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2012

Online at <http://mpa.ub.uni-muenchen.de/22874/>

MPRA Paper No. 22874, posted 21. December 2012 09:49 UTC

Distortions in infrastructure development in urban transport in India: How to remedy it?

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Abstract

National Urban Transport Policy, the guiding document for urban transport in India, emphasis movement of people and goods and not vehicles. The paper establishes that investment on walking and cycling facilities, and surface rail projects give maximum benefit compared to high cost motorised transport and metro rail. From past studies the paper also brings out that share of cycling and walking is very high – varying between 58 and 30 % in different cities. The paper identifies that contrary to benefits accrued and usage patterns, analysis of investment - both past and future projections, shows that metro rail and road development projects are preferred crowding out the other investment. The paper also identifies the reasons for distortion by identifying various groups working in the policy and their distorted perception on urban transport development. Finally the paper recommends increased investment in non motorised facilities by retrieving road space. To facilitate investment in surface rail it is necessary that Ministry of Railways, Ministry of Urban Development and Planning Commission should jointly work out the strategies. The study also recommends recasting of academic programs in urban transport to make them multi disciplinary and policy oriented.

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1 Introduction

National Urban Transport Policy (MoUD, 2006) of India prescribes that urban transport policies and infrastructure in cities should help move people and goods and not vehicles. While the policy objectives are clear development of infrastructure in Indian cities is far from the desirable. The paper aims to unravel the distortions that have set in infrastructure development for urban transport and suggests remedies to overcome them.

The paper is divided into 6 sections. The remainder of this section focuses on future of Indian urban demographics to bring out the burgeoning needs of urban transport in the country. Section 2 brings out the characteristics of different modes of transport to highlight the importance of investment in surface rail, cycling and pedestrian infrastructure. The section also reviews the urban transport trends highlighting importance of cycle and walk shares and their persistence over periods of time. Section 3 reviews the investment trends to show how urban transport investment is highly distorted in favour of building and widening roads and to build metro rail neglecting surface rail systems, and walking and pedestrian facilities. Section 4 identifies reasons for the distortions in the investment policies and section 5 suggests various measures to remedy the situation to develop a people friendly urban transport. Finally, Section 6 presents the conclusions.

1.1 Urban demographics

The rapid growth of urban population in India is well documented and as per the 2011 census urban population is 33.7 crores² constituting 31 per cent of the total population. This is an addition of 9.1 crores over the 2001 census when urban population was 27.8 per cent of the total (Registrar General of India, 2011a). The increasing urban trend would continue and urban population is projected to be 38.2 per cent by 2026 (Registrar General of India, 2006). As per an estimate, Indian urban population would increase to 59 crores by 2030; an increase of 75% compared over 2011 figures. India would have 68 cities with 1 million population by 2030 up from 42 in 2008 (Mckinsey Global Institute, 2010) and 53 in 2011(Registrar General of India, 2011a).

² The document uses Indian Numerals and currency. The values are: 1 crore = 10 million and 1 lakh = 0.1 million. Currency in India is Rupee (or Rs). As on 11/10/12, 1 Dollar = 52 Rupees and 1 Euro = 68 Rupees.

In addition to the absolute number population diversity has an important on demand for urban transport and it is brought out on three attributes; age, money spent on transport, and transport vehicle ownership.

Urban transport needs of young (less than 18 years) and senior citizens (> 65) are different from adults (19 to 65 years). People less than 18 years of age, constituting 44 per cent of the population; cannot drive and thus are dependent on others for use of motor vehicles. In absence of personal transport, they have to use public transport, non motorised transport or for hire transport. Out of this 36 per cent is less than 14 years and they are rarely sent alone. Senior citizens above 65 years of age are 4 % and they depend less on self driven vehicles. Both groups would prefer public transport or non-motorised transport (NMT) friendly environments.

Money spent on transport is another important parameter in mode choice and it is highly distorted in India. As per Planning Commission estimates, in 2009-10, 20.9 % of urban population is below poverty line (Planning Commission, 2012 based on 2009-10 survey data of National Sample Survey Organisation - NSSO) compared to 25.7 in 2004-05 (Tendulkar, Radhakrishna, Sengupta, 2009). These people cannot afford personal motor transport and usually limit themselves to walk or cycle for their transport needs with occasional use of public transport.

The actual money spent on travel, both intra and intercity, by different sections of urban people in 2009-10, is compiled by NSSO (NSSO, 2012). It indicates that on an average an urban resident spent Rs 3.73 per day on transport- including the long distance and short distance trips. However, 70 % of the people spent less than the national average. As average price of a minimum ticket was around Rs 3 per trip by a bus and Rs 2 per trip by train and around 80% of the people spend less than Rs 4.66 per day not more than 1 or 2 trips are carried out by people at large. This effectively implies that the improvements in roads are benefitting only small section of people.

An analysis of ownership of transport assets indicates that in urban areas ownership of cycle is much higher than motorised personal transport vehicles (Registrar General of India, 2011b). As per the 2011 census, out of the urban households 44.8 % own cycles, 21 % own 2-wheelers and 4.7 own cars (Registrar General of India, 2011b). As against it, as per the 2001 census, the ownership was 43.8 %, 11.7 %, and 2.5 % for cycles, 2-wheelers and cars respectively. While

the car and 2-wheeler ownership nearly doubled against a marginal increase of cycle ownership in the decade, cycle is still a widely owned transport asset – two times of two wheelers and 9.5 times of cars. If we assume that possession of 2-wheelers and cars is not overlapping, then households possessing cycles alone is around 19 per cent (44.8-21.7-4.7). Importantly, around 30 % of the households do not possess any transport assets.

1.2 Mode share trends: National and international

In 2007 Ministry of Urban Development has commissioned Wilbur Smith Associates to undertake a study of urban transport patterns in 87 cities across the country. The study selected 30 cities for a detailed survey. The cities are distributed into 6 categories as given in Table 1.

Table 1: Categories wise break up of population in 30 sample cities

Sl. No.	City Category	Population	Number
1	Category-1(a)	<5 lakhs with plain terrain	2
2	Category-1(b)	<5 lakhs with hilly terrain	1
3	Category-2	5-10 lakhs	6
4	Category-3	10-20 lakhs	9
5	Category-4	20-40 lakhs	4
6	Category-5	40-80 lakhs	4
7	Category-6	> 80 lakhs	4

Source: Wilbur Smith Associates (2008)

Shares of different modes of transport are given in Table 2. The study is revealing in that the share of non-motorised (walk + cycle) trips is very high; highest being 58 per cent for category 1(b) cities (cities in hilly region and population less than 5 lakhs) and lowest being 30 per cent for category 6 (cities with population > 80 lakhs). This indicates a very predominant share of NMT compared to other modes. It is only in large cities that non motorised trips are over taken by the public transport trips.

Table 2: Shares of different modes of transport in different categories of cities

Category	Non motorised			Two Wheeler	Public Transport	Car	IPT
	Walk	Cycle	Total				
Category-1 a	34	3	37	26	5	27	5
Category-1b	57	1	58	6	8	28	0
Category-2	32	20	52	24	9	12	3
Category-3	24	19	43	24	13	12	8
Category-4	25	18	43	29	10	12	6
Category-5	25	11	36	26	21	10	7
Category-6	22	8	30	9	44	10	7

Source: Wilbur Smith Associates (2008)

A similar pattern is also noticed for larger cities whose mode split is given in Table 3. Non motorised trips are the highest for Mumbai and Delhi accounting for 33 per cent with Hyderabad and Bangalore close by accounting for 31 and 25 per cent respectively. The public transport trips are also high ranging from highest of 45 per cent for Mumbai and lowest of 32 per cent for Hyderabad.

Table 3: Share of different modes of transport in four large cities

Mode	Delhi		Mumbai		Bangalore		Hyderabad	
	Share*	Trips*	Share	Trips	Share	Trips	Share	Trips
Two Wheeler	5.0	12.6	7.0	25.2	21.0	32.1	22.0	25.7
Car	14.0	33.8	8.0	28.9	8.0	11.5	9.0	10.1
Auto	6.0	13.7	7.0	22.4	11.0	16.2	7.0	7.8
Walk	21.0	52.2	27.0	92.9	20.0	29.4	22.0	25.6
Cycle	12.0	28.6	6.0	20.4	5.0	8.2	9.0	9.9
Public Transport	43.0	104.7	45.0	154.0	35.0	53.0	32.0	37.2

* Units: Share is in % and Trips are in lakhs

Source: Wilbur Smith Associates (2008)

Juxtaposing the 2007 study with the 1994 study by RITES Ltd, also organised by the Ministry of Urban Development, gives a revealing trend on changes in the modal shares. The two studies had 8 common cities and the trend of traffic in those 8 cities, with a break up of slow and fast moving vehicles, is given in Table 4. The slow vehicles consist mainly of cycles and rickshaws and fast vehicles consist of motorised transport. The share of slow moving vehicles drastically fell from 30 per cent in 1994 to 12 per cent in 2007. The reduction in share of slow vehicles is very high for Kanpur (27%), Varanasi (27%), Nagpur (24%) and Ahmedabad (21%). This happened despite the policy assertions to increase the share of non motorised transport.

Table 4: Changes in Modal shares between 1994 and 2007

Sl No	City	Traffic Composition in 2007		Traffic Composition in 1994	
		Share in (%)		Share in (%)	
		Fast moving	Slow moving	Fast moving	Slow moving
1	Shimla	100	0	100	0
2	Guwahati	89	11	71	29
3	Varanasi	73	27	46	54
4	Bhopal	94	6	83	17
5	Nagpur	83	17	59	41
6	Kanpur	86	14	40	60
7	Pune	89	11	79	21
8	Ahmedabad	92	8	71	29
9	Kolkata	88	12	84	16
Average		88	12	70	30

Source: Wilbur Smith Associates (2008). Data for 2007 is based on Wilbur Smith Associates study and data for 1994 is based on study by RITES Ltd and quoted by Wilbur Smith Associates (2008).

Another dimension to the mode choices in urban transport is the income disparity in use of different modes of transport. A study by Baker et al (2005) of patterns of commuting by residents of Mumbai to work shows that while 46.9 % of total sample either walk or cycle in the city the ratio for those with household income less than Rs 5,000 is 66.9 %; around 43% more than the average. Corroborating with poverty indices for many of the poor cycling and walking is not enviable option but a necessity. Similar trend is also noticed in Delhi (for details see Badami, Tiwari and Mohan, 2004).

It is often argued that increased share of personal transport and motorised transport is result of rising incomes and cannot be abated. However, international experience does not show simple correlation and trend of motorisation is not inexorable. For example, American cities, barring few exceptions such as New York, show very high motorisation (see Ramos. 2008). New York, however, has public transit share of 55 %. Similar is the experience of the European and Asian cities. Barter (1999) presents data for a large set of European and Asian cities and concludes that motorisation is not a necessary concomitant of increasing incomes but is mediated by a number of factors. Even in India while the income levels in Mumbai are higher than other cities share of car travel is lower than other cities (see Table 3).

From the above it is surmised that i) the present demand for urban transport in India is very high, ii) demand will continue to grow; iii) a large sections of population – young, old, economically vulnerable, and those who do not own transport assets; are dependent on non motorised transport (NMT) and low cost public transport, iv) NMT forms a substantial share of

different modes of transport used and v) if not properly managed motorised transport would crowd out the NMT and public transport.

2 Characteristics of different modes of transport

National Urban Transport Policy (NUTP) leaves modes to be developed to the city and state governments stating that “it is not possible to prescribe a particular technology in a generic policy and such a choice will have to be made as a part of city specific land use and transport plans” (Pg 9, NUTP 2006). However, it takes position that surface rail, also called “at grade” railway, is for suburban areas and cannot cater to within city transport.

While the NUTP takes a neutral position with reference to different modes of transport the modes themselves have different yields per rupee invested. Characteristics of different modes are presented in Table 5. Walking and cycling facilities with an investment of Rs .005 lakhs and Rs .02 lakhs per passenger per kilometre/per hour/per direction respectively are the least. Amongst the mechanized transport surface rail has the least investment followed by bus rapid transit and they are much lower compared to metro. The car based transport and metro, obviously, take up the maximum investment.

Table 5: Characteristics of different modes of transport

Modes	Average costs (in Rs Crores/km)	Peak Capacity (passenger/hour /direction)	investment in Rs lakhs/pass/km/hour/direction
Surface rail (double line)	15	60000	0.03
Elevated metro rail (double line)	150	40000	0.38
Bus Rapid Transit (bi-directional)	14	20000	0.07
Car (1 lane on either direction)	3.5	1800	0.19
Cycle (1 lane on either direction)	1.2	5400	0.02
Walk (1 lane on either direction)	0.6	9000	0.01

Note: It is assumed that right of way is available. Thus except metro others modes need the right of way of around 3-3.5 meter per lane. Surface rail uses available right of way.

Sources: Capacity assessments are based on Authors experience and supported by data from Bharadwaj (2010), and Tiwari (2002). Costs except cycling and walking are based on RITES (2011) study. The walk lane costs are assumed double than those in RITES (2011) study to provide better facilities. Cycle lane costs are not given in RITES (2011) report and they are assumed double of walk lane costs.

In addition to cost and capacity the other important characteristics are affordability, accessibility and environmental sustainability. On all the three parameters walking and cycling outweigh all the other modes. In the mechanized modes surface rail would be the most economical, as construction cost is around one tenth of an elevated metro system and operational cost is lower to a BRT and an elevated or underground metro system. A well integrated BRT would be the most accessible compared to surface rail and metro systems.

However, as distances increase, walking and cycling have to reduce. Maximum walk distance for commuters could be 1-2 kilometres with the average being around 0.5 to 1 kilometres and for cycling they would be around 3-4 kilometres with average being around 2-3 kilometres. Thus, as trip lengths increase with growth in size of a city it is necessary to integrate walking and cycling infrastructure to public transport infrastructure. As seen above amongst public transport options surface rail systems provide maximum benefits followed by rapid transit system and then finally the metro systems.

3 Investment and infrastructure development pattern: Current and future

As urban development is a state subject, majority of the investment decisions are made by state and local administrations. However, as most state and city administrations are fund strapped, they are dependent on central grants and thus central government policies have significant influence on local government decisions. Hence, to bring out the distortions in the investment pattern we analyse the Central aided projects and those with funds from state and city administrations. The next sub section analyses the current investment pattern and the following subsection the proposed investment patterns.

3.1 Past investment patterns

3.1.1 Projects with central assistance

Jawaharlal Nehru National Urban Renewal Mission (JnNURM) is a central government mission to renew and develop systematically 63 selected urban areas in the country. (JNNURM, 2011b). Under the mission as on December 2011, 537 projects worth Rs 60,700 crores were approved. The share of urban transport related projects is around 25 % with approved value being Rs 15, 000 crores, assistance committed being Rs 6,400 crores, and amount released being Rs 3,300 crores (authors` analysis based on JNNURM, 2011a).

A sectoral break up of the urban transport projects approved under JNNURM, given in Table 6, indicates a preponderance of projects for building flyovers and road over bridges accounting for 46 % of the total value. This is followed by bus rapid transit projects (BRT) accounting for 36 per cent. Road improvement and other urban transport projects - which includes terminal improvements or facilitation centres, account for 6 per cent each. Projects for parking improvement account for another 5 per cent. Finally one is left with a miniscule of 0.1 per cent each for projects exclusively dealing with pedestrian pathways and facilities. To be fair, some of the BRT projects do carry a non motorised investment component. Assuming that around 5

% of the value of BRT projects is spent on cycle and pedestrian facility development, the total investment on cycling and pedestrian facilities would be around 2.5-3 % of the total.

Table 6: Analysis of projects sanctioned under JNNURM

Sector	Projects		value	
	Number	Per cent	cost (in Rs crores)	Per cent
Flyover/ROB	82	60.7	6515	46.3
BRT	20	14.8	5024	35.7
Other Urban Transport	17	12.6	912	6.5
Road improvements	10	7.4	846	6.0
Parking	3	2.2	754	5.4
Pedestrian	1	0.7	18	0.1
Pedestrian subways	2	1.5	14	0.1
Grand Total	135	100.0	14083	100.0

Source: Authors' analysis based on JNNURM (2011a).

Note: Though total value of projects approved in urban transport is Rs 15,000 (JNNURM, 2011b) crores detailed data is available for projects worth Rs 14,083 crores only (JNNURM, 2011a).

In addition to the projects discussed above, Ministry of Urban Development (MoUD) approved two big ticket projects (Lohia, 2010). The first is the Metro rail projects; as of 2010, 380 kms of metro projects are sanctioned with an estimated cost of Rs 90,000 crores. Second important project is procurement of 15,200 buses at an estimated cost of Rs 5,000 crores (\$1020 million). No big ticket projects are ever made for pedestrian and cycling facilities.

Thus the total investment on non motorised transport works out to a measly amount of around Rs 400 crores against a total envisaged investment of Rs 1.1 lakh crores. No money is sanctioned for the surface rail projects.

3.1.2 Projects undertaken without central assistance

In addition to the above projects involving central assistance, states and city governments take up urban transport projects with internal funds and the scenario is similar across different states. As detailed data is not available for all cities together, data for Hyderabad is presented in detail.

In addition to a metro rail project of 72 kilometres with an indicative cost of Rs 12,132 crores (Hyderabad Metro Rail, 2008), Hyderabad has a few large ticket projects - all related to road development; the outer ring road – a 158 kilometre venture estimated to cost Rs 3400 crores, an elevated express highway to connect the city to the airport - 12 kilometres costing Rs 1100 crores, and a slew of inner ring roads costing around Rs 1700 crores (HMDA, 2011; and

Ravibabu, 2006). In addition to the big ticket projects, general budget of the municipal corporation of Hyderabad in 2010 provides for Rs 525 crores for roads; another Rs 525 crores for bus rapid transit, and Rs 200 crores for the surface rail improvement (GHMC,2011). Incidentally, Hyderabad is the only city where phase 1 of surface rail project was started in 2003, but since then its phase 2 has been a non starter. The situation in other cities is no better.

Thus at all levels present investment is biased against non motorised transport and surface rail transport.

3.2 Envisioned future investments

A number of studies have projected investment needs and most follow the similar pattern of highlighting costly schemes and neglecting low cost and more effective schemes. We analyse national level projections made by two studies – first, the Ministry of Urban Development sponsored study of Wilbur Smith Associates (2008) and the second, the working group report on urban transport for the 12th plan. Similarly, at the city level comprehensive transport studies of Bangalore and Mumbai are analysed to present a similar picture of discrimination.

Wilbur Smith Associates (2008) projects, for 87 cities in the country, for the 20 year period from 2008-2027, a cumulative investment of Rs 4, 35,380 crores. Out of this, the roads account for 33 per cent (Rs 1.43 lakh crores), the mass transport systems of BRT, mono rail and metro account for 54 % (Rs 2.35 lakh crores) and the NMT management – cyclists, pedestrians and the crossing facilities, together account for 4 % (Rs 17,415 crores).

Another national level projection is made by the 12th plan working group constituted by the Ministry of Urban development (MouD, 2011). Over the 5 year period the group envisages an investment of 3,88,308 crores with around 43 % for street development, 52 % for public transport and the rest 5 % on a number of other areas including institutional development and capacity building. Out of these pedestrian facilities, non motorised vehicle (NMV) transport and streetscaping are allotted Rs 42,509 crores - 11 % of the total investment, against Rs 1, 24,709 crores – 32 % of the total investment for road development. Though compared to past the group has recommended substantial amounts to pedestrian and NMV facilities it still has significant limitations.

Out of the 52 % to be spent on public transport, 34 % (Rs 1, 30,726 crores) is for metro rail, 13 % (Rs 52,122 crores) is for bus transport and a meagre 5 % (Rs 19,780 crores) on the surface rail systems.

Review of future investments of Mumbai and Bangalore present a similar picture of distortion. Comprehensive transport plan for Mumbai region, titled TranSfoRM (**T**ransport Study **f**or **R**egion of **M**umbai), envisaged an investment of Rs 2.08 lakh crores over a 25 year period ending in 2031(Lea International Ltd, 2011). Out of this investment 52 % is on metro rail systems, 29 % on highway systems including traffic improvements, 15 % on suburban railways, and the rest 4 per cent on other works. Included in the road works is the investment of around Rs 1000 crores on improvements to footpaths i.e. 0.5%. The study has not recommended any direct investment on cycle tracks.

For Bangalore, in the draft report, the consultants (Wilbur Smith Associates, 2010) have envisaged a total investment of Rs 73,233 crores for 22 year period ending 2031. Out of this, metro rail accounts for 33 %, mono rail 44%, BRT 8 %, roads 13 % and other improvements account for 2 %. Investment on pedestrian facilities, including footpath improvements and the grade separated crossings for pedestrians, is 0.4 and on the cycling facilities is 0.001 %.

From the foregoing the following about the future plans is clear:

- Investment on roads and metro systems crowds out other modes
- Investment on cycling and walking is very low
- In public transport investment on surface rail is much lower

Next section identifies the reasons for the distortions in project selection.

4 Reasons for distortion in infrastructure development

The major reasons for distortions in development of physical infrastructure are:

- Inadequate focus and understanding of issues related to urban transport at the political executive level
- Limitations of the official machinery in understanding complexities of the urban transport
- Excessive media focus on problems of motorists compared to other travellers
- Bias in favour of selection of large projects
- Failure of coordination between different government wings at state and central level in taking up surface rail urban projects

Each of the above is explained below.

The transport investment decisions are made by the political and official executives. These executives are usually helped by various types of consultants. Unfortunately, for most politicians provision of an inclusive urban transport - with focus on cycling, walking and public transport - is a peripheral issue. This corroborated by a quick review of the election manifestoes

released by various political parties for the 2009 elections of Indian Parliament (Indian National Congress, 2009; Bharatiya Janata Party, 2009, Election Manifestoes, 2009). Thus, it appears that the problems of urban transport, especially of the poor, are not perceived as an important enough issue to appear in their manifestoes. In this scenario it would be difficult for the politicians to develop a coherent approach in development of urban transport infrastructure. While this does not mean that political executive is not interested in resolving the problems, most often they do not have a grip on the multidimensional nature of urban transport and thus they are dependent on bureaucrats for a deeper analysis and solution.

Senior posts related to urban transport are manned mostly by officers of Indian Administrative Services (IAS) with an occasional sprinkling of officers from other services. By design, IAS officers are trained to be generalists (LBSNAA, 2012) and they have limited exposure to urban transport. They are unable to appreciate the multidimensional nature of the urban transport problem. As they are not trained in depth they look up to some other officials and consultants for guiding them on the making decisions or make decisions based on expediency of the situation.

In this scenario three other functionaries become important; technical experts – mostly civil engineers in the government, consultants appointed by government, and the media. The civil engineers and most consultants are trained in technical colleges in India or in Western countries (again with large share from US of A). A quick review of the academic activity of a few institutes would bring out the reasons for bias in favour of motorised road transport.

In India, courses in transportation are offered at Masters level in engineering and planning. A review of engineering courses at Indian Institutes of Technology at Chennai and Mumbai (IITM, 2011; IITB, 2011) show a strong focus on road engineering aspects of the course. Though a course is offered on economic evaluation of projects, not many courses are offered on transport economics including study of various modes, and social and economic implications on different sections of population.

Similarly, review of Masters programmes in Transport Planning at School of Planning and Architecture (SPA), New Delhi, and Centre for Environment and Planning (CEPT) University, Ahmedabad, indicates, and as expected, a strong planning focus but with emphasis on road transport (CEPT, 2011; SPA, 2011). CEPT offers one compulsory course on metro systems and one elective on Railway Planning and Management.

In addition the role of media in projecting motorist problems as more prominent than other issues is also worth mentioning. This is stated by Kahneman (2011) as availability heuristic. Media highlights what public perceive as an important issue and public recollect the issue and feels that it is important as media is highlighting it. Most journalists, both print and electronic, feel the pinch of motorised travel and thus would report it. As the problem is highlighted in media and also felt by other car travellers it gets highlighted. This then becomes an important problem for public policy discourse. As the problems of non motorised travel are only felt vicariously by the media its importance is not felt in the media discourse. One prominent example is the bad publicity given to Delhi BRT (The Times of India, 2012) in spite of positive reports from large scale survey of users (CSE, 2008)

Bias to select large projects, called “the survival of the unfittest projects” (Flyvbjerg, 2009), is seen in urban transport. Second perverse incentive for selection of larger projects is corruption and siphoning of money. Corruption in India is well chronicled (Transparency International, 2011) and as the project size increases amount available for siphoning would also be higher. Thus there is always an urge to increase project size and given two similar projects, one with larger outlay is preferred to the one with smaller outlay.

Surface rail, in spite of numerous advantages (Ravibabu, 2006) has not received the due attention. Major reason is the lack of coordination between the two important central ministries of Railways and Urban Development and between central the state governments. Most state governments and Ministry of Urban Development are willing to invest about Rs 200 crores per kilometre on metro systems and say they are profitable and viable (The Hindu, 2007; Amy, 2009) but unwilling to develop surface rail projects costing Rs 10 - 20 crores per kilometre to build rail system of the nearly same capacity.

5 How do we remedy it

In spite advocacy for walking and cycling (amongst many others see Badami, 2009; Tiwari 2002) distortions have set in at a number of layers. This section identifies the various steps needed for remedying the situation and how it can be brought about.

The immediate step is to earmark funds in proportion to the potential users. Such an earmarking of funds is prominently used elsewhere by central government; making sub plans for scheduled castes and scheduled tribes so that they receive funds directly (Planning Commission, 2006). If we assume that investment has to be proportionate to the users then on

an average the investments on non motorised transport should be of the order of 40-45% of the total investments. Further, if we take into account neglect of these modes of transport over the years, the proportion for the next few years (say in the 12th plan) should be much higher – at around 60%. At the central level the Ministry of Urban Development (MoUD) should initiate big ticket investments in cycling and pedestrian facilities - as it had done for metro systems or for bus acquisition programme, to send clear signals to the states and urban local bodies on its priorities.

Immediate investment in non motorised transport (NMT) should focus on retrieving urban road space from motor vehicles and providing a safe transit for cyclist and pedestrians. Every town should have plan for interconnecting all colonies in the city to every other place with a safe non motorised transport (NMT) route. Already a large body of literature is available both in international context (for example see <http://www.fietsberaad.nl> for the Netherlands case, pioneers in non motorised transport) and in Indian context (see ITDP and EPC, 2011 UTTIPEC, 2010) for implementing the scheme. As all cities are also mandated to develop comprehensive mobility plans (CMPs) with aid from MoUD, MoUD should clearly mandate the cities to develop CMPs with NMT and public transport occupying the central place in their scheme of things.

Regarding surface rail projects it is essential that Planning Commission or the Central Cabinet set up a high level committee to review the surface railway projects and their relative economics of metro transport. Tripartite agreement between central ministries (railways and urban development) and state governments to share costs and expenditure would be essential. Surface rail projects for urban transport should be given all concessions extended to metro systems to exploit these valuable assets. Another potential problem would be the conflict between different streams of rail traffic. This could be resolved by developing ring rail systems around the city in peri-urban areas so that long distance and goods trains get alternate paths.

Another area would be the revision of National Urban Transport Policy. The NUTP should give top priority for cyclist and pedestrian. The policy should push for ‘pedestrian emperor’ and ‘cyclist king’ followed by the council of Amsterdam city (for documents in Dutch see Fjodor, 2010 and Fjodor, 2011. Details are based on personal email correspondence with Fjodor Molenaar on 28/03/2012). After NUTP incorporates such a policy the pedestrians and NMT users will have adequate space on the roads.

NUTP takes a neutral stand on technologies to be adapted for public transport. This needs to be revised. As surface rail is the cheapest it should get the highest priority. Second priority should be given BRT projects where feasible. Metro should be provided in dense corridors and as missing links.

6 Conclusions

The foregoing indicates a wide dichotomy between the investments made for urban transport infrastructure development and the needs of people. Thus while expansion to accommodate motor vehicles is the focus of investment people have continued to pedal and walk in the city streets despite perils on the roads. People continued with this perilous cause either because there were no alternatives left or that they were too poor to afford them. Immediate efforts should be made to bring non motorised transport to the centre stage of transport investment. In public transport the surface rail is far more economical compared to metro systems and they should be given a central place for public transport in cities where it is possible.

7 Acknowledgements

I acknowledge the comments provided Sri B. Prashant on a draft version of the Article. I also owe gratitude to large number of participants in group mailing list sustran-discuss@jca.apc.org. While all efforts were made to cite the relevant sources, the overall spirit nurtured by group needs a special acknowledgment.

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