

Special

A way out of tyrannical traffic

By Md Aroz Ullah Sumon

BAKLADESH is a relatively small country covering an area of little over fifty five thousand square miles. Dhaka is the capital city of Bangladesh and the hub of economic activities of the country. With rapid rate of growth and development, sustainability has emerged as a critical issue for all planning and development endeavours for the city. By 1971, the increase in the population of Dhaka Metropolitan area had far exceeded all projections from 0.28 million in 1951 to around 1.2 million in 1971. Annual growth rates of population during 1961-74, 1974-81 and 1981-91 periods were 9.32, 9.94 and 8.70 per cent respectively. The reason for this increase has been its growing importance as a centre of administration, education, commerce, trade and industry, etc. People come to Dhaka from all over the country in search of employment. Due to increasing population, the transportation system in Dhaka city is on the verge of a collapse. The ill-planned transportation system will even more adversely affect the already deteriorating living conditions, sagging productivity, declining quality of life and degrading social and physical environment.

GIS planning tools can be helpful to make a systematic transportation plan in this respect with the aim to develop a computer-based technique for determining appropriate routes and hence provide a framework for designing better transportation system. The dismal picture of the existing situation indicates that our planners should follow computer-based transport planning without any further delay. The national government should take necessary legal and administrative measures to facilitate various actions by all agencies concerned under public or private sectors towards the common goal of achieving a sustainable future transport plan for Dhaka city.

Traffic jam is the most conspicuous problem in Dhaka and inefficient transportation system is largely responsible for this. In Dhaka, the total length of roads is around 2500 km, out of which the length of primary roads is around 200 km (Chowdhury, 1998). The total number of vehicles (Motorised and non-motorised) moving in the city occupy roughly 32 per cent of total road space. A unique feature of the city is dependence on cycle rickshaws; there are more than three lac rickshaws, most of which are not licensed. While these provide convenient, pollution-free, relatively less expensive, personalised door to door transport service for chiefly the low-income group, they contribute significantly towards creating traffic jams due to their low speed range. Total number of motorised vehicles is around 220,000, out of which there are around 50,000 three-wheeled autorickshaws. These run on two-stroke engines and are largely responsible for air pollution in the city. There are 380 buses, 1250 minibuses and about 70 double-deckers. The number of buses is inadequate for such a large population. Traffic jam, which is a regular feature in the relatively narrow streets of old Dhaka, has now become commonplace in some of the newly-developed areas as well. The roads are always crowded due to encroachment by unauthorised shops, temporary storage of construction materials on footpaths and roads, garbage bins, haphazard parking by rickshaws, autorickshaws and buses, ignorance about traffic rules, forcible occupation of footpaths and roads (eg. by hawkers, squatters) creating obstructions to pedestrian movement. A good number of people have been using different kinds of vehicles in the city, both motorised and non-mo-

Vehicle Population of Dhaka City

Broad Group	Vehicle type	Population
Motorised	Car	45,600
	Bus/Minibus	8,600
	Taxi	1,500
	Truck	9,900
	Auto-tempo	1,500
	Auto-rickshaw	18,800
Non-motorised	Motorcycle	26,000
	*Rickshaw	150,000
	Rickshaw van	10,000
	Bicycle	NA
	Pushcart	3,000

* Number of rickshaws are estimated. Source: Government of Bangladesh (1993)

Transportation problem has become more acute with increasing population. Settlements, land use patterns, administrative and socio-cultural centers have multiplied enormously in the city. People are rushing to Dhaka, more than ever before, for pursuing employment, administrative, private functions and other socio-economic activities. So, there is a requirement for maintaining all kinds of data for future development programmes. For this reason, we can use computer for updating and manipulating data drawing lay-outs, analysing map cover, etc. In this situation GIS technology may play an important role. Transport planners have been using information systems for a long time now to support planning and management tasks. Most of these previous systems deal with manually maintained textual/numeric data. Traditionally, we rely upon the data from paper maps or from site surveys that can be both time consuming and expensive. However, the availability of digital map data offers a new data source which can provide a more detailed description of the existing road network. In modern GIS utilities all such data are available, and it also has the significant additional capability of providing a spatial view of all information. GIS is an information technology which can effectively capture, store, retrieve, update, analyse and finally display all forms of georeferenced data, graphs and tabular information in a variety of output media. GIS is not the

ideal for managing transport related resources in urban government. For instance, GIS can help figure out the shortest route to the service centre. Through application of GIS technology, the present transport planning would be more viable and cost effective. An on-line access to these information can help inter-agency co-ordination as well as preparing their own plans. Either the planning commission or RAJUK can take a leading role in implementing such an on-line information system. It is possible to identify basic functional movement of intracity passenger travel and associated transport modes. Ideally, a transport system as a whole, should be capable of accommodating these different types of demands. Different modes will match the requirements of different categories in terms of capacity, speed and range with some overlapping of course. No single mode can accommodate all types of movement. However, use of modes still remains limited in Dhaka city considering two vital issues of affordability and sustainability. There are different types of transport systems in Dhaka. However, three movement demands and system categories can be identified: pedestrian, local area and intracity movement.

Pedestrian: Short trips of half to one kilometre, which cannot be made conveniently using vehicular modes, are commonly taken on foot.

Local area movement: There are two major forms of local area movements: for distribution and collection of longer distance intracity trips and short distance local trips made mainly to meet the daily necessities. To cater to the needs of this type of trips, provision of medium to low speed, low volume systems accommodating trips of 2-5 kilometres in length, operating at perhaps 10-20 kph is suitable. These modes may operate over short distances with frequent stops, can provide personal door to door services, and may also act as collectors or feeders for the intracity systems. Different types of vehicular NMTs (bicycles, rickshaws, etc.) and MTS (mostly low-cost three and

four wheelers operating as paratransit) with low to medium capacities and speeds can conveniently meet the demands of local area movements.

Intracity movement: These include longer distance trips of say 10-30 kilometres and represent the line of a typical transit trip from outer areas to the Central Bangladesh CBD. To meet the requirements of these types of trips, medium or high speed, high capacity systems with less frequent stops are required. Conventional higher capacity transit systems and the car can meet the requirements of these types of trips.

Nowadays, regular articles on transport problem in the city appear in different newspapers and the issue comes up in seminars, symposia, workshops, etc. Suggestions are coming up from different organisations to solve the present problem without any internal coordination. The government must aggressively address the transport problem with a view to formulating an efficacious plan for solving it. Government may change the system in such a way so that the existing bus terminal of, say, Gabtoli may operate from Saydabad bus terminal and vice versa. The passenger will have the opportunity to avail all buses from the locality. On the other hand, Mohakhali bus terminal may operate from Mohakhali after serving the whole area of Dhaka city. The practical situation is that a certain percentage of autorickshaws and rickshaws are serving for picking up and delivering passengers from different places in the city. Some private enterprises like long distance buses are operating from different places. So, automatically a certain percentage of vehicles, autorickshaws and rickshaws will be slowly phased out after changing the bus terminal. Mostly rickshaws may ply the artery roads, inner roads and lanes and in no way main roads after introducing adequate number of buses which can be solved by changing the bus terminal. There is still a good number of buses running in different parts of our city. Because, autorickshaws and rickshaws are making traffic jams at important places of the city, introducing sufficient number of buses and double deckers in public and private sectors will ease up traffic conditions. It has been recommended that there is an immediate need for introducing three thousand buses (Chowdhury, 1998). There is no government or private enterprise which can invest the huge amount of money needed for this purpose. So, alternatively, if these terminal buses can serve the city area, then traffic jam can be reduced gradually. On the other hand, passengers will be economically benefited.

As for the long run, the Dhaka Integrated Transport Study recommended that it would be necessary to go for an underground rail system. However, it will be very expensive. Being a poor country it is not possible to invest a huge amount of money for constructing an underground rail system. It may be noticed that the first lane of the city roads remains more or less blocked one way or the other. If we could set up either a small-scale slow moving commuter electric train network or a small-scale slow moving long vehicle road network over and along the first lane, then the space will be fully utilised by running the train or slow moving long vehicles. As a result, vehicles will move easily using the wide space of the road. After effective use of this lane all business centres, enterprises, industries, etc. will be slowly shifted from the roadside to other places in the city.

Footpath-bazar is now a nagging problem in Dhaka city. For using the first lane, footpath-bazar will automatically be removed from the roadside.



GIS can envisage future transport routes based on the existing data. So, public or private line agency organisation has to follow computer-based analysis for determining appropriate routes and hence provide a framework for designing better transportation systems.

Needless to say, the government will have to strongly enforce the rules. A tentative proposal for commuter electric train line for an area covered around Shamoli, Agargaon, Mirpur-10, Mirpur-1, Technical, and Kalyanpur is depicted below. We can say for example, Mirpur-10 to Farmgate road linkage has been constructed as per traffic volume demand. There is traffic jam due to vehicles making U-turn, building materials piled up by the roadside, car parking, garbage disposal units, rickshaws, baby taxis and floating bazar etc. During peak hours, vehicles will never be allowed to make a U-turn except only at some designated places. Irregular stoppages on the road can be stopped by penalty system with the help of video camera. Slow moving vehicles should avoid using the right lane. High-speed vehicles may only use the right lane. Another regular feature of traffic jam is found in front of Hotel Sonargaon, one of the busiest locations in the city, creating traffic jam for a minimum of a 1/2 km stretch from oval point to Farmgate depending on volume of traffic and speed. Therefore, a fly-over is immediately required in front of Sonargaon Hotel. Signal Timing alone at this point is not enough for ensuring smooth flow of traffic as vehicles are converging to this point from four different directions. Therefore only a fly-over in between the oval point in front of Sonargaon Hotel and Bangla Motor can solve the problem. There are other similar points in the city where the traffic signal time cannot serve properly the traffic generating point of the main linkage road.

Alternatively, road pricing can be one solution for traffic jam especially for slow-moving vehicles as well as for reducing the number of vehicles, increasing speed, increasing vehicle capacity, etc. Adequate pedestrian movement channels are required to be provided especially in areas of intense activities. The most common facilities include pedestrian walkways, footways, overpasses and underpasses, etc.

The government should take necessary legal and administrative measures to facilitate various actions through all agencies concerned under public or private sectors. It should stop granting approval for any government offices or private enterprises at the heart of the city. Offices or enterprises may operate from satellite towns mostly in flood-free areas commonly linked with the capital city. The government should establish cottage industries and other employment opportunities in the rural areas to employ people locally and thus to arrest unplanned rural-urban migration that puts excessive pressures on the services of cities. Traffic rules and regulations are not for display on BTV screen only. The government should monitor traffic violations and introduce a system of penalty for those who break the rules. In order to be effective the penalties would need to be so high and enforced so strongly that people would desist from breaking the rules. Nonetheless, the government may form a regulatory body like a task force which can regulate the transport system. In some cases, the government line agencies or private enterprises may change the strategy to solve the traffic problem.

Although some transport studies in Bangladesh are available, none of these studies dealt with transportation systems depending on present and future transport demand. GIS can analyse such type of transport demand through the use of present and past data. GIS can envisage future transport routes based on the existing data. So, public or private line agency organisation has to follow computer-based analysis for determining appropriate routes and hence provide a framework for designing better transportation systems. The policymaker or planners may recommend that either the slow

moving small-scale commuter electric train or long vehicles may operate along the first lane. The benefit is that no one can engage the roadside as operates in important locations in Dhaka city. The idea may be drawn from technocrats, consultants, professionals, planners, educationists and government high officials so that the transport planning should be institutionalized. There is also recommendation for setting up of a separate ministry for public utilities including railways, road transport, DESA and WASA (Observer, 24.10.1999).

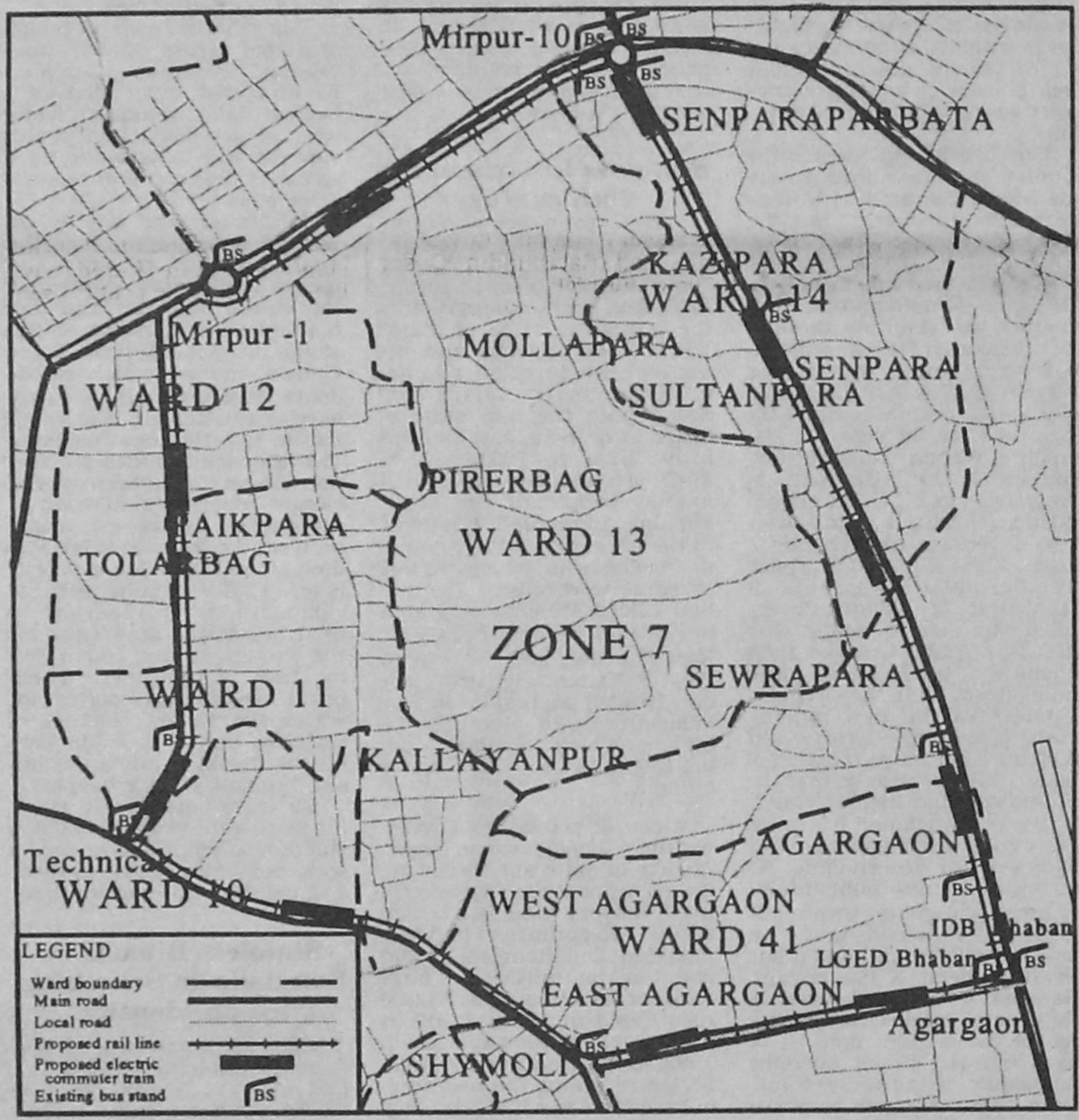
Finally, there is a clear need for an integrated authority to have a sound development of different transportation facilities that should be evaluated in terms of long-term development objectives. Due to institutional weaknesses and governance problems it is difficult to abolish existing practices that appear to have little relevance to our proposed changes in transport planning. We must look for new approaches appropriate for transport planning. To meet the demands of the existing situation for sustainable transport planning and design, we must institutionalise transport planning. The urgency of the existing situation dictates that transport planning must be followed without any delay by our planning authority. It requires extensive background information, technical and socio-economic data, specific computer technique or model, human resource, adequate time and resources to come up with a viable plan. The GIS based planning information system must also be developed through pragmatic transport planning technique as has already been developed in the world. The national government must take necessary legal and administrative measures to facilitate various actions through all agencies concerned — public or private.

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A case of co-ordination failure

By Syed Abul Basher

INDIAN economist Kaushik Basu made an interesting observation that people in wealthier countries walk at a faster pace. Those of us who have watched western movies or have had the experience of visiting any western country may agree with Basu's assertion. In contrast, people in poorer countries walk at a relatively slower pace. This apparent contrast in the gaits between the rich and poor countries can be attributed to opportunity cost denoting the cost of forgone activity. For example, the opportunity cost of going to class early in the morning is sleeping. People in rich countries walk faster because they place a relatively higher value on their time. The opportunity cost of walking slow is higher in rich countries. Poorer countries like Bangladesh, however, have the opposite scenario. Thousands of people walking everyday in Dhaka can be seen maintaining a pace that is relatively slower than that of their counterparts in wealthier countries. Strange as though the slow-walking approach of the denizens of Dhaka is one of the contributors of capital menace traffic congestion! In this article we will discuss traffic congestion as a cause of coordination failure and how the slow-walking phenomenon and other trans-

portation-related problems are contributing to the congestion. In Bangladesh most people choose to walk on the road rather than use the footpaths. This is because many of the footpaths are monopolized by small traders and street hawkers while other footpaths are rendered inaccessible as a result of garbage and odour. Not surprisingly, in areas where footpaths are not under such grievous assault, traffic congestion is relatively less. One statistic shows that, for every 100 people, 61 use foot as a primary mode of their transportation followed by 18 by rickshaw, 13 by buses, three by private cars, three by auto-tempo, and two by motorcycles. The high proportion of foot as a mode of primary transportation coupled with the relatively slower pace of walking results in the interruption of the normal flow of traffic on roads.

The traffic congestion is, of course, exacerbated by drivers who park their vehicles (both manual and motorised) haphazardly on the roads and who show disregard for traffic rules. This culture of congestion can be attributed to the low opportunity cost of having regard for others in traffic situations. If time were regarded as valuable, we would have walked much faster; if penalties were steeper or traffic rules better enforced,

In China, cycle was once the preferred mode of transportation. Now the Chinese Authority is prohibiting cycles from major subways. It is true that rickshaw cannot be abolished at a glance in Dhaka. As a quick step, a separate lane should be provided for rickshaws so that they do not overlap with motorised vehicles. Although this has been attempted without much improvement to the situation, lack of enforcement of the rules played a key role in the failure of the separate lane.

drivers would be less apt to violate the law and common courtesy. Rickshaw is yet another cause of the high traffic congestion in our city. A misconception about the three-wheeler is that it is environmentally friendly. Rickshaw is relatively a slow vehicle and almost 50 per cent of the city traffic consists of rickshaws. Although rickshaw does not directly contribute to pollution, its indirect contribution cannot be ignored. It slows down the traffic speed and causes more fuel consumption. By prolonging the travel time, it subjects all commuters to higher levels of exposure to air pollutants. In China, cycle was once the preferred mode of transportation. Now the Chinese Authority is prohibiting cycles from major subways. It is true that rickshaw cannot be abolished at a glance in Dhaka. As a quick step, a separate lane should be provided for rickshaws so that they do not overlap with motorised vehicles. Although this nas

been attempted without much improvement to the situation, lack of enforcement of the rules played a key role in the failure of the separate lane. Abolition of rickshaws with a single stroke will be impossible and politically undesirable. The market can play a vital role in resolving this issue. Why not reduce the overall demand for rickshaws, thus rendering rickshaw-pulling an unprofitable and costly venture? Demand for rickshaws can be reduced by prohibiting rickshaws from capital roads phase-by-phase. As a starting point, the government can phase out rickshaws from important commercial areas of Dhaka like Motijheel and then extend the prohibition gradually to other important parts of the city. Similar steps can be taken in other cities of the country.

A gradual prohibition will limit monetary incentive for rickshaw-pulling. Rickshaw-pullers will slowly abandon the profession and seek professions with lower opportunity costs.

Calcutta has successfully executed such an effort. Opponents will contend that, before taking such steps, public transportation needs to be strengthened. Whether the issue is better public transportation or alternative vocations for rickshaw-pullers, the market will adjust to the demands and needs of the citizens over the course of time.

Another coordination problem of traffic congestion is asymmetry in information. If travellers are informed beforehand about the upcoming flow of congestion in roads, they might fix their time and route accordingly. Radio transmission plays a crucial role in this regard. The collaboration between Bangladesh Betar and Dhaka Metropolitan Police (DMP) can produce a separate programme during peak-hours that will report on traffic conditions for different roads in Dhaka city. This has been done in Calcutta, where information about possible congestion either due to political protests or road con-

struction is announced a day before on the radio/television. Such a strategy has also been successfully executed in western countries. In the United States, for example, Washington Department of Transportation's website offers an up-to-date map of motorway hotspots, each segment coloured according to the speed of traffic flow. Most radio stations in the United States also feature traffic reports that are interspersed with their news and regular programming.

An adverse consequence of traffic congestion is environmental pollution, better known as vehicular air pollution. A recent survey showed that the two-stroke engine alone is contributing 55 per cent of the hydrocarbon compounds to Dhaka's air and is growing by 31 per cent annually. Apart from environmental pollution, motorised vehicles also seem to contribute to psychological pressures on the commuters of Dhaka. The survey also re-

vealed that people ranked minibuses as the primary stimulant of aggressive behaviour, followed by buses and trucks. People perceived the air-conditioned buses to be the least offensive to the environment.

Another co-ordination failure comes from the construction firms which encroach upon the city's roads with construction material, thus aggravating traffic congestion. The City Corporation has failed to define its property rights vis-à-vis the construction firms. If property rights are clearly defined and followed with strict enforcement, construction firms will be faced with a much higher opportunity cost in violating the law and contributing to congestion.

Recent efforts show that traffic congestion can be abated if traffic rules are properly enforced. Success of military deployment in combating congestion indicates that our current traffic woes can be permanently avoidable if authorities are willing to intervene. The success, however, was short-lived as a result of political nitpicking. There has been some co-ordination crisis between the military and the government over the deployment of the military in controlling traffic congestion. Rumors swirl that the DMP is concerned that military involvement in traffic management will curtail its revenue, whereas the military fears that

their role in traffic management will serve to reduce their image. Whatever the issue, the ultimate responsibility shifts to the government. It is, therefore, a co-ordination problem among the concerned and relevant authorities that is contributing to traffic congestion and depriving city residents of an efficient and stress-free commute.

In conclusion, traffic congestion is the outcome of a massive coordination failure, in which the absence of law and enforcement, coupled with political nitpicking, serve to dangerously undermine the physical and emotional health of the city's residents. People do not cooperate or maintain traffic rules simply because they see that there are no penalties for violations. The opportunity cost of violating the law, therefore, is low. The government has failed to enact any definite traffic acts that would enable them to charge offenders. Examples of such coordination failures run abound. In order to ease the flow of traffic on city roads an overall coordination is required among the concerned and relevant authorities.

Dhaka is already infamous for its vile traffic conditions. Time has now come for radical changes. If the authority in question fails to deliver better traffic, why not privatise the traffic service?

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