must be an important one, and these functions must be emphasized much more than in the past.

FUTURE PLANNING

The ever-increasing complexity of transport systems, the many interdependencies within the transport sector and between that sector and the rest of the economy, the increasing choice of technologies and the importance of transportation to economic and social development all indicate an increasing need for a structured, continuing system of transport analysis. This has been recognized by the Egyptian Government, which recently established the Transport Planning Authority to take the lead in systematic transport analysis. A number of studies have been carried out since the formation of the Authority, including the first nation-wide highway origin-destination study to be carried out in Egypt and studies of the cost effectiveness of each mode of transport. However, this is a fairly recent development and further studies are being either planned or executed. Some modifications of the current Five-Year Development Plan for the transport sector are expected as a result of the preliminary studies already completed, and further studies will play a large part in the formulation of the next five-year plan for the period 1981 to 1985. A transportation data bank is to be established and a continuing analytical system, using transport models and computerization as appropriate, is now being planned for implementation over the next two years.

In summary, even though the Egyptian situation seems relatively straightforward in terms of intercity passenger transport, it is in fact exceedingly complicated. It will be very difficult to carry out an analysis which takes account of all the complexities, but it is clearly not possible to have rational decisionmaking and policy formulation without the support of such an analysis, at least to the maximum degree possible. The conclusion is that the decisionmakers will still have to rely on judgement to a considerable degree, but the amount of subjective judgment required will be greatly reduced, and the judgements which are still necessary will be based on the best possible information.

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RAILWAYS

Table 1 – E.R. Passenger traffic, 1970-75

Year	Main/Branch Million	Suburban Journeys	Total	Pass. Km (million)	Aver. Trip (Km)
1970/71	91.0	130.2	221.2	6772	30.6
1972	105.2	142.4	247.5	7216	29.2
1973	117.5	164.8	282.2	8258	29.3
1974	125.8	167.2	293.5	8671	29.5
1975	129.2	176.0	305.3	8831	28.9

Table 2 – Seats per train and load factor, 1974

	Main/Secondary Lines	Suburban Lines	Total
Seats Per Train	413	384	410
Load Factor	56%	97%	62%

Table 3 – Seasonal variation in E.R. Passenger traffic (April 1975 - March 1976)

Month	% of Annual	Month	%of Annual
January	7.4	July	8.3
February	7.8	August	8.9
March	7.8	September	7.9
April	8.3	October	9.3
May	8.4	November	8.8
June	8.3	December	8.9

Table 4 – E.R. Daily Passenger trips, 1976

Category	Trips/Day (000)	Percent of All Trips
Suburban Lines	603	55
Other Lines	498	45
Total	1101	100
Of Which:		
Intrazonal	897	81
Interzonal	204	19
Alex-Cairo-Asswan Corridor		
Originating	910	83
Destinating	909	83
Of Which:		
Interzonal	108	10

Table 5 - Egyptian Railway Passenger revenue, 1970 to 1974 (LE million)

Type of Ticket	1970/71	1971/72	1973	1974	Growth Rate 1970/74 % per annum
Main Lines					
First Ordinary	1.54	1.93	2.01	2.01	7.9
Second Ordinary	2.63	2.96	2.92	3.50	8.5
Third Ordinary	7.47	7.67	8.53	8.48	3.7
Total Ordinary	11.64	12.56	13.47	13.99	5.4
Season	0.79	0.84	0.90	1.01	7.3
Kilometric Season	0.38	0.41	0.39	0.37	0.8
Total Main Lines	12.81	13.81	14.75	15.38	5.4
Branch Lines					
Ordinary	1.88	2.33	2.87	3.06	14.9
Season	0.39	0.46	0.48	0.54	9.7
Total Branch Lines	2.27	2.79	3.35	3.60	14.1
Suburban Lines					
Ordinary	1.40	1.75	2.06	2.18	13.5
Season	0.58	0.63	0.71	0.75	7.6
Total Suburban Lines	1.98	2.38	2.77	2.93	11.8
Total Ord. and Season Ticket Revenue	17.06	18.98	20.87	21.91	7.4
Misc. Revenue	7.18	9.21	8.24	9.11	7.0
Total Revenue	24.24	28.19	29.11	31.02	7.3

HIGHWAY

Table 1 – Road categories

Category	Length	% of Total	Km Paved
Divided Highways	238 Km	1%	238
Main Highways	11,244 Km	42%	10,282
Regional Roads	15,039 Km	57%	1,799
Total	26,521 Km	100%	12,319

Table 2 – Annual average growth of the vehicle fleet (% per year)

Period	Private Cars	Taxis	Total Pass. Cars	Buses	Trucks	Trailers	Total Trucks, Trail.	Total Fleet
1962-65	11.1	1.4	9.6	9.7	6.8	50.3	8.7	9.4
1965-70	4.9	5.1	5.2	1.5	0.2	20.8	2.3	4.6
1970-74	7.9	20.8	10.0	8.9	9.0	14.1	9.8	9.9
1962-74	6.8	10.0	7.5	5.5	5.7	22.0	7.0	7.3

Table 3 – Passenger and freight transport, 1974

Grouping	No. of Vehicles (000)	Percent
A. Passenger Transport		
Private Autos	138.3	59.9
Taxis	40.1	17.4
Other Autos	5.5	2.4
Buses	8.7	3.8
Subtotal	192.6	83.5
B. Freight Transport		
Trucks	31.5	13.7
Trailers	6.5	2.8
Subtotal	38.0	16.5
C. Grand Total (a)	230.6 (a)	100.0

Table 4 – Characteristics of bus traffic by ownership

	Public Bus Companies	Government and Public Enterprises	Private	Other
Distribution of Number	67.0%	24.7%	6.4%	1.9%
Average No. of seats	42	39	27	40
Load Factor	0.98	0.77	0.81	0.61

Table 5 – Intermodal comparison (ADT) (1976)

	Private Cars	Taxis	Buses	Total
Total Vehicle Trips	25,654	38,873	4,981	69,508
Average occupancy (persons)	3.60	5.10	37.15	–
Vehicle Km	(38.1%)	(55.2%)	(6.6%)	(100%)
(000)	3,362	4,867	500	8,809
Passenger Km	(20.5%)	(42.2%)	(37.3%)	(100%)
(000)	12,103	24,822	21,902	58,826
Total Passengers	(19,4%)	(41,7%)	(38,9%)	(100%)
Transported	92,354	198,044	185,044	475,650
Average Vehicle Trip Length	131	125	116	–