

Sustainable Transport System for Urban Development in India

***R. Unnamalai**

*Assistant Professor, Economics Wing, DDE, Annamalai University,
Annamalai Nagar – 608 002

Abstract

Sustainable transport is about transport policies, systems and technologies that allow for people and goods to move comfortably, efficiently and quickly with an emphasis of safety and environmental protection. It means a transport system that is planned and designed to benefit everyone equally and environmental friendly whether they walk, drive or use public transport. As far as India is concerned, it is difficult task to provide road facilities in the urban area because the needs of people belonging to various income groups are not only different, but also often inconsistent in nature.

In India an outsized section of the population in urban area cannot often afford to use motorized transport private vehicles or public mode of transport because they have to either walk to their place of work or use bicycles. Providing a safe infrastructure of roads for cyclists and pedestrians' mean either physically segregating lane for cyclists and pedestrians from power-driven traffic or if that is not possible reducing the speed of powered traffic. It is possible to redesign existing roads to provide a safe and suitable environment for non-motorized modes of transport. Further, the eco-friendly transport system is very much necessary for maintaining environmental sustainability in urban area. Sustainable transport system can be improved efficiency of public transport system and an enhanced capacity of the eco friendly transport system in urban area.

Introduction

Over the last few years the word 'sustainability' has attained a prominent place in transportation policy and planning in India. Sustainability can be broadly defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs. In the context of transportation, sustainability would mean developing better transportation systems, options, and expectations consistent with the objective of securing future social and economic development within a sustainable environment that ensures people's well-being. Sustainable transport can be achieved through measures pertaining to transportation system management, energy management, capacity management and environmental management. Sustainable transport is also an important from the perspective of climate change, i.e. decreasing the carbon foot print and ecological foot print of transportation.

As per 2001 census, India has 393 towns with a population exceeding 0.1 million and it increases still. Also, during the second half of the last century, the number of cities in India with a population of one million and above has steadily increased from 5 in 1951 to 35 in 2001, and is expected to further increase to 70 by 2025. The share of urban population to the total population is also projected to increase from 28% in 2001 to 58% by 2025. It is clearly understood that cities are the economical contributors of the nation with 50-60% contribution to national cross domestic product urban India can survive and thrive with the aforementioned estimated population is a challenge of paramount importance to provide infrastructure read fertilities. In this context the present study deals with sustainability of urban transport system with different mode of transportation in India.

Urban Transport System in India

Indian cities have registered a huge growth increasing registered motor vehicle, inadequate public transport with respect to demand, comfort or both and governments encouraging policies etc. are few reasons for the rapid increase in motor vehicles in Indian cities. From 1981 to 2001, population increased in six major metropolitan cities by 1.9 times but motor vehicles increased by 7.75 times. Energy demand in the transport sector is projected to grow at 5-8% per annum. The estimates of vehicular growth are unimaginable and threatening. To illustrate with an example, cars and heavy vehicles will increase thirteen – fold by 2035 with respect to 2005 figures, in a do-nothing scenario. Although we can see a clear increase in vehicular growth from past few years, it is only applicable for private vehicles and not the bus fleet. In fact, the size of our bus fleet has been decreasing in most urban transport undertakings except in Bangalore where the annual growth is about 10 per cent.

National Urban Transport Policy (NUTP) 2010

India is poised for rapid economic growth. Such future growth will largely come from the secondary and tertiary sectors of the economy, i.e., the industrial and service sectors. Since economic activities in these sectors primarily take place in urban areas, the state of our towns and cities is crucial to India's future growth. Further, India's urban population is currently around 30% of its total population. Experience across the world has been that as economies grow, rapid urbanization takes this proportion to over 60% before it begins to stabilize. As such, it is projected that India's urban population would grow to about 473 million in 2021 and 820 million by 2051, as against only 285 million in 2001. Hence, cities must not only meet the mobility needs of the current population but also provide for the needs of those yet to join the urban population. In this context, the Government of India has launched the National Urban Renewal Mission (NURM) that inter-alia seeks to bring about comprehensive improvements in urban infrastructure, committing substantial funds for this purpose and requiring a series of reforms that would make the investments sustainable.

The cost of travel, especially for the poor, has increased considerably. This is largely because the use of cheaper non-motorised modes like cycling and walking has become extremely risky, since these modes have to share the same right of way with motorized modes. Further, with population growth, cities have tended to sprawl and increased travel distances have made non-motorized modes impossible to use. This has made access to livelihoods, particularly for the poor, far more difficult. At present, road space gets allocated to whichever vehicle occupies it first. The focus is, therefore, the vehicle and not people. The result is that a bus carrying 40 people is allocated only two and a half times the road space that is allocated to a car carrying only one or two persons. In this process, the lower income groups have, effectively, ended up paying, in terms of higher travel time and higher travel costs, for the disproportionate space allocated to personal vehicles. Users of nonmotorized modes have tended to be squeezed out of the roads on account of serious threats to their safety. If the focus of the principles of road space allocation were to be the people, then much more space would need to be allocated to public transport systems than is allocated at present. All cities have corridors that have varying densities of travel and hence need technologies that best match the level of demand on the corridor. This often requires different operators managing such systems. However, a good public transport system is one that is perceived by the user as a single system and allows seamless travel between one made and the other as also between systems managed by different operators. Such

seamless interchange is possible if proper inter-change infrastructure is available and users are able to use a single ticket over all such systems. This also requires that a single agency takes responsibility for coordination so that there is a common approach to public transport planning and management. Urban transport policies can not succeed without the fullest co-operation of all the city residents. Such cooperation can be best secured if the objective of any initiative is made clearly known to them. It is, therefore, necessary to launch intensive awareness campaigns that educate people on the ill effects of the growing transport problems in urban areas - especially on their health and well being. The campaigns would seek their support for initiatives like greater use of public transport and non-motorized vehicles, the proper maintenance of their vehicles, safer driving practices, etc. Such campaigns would also encourage individuals, families and communities to adopt "Green Travel Habits" that would make travel less polluting and damaging. The Central Government would take up a major awareness campaign in this regard and seek the support of the State Government in its implementation. Particular emphasis would be laid on bringing about such awareness amongst children through inputs in their school curricula.

Improving Energy Efficiency of Transport Systems

Nearly every policy in the transport sector emphasizes the nexus between transport and energy sectors. The three key strategies highlighted in every policy document are checking the decline in the modal share of railways in traffic and augmenting the capacity of other modes like inland waterways and coastal shipping, increasing the share of public transport in meeting urban travel demand, and introducing modern and energy efficient technologies. Thus it is clear that the policy makers in the transport sector in India are seized of issues that have received substantial attention.

To further promotion of energy efficiency in transport systems, efforts have been put in place to arrest the decline in the share of railways. Historically, the share of the railways has constantly been declining, both in passenger and freight movement. This can be in part attributed to declining budgetary allocations that have declined to 23% of the Railways Plan in 1997 – 98 from 75% in the Fifth Plan (MoF.1999). In the face of a declining budgetary support to the Railways, the Railways have increasingly taken recourse to market borrowing that were at Rs.29.71 billion in 1997/98, about 35% of the Railways Plan Outlay (MoF.1999). The resultant market borrowing has put constraints on the ability of the Railways to raise resources internally due to a rising interest burden delaying development projects. On the other hand, with the liberalization of the road transport sector, funding has become easier for road infrastructure resulting in a further pressure on railways share in freight transport. Nevertheless, the Government has recognized the importance of ensuring the commercial viability of the railways and has taken steps to increase its revenue generation (Planning Commission, 2001).

Similarly, efforts are on to check to the decline in the share of public transport in urban areas. This decline can be attributed to a gradual withdrawal of state funding for public transport and increasing emphasis on commercial viability as also the inability of public transport infrastructure to keep pace with the increasing demand and the deteriorating quality of service. The government of India and various state Governments are attempting to address this issue by permitting greater private participation in the sector as also restructuring the operations of public transit providers (TERI.2000).

Every Policy in the transport sector emphasizes the nexus between transport and energy sectors, implementation of these policies has been inadequate. The share of the

railways has constantly been declining. Of greater concern is the dichotomy in policies for the road and rail sectors. While the import of arresting the decline in rail shares has been universally recognized, liberalization of the road transport sector has put further pressures on railways share in freight transport.

Similarly, the declining share of public modes in urban transport due to increasing emphasis on fiscal discipline leading to gradual withdrawals of state funding have led to increased usage of personal modes and consequently increased energy consumption. For instance, in Delhi, the penetration of public transport has declined from 62% in 1985 (GNCTD.1997) to 57.25% in 1990, to 49.54% in 2000 (TERI.2000a) resulting in personal modes meeting an increasing proportion of travel demand. Another problem has been the relatively little concern for consumer satisfaction as in most cities, government – owned agencies operate and manage public transport services. Given the virtual monopoly that public sector service providers enjoy, service planning has been largely dominated by the dictates of operating convenience rather than by consumer convenience.

Finally, integration of land and transport planning, essential to optimization of transport demand, has not been realized due to lack of co-ordination between various agencies in the transport and land development sectors. This can be partially attributed to these activities not being devolved to the local bodies despite the 74th constitutional amendment.

Requirement of separate lane for non-motorized vehicle

A sustainable transport system must provide mobility and accessibility to all urban residents with safe and environmentally friendly modes of transport. For example, if a large section of the population can not afford to use motorized transport – either private vehicles or public buses –they either have to walk or cycle to their place of work. If cyclists and pedestrians are to be provided with a safe infrastructure, either road space for them must be physically segregated from motorized traffic, or the speed of the motorized traffic must be reduced. The major arterial roads of the city must be made NMV –friendly. Dedicated NMV routes through parks, green belts and narrow city streets could serve as additional network capacity for cyclists.

Pedestrians, cyclists and non-motorized rickshaws are the most critical elements in mixed traffic. If the infrastructure design does not meet the requirements of these elements, all modes of transport operate in suboptimal conditions. It is possible to redesign existing roads to provide a safe and convenient environment for non-motorised modes, especially if the right of way is 30m or more (Tiwari 1999), and this can also result in the improved efficiency of public transport vehicles and the enhanced capacity of the corridor when measured in number of passengers per hour, per lane.

Motorized Vehicle

Segregated bus lanes are necessary to meet increasing travel demand and to improve public transport. In many cities around the world the lane is reserved for buses. This has been attempted in Delhi, but without success. In the absence of segregated cycle lanes, cyclists use the lane. This makes it impossible for buses to use the lane, in spite of repeated attempts at enforcement by the Delhi Police. If separate lanes were available all cyclists would use them and that would make the curbside lane available for buses. Segregated cycle lanes must be established before dedicated bus lanes can be implemented.

Increased capacity of urban roads

If a separate segregated lane were constructed for bicycles, the kerb-side lane, which is currently used by cyclists, would become available to motorized traffic. This relatively small investment in cycle lanes could increase the road space for motorized traffic by 50 per cent on three-lane roads. Cycle lanes also result in better space utilization. For instance a 3.5 m lane has a carrying capacity of 1,800 cars per hour, but 5,400 bicycles per hour (Replogle 1991). The average car occupancy is 1.15 persons (Indian Road Congress 1990) and a bicycle carries one person. This implies that in order to move the same number of people by car we would need 2.6 times the road area that would be required for cyclists. Given the fact that there is not much space available to expand existing roads, future mobility needs can only be met by increasing the capacity of the existing road network. This can only be achieved by encouraging modes of transport which are more efficient in terms of space utilization.

Reduced congestion in urban transport

Congestion has long been recognized as an environmental problem. Other than causing delays, it causes noise and fumes and increases health risks to road users and residents. Congestion and cycling policies are interconnected in two ways. First, because congestion leads to poor air quality and a poor environment, it may- act as a deterrent to cyclists. Second, policies which promote cycling would in themselves help to relieve congestion because cyclists require so much less road space than motorists do, both when travelling and parking.

Safety on urban roads

Recent statistics show that even at per capita income levels of US\$ 3,000, car ownership levels remain low and the proportion of motorized two-wheelers can be more than 50 per cent (Mohan and Tiwari 1998). Most least motorized countries (LMCs), including India and China, will not reach the income level of US\$ 3,000 in the next decade. As incomes increase, the poorest people in countries like India and China will be able to own bicycles, and those who own bicycles today may opt to buy motorcycles when they become richer. As the number of poor and lower middle-class people in these countries is larger than that belonging to the upper class, we are likely to witness greater increases in absolute numbers of bicycles and motorcycles than cars in the next decade or so. Road safety policies and countermeasures used in societies where cars constitute about 80 per cent of vehicles will not be suitable for most LMCs, where motorized two-wheelers comprise more than 40-50 per cent of the total number of vehicles.

Conclusion

It is clear from the above discussion that non-motorized modes of transport which include bicycles and rickshaws are an integral part of the transport system in all Indian cities. Existing socioeconomic patterns and land-use distribution ensure the presence of Non motorised vehicles in the whole city and on the complete road network. The densities and modal shares of NMVs in total traffic may differ from one part of the city to the other. However, as long as NMVs are on the road, regardless of their numbers, all vehicles move under suboptimal conditions. Efficient bus systems cannot be designed without taking account of the slow vehicles on the road. Since sustainable transport systems in Indian cities have to move large numbers of people by bus transport and **NMVs**, planning for NMVs is indispensable.

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