Working Paper - 18

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November 2012

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## 1. Introduction

Urban road infrastructure in India is biased in favour of motorised vehicles. This is on account of lack of a reaction to extremely high growth in motorized vehicles in urban India in the last two decades. While the population of India's six major metropolises increased by about 1.9 times during 1981 to 2001, the number of motor vehicles went up by over 7.75 times during the same period (Ministry of Urban Development, 2007, pp. 1-2). From the population census of 2010, at least 35 per cent (27.76 million) urban households had a motorized two wheeler and 9.7 per cent (7.65 million) urban households had a motorized four-wheeler. While, on the whole, the registered motor vehicles increased by 2.4 times during 2002-2011 period or at the rate of 10.2 per cent per annum, in 19 metropolitan cities for which the two time point data is available, registered an increase at 8.8 per cent per annum in the decade (Transport Research Wing, 2012, pp. 3-4).

This has created congestion on the roads, resulting in road widening exercises and construction of flyovers. These two infrastructures have also become symbols of world class cities. Many cities are aspiring to become world class to attract investments. Car usage has become a status symbol, and car buying is termed by the government as contributing to economic growth[1]. This in turn has made car-users a group which is set to de-rail any equitable road development exercises in a city, claiming every inch of road space for their own rightful consumption.[2]

The policy leaning towards promotion of motorised vehicles has another reason, which is not stated clearly and openly. The cities are branding themselves with various 'big-ticket projects' as they are called. These projects form the urban vision. Mahadevia (2011,p.57) states: These visions promote big money and big players in urban space, opening up cities for monopolistic control." Big projects mean big financiers, big contractors and increase in land values to benefit those who have captured lands. Hence, the motorized transport based paradigm also caters to such interests in the cities; interests which are supporting the urban renewal projects towards transformation of Indian cities into 'World Class Cities'. Hence, the problem is not only of the paradigm but also of interest groups within cities, that area close to the political and bureaucratic class. This is the reality of Indian political economy and also of the cities of many developing countries.

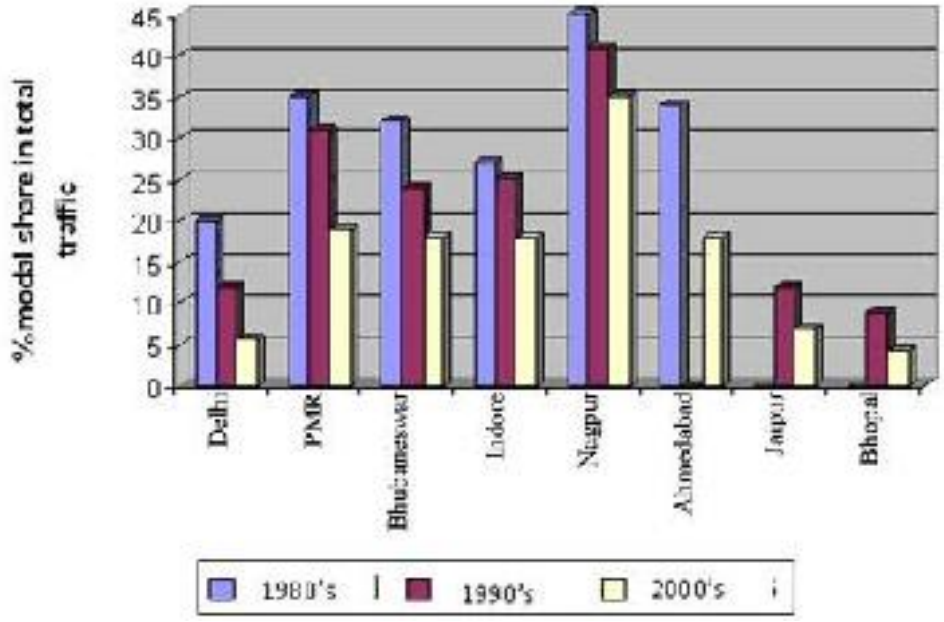
Contrary to what the transport planners plan for, which is for motorized vehicles, reducing every planning to the PCU (per car unit) unit, the reality in Indian cities is that the walking and bicycling dominate the modal use. In the year 2007, cities having population of above 8 million had 30 per cent modal share of walking and bicycling. The modal share for walking and bicycling was 36 per cent for category-5 cities, 43 per cent for category-3 and 4 cities, 52 per cent for category-2 cities and 58 per cent for category-1b cities (Table 1). The most striking fact was that the average share of walking and cycling in the 30 cities which were considered for the study was 42 per cent (Table 1). Wilbur Smith Associates and Ministry of Urban Development (2008) argued that a significant number of trips in Indian cities are made by foot, but pedestrian infrastructure, amenities and services are neglected and are not given adequate focus (p.44). Average Walkability Index in these 30 cities was found to be 0.52, which was embarrassingly less than the cities like London where the this index is almost 1.5-1.7 (p.46).

**Table 1: Modal Share in Cities of India (2007)**

| City Category according to Population | Walk | Cycle | 2W* | Public Transport | Car | IPT |
|---|---|---|---|---|---|---|
| Category 1a (< 0.5 million, Plain Terrain) | 34 | 3 | 26 | 5 | 27 | 5 |
| Category 1b (< 0.5 million, Hilly Terrain) | 57 | 1 | 6 | 8 | 28 | 0 |
| Category 2 (0.5-1.0 million) | 32 | 20 | 24 | 9 | 12 | 3 |
| Category 3 (1.0-2.0 million) | 24 | 19 | 24 | 13 | 12 | 8 |
| Category 4 (2.0-4.0 million) | 25 | 18 | 29 | 10 | 12 | 6 |
| Category 5 (4.0-8.0 million) | 25 | 11 | 26 | 21 | 10 | 7 |
| Category 6 ( Above 8 million) | 22 | 8 | 9 | 44 | 10 | 7 |
| Total | 31 | 11 | 21 | 16 | 16 | 5 |

*2W= 2-Wheelers like Scooters and Motorcycles.
Source: (Wilbur Smith Associates and Ministry of Urban Development, 2008, p. 38)

**Figure 1: Trends in Bicycle modal share in Indian Cities**




Source: Tiwari and Jain (2008, p.60).

In the Indian cities, for which data has been tracked since 1980's, the modal share of bicycles in the total traffic has reduced in two decades since then (Figure 1). This trend has been irrespective of the size of the city. As discussed above, the smaller the city size, higher is the modal share of cycles with the exception of Jaipur and Bhopal. There are number of reasons for this, which are discussed later.

Vasconcellos (2001) argues that transport is not an end in itself. The 'end' has to be the equitable appropriation of space and the corresponding access to social and economic life. It is quite clear that road infrastructure in India completely ignores facilities for pedestrians and bicyclists, and hence is not equitable. The National Urban Transport Policy (NUTP) 2007 has also acknowledged that there is a need for bringing about a more equitable allocation of road space with people, rather than vehicles (p. 3). This inherent inequity in distribution of road space has also resulted in a rampant growth in number of accidents. As per Transport Research Wing & Ministry of Road and Transport (2011), 497,686 accidents occurred on Indian roads in 2011 alone, of which 24.4 per cent were fatal accidents in which 142,485 persons were killed. Accident severity[3] has increased from 20.8 in 2002 to 28.6 persons (p.3).

Numbers of accidents in India have increased from 21.2 to 41.1 per lakh population in 2011. The share of urban areas in these accidents was 46.5 per cent (p.18). Moreover, the most vulnerable groups, the pedestrians (9 per cent) and the bicycle riders (4.8 per cent) were the most affected by these accidents (p.21). NUTP (2007) also states that the use of cheaper non-motorised modes like cycling and walking has become extremely risky (p.2), and raised a concern that it tends to impact the poor more severely as many of those killed or injured tend to be cyclists, pedestrians or pavement dwellers (p.2).

It is known that the use of NMT increases the road capacity. Pedestrians and cyclists require less space than cars and hence better laid footpaths and segregated bicycle lanes would assist in better utilising existing roads. In capital deficit countries, which are the developing countries, this strategy would mean better spent available capital. Carrying people by car requires 2.6 times greater road area than by bicycle (IRC 1990). Together with this, NMT provides personal, flexible, and inexpensive mobility.

Walking and cycling are the two activities that generally happen at road edges, which are undoubtedly one of the most neglected spaces on Indian roads. The general definition of road is taken to be as movement space for motorised vehicles, and its purpose is thought to be solved if car traffic moves smoothly on it. This is the prime reason why footpaths, if they exist, in many cities have been reduced to mere road kerbs with all kinds of obstructions on them including sewage line covers, telephone boxes, sign boards, street lights, unauthorized parking, stray animals, electricity poles and also bus stops. Footpaths are often not walkable as they are having uneven surface and even uneven height. Where there is a junction on account of entrance to a property or a road junction, instead of smooth transition down, there are jumps, making them un-walkable. In fact, rarely, one comes across well designed and constructed footpath in any Indian city. In many cities, pedestrians either walk on the road or in the sand/ mud on the sides of the road, making for a very unpleasant experience. The footpaths are either not lit or inadequately lit, making them unsafe for walking. Besides, there are issues of physical safety on deserted roads and hence footpaths should have multiple activities round the day, which provides sense of safety, particularly to women. To some extent, encroachment on footpaths, if they are there, by certain activities (such as restaurants, vendors, etc.) is desirable, but, that calls for wider footpaths than they are there in general. In absence of these policy and design solutions, those owning motorised vehicles prefer to use them even for short distances. Amidst such conditions, asking for usability of footpaths by the disabled is asking too much.

Bicycle users have no rights on the road. They too are forced to either remain on the sides with tattered edges making cycling unsafe or they have to ride on the road space meant for motorised traffic. Many are found riding on the middle of the road and motorised vehicle drivers consider them to be hindrances on the road. These hazardous practices are unsafe for the cyclists and them on the road slow down the entire traffic. Many cities in the country, particularly the non-metros also have cycle rickshaws as important mode of transportation, which is getting either discouraged, or remains non-facilitated. In metro cities such as Delhi, a cap on their numbers was put by the Municipal Corporation of Delhi (MCD), till the Supreme Court ordered to remove that cap and allow all of them to ply in the city. The MCD had put a cap arguing that the roads were congested and cycle rickshaws were the cause of that[4]. Their number is anything between 700,000 to 800,000 then. Moreover, there seems to be a complete lack of interest in designing the road edges properly in the interest of the Non-Motorised Vehicles (NMVs). In general, the NMTs are losing out in the competition for space, speed and money, although they complement and sustain public transport.

Another layer of complexity is added by street vending, which carries an illegal status and is thought to be creating hindrance on roads. In 2009, Ministry of Housing and Urban Poverty Alleviation, Government of India released National Policy of Urban Street Vendors 2009, which pronounced that urban street vending employs upto 2 per cent of population in many cities and is not only a source of self-employment to the poor in cities and towns but also a means to provide 'affordable' as well as 'convenient' services to a majority of the urban population (p.1). The policy also acknowledged that public authorities often regard street vendors as a nuisance and as encroachers of sidewalks and pavements and do not appreciate the valuable services that street vendors render to the common man (p.1). The Supreme Court of India in its judgement in 1989 also proclaimed that the right to carry on trade or business mentioned in Article 19 (1) g of the Constitution, on street pavements, if properly regulated, cannot be denied on the ground that the streets are meant exclusively for passing or re-passing and no other use (India, Ministry of Housing and Urban Poverty Alleviation, 2009, p. 1). Therefore, amalgamation of street vendors in road laying exercises is a factor which could not be ignored.

The true definition of "inclusive roads" in Indian context should be a road which actively facilitates pedestrians, bicyclists, cycle rickshaws and also street vendors. It should be a road, where edges are equally important as the central tarred surface. Contrary to this feeling, urban transport investments have served mainly to increase the road capacity for automobiles, often at the expense of travel modes used by the poor. There has been little or no focus in urban transport plans to improve quality for non-motorised users e.g. pedestrians and cyclists (David, Hanmer, & Lovell, 2000, p. 63). Launched with a huge fanfare in the year 2005, Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was one of its kinds reform linked programme for funding urban infrastructure in deficient Indian cities. After the launch of the JNNURM, the Ministry of Urban Development, Government of India (GoI) also announced the National Urban Transport Policy (NUTP) in 2006. The current discussions in India around need for NMT infrastructure have antecedents in the NUTP, 2006. NUTP (2006) had mentioned:

> "The Central Government would give priority to the construction of cycle tracks and pedestrian paths in all cities, under the National Urban Renewal Mission (NURM), to enhance safety and thereby enhance use of non-motorized modes. Cities would also be encouraged to explore the possibility of a public bicycle program, where people can rent a bicycle for use in specially designated areas (p.13)."

On one hand NUTP projected JNNURM as a project based solution to the problem of safety of pedestrians and bicycle users and on the other hand 13.3 per cent funds under the Urban Infrastructure and Governance (UIG) component of JNNURM were allotted to construct just roads and flyovers and a meagre 8.6 per cent for constructing Mass Transit which included all the BRT projects in India (Mahadevia, 2011, p. 59). No specific projects pertaining to better pedestrian facilities and bicycle tracks were undertaken under the JNNURM. The Ministry of Urban development pushed cities to build footpaths and bicycle tracks along the proposed BRT corridors, just to abide to the NUTP agenda. It was made mandatory for a city to have NMT facilities along BRT corridor for approval by the Central Sanctioning and Monitoring Committee (CS&MC).

Almost all the BRT projects sanctioned by JNNURM in India have constructed pedestrian and bicycling infrastructure of one or the other kind. Some projects have remained success stories in terms of NMT implementation and others have just done a lip service. This paper is an effort to look into the status of such infrastructure in three cities of India namely, Delhi, Pune and Ahmedabad which have implemented BRT projects, and see if pedestrians and

bicyclists have gained anything from millions of rupees of investment in urban transport infrastructure. We have also tried to add certain other case studies pertaining to cycle rickshaws, and other model road building exercises in the cities. Information on guidelines for pedestrians by the Indian Road Congress (IRC) and other relevant institutions has also been added to make this paper more informative.

## 2. Norms for Designing of Footpaths and Bicycle Tracks

In 1988 Indian Roads Congress (IRC) released the guidelines for pedestrian facilities (IRC: 103-1988) after getting the approval from the Highways Specifications and Standards Committee. The guidelines kept forward an argument that pedestrians are more vulnerable to being involved in accidents and it is imperative that adequate consideration should be given to their safety (IRC:103-1988, 1989, p. 2). It recommended that pedestrian facilities should be planned in an integrated manner to ensure a continuous pedestrian flow and an overall strategic plan should be made to ensure that. Another important recommendation by the guidelines was that the convenience of the pedestrian should be a paramount consideration; otherwise the facilities provided will not be fully used (p.3). The guidelines recommended widths of footpaths as per their carrying capacity in terms of number of persons per hour. The minimum width of a footpath in the guidelines is suggested to be 1.5 metres, at places where number of people going in both directions per hour is less than 800. A footpath of width 4 metres can carry 6,000 persons per hour per in one direction or 4,000 persons in both the directions (

Table 2).

**Table 2: Capacity of Side Walks**

| Width of side walk | Capacity in number of persons per hour | |
|---|---|---|
| (in metres) | All in one direction | In both directions |
| 1.50 | 1,200 | 800 |
| 2.00 | 2,400 | 1,600 |
| 2.50 | 3,600 | 2,400 |
| 3.00 | 4,800 | 3,200 |
| 4.00 | 6,000 | 4,000 |

Source: (IRC:103-1988, 1989, p. 3)

At places where side-walks are in shopping areas, the width of the footpath should be increased by 1 metre and should be treated as dead width. In situations where side-walks pass adjacent to buildings and fences, the dead width can be taken as 0.5 metres. There are also ideal layouts given for putting in zebra crossings at four armed channelized road intersections and other kinds of four arm intersections (Figure 1).

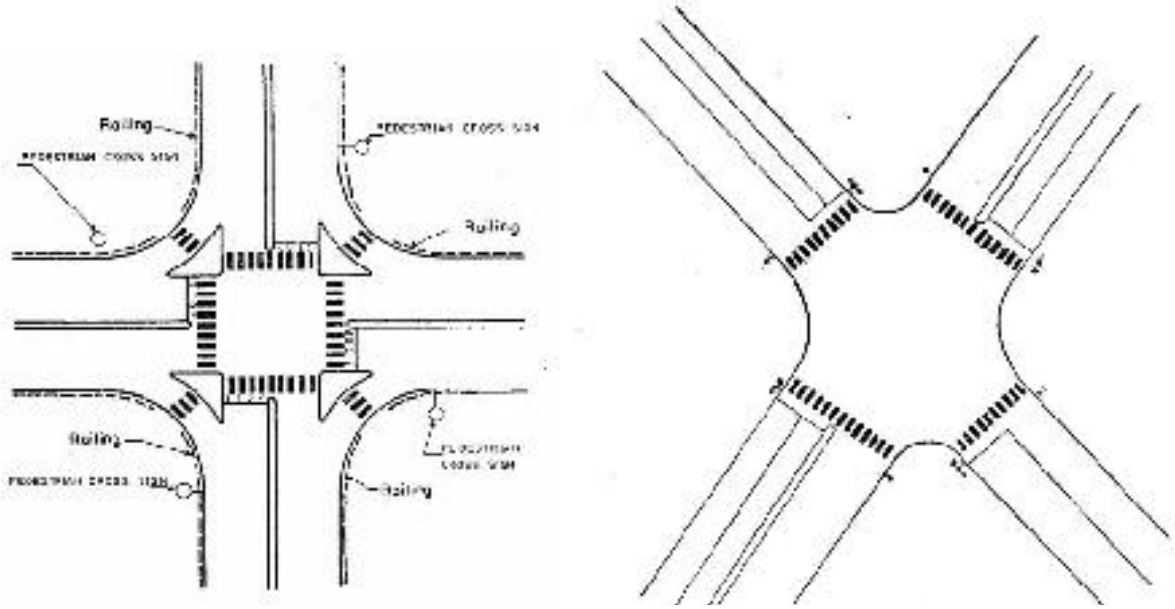



**Figure 1: (Left) Zebra Crossing arrangement for four armed channelized section (Right) and at four arm intersection**

Source: (IRC:103-1988, 1989, pp. 9,11)

Unified Traffic and Transportation Infrastructure (Planning & Engineering) Centre (UTTIPEC) (2010) has recently prepared street design guidelines for equitable distribution of road space, as per the recommendations of the NUTP. These are responding to the contemporary transport and development paradigm. These guidelines though adapted for the problems in Delhi, also made certain universal recommendations for designing of footpaths and bicycle tracks. It was the first time that a guideline was issued keeping in consideration road edges more than the road centre, with entire focus on safety of pedestrians and bicyclists.

The guidelines illustrated various design elements leading to universal access. It also recommended various lane sizes for Non-Motorized Transport (NMT) lanes for bicyclists, cycle rickshaws, hand push carts, hawker carts, animal carts etc. It recommended the minimum acceptable width of NMT lane for single lane movement to be 2.5 metres (p.76). An important suggestion with respect to bicycle lanes was to avoid kerbs as far as possible on the NMT lanes (p.86) as kerbs increase the possibility of a bicycle pedal striking it during bicycling and causing an accident. The minimum width of a footpath was recommended to be 1.8 metres which allows minimum two people to cross each other comfortably. The footpath should have clear headroom of minimum 2.4 metres (pp.43-44). Width of footpaths was also recommended according to land-uses as pedestrian flow is largely determined by it. The guidelines recommended footpath width for commercial nodes to be minimum 4 metres (Table 3).

Table 3: Footpath widths according to land-use.

| S.no. | Land-use | Minimum width of footpath in Metres |
|---|---|---|
| 1 | Residential | 1.8 |
| 2 | Commercial/Mixed use | 2.5 |
| 3 | Commercial nodes | 4.0 |

Source: (UTTIPEC, 2010, p. 44)

A highlight of the guidelines was to propagate the concept of "Inclusive Streets" bringing into focus other street related activities like street vending, which has symbiotic relationship with walking. People walking back or to the public transport would purchase necessities from the street vendors and also depend on the vendors for providing them water, food items and even safety. Another major concept propagated by the guidelines was to create "eyes of the street" by removing setbacks and boundary walls and building up to the edge of the street Right of Way (ROW), which would allow people from inside to look out on to the pavement, thus discouraging misbehaviour, shady corners, peeing, etc. The guidelines mentioned that it is a desired element of a successful and active street to have attractive windows and hawkers in a shopping district (UTTIPEC, 2010, p. 52). It recommended that designated hawker zones must be allowed to locate in areas where pedestrians tend to wait or congregate i.e. street intersections and near bus stops or major civic destinations, public offices, etc. (p.104). They keep streets busy, vibrant and their placement along 'dead' boundary walls provides "eyes on the street" making it active and safe (pp.110-111). Principally hawkers must be accommodated with the road ROW approximately every 500-100 metres on a public street. It recommended that all essential utilities as outlined in the National Policy for Urban Street Vendors (NPUSW) must be provided to the urban street vendors (p.112).

Institute for Transportation and Development Policy (ITDP) (2009) in its presentation titled Designing for Cyclists suggested four features of a good bicycle track as continuity, shade, trash free and non-encroached. The minimum design requirements suggested in the document were smooth riding surface, minimum 2 metre width allowing overtaking and no high kerbs (ITDP, 2009).

## 3. NMT Infrastructure along Delhi BRT corridor

Tiwari (1999) propagated the idea of a bicycle Master Plan of Delhi. The author very thoughtfully named the report as Road Designs for Improving Traffic Flow, hinting the larger benefits of pursuing this plan. This document was adapted from the final report submitted to the transport department of government of Delhi in August 1998. The report created a case for bicycle users of Delhi and their inclusion into the street design of Delhi. It also made certain suggestions for alternative road layouts including better facilities for pedestrians and bicyclists making roads accessible and safe for all income groups.

In 2008, Delhi Development Authority (DDA) released a notification[5] forming UTTIPEC with a view to enhance mobility, reduce congestion and promote traffic safety by adopting standard transport planning practices, capacity building, laying enforcement measures, promoting road safety audits, introducing pedestrian-friendly traffic engineering practices and better organizational co-ordination for improved traffic management. The last agenda was proposed to be served by efficient lane capacity and work zone management, utilities coordination, developing traffic culture and avoiding transport planning pitfalls in the National Capital Territory of Delhi[6]. As per the notification, all transportation projects/ transport engineering solutions in Delhi by any agency having road engineering/ infrastructure implication would require clearance of the Centre (UTTIPEC). UTTIPEC in the year 2009 prepared the street design guidelines for creating better designed inclusive streets for Delhi. These guidelines were adopted by DDA in the year 2010 (UTTIPEC, 2010, p. 1).

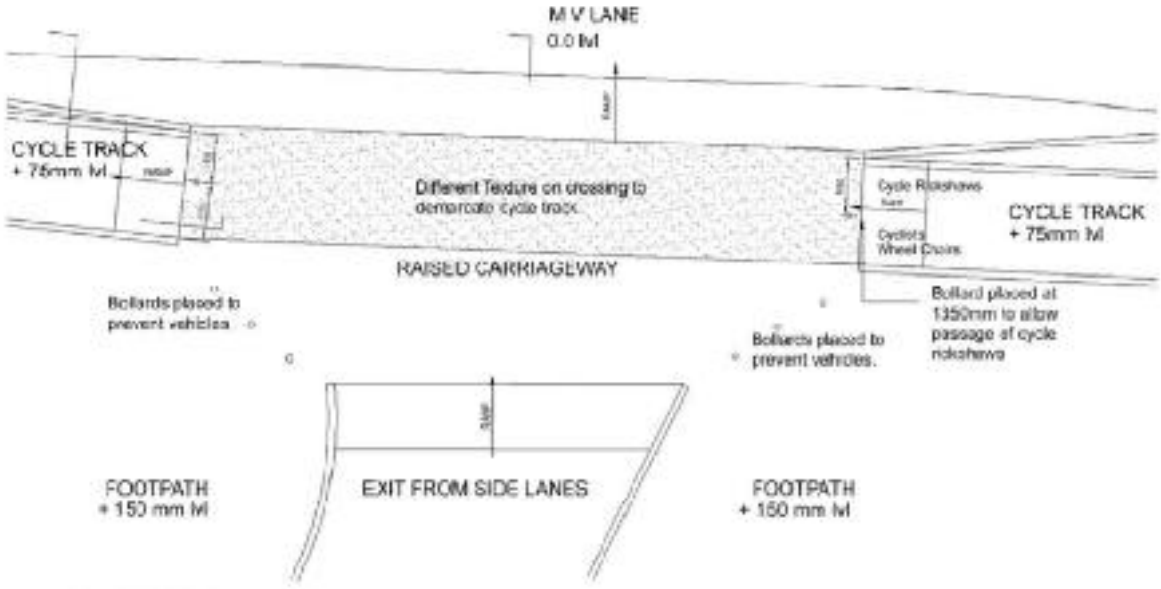
The modal share of walking and bicycling in Delhi's trips was very substantial. A survey of passenger trips was also done by RITES in 2001, which recorded 33 per cent trips as walking trips and 3.6 per cent as bicycling trips. In 2007-08, RITES carried out another Transport Demand Forecast Study- "without walk trips" which concluded that the share of bicycle in

modal split increased from 5.3 per cent to 6.8 per cent. (DIMTS, 2011, p. 8). Wilbur Smith Associates and Ministry of Urban Development (2008) found the modal share of walking and bicycling in Delhi to be 21 per cent and 12 per cent respectively. Another matter of concern was the share of pedestrians and bicyclists in road accidents, which was found to be 24 per cent and 6 per cent. This was crucial as walking and bicycling were also the most prominent modes used by the urban poor in Delhi. As per TRIPP (2005) modal share of walking and bicycling for low income households of Delhi to access their workplace was 22.1 per cent and 38.9 per cent respectively. Buses contributed to 31.4 per cent in the modal share (p.14). This meant that modal share of walking; bicycling and public transport was 92.4 per cent for the low income households.

It was almost evident that a high capacity bus corridor without proper NMT delineation will not be inclusive. There was a need to improve bus speeds, but also a need to increase safety for pedestrians and bicyclists. The Delhi BRT proposal also looked into this aspect and proposed the first of its kind NMT Corridor which followed the recommendations of UTTIPEC (2010). The corridor was initially made to be 5.8 km long from Ambedkar Nagar to Moolchand Hospital along the bus lane on both the sides. One of the major positives of this NMT corridor was continuous footpaths and bicycle lanes with proper planning at junctions and side lane entries. The bicycle lane is made of clear width of 2.5 meters. At locations where the right of way widths do not permit segregated bicycle tracks, bicycle track combines with the pedestrian path with a total minimum width of 2.0m. The bicycle lane is raised from the Motor Vehicle (MV) lane by 75mm (

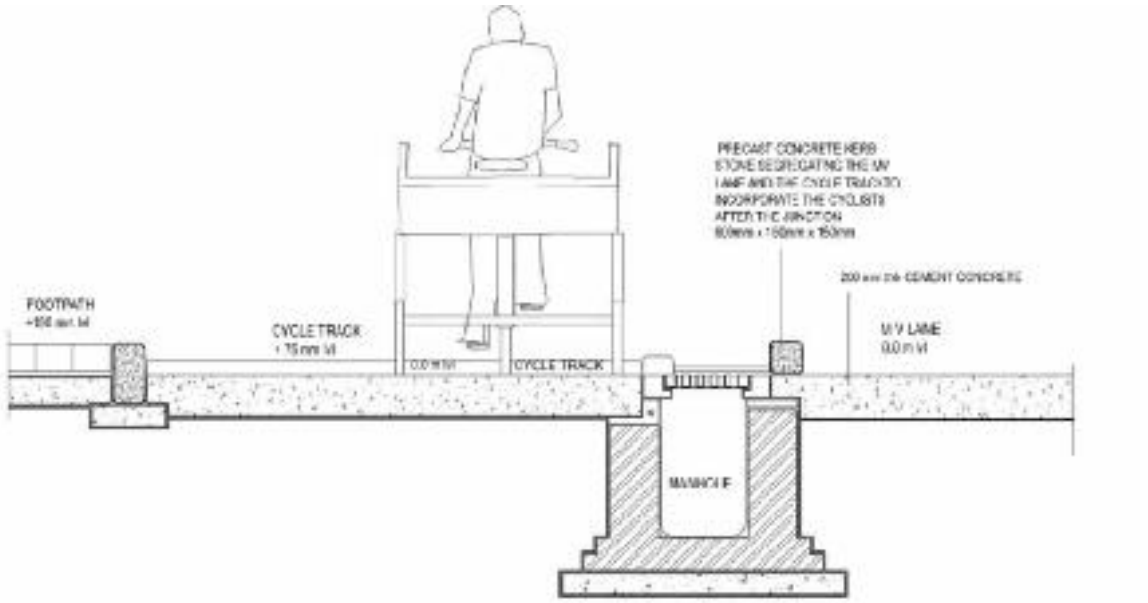
Figure 3). Segregation between MV lanes and cycle tracks is designed to allow the cyclists to leave the cycle path at any time with little or no difficulty. On streets where fast moving MV traffic is expected, a 0.6 to 0.75m wide segregation between Motor Vehicle (MV) lane and the cycle track is been provided. The minimum clear width of the footpath is kept to be 1.5 metres.

**Figure 2: Detail plan showing cycle track and exit from side lanes**




Source: (TRIPP, 2005, p. 28)

**Figure 3: Detail cross section of cycle track entry at junction**




Source: (TRIPP, 2005, p. 29)

**Figure 4: (Left) Bicyclists using the NMT corridor (Right) The bicycle renting kiosk**

Though this corridor was just 5.8 Kilometres long, its benefits were immense. Tiwari and Jain (2012) evaluated the impact of implementation of BRT corridor in Delhi by using traditional and new indicators of accessibility and safety, which indicated that accessibility options to opportunities has increased by 120 per cent for bicycle users and 730 per cent for people who walk to access bus on the BRT corridor. In 2011, our team of researchers found that about 1200 bicycles used the bicycle lane per hour at peak times (Figure 4, Left). In spite of the occasional illegal intrusion from motorized two wheelers, bicyclists felt relatively safe. Bicycles are also available on rent, at two kiosks on the corridor, which is also a noteworthy initiative to promote cycling. Existing trees have been saved to keep the footpaths and bicycle

tracks in shade. The corridor has worked really well for the pedestrians and bicyclists and has provided them with a safe environment for movement.

### The case of Cycle Rickshaws in Delhi

Interestingly, Delhi also has a history of constantly discouraging another important low carbon transport and non-polluting mode like the cycle rickshaw. The cycle rickshaw was the most favoured Intermediate Public Transport (IPT), but now has started losing its demand due to many hindrances like road congestion and limiting of licences to rickshaw pullers. As per the data collected in 2007-08, 1.31 million trips were made by cycle rickshaw, which proves that it has potential to become a feeder to Metro and BRT system (DIMTS, 2011, p. 9). In 1960 Municipal Corporation of Delhi (MCD) passed special bylaws for rickshaws, which remained in force up to 1975. Many attempts were made to reduce the number of rickshaws by issuing only 600 licences. In 1976, the quota for licences was raised to 20,000 but the numbers continued to multiply. In 1993, the quota went up to 50,000. In December 1998, the licence quota was raised to 99,000 (Gurung, 2006). The number of rickshaws that ply on Delhi's roads is as high as 700,000 of which only 89,429 have licences (DIMTS, 2011, p. 2). The latest estimate, as mentioned earlier, is close to 800,000. These licences have been granted in 12 zones against different colour schemes (p.14). In 2007, MCD imposed a new scheme of scientific management of cycle rickshaws in which 80 per cent of the city roads were declared as no entry zones for cycle rickshaws (p. 18).

In February 2010, Delhi High Court lifted the cap on the total number of cycle rickshaws allowed in the city (p.17) and in April 2012 the Supreme Court of India also upheld the judgement that municipal authorities could not cap the number of licences to cycle rickshaws (Venkatesan, 2012). However, it is expected that the demand for the cycle rickshaw will increase after the increase in the petrol and Compressed Natural Gas (CNG) prices as they are providing links to the residential areas from many metro stations. In 2007-08 a transport demand forecast study concluded that the modal share of person trips done by Cycle Rickshaw has doubled in the period of last 6 years, from 3.6 per cent in year 2000-01 to 7.9 per cent in year 2007-08[7] (DIMTS, 2011, p. 8).

Delhi Integrated Multi-modal Transport System Limited (DIMTS) is now trying to create a system called "GreenCAB" which would be a dial a cycle rickshaw service, to integrate BRT with emission free non-motorized transport. GreenCAB as a system shall be organized under NMT Cell of DIMTS. DIMTS along with other planning and development agencies shall provide necessary infrastructure. The city would be divided into different zones based on its existing land use and traffic pattern. A control centre and parking space for rickshaws would be created for the proposed service (DIMTS, 2011, p. 3).

Delhi has taken a lot of good initiatives, both in terms of policy and implementation, which go in favour of "inclusive roads". One needs to see, if these initiatives grow larger in scale in the coming future, making Delhi's roads much for safer for pedestrians and bicyclists.

## 4. Pune's NMT Corridor along BRTS

Historically known as the "cycle city" of India (Wilbur Smith & Associates and IL&FS Urban Infrastructure Services Ltd, 2008, p. 4.23) the city of Pune still has a vast majority of population walking and bicycling. The modal share of walking and cycling is 22 per cent and 11.1 per cent respectively. The modal share of public transport is 12.2 per cent, which means a total 45.3 per cent people in Pune either walk, bicycle or use public transport (Wilbur Smith

& Associates and IL&FS Urban Infrastructure Services Ltd, 2008, p. 4.20). The comprehensive mobility plan (CMP) for Pune also noted the fact that due to the significant slum population and student population there is a continued usage of bicycles in Pune, and initiatives should be taken to not only preserve but to enhance the share and safety of NMT (p.7.2). The CMP also observed that 50 per cent of the roads had no footpaths on both the sides (p. 4.23).

The Pune Municipal Corporation (PMC) constructed footpaths and bicycle tracks along the pilot BRT corridor. Although Pune's tryst with BRT is also laden with a lot of criticism from the media and the elite, very few things have been written about its NMT corridor. A comprehensive study of bicycle tracks in Pune was done by an NGO called Parisar. An RTI filed by them revealed that a total of 132 kilometres of cycle tracks were said to be completed. They surveyed all of them, and found that only 87.5 kilometres of bicycle tracks were worthy of being called bicycle tracks (Singh & Gadgil, 2011, p. 3). The length of cycle tracks proposed under BRT implementation were over 115 km (p.15). Their main conclusions regarding the bicycle tracks were that they were badly designed and had a large number of obstructions. Cycle tracks had missing portions and unconnected sections, with encroachments in between (pp.3-4). Over 80 per cent of bicycle tracks were built with interlocking blocks, which is not a good surface treatment for cycle tracks, as it makes tracks bumpy to ride. A lot of surface undulations get created on them, causing water stagnation which makes the surface slippery and accident prone (p.16).

Our research team took up studying 13.2 kilometers of implemented BRT corridor including an NMT corridor running in almost the full stretch of BRT. The pilot project did hit a road block while entering the cantonment and old city area, and the dedicated bus lane was not constructed in a stretch of almost 4.5 kilometres. Footpaths and bicycle tracks were not constructed in almost 3 kilometres of stretch. The width of bicycle tracks followed the Delhi model, with a bicycle track having a minimum width of 2.5 metres and a footpath of minimum width 1.5 metres (Figure 5).

**Figure 5: (Left) Footpath and Bicycle track along Pune BRT (Right) Properly laid stretch of the footpath and cycle track**

**Figure 6: (Left) People walking on Bicycle track, due to insufficient width of footpath (Right) A PMC Garbage container on the footpath and bicycle track**

The research team found that, bicycle tracks along the BRT were better designed, with asphalt surfacing, but widths of footpaths were seen varying from 1.0 metre to 1.5 metres. The width was also less at places like Swargate bus terminus where the pedestrian pressure is more. At such places people were found to be walking on the bicycle tracks (Figure 6, Left). The team also found large many obstructions on the NMT corridor, which were created by the PMC itself. A huge garbage collection container was kept in the middle of the bicycle track near the Swargate junction; making it unusable for either walking or cycling (Figure 6, Right). The bicycle tracks were also fairly discontinuous at certain locations, and were completely missing at locations where road widths were less. At such places only a bicycle track sign was put on the road edge, without provision of an actual bicycle track. In the cantonment area, bicycle tracks suddenly bumped into trees and ended, while at other places sewage chambers were found open in the middle of the track, and bicycle track signage was put at various places showing non-existent bicycle track.

**Figure 7: (Left) A Sewage chamber lid left open on a bicycle track (Right) A wedge shaped concrete patch added as afterthought beside a tree.**

**Figure 8: (Left) A tree obstructing entry into a bicycle track. (Right) A bicycle track signage over a non-existent track**

Pune's footpaths and bicycle tracks could be said as a half-hearted implementation of a good plan, derived mostly from its counterpart at Delhi. This gets reflected in partial implementation and missing design details showing genuine interest in putting up NMT infrastructure. At least, it could be said as a good start which needs to be pursued with vigour and interest through taking care of all design details. The city requires repeated social audits of the NMT infrastructure so as to provide these services to its citizens.

## 5. Ahmedabad's Janmarg: A bus missed for Pedestrians and Bicyclists

Gujarat celebrated an "Urban Year" in 2005, when Ahmedabad Municipal Corporation (AMC) decided to construct a Bus Rapid Transit System (BRTS) in the city. It was an important decision, as it also increased expectations of getting properly laid out roads, the creation of proper road space for pedestrians, bicyclists and vendors, management of on-street parking and mainly, the provision of an efficient and reliable bus system. This coincided with the launching of the JNNURM and NUTP at the national level in 2005. The JNNURM and the NUTP had an important agenda of encouraging and supporting better public transport in the cities and showed willingness to support DPRs for the BRTSs in all the cities. Ahmedabad was among the first of the cities to take this opportunity and submitted a DPR under the UIG component of the JNNURM. The Ahmedabad BRTS was very thoughtfully given the name "*Janmarg*" meaning "People's Way" hinting creation of an inclusive public transport system serving the common-folk. Since its opening in 2009, it is one of the most lauded BRT systems in the country bringing the Ahmedabad Municipal Corporation national and international laurels.

In principle, the planners of Janmarg also decided to follow the recommendations of the NUTP, and understand the project in context of the larger mobility issues rather than just delineating separate bus lanes on the road. It was evident to the planners that walking and bicycling constituted total of 55.21 per cent of the total trips in the city (AMC, AUDA and CEPT University, 2008, p. 5.7). The detailed project report also quoted that most of the poor walked or bicycled to save transport costs. The percentage of walking and cycling in trips made by the EWS[8] and LIG groups was near 85 per cent and 65 per cent respectively (AMC, AUDA and CEPT University, 2007, p. 5.9). A detailed trip distribution by gender also revealed that most of the women in Ahmedabad either walked (63 per cent) or used public buses (12 per cent). The trip lengths made by women were also shorter (AMC, AUDA and CEPT University, 2008, p. 4.6).

In another study done by Mahadevia, Joshi and Datey (2012) which surveyed 580 households living in 15 slum settlements in whole of Ahmedabad, it was found that 40.4 per cent trips were made by walking, 13 per cent by cycling and 10.7 per cent by Ahmedabad Municipal Transport System (AMTS). 58.9 per cent of trips done by women were walking trips, and 16.3 per cent trips were made by using shared auto-rickshaws (Mahadevia, Joshi, & Datey, 2012, p. 118). It re-establishes the point that walking and cycling are two modes most used by the urban poor, and women pedestrians are much more in number than their male counterparts, and hence more vulnerable on the road in the absence of better walking infrastructure.

The data of accidents also revealed the plight of pedestrians and bicyclists on roads in Ahmedabad. The share of pedestrians and cyclists in affected mode during accidents was 19 per cent and 42 per cent respectively. The responsible mode for the accident was mostly trucks (47 per cent), buses (12 per cent) and two wheelers (13 per cent) (AMC, AUDA and CEPT University, 2008, p. 3.13). This also meant that the women and the urban poor were the most vulnerable socio-economic groups on the road, as their most preferred modes were walking and bicycling. Hence, some concrete steps were required to be taken to reduce vulnerability of NMT modes on the road and therefore the main expectation from *Janmarg* was that, it will ensure a more equitable allocation of road space for people, rather than vehicles, as per the recommendations of NUTP.

Although *Janmarg* did start by putting walking and bicycling infrastructure along the BRT corridor, but soon the efforts derailed due to a complete lack of vision while dealing with the dynamic road edges. The focus shifted to just bus and bus lane infrastructure, rather than larger issue of creating equity in distribution of road space, enhancing mobility for all and making roads more inclusive, usable and safe for all socio-economic groups. *Janmarg* completely ignored inclusion of sustainable and low-carbon modes like walking and cycling and still, in the year 2010 received the sustainable transport award, whose citation claimed that the city is making continued efforts to be a leader in sustainable transport, including incorporating high quality pedestrian facilities throughout the city as well as bicycle lanes[9]. In reality, the bicycle lanes had a faulty design with high kerb, and a fairly discontinuous stretch and non-uniform width. Footpaths were obstructed by project's own signboards (Figure 10, Left), and illegal parking (Figure 9, Right).

**Figure 9 (Left) A woman walking on road along BRTS with no footpath (Right) Unauthorized parking on footpaths**

**Figure 10 (Left) A JNNURM signboard obstructing the footpath (Right) Unusable width of the footpath and bicycle track**

A survey of 1040 BRT users comprising of all income groups also suggested that the mode used for access to a BRT station was walking for 46.3 per cent (Mahadevia, Joshi, & Datey, 2012, p. 103) users, and similarly the mode used for egress from a BRT station to reach their destination was also walking for 64 per cent users (p.104). A negligible proportion used bicycles, which may be attributed to lack of parking and security for bicycles on BRTS stations. Interestingly all these walkers to BRT stations lived at a median distance of 380 metres (p.103), which is not quite much. It also proves that probably it was not comfortable to walk slightly longer distance to reach a BRT station due to non-availability of side-walks. The median distance to destination from a BRT stop was just 270 meters (p.104), which is even lesser.

After a point of time, *Janmarg* almost withdrew itself from the provision of bicycle tracks claiming it to be non-useful. The reasons for averting were rather amusing. In the current implementation phase of the all newly planned *Janmarg* corridors, bicycle tracks are being discarded under the excuse of a 'lack of space' and 'security concerns'. In a particular stretch passing next to the Indian Space Research Organization's (ISRO's) campus, the AMC has stated that the cycle tracks would not be laid as they would cause a security threat to the establishment (Times of India, 2011)! If such arguments are repeatedly forwarded, the *Janmarg* might ultimately discard the idea of bicycle tracks, and thus it might fail to achieve the goals of sustainable and inclusive transport for Ahmedabad. Furthermore, one should not forget that the only component most relevant for urban poor in the implementation of *Janmarg* was its footpaths and bicycle tracks as poor are not using the high cost BRTS. Mahadevia, Joshi and Datey (2012) also illustrated that the overall usage of BRT by slum dwellers of Ahmedabad was just 0.4 per cent (p.118) and the share of low income groups in total surveyed BRT users was just 13.6 per cent (p.99, having monthly income less than Rs. 5000).

We also did a detailed enquiry into the provision of bicycle tracks and footpaths along the Janmarg corridor by a comprehensive mapping and measurement. Table 4 gives the extent of provision and Table 5 gives the state of the NMT infrastructure along the BRT corridor. The maps are included as annexures.

**Table 4: Provision of Footpaths and Bicycle Tracks AlongJanmarg Corridor**

| | BRT length in km (L+R) | Bicycle track provided (L + R) | | Footpath provided (L+R) | |
|---|---|---|---|---|---|
| | | in km | % of BRT | in km. | % of BRT |
| R.T.O to Naroda | 63 | 20.4 | 32.5 | 53.5 | 85.0 |
| DanilimdaC.R. to Kankaria T.E. (Loop) | 15 | 0 | 0.0 | 11.7 | 78.0 |
| Total | 78 | 20.4 | 26.2 | 65.3 | 83.7 |

Source: Primary Survey

**Table 5: Percentage of Obstructed Bicycle Tracks and Footpaths AlongJanmarg Corridor**

| | Availability of Bicycle Tracks | | | Availabilityof Footpaths | | |
|---|---|---|---|---|---|---|
| | Provided(km) | Obstructed (km.) | % obstructed | Provided (km) | Obstructed (km) | % obstructed |
| RTO to Naroda | 20.4 | 7.2 | 35.0 | 53.5 | 28.2 | 52.6 |
| Danilimda C.R. to Kankaria T.E. | 0 | 0.0 | NA | 11.7 | 6.1 | 52.0 |
| Total | 20.4 | 7.2 | 35.0 | 65.3 | 34.2 | 52.5 |

Source: Primary Survey

In the surveyed stretches, bicycle tracks were provided only on 26.2 per cent of the BRTS track, and footpaths were provided on 83.7 per cent of the BRTS track. Even these were not obstruction free. Of the available bicycle tracks, 35 per cent were obstructed due to various reasons like unauthorised parking, open manholes, rainwater drainage, electricity poles etc. 52.5 per cent of the footpaths are obstructed. The width of footpaths is also very narrow at certain places and they are more road kerbs than footpaths. The rest of the cycle track is also not very continuous and is hence rendered unusable. Bicycle tracks are also badly designed, and have high kerbs segregating them from the mixed-traffic lane. The effective usable width of the cycle track reduces as a result. Due to the fear of their bicycle paddles hitting the kerb and causing accidents, the cyclists are often found in the mixed-traffic lane rather than the cycle track. Observing the usages of the walking and cycling facilities, the sizes of footpaths and bicycle tracks along the corridor raises the question of their adequacy. The widths of both the footpaths and bicycle tracks as per the DPR each varied between 2m and 2.7m. The width of cycle lane is not enough for cyclists to overtake others. Being stuck behind slower cyclists discourages the use of cycle lanes. Hence, instead, cyclists start using the mix traffic lanes.

The obstructions were mostly elements which were not taken into consideration while designing the NMT corridor like telephone boxes, electricity poles and AMTS bus stops. Other obstructions were more infrastructures based, like open drainage grates, water logging and garbage & construction waste heaps. The third kind of obstructions was more elite capture like illegal parking on footpaths (and not street vendors!).

The NMT infrastructure along Janmarg has been given short shrift. Some strong steps are needed to improve this infrastructure for pedestrians and cyclists, and thereby encourage walking and cycling in the city to meet climate change goals. Yet walking and cycling as every day transport has drastically reduced in the city over time as already mentioned, and the NMT infrastructure along the BRT corridor has not been able to stop this trend and has not delieveredon its promises. It is clearly a case of lost opportunity. It would not be wrong to say that Janmarg has failed the urban poor households of the city.

**Figure 11 (Left) An open grate on the bicycle track (Right) A heap of construction waste on the bicycle track**

**Figure 12 (Left) An electricity transmission pylon obstructing the NMT lane (Right) The sorry state of NMT lane**

The project also ended up displacing a large number of slum households. A public hearing held in December 2009 on the displacements in Ahmedabad stated that 7,500 households were displaced from one stretch of the BRTS corridor (Akhbarnagar-to Vadajbus stand) for road widening for Janmarg, of which just 1050 families were resettled (Our Inclusive Ahmedabad, 2010, pp. 36-37). Janmarg has also completely ignored "street vendors" from its world class plans, and has threatened their existence. Janmarg's foray into the heart of the old city will further increase these problems if the street character is not taken into consideration in street design. Janmarg's new route construction near the main bus stand has already started displacing vendors and other markets along it. Nearly 500 vendors and residents around Geeta Mandir Bus terminus held a *dharna* (protest sit-in) in January 2012 against the decision of the civic body to construct a double track of BRTS there, as the BRTS is expected to demolish 300 shops (Daily News Analysis (DNA), 2012).

**Figure 13: (Left) A buzzing vendors market along Janmarg (Right) A women street vendor along a footpath-less road.**

In the end, what Janmarg has achieved is just a reliable bus service for its 0.13 million users (Ahmedabad Municipal Corporation, 2011) at the cost of displacement of the poor settlements and street vendors with a complete apathy towards more prominent transport modes, and a complete indifference towards the NUTP and other mandatory guidelines. The Janmarg in a true sense has become a bus missed for pedestrians and bicyclists. It has to still fathom a long distance to prove the significance of its thoughtful name.

**Model Roads of Ahmedabad: What is new?**

In 2011, AMC decided to make 8 roads in the city as model roads. The AMC's press release highlighted the components of a model road[10]:

a) All these roads will be made dust-free.
b) Existing central verge and footpaths on both sides will be either repaired or will be made again.
c) With wall-to-wall roads all hawkers will be removed on these roads.
d) Retro reflective material will be used for better traffic guidance. Also various signage like mandatory, informative, and cautionary and direction signage and keep-left board will be put on these roads.
e) Commuters will get information about lane through hot applied thermoplastic paint. Also shoulder line paint will be used for retro reflective cat-eye fixture.
f) Benches and dustbins will be put at proper distances on model roads.
g) On-road parking place will be created after permitted by the city traffic police.

The city's municipal commissioner declared that these roads would not have encroachments and will have road signs, cat's eyes, marked lanes, proper footpaths and zebra crossings. The roads would be constructed as per highway specifications and their structural design will be improved (Shastri, 2012). AMC also declared a new street vending policy in which roads were divided into three zones green, amber and red. The red zone would cover busy areas or roads such as BRTS corridor, where vendors often add to chaos in the restricted space (DNA Correspondant, 2012).The town vending committee formed under the recommendations of the NUSWP (2009) declared these eight model roads with a length of 45.8 kilometres as no-vending zone, as all these model roads were the busiest roads falling under the red zone. This is in turn going to displace 2,000 vendors in the city (DNA Correspondant, 2012) to the roads with less traffic and unfortunately also less business.

**Figure 14: (Left) Zebra crossing ending at a road divider grill (Right) Zebra crossing abruptly ending at turning**

Model roads are nothing, but roads which are made according to the IRC guidelines which are anyways mandatory to follow. The model road concept is already questionable as it also means that most of the roads in the city are violating Indian Road Congress (IRC) guidelines for pedestrians. Still after earmarking and spending a portion of Rs 125 crores on improving facilities on roads and construct them, while maintaining IRC standards[11], the pedestrian facilities and zebra crossings on the already implemented model road from Usmanpura to Passport Office have not been properly laid out. Crossings on one lane end at a divider with a planter in between. New wider footpaths have not been built, and existing ones are still fairly discontinuous and have obstructions like trees and bus-stops (Figure 15, Right). Road dividers have been placed on a long stretch without mid-block zebra crossings, which are recommended by IRC when the distance between two consecutive intersections is more than 300 metres, and simultaneously when there is a genuine demand for such a facility (IRC:103-1988, 1989, pp. 10-11).

Whenever the provision for road crossings is not made at right places, people themselves create space for it. This has also happened in Ahmedabad where, a road separating grill on the model road was broken down by people to make it easier for them to cross the road (Shastri, 2012). All the street vendors of the model road which were selling readymade garments and street-food have been displaced to internal roads rendering the model road devoid of any activity in the night. This means that the city's concept of "model road" includes neither street vendors nor the pedestrians. Inclusion of bicyclists is still a far cry. One wonders that what is model about model roads. Since when, abiding mandatory guidelines became a model concept? Anyway, time now has come to modify the IRC codes to orient them towards NMT friendly from motorised transport paradigm. Such discussions have already begun in India. The real tragedy however is that even the minimalist norms for the NMT in the existing IRC codes are also not being implemented in Ahmedabad City.

**Figure 15 (Left) A footpath obstructed by trees, with no tree breathers/guards (Right) A bus-stop obstructing the footpath**

## 6. Conclusion

It is not inappropriate to conclude that roads for Indian cities are much more than just a carriageway for cars. Their mismanaged and neglected edges carry more road users; the pedestrians, the cyclists, the hand-carts, the street vendors and the cycle rickshaws than the cars carried by its well defined and nicely constructed central portions. Indian cities have high percentage of walking and cycling, high percentage of informal economy comprising of street vendors, weight pullers and a large number of people still rely on cycle rickshaws for employment and transport. It is of prime concern, that a new transport paradigm of "people above cars" is mandated to tackle this apathy of transport planners and urban local bodies towards the prominent transport modes like walking and cycling, which are still used by a large number of people.

A good beginning has been made in the NUTP (2007) whose major framework supports people more than the cars. The NUTP ideas have been given a concrete shape by UTIPPEC guidelines. Still, a closer look at the three cities reveals that even if this concept is heavily propagated by the policy, it has yet not penetrated to the local policy making and implementation of the road infrastructure in the cities. Except Delhi's limited success, the other road and road based mass transit projects which are propagated by the National level programmes like JNNURM, have completely neglected the proper infrastructure provision and design of the road edges. Pedestrians and bicyclists are the most vulnerable users on road just because, the concerned authorities in charge of transport projects arbitrarily decide to pick and choose the components of a project during implementation. Therefore, there is an urgent need that national-level monitoring systems should also make sure while funding the projects that the goals of the NUTP are not compromised, and all aspects of the project such as infrastructure for walking and cycling are also implemented with efficiency.

One may hope that with the support and supervision of the National and the State governments the cities in India will be able to come out of the car-centric transport paradigm, to a more inclusive, people oriented approach to transport. Till then, the struggle of reclaiming road edges from cars will continue which is important for not just the betterment of vulnerable NMT users and street vendors, but is also of importance for reaching an inclusive and low-carbon future of transport in the context of urban India.

## 7. References


Ahmedabad Municipal Corporation. (2011). *Janmarg-Ahmedabad Bus Rapid Transit System:Accessible Ahmedabad.* Ahmedabad: Booklet issued by Ahmedabad Municipal Corporation at the Sub-Regional EST Workshop for Policy Dialogue in South Asia on August 26-28 2011.

AMC, AUDA and CEPT University. (2007). *Bus Rapid Transit System Ahmedabad Detailed Project report Phase I.* Retrieved December 21, 2011, from http://www.ahmedabadbrts.com/images/Ahmedabad%20BRTS%20Phase-1%20DPR_Feb%202007.pdf

AMC, AUDA and CEPT University. (2008). *Bus Rapid Transit System Plan Phase II Detailed Project Report.* Retrieved September 12, 2011, from http://www.ahmedabadbrts.com/images/Ahmedabad%20BRTS%20Phase-2%20DPR_April%202008.pdf

Daily News Analysis (DNA). (2012). Residents hold dharna to protest BRTS track in Ahmedabad, *DNA,* January 17.

David, B., Hanmer, L., & Lovell, E. (2000). *Poverty and Transport* . Retrieved March 2012, from www.worldbank.org: http://www4.worldbank.org/afr/ssatp/resources/html/gender-rg/Source%20%20documents/Technical%20Reports/Poverty/TEPOV1%20poverty%20and%20trans02%20ODI%20for%20WB%20DFID.pdf

DIMTS. (2011). *Green Cab- Integration of BRT with an emission free Non-Motorized Public Transport Feeder Network.* Retrieved March 14, 2012, from http://www.dimts.in/download/Concept_Paper-Green_CAB.pdf

DNA Correspondant. (2012). 2000 vendors to lose biz spoace on eight roads. *Daily News Analysis (DNA),* September 8.

Gurung, M. (2006). *Delhi's graveyard of rickshaws.* Retrieved April 2012, from http://infochangeindia.org/livelihoods/features/delhis-graveyard-of-rickshaws.html

India, Ministry of Housing and Urban Poverty Alleviation. (2009). *National Policy on Urban Street Vendors-2009,* Retrieved November 1,2012 from Ministry of Housing and Urban Poverty Alleviation: http://mhupa.gov.in/policies/StreetPolicy09.pdf

IRC:103-1988. (1989). *Guidelines for Pedestrian Facilities.* New Delhi: The Indian Roads Congress.

Indian Road Congress (1990). *Guidelines for Capacity of Urban Roads in Plain Areas,* New Delhi: IRC.

ITDP. (2009). *Designing for Cyclists,*Retrieved November 1,2012 from Embarq India: http://embarqindia.org/sites/default/files/Chris-Bicycle%20infrastructure_0.pdf

Mahadevia, D. (2011). Branded and renewed? Policies, politics and processes of urban development in the reform era. *Economic and Political Weekly , 46* (31), pp 56-64.

Mahadevia, D., Joshi, R., & Datey, A. (2012). *Low Carban Mobility in India and the Challenges of Social Inclusion: (BRT) Bus Rapit Transit Case Studies in India (Upcoming).* UNEP Risoe Centre .

Mahapatra, D. (2010). SC refuses to cap number of rickshaws in Delhi, *The Times of India*, August 6, 2010; Retrieved on December 13, 2012 from http://articles.timesofindia.indiatimes.com/2010-08-06/delhi/28661100_1_cycle-rickshaws-cap-number-licenses.

Ministry of Urban Development. (2007). *National Urban Transport Policy.* Retrieved May 25, 2010, from http://www.urbanindia.nic.in/policies/Transportpolicy.pdf

Our Inclusive Ahmedabad. (2010, October). *Report of Public Hearing on Habitat and Livelihood Displacements* . Retrieved March 12, 2011, from http://www.spcept.ac.in/download/cuemisc/Public-Hearing-Report-2010.pdf

Shastri, P. (2012). Where is the walker's paradise of the city? *Times of India*, January 6.

Singh, A., & Gadgil, R. (2011). *Comprehensive Assessment of Cycle Tracks in Pune.* Pune: Parisar & Centre for Policy Research.

Times of India. (2011). BRTS cycle track discarded over space security concerns. *Times of India*, August 7.

TRIPP. (2005). *First Delhi BRT Corridor-A Design Summary.* Retrieved May 11, 2011, from http://tripp.iitd.ernet.in/delhibrts/brts/hcbs/hcbs/BRTdesignsum.pdf

Tiwari, G. and Jain, H. (2008). Bicyles in Urban India, *Institute of Urban Transport (IUT) Journal*, December, pp. 59-68. Retrieved December 13, 2008, from http://tripp.iitd.ernet.in/publications/paper/planning/bicle%20in%20india-IUT-himani.o.pdf

UTTIPEC. (2010, November ). *Street Design Guidelines-for Equitable Distribution of Road Space.* Retrieved June 12, 2012, from http://www.uttipec.nic.in/StreetGuidelines-R1-Feb2011-UTTPEC-DDA.pdf

Venkatesan, J. (2012). Supreme court bats for poor rickshaw pullers. *The Hindu*, April 3.

Wilbur Smith & Associates and IL&FS Urban Infrastructure Services Ltd. (2008). *Comprehensive Mobility Plan for Pune City.* Pune: Pune Municipal Corporation.

Wilbur Smith Associates and Ministry of Urban Development. (2008). *Study on Traffic and Transportation-Policies and Strategies in Urban Areas in India.* Retrieved June 23, 2011, from http://www.urbanindia.nic.in/programme/ut/final_report.pdf

[1] The finance minister of India at his meeting with bank chiefs prodded them to reduce the interest burden on automobile loans, a move that may revive the fortunes of the industry and spur demand across other sectors. The full article featured on August 18 in Business line daily and can be read at http://www.thehindubusinessline.com/industry-and-economy/economy/article3790731.ece accessed on 01.011.2012.

[2] There is a great debate on Delhi BRT proposal snatching away space from car users. The bad press attracted by the project is due to car users lobbying against the project. A PIL was put in high court of Delhi by Mr. B.B. Sharan, the 84 year old lawyer and activist, who argued on the point that the time of the people in the cars is much more important, since they're the "thinkers, the managers, the judges, the advocates, the real wealth-makers of the city." Please see the article in Wall Street Journal http://blogs.wsj.com/indiarealtime/2012/05/25/delhi-journal-the-big-bad-brt/ dated May 25 2012 called "Delhi Journal: The Big, Bad BRT". The high court thrashed the concerns raised by him, dismissed the writ petition in a historic judgment delivered on 18th October 2012. The judgment thrashed the argument as elitist, and frowned upon the idea that those who generate wealth should be entitled to a larger share of the public resource (p.21). The judgment is available to read on http://lobis.nic.in/dhc/PNJ/judgement/18-10-2012/PNJ18102012CW3802012.pdf accessed on 30.10.2012.

[3] Accident severity: No. of persons killed per 100 accidents.

[4] The Supreme Court lifted the ban on registration of cycle rickshaws in Delhi. Its order on August 6, 2010 stated that the cycle rickshaws can ply in the national capital without any curb on their number. The apex court also lambasted the government for being anti-poor. The Supreme Court has upheld the Delhi High Court ruling on this issue. Previously, the Delhi High Court had ruled that the Municipal Corporation of Delhi's (MCD's) policy of limiting the number of cycle rickshaws was unconstitutional. The MCD had capped the number of licenses to operate cycle rickshaws at 100,000 (Mahapatra, 2010).

[5] DDA Notification vide S.O. 1903 E is available on http://uttipec.nic.in/writereaddata/linkimages/5231506496.pdf accessed on 8.10.2012

[6] Information is taken from http://www.uttipec.nic.in/. Accessed on 8.10.2012.

[7] In the RITES Transport demand forecast study of 2007-08 walking trips were not considered, therefore percentage distribution for other modes is on the higher side.

[8] EWS income limit as per the document was an income up to Rs. 2500, LIG was taken as an income group earning between Rs.2501-5500

[9] The details can be found on the ITDP website, http://www.itdp.org/get-involved/sustainable-transport-award/previous-award-recipients/ahmedabad-india accessed on 25.04.2012

[10] The article in Desh Gujarat could be accessed on http://deshgujarat.com/2011/09/16/ahmedabads-8-road-stretches-to-be-developed-as-model-road/ accessed on 23.10.2012.

[11] The details of estimated budget for model road has been taken from the article on Indian Traffic Network media private limited. http://www.trafficnetwork.in/index.php/amd-traffic-news/9-test2t accessed on 25.10.2012

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