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Urban Transport in India: Beyond the “Nano”

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A positive fallout of the unveiling of the Nano, a low-cost (US\$2,500) car by Tata Motors at Delhi last month (and slated to go into production later this year), is that it has re-ignited the debate about urban transport in India. Proponents of motorisation have argued that the advent of an inexpensive car will usher in a transport revolution in the country while critics have warned of impending chaos on the roads and of adverse impacts on air quality, among other things. Further, several other auto manufacturers have also unveiled plans to introduce budget cars in the Indian market. Given that the penetration of cars in India is about seven per 1,000 people (as compared to 550 per 1,000 in Germany, for example), the potential size of the market is indeed enormous in a country of over a billion people. A larger issue, however, that the impending advent of low-cost automobiles has raised, is the direction in which urban transport in India is headed. This brief focuses on the current state and likely future of urban transport in the country and steps required to make it sustainable.

Urban transport in India has to be examined within the overall context of trends in urbanisation in the country. At present, India is about 29 percent urban (second in South Asia behind Pakistan at 36 percent, see Table 1). Also, contrary to popular belief, India’s rate of urban growth has been and will continue to be relatively slow in the short-run – about 2.3 percent annually during 2005-2010 (ranking behind Bangladesh, Nepal and Pakistan in South Asia alone). Nonetheless, at present, about 321 million Indians live in towns and cities, a very large number in absolute terms. And this number is likely to double in the next 30 years (see Table 2). In fact, after China, India has the largest urban population in the world. Also, what the rate of urbanisation does not indicate is the growing size of existing Indian towns and cities – while the total urban population increased eight-fold between 1901 and 1991, the number of settlements only doubled. In other words, urban expansion in India has been due to the enlargement of existing towns and cities.

All of this has important implications for urban transport. A large number of people living in large urban conglomerations enable economies of scale in urban transport. At the same time, if urban transport is not managed well it has the potential to choke cities and bring economic activity to a grinding halt. Here lies the promise and peril of urban transport in India.

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Table 1. Urbanisation in South Asia and China

	Total population (millions) (2007)	Average population growth rate (%) (2005-2010)	% urban (2007)	Urban growth rate (%) (2005-2010)
Bangladesh	147.1	1.8	26	3.5
Bhutan	2.3	2.2	12	5.1
India	1,135.6	1.4	29	2.3
Nepal	28.2	1.9	17	4.8
Pakistan	164.6	2.1	36	3.3
Sri Lanka	21.1	0.8	15	0.8
China	1,331.4	0.6	42	2.7

Source: State of World Population 2007: Unleashing the Potential of Urban Growth, United Nations Population Fund.

Table 2. Projections of Urban Population in India

Year	Total population (million)	Decadal growth rate (%)	Urban population (million)	Decadal growth rate (%)	% urban
2001	1027	21.7	285	31.3	27.8
2011	1220	18.8	372	30.5	30.5
2021	1390	13.9	473	27.2	34.0
2031	1534	10.4	583	23.3	38.0
2041	1648	7.4	700	20.1	42.5
2051	1732	5.1	820	17.1	47.5

Source: E.F.N. Ribeiro (2003). "Urban India in 2051: An Emerging Transportation cum Settlements Interface", paper presented at the Annual Congress of the Institute of Urban Transport (India), New Delhi on India's Urban Transport Vision 2050.

So far, the trend is not encouraging. Factors that determine transport demand, namely, increase in population, household incomes and economic activity, have placed heavy demands on urban transport systems, a demand that most Indian cities and towns have been unable to meet. In the absence of an adequate and efficient public transport system, the number of private and intermediate public transport (IPT) or para-transit vehicles has increased to meet travel demand. Nonetheless, the predominant modes of urban travel in Indian towns and cities are still walking, cycling and public transport, including IPT.² Despite the high growth rates of two-wheelers and cars their penetration is still relatively low. Across different cities and towns car ownership ranges from 3-13 percent of households and two-wheelers from 40-50 percent, the latter is about the same as bicycle ownership. The dependence on bicycles and cycle rickshaws is higher in smaller cities which have lower incomes and are smaller in size. In medium-sized cities (1-3 million) such as Lucknow, Hubli, Varanasi, Kanpur and Vijayawada, IPT modes like tempos and cycle rickshaws become important. This segment has little regulatory oversight and largely operates as a free for all by private operators, often resulting in serious safety and emission violations. Other than the metros, most other urban areas in India have skeletal bus services provided by the municipality. With regard to the urban poor who account for a third of India's urban population and many of whom live in slums, travel patterns are very different from residents in formal housing. Generally, cycling and walking account for 50 to 75 per cent of the commuter trips for those in the informal sector whereas the formal sector is dependent on buses, cars and two wheelers. This implies that despite high risks and a hostile infrastructure,

² The discussion in this paragraph is based on "Urban Transport in Indian Cities," by Geetam Tiwari, November 2007: http://www.urban-age.net/10_cities/07_mumbai/_reflections/india_Tiwari.html

low-cost modes exist because their users do not have any choice. They are captive users of these modes.

With regard to modal split, in most urban areas, the share of mass transport is well below desired levels and that of personalised transport and para transit above the optimal level (see Tables 3 and 4). Moreover, a third of all motor vehicles ply in the seven metropolitan cities alone (cities with a population of four million or more, namely, Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad and Ahmedabad) which constitute around 11 percent of the total population. Delhi by itself, with 1.4 percent of India's population, accounts for more than seven percent of all motor vehicles in the country. One consequence of this is heavy dependence on oil imports which were about 102 million tonnes in 2005, of which over a third (35 million tonnes) was consumed by the transport sector alone.³

Table 3. Desirable modal split for Indian cities by size (Percent of total trips by mechanical modes)

Population (million)	Mass transport	Bicycle	Other modes
0.1 - 0.5	30-40	30-40	25-35
0.5 - 1.0	40-50	25-35	20-30
1.0 - 2.0	50-60	20-30	15-25
2.0 - 5.0	60-70	15-25	10-20
5.0 +	70-85	15-20	10-15

Source: Traffic and Transportation Policies and Strategies in Urban Areas in India. Final Report, Ministry of Urban Development, Government of India, New Delhi, March 1998.

Table 4. Existing modal split in Indian cities, 1994 (Percent)

Population (million)	Walk	Mass transport	Intermediate public transport, IPT (Fast/Slow)	Car	Two-wheeler	Bicycle	Total
0.10 – 0.25	37.1	16.4	10.4 20.1	3.3	24.1	25.7	100
0.25 – 0.50	37.8	20.6	8.9 17.2	2.6	29.8	20.9	100
0.50 – 1.0	30.7	25.4	8.2 12.0	9.5	29.1	15.9	100
1.0 – 2.0	29.6	30.6	6.4 8.1	3.3	39.6	12.1	100
2.0 – 5.0	28.7	42.3	4.9 3.0	5.0	28.9	15.9	100
5.0 +	28.4	62.8	3.3 3.7	6.1	14.8	9.4	100

Source for Tables 3 and 4: Traffic and Transportation Policies and Strategies in Urban Areas in India. Final Report, Ministry of Urban Development, Government of India, New Delhi, March 1998.

The policy response so far has been ad-hoc and has had limited impact. The Report of the Working Group for the 11th Five Year Plan on Urban Transport, constituted by the Planning Commission of the Government of India in 2006 and chaired by the Secretary, Urban Development,⁴ had stated in its review of government interventions on urban transport,⁵ “By and large, the following investments have been made in the past few years in an attempt to improve transport: (1) construction of flyovers in a large number of cities; (2) widening of roads; and (3) construction of the Mass Rapid Transit System (MRTS) in Delhi. The

³ This, of course, includes transport other than urban transport. Source: International Energy Agency, Energy Balances for India, accessed at: http://195.200.115.136/Textbase/stats/balancetable.asp?COUNTRY_CODE=IN&Submit=Submit

⁴ http://planningcommission.gov.in/aboutus/committee/wrkgrp11/wrk11_9b.htm
<http://urbanindia.nic.in/moud/programme/ut/utwg11plan.pdf>

⁵ http://planningcommission.nic.in/aboutus/committee/wrkgrp11/wg11_MRTS.pdf (emphasis added).

construction of flyovers and widening of roads have not produced the desired improvements in all locations. These policies have to be reviewed critically and best practices adopted taking into account the experience of cities considered “good” internationally. The construction of flyovers and widening of roads has, unfortunately, also been accompanied by the removal/reduction of pedestrian facilities. Considering that India has very high pedestrian mortality rates, this practice must be stopped immediately. It must be mandatory to provide at least a minimum of a prescribed area for pedestrian and bicycle facilities on all arterial roads (say, 4-5metres combined in each direction). The MRTS in Delhi is operating at about 20 percent of its projected capacity for December 2005 (4-5 lakh passengers per day vs. projection of 21.8 lakh passengers per day). The Kolkata MRTS is operating at 10 percent capacity. *Therefore, the operating experience of metro rail systems in India should be taken into account in the proper planning and design of new systems.* It is also seen that there are considerable weaknesses in the proper planning of urban transport, which is a highly complex area. The skills and competencies required for urban transport planning are vastly different from those required for inter-city planning. Hence, a major capacity building initiative would be essential if meaningful proposals for improving urban mobility are to emerge from the state/city level authorities.”

Of particular importance in the government review of its own interventions are its observations on the MRTS. It points to a careful examination of the cost-effectiveness of very expensive solutions such as monorail and underground metros. At-grade systems (those that run at ground level) such as light rail or bus-based rapid transport (with dedicated bus lanes) could work equally well and cost a tenth of an elevated system and a thirtieth of an underground system. With regard to the Delhi MRTS, even when the full system is in place with 200 kilometres of track built at a cost of over 150 billion rupees at 1996 prices (approximately US\$4 billion), about 80 percent of the population of Delhi and about 70 percent of its area will remain beyond walking distance (500 metres) of the Metro.⁶ Researchers at IIT Delhi have estimated the system will be utilised at about 25 percent of its capacity even when fully built, leading them to conclude, “High capacity system does not necessarily generate high demand.”⁷

Looking to the future, the National Urban Transport Policy (NUTP), a white paper approved by the Union Cabinet in April 2006 provides a way forward if implemented effectively. The document rightly states that the key objective is to move people and not vehicles. Thus, it emphasises promotion of *cost-effective* public transport as well as priority for non-motorised modes such as cycling and walking. Effective implementation of the NUTP, however, requires a concerted effort at the city level: *inter alia*, it requires preparation of integrated land-use and transport plans. Another positive development is that the Indian government’s ambitious urban renewal programme, the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), has been coupled with the NUTP. To obtain approval for transport projects under the JNNURM, the guidelines require transport infrastructure improvement schemes to be in compliance with the NUTP. Since the focus of the NUTP is on public transport, pedestrians and bicycles, cities are modifying earlier road expansion projects to the Bus

⁶ “Evaluation of Public Transport Systems: Case Study of Delhi Metro,” by Mukti Advani and Geetam Tiwari, proceedings of START-2005 Conference held at IIT Kharagpur, India. Accessed at: http://web.iitd.ac.in/~tripp/publications/paper/planning/mukti_metro_kharagpur_05.pdf

⁷ op. cit. While the Delhi Metro is designed to handle 12.6 million commuter trips when fully completed, is not likely to handle more than 3.13 million commuter trips.

Rapid Transit (BRT) and bicycle-inclusive plans. The BRT and bicycle-inclusive plans have been approved by the central government for at least 10 cities.

In sum, the current trajectory of urban transport needs urgent correction. While some steps have been initiated, much still remains to be done to ensure sustainable urban transport so vital for viable urban growth in India.

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