Transport Problems in Cairo*

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Introduction

Cairo is one of the world's great urban centres with centuries of history; it is also at the cross-roads. Poised on the threshold of further growth, and despite heroic efforts to the contrary, it is, as far as urban management and efficiency is concerned, in decline.

The paper reviews the present rapid growth of car ownership against a backdrop of fragmented local governments (there are three governorates serving the city), and traffic constraints (i.e., lack of a secondary road network and off-street parking spaces, which in turn affect already overburdened transit services).

It emphasises the need for a transport planning organisation with broad metropolitan authority capable of developing transportation policies from an analysis of the trade-offs between alternative courses of action.

An underlying theme of the paper is that the response to more cars is not necessarily more roads and bridges. The point is made that there is a need to charge either directly or indirectly for the use of road space from the people who derive benefit.

Thus, Cairo's transport problem is part of a broader urban problem and can only be discussed in the context of the major issues facing the city. Some of these major issues can be summarised under three headings:

- Growth,
- Residual Deficiencies, and
- Urban Management.

1) *Growth*
The city is growing at the rate of about 350,000 persons per year or about 1,000 per day. This stark fact affects all sectors and loans particularly when one realises that a large proportion of the poor are settling on agricultural lands. Major squatter thrusts to the north (Shubra al-Khima) and the west (Bulaq al-Dakrur) are very evident. As the Egyptian authorities are well aware, the results of this massive, unanticipated and undirected growth have seen even further reduction in scarce agricultural lands, shortages, inefficiencies and congestion which impede urban development and the effective disposition of urban resources in (and hence the international competitiveness of) the national economy.

2) *Residual Deficiencies*
An analysis of the 1976 Census indicates that between 56 and 60 per cent of all dwelling units were without individual connections for water and sewerage at the time of the Census. In 1980, it was estimated that over 400,000 families lived in overcrowded single rooms, cabins, kiosks and homes in tombs, without direct access to sanitary facilities In other words, there is a serious housing shortage and it is getting worse each year. In addition, the collection of solid wastes leaves much to be desired, with about 300 tonnes per day not collected and left on the streets.

3) *Urban Management*
Urban management embraces operation and maintenance; yet, because of a shortage of municipal funds and expenditures, the problems highlighted above are compounded. The limited infrastructure which exists is deteriorating because of a lack of upkeep and the situation is exacerbated by well-intentioned pricing and subsidy policies that are giving rise to profound inequities. The unfortunate fact is that the institutional and managerial apparatus that could effectively address these problems is not yet fully in place. This lack severely handicaps the commendable efforts of the Egyptian authorities at all levels of government to cope with growth and to meet the immense current backlog of unfilled needs. In short, this great and wonderful city is a very inefficient one.

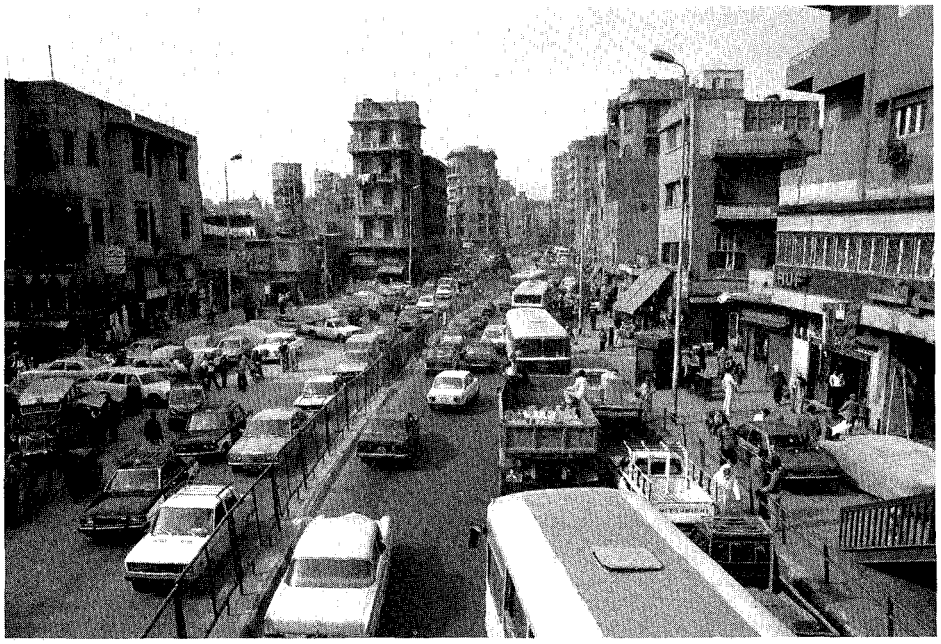
Issues in the Provision of Transportation Services

Challenges in the provision of transportation services in Greater Cairo include a dramatic growth in the number of private vehicles, impeded traffic flows, an inadequately developed secondary road network, an insufficiently effective traffic management and engineering system, especially with respect to the Central Business District (CBD), parking and congestion, and wide-spread difficulties in the adequate provision of public sector transportation Greater Cairo's transportation problems are by no means insoluble, but involve important trade-offs between investments. For example, reduction in population density would provide significant additional space for residence but, by expanding the urbanised area, would increase transport and infrastructure costs. Another potential trade-off exists between commuting that now takes place by automobile and the proposal for major transport investments. In public transit, there are choices to be made between diesel, gasoline and electric trolley buses, light rail systems and the metro, and also between large and small capacity vehicles. In the links with the new communities there are choices between fixed rail and bus systems. In providing access to outlying areas and areas across the river, the high-cost solutions such as ring-roads and bridges have to be evaluated and compared to the benefits.

All of these choices require analysis of alternative investments and assessment of intersectorial priorities and implications. Such choices must be based on relatively sophisticated analysis which implies the need for a central planning agency that has binding authority over all of Greater Cairo. However, the city's transportation crisis, like all its other problems, involves not one but three governorates with separate administrations and institutional preferences. The growing pressure upon all means of transport for the foreseeable future underscores the need for a transport planning organisation with broad metropolitan authority.

Travel Patterns

The rapid pace of urbanisation in Cairo has triggered an even faster growith of demand for transport. Daily trips by all modes in-



Traffic on Al-Azhar Street.

Photo François Vigier.

creased by about 7 per cent during the 1971-78 period to about 5 5m and probably exceeds 8m today. The situation with respect to cars and taxis is even more dramatic. During the 1960s and early 1970s there was a relatively slow increase in the number of private vehicles registered in Greater Cairo, but since 1974 there has been a dramatic increase from 99,000 in 1974 to 183,000 in 1980 and by July 1983 the number was 294,000. Growth rate for the last ten years has been 17 per cent per annum, even so, private car ownership is low, at around 26 per thousand inhabitants versus 300-450 per thousand in many European and North American cities.

Other statistics are equally impressive. By the start of this decade the CBD, for example, was estimated to generate about 600 person trips per hour per hectare compared with 139 person trips per hour per hectare in Central London; (the reason the number of person trips is so high in Cairo may be because the telephone system is so inadequate). Some 63 per cent of person trips are made by public transport (including taxis and shared taxis), 23 per cent are by walking, and 14 per cent by private cars and motorcycles. About 90 per cent of peak hour motorised trips are made on buses and other high occupancy vehicles.

The Road Network and Traffic Management

About 25 per cent of Greater Cairo's total urbanised area is road space. However, the practical traffic-carrying capacity of these roads is approximately 25 per cent less than that in developed countries where maintenance standards are higher and driver/vehicle performance is better. But the severe transport infrastructure problems of Greater Cairo are not due either to a lack of total road space, or to excessive vehicle densities or low vehicle occupancy rates, but are more a function of a high percentage of unsurfaced roads in the city's secondary and tertiary network; bottlenecks in the existing primary road network and in its repair and maintenance; rapid and unmanaged growth in private car ownership; and the absence of parking restraint and other traffic management measures. These conditions are exacerbated by Cairo's high average population density.

With the notable exceptions of certain high income suburbs (Heliopolis, Maadi and Dokki), the general state of repair of roads and foot-paths in Greater Cairo is extremely poor. The foot-paths are frequently unsurfaced and blocked by building materials and parked vehicles forcing pedestrains into the streets. The resultant conflict of moving vehicles with pedestrians and parked vehicles is both dangerous and inefficient. In the CBD, inadequate parking control, the low standards of traffic signs and signals, and the lack of resources for control and enforcement aggravates the traffic problem. Many of the existing traffic signal installations operate poorly and are in need of repair. Drivers generally do not expect signals to work and ignore them frequently, often encouraged by traffic police who direct traffic independently of the signals. Acute shortages of trained staff and facilities preclude driver and vehicle testing procedures from being anything but cursory and there are no established facilities for driver education and training. Accident rates in Cairo currently rank among the highest in the world, at 80 fatalities and 600 injuries per 10,000 vehicles, 20 times that of the levels of the U.K. or the U.S.A.

In many heavily built-up and low-income sections of the city, there are effectively no secondary roads, and where they do exist they are unpaved. According to consultants' reports, at least 60 per cent of the area of Greater Cairo has no surfaced road network. This includes well-established districts where three to six-storey apartment buildings house up to 100,000 people per sq. km. (e.g. Zaitoun, El Zaher, Shubra, and Rod al-Farag). The lack of surfacing results in problems of solid waste removal, emergency vehicle access, flooding,

silting and blockage of sewer lines. Such problems are strongly interrelated. Until the streets are reasonably surfaced, solid waste collection vehicles cannot gain access to the houses.

Because of the lack of surfacing and lack of street cleaning and solid waste management, public health problems in such areas are severe. Children, who usually go barefoot in the dirt streets and alleys, are particularly at risk. In one section of the Imbaba District of Giza, street conditions are so bad that public transport cannot penetrate a five sq km. area, and officials responsible for emergency services stated that they could not gain access to the whole area for ambulances or fire engines. The absence of street-lighting in these high-density areas adds further to the difficulties of living there.

The Impact of Recent Policies

A crucial decision has confronted Cairo's planners for at least twenty years; whether or not to place primary emphasis on designing the city's road system and use of space to cater to the private automobile, or to stress mass transportation. Apart from emergency measures, most investment has gone into servicing private automobile owners who, including their dependents, represent no more than 15 per cent of the population. The most visible sign of this emphasis has been the construction of several bridges across the Nile (the 6th of October Bridge, El Tahrir Bridge, the 26th of July Bridge, El Azahal, El Abbasiya and some other bridges under construction). They serve the essential function of moving the higher-income groups between their places of residence and work, schooling and shopping, etc. While public transport can use these arteries, they were not designed to improve the efficiency of public transport, for example through the use of exclusive bus lanes. Moreover, they constitute an added incentive to the proliferation of private vehicles, especially in the CBD, a process that city planners should discourage rather than encourage. The response to more cars should not necessarily be more roads and bridges.

Given the rapid rate of increase in car ownership, it is likely that in the long-term it will be necessary to introduce measures that will directly restrain unnecessary, inefficient or unproductive use of the automobile. One of the most effective would be to increase the price of motor fuel; but any significant increase is likely to be hampered by the structure of the Egyptian economy, in which virtually all goods and services, including petroleum products are covered by price subsidies. However the domestic price of gasoline has been increased somewhat in the last three years and is now about 60 per cent world prices; this compares with diesel and fuel oil prices which average 20 per cent and 6 per cent respectively of world prices.

There are signs, however, of a growing awareness that something must be done about transport, and this is partly reflected in the government's response to the World Bank-supported Greater Cairo Urban Development Project, which is at an early stage of implementation. Included in this project are:

1) corridor improvements;
2) bus route extension into low-income areas;
3) traffic engineering in the CBD, including the provision of multi-storey, "off-street" parking spaces;
4) improvement in bus maintenance and overhaul facilities;
5) road maintenance and street lighting equipment;
6) institutional strengthening, particularly in the Cairo Governorate, and
7) training of traffic police and bus operational and maintenance personnel.

The CBD component is particularly interesting and shows that the Cairo Governorate can act quickly and independently when it is convinced that a certain course of action is a good one. This component consists of three on-going elements:

1) A traffic engineering study to prepare functional and engineering designs for traffic management measures in the CBD;

2) US$5m equivalent to finance agreed components arising out of (1) above; and

3) approximately US$14m to build two multi-storey car parks, one at Opera Square for 1,000 cars and the other at Ataba Square for 600 cars.

In addition, the CBD component will also benefit from the traffic police training component

The bidding process for the two parking garages resulted in considerable interest being shown from a large number of international and local construction firms bidding on a turnkey basis. The interest was such that the Governor of Cairo decided to seek further bids for other sites owned by the Governorate, this time linked with financial proposals. The results of all this have been fascinating in that, at the present time, there are three real estate development proposals incorporating a further 3,500 spaces (for public use) under active consideration by the Governorate, with financing coming from the private sector. It is to be hoped that the negotiations will be successfully concluded as traffic schemes in the CBD cannot hope to succeed without moving some cars from the streets and footways. Another innovative aspect of these proposals is that they incorporate more than "off-street" parking bays. Shops and offices will be included and the proceeds from the sale of leases will help defray some of the cost of the car parks, hopefully making them affordable to a wider public.

Public Transport Services

The Cairo transit system has extremely high ridership with 80 per cent of urban dwellers depending on public transit as a mode of travel within Greater Cairo. The bulk of public transport is provided by two publicly owned undertakings: the Cairo Transport Authority (CTA) which operates buses, trams and river buses, and the Heliopolis Metro which operates a sub-

Table 1 **Public Transport Operations in 1978**

Mode	Daily Passengers In '000s	% of Total	Number of Vehicles
CTA — Buses	2734 6	79	2300
Trams and Trolleys	368 5	11	234
River Buses	33 7	1	30
	3136 8	91	2564
Heliopolis Metro	292.1	9	221
	3428.9	100	2785

urban tram system. As Table 1 indicates, CTA is by far the predominant provider of public transport.

The total stock of the CTA bus operations is 2,300 vehicles. Operating speeds range from 28 kph to 7 kph depending on location and length of route. Passenger loadings on the buses are extremely high with up to 2,100 passengers per unit per day. On a typical day, up to 33 per cent of the operational fleet is not available for service. Rough handling and driving, overloading, inadequate maintenance, and the chronic lack of spare parts account for this relatively high rate. Average vehicle life is only 7 years compared to about 12-15 years in western Europe The tram fleet is in much the same condition. Break-downs are frequent for all types of vehicles and can result in all traffic being brought to a halt for hours on narrow but extremely busy streets.

Among the many factors that contribute to this unsatisfactory state of affairs, three are:

- *political.* fares have been politically determined and held in check during a period of sharply rising prices;
- *managerial.* procurement, operational and maintenance practices need improvement; and
- *external to CTA* · e.g. congestion and the operational condition of the streets and roads.

There is considerable concern over the size of the bus fleet, and current investment plans call for the purchase of about 300 buses per year over the next five years. As necessary as these purchases may be (in fact they will only meet replacement needs), it does not get around the fundamental problem of congestion. Additional buses cannot be put onto streets that are too crowded to handle them. For instance, the most heavily travelled routes are along the north-east axis where demand for public transport is greater, but where traffic is already nearly at a standstill during the rush-hours. The same holds for lines coming from or going to Helwan in the south or where a line crosses any of the Nile bridges. New buses can pick up additional passengers, but may further reduce the speeds at which they operate. Despite considerable effort and much expense, CTA has hardly increased the number of passengers carried per day in the last twelve years. CTA and the Heliopolis Metro were carrying 3.3m passengers per day in 1972.

Public transport services are also provided by the Heliopolis Metro System, the Egyptian State Railways and by about 37,000 taxis and larger fixed-route shared taxis, some of which consist of 12-seat minibuses operating on specified routes. Especially noteworthy is the fixed-route shared taxi system in which 12-seat minibuses operate on specified routes. This service is a relatively new phenomenon in Cairo, but it is supported by the Central Traffic Police and by a well-organised drivers' union. Since its introduction four or five years ago it has grown rapidly and there are now over 6,000 private buses (not all of which are shared taxis) registered in Greater Cairo. Growth in this service has taken some of the strain off conventional buses and trams. It is likely, however, that for the medium-term at least, large buses and trams will continue to dominate the public transport sector, although it is understood that CTA is considering the purchase of minibuses as part of its fleet renewal program.

The Proposed Metro (Part Subway) System

Proposals for a Cairo subway system have been around since 1954 French consultants first studied the project soon after the Free Officers came to power, but the cost estimates appeared prohibitive at that time and the project was shelved. Another French mission returned in 1963, followed by English consultants in 1964 and then Japanese and Soviet missions. The French consulting firm, SOFRETU, studied the problem again in 1971, and completed preliminary designs for a system with a total network of 142 km of ground level track, and 30 km of underground track. This compares to 172 km of underground track in Paris, 385 in New York, 387 in London and 412 in Moscow.

Phase I has already commenced and will integrate the major north-south axis. It consists of a total of 41 km of track that would link the Helwan and Al-Marg railroad lines through the CBD by 5 km of underground track from Bab al-Louk to Ramses Square. Concomitantly 44 km of double-track train lines would also be developed.

Phase II would link the northern industrial district of Shubra al-Khima by surface and underground track to Tahrir Square.

Construction of the metro station, Tahrir Square.
Photo. C D C./Tareq Sweilam

Phase III would link Bulaq and Imbaba on the west bank of the Nile to Tahrir Square.

The logic of the underground is compelling. It utilises little or no surface space, and it can haul far more passengers per hour than any rival mode of transportation. The underground could carry 60,000 passengers per hour in either direction compared with 20,000 by tram, somewhat less by bus (especially during rush hours), and only 2,000-2,500 by car. Cairo's basically linear physical alignment lends itself to the metro. The first phase, with a minimum of bus-operated feeder lines, could put the bulk of Cairo's 10 million inhabitants within reach of the subway.

A major concern and policy option for the desicion-makers concerns the proposed fare levels for the metro and the debt service costs alone may approach 20P per ride, without allowing for operation and maintenance expense. If fares were set only to cover debt service, they would be much higher than the current level of public bus fares. One of the most constraining factors is that the city's transportation involves not one but three governorates. This again underscores the need for a transport planning organisation with broad authority But notwithstanding such institutional constraints, there are several, relatively cheap, intermediate measures that can be taken, given proper co-ordination. For instance, sidewalks could be cleared, particularly in the CBD, of auto repair shops and street vendors; no parking zones could be strictly enforced and one-way streets with bus priority lanes designated. Restraint measures (starting with trip and restraints, i.e., parking control) can be gradually introduced in the CBD followed by area pricing for use of downtown roads. This would gradually allow the CBD to revert to the functions for which it was designed.

All these measures presume a marked transformation of citizen behaviour and the rigor with which laws and regulations are applied. Bus and taxi drivers must be adequately trained and held accountable for violations of traffic regulations. Traffic police must be sufficiently well-paid and their general working conditions improved

enough to supply an incentive to apply regulations. They must be instructed in the logic of these regulations so that they know when and where to apply them and how to enforce them. This is decidedly not the case now. Moreover, tickets for public and private traffic violations should be issued and, if possible, payment should be enforced. As it is, traffic police simply write down a violator's license number and the nature of his violation and when he renews the vehicle's registration, he pays the cumulative fines without knowing definitely if he actually committed the violation. The policeman gets a percentage of whatever he reports. This system may earn the traffic department some money but does little else. On-the-spot tickets to violators followed by withdrawal of licenses would be more effective if combined with the recently instituted periodic spot checks on licenses and car registrations.

The general citizenry might behave more responsibly if they felt the traffic system was designed for their benefit. A sidewalk covered with private automobiles forces people into the streets where they ignore red lights as blithely as they do vehicular traffic. At the moment, civic responsibility does not clearly benefit the average citizen. If the authorities in Cairo confine their efforts to meeting the traffic crisis by attempting to improve conditions for the private automobile alone, the city risks writing a prescription for future paralysis.

A final word on prices. The critical aspect of highway infrastructure investment proposals are that they should be more than fully financed by the vehicles that directly benefit from them. This is always required for economic efficiency, but distribution issues are also important. Progressive taxation of automobile ownership is one of the few taxes that realistically address pricing issues. The presently high auto import duties, which increase with vehicle size and value, would seem to be fully justified. Unfortunately, the government has not yet taken a similar policy with respect to vehicle operation. As mentioned earlier, the current gasoline price is far below the untaxed level of the rest of the world. If the price were doubled, it would not only raise revenue, but also help to pay for transportation improvements. Letting the high-income groups consume untaxed and subsidised gasoline while the city's bus fleet strains for funds, parking is unregulated and pedestrians are forced into the streets, seems to satisfy few economic or political objectives.