

# Institutional Analysis of Urban Transportation in Bangalore

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**Abstract**—This paper maps and explains the institutional structure of urban transportation policy in Bangalore, India. Our critique of individual agencies and methods of policymaking and implementation will demonstrate how the current setup negatively affects urban transportation planning in Bangalore. We close with suggestions about broad institutional changes that we believe would improve outcomes and service delivery.

## I. INTRODUCTION

URBAN transportation is a topic which never quite captured the imagination of the Indian policy makers until the early 2000s. However with the tremendous growth that India and its cities have been experiencing, fuelled by the exponential population growth, there has been an increased focus towards urban transportation. There is a growing realization that the present culture with proliferation of private vehicles on city roads is unsustainable and there is an urgent need to promote mass transport. Accordingly, the Indian government passed various legislations and promulgated various missions like the National Urban Transportation Policy (NUTP) and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) to strengthen public transportation.

Bangalore is one such city that has experienced both tremendous population and vehicular growth in the last two decades. In response, various public transportation projects have been mooted – the metro, monorail, Bus Rapid Transit systems, along with projects of road widening and construction of flyovers. However, many of these projects have been initiated in an ad-hoc manner and are not taken up comprehensively. These projects also face tremendous cost over-runs and face opposition from local communities. The problems raised above are symptomatic of larger institutional issues at play. Various components of urban transportation planning

and implementation are controlled by different government agencies, which have their own vested interests in promoting certain solutions while scuttling others. The current paradigm of mega projects whose potential and real costs and benefits are not clear needs to be re-examined. In addition, the role of parastatal agencies and their bureaucratic and political masters in subverting the rule of law in these projects also needs examination.

This paper will unpack the institutional structure of urban transportation and demonstrate how the current setup negatively affects urban transportation planning in the city of Bangalore. It will begin by highlighting why we believe an institutional approach is of use. Next we provide the context of urban transportation policy in India and then hone in on Bangalore's specific institutions in this area. We then critique these institutions, and attempt to point to suggestions for a revised institutional structure better suited to address the urban transportation issues of Bangalore today and in the near future.

## II. INSTITUTIONS AND THEIR IMPORTANCE

Institutions can be defined in multiple ways. In the context of this paper, our understanding of institutions is defined by the scope of institutional economics. Building on the works of Thorstein Veblen, John R. Commons [1], and Elinor Ostrom [2], we understand institutions to be the rules of the game (formal and informal), and an institutional analysis is concerned with the study of these rules, who/what defines and reinforces them (rules), and the conditions under which they work.

We believe that understanding the dynamics of institutions in the urban transport policy space will help us better analyze the interests at play and the reasons for the outcomes that emerge. However, given the relatively non-transparent policy process in India, mapping processes and policies themselves becomes a time consuming and important part of research.

Urban transportation planning in India is subject to myriad and often inconsistent rules and regulations. There are multiple agencies in charge of planning and execution (elaborated in IV). With billions of rupees invested in these projects, one gets to see these agencies and the people in-charge desperately trying to out-do each other. This occurs in the form of agency heads

Manuscript received October 9, 2011. (Write the date on which you submitted your paper for review.)

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approving their pet transportation projects which will form part of their legacy. At the end of the day, it is the citizens, commuters, tax-payers and other stakeholders who have to bear the brunt of these decisions. A robust, transparent and flexible institutional structure could help create a comprehensive transportation policy for urban areas; the current lack of such structures easily leads to chaos.

### III. URBAN TRANSPORTATION IN INDIA

#### A. Background

Urban transportation planning in India is a relatively recent phenomenon which has emerged over the last two decades or so. Traditionally, walking and bicycles comprised the predominant modes of mobility across India for people, with trucks moving both goods and the people associated with them as well. Until the 80s, India only had two car companies producing a model each and it was only in the early to mid-80s that the Suzuki motor company of Japan, in collaboration with the Indian government, started producing a model which would later on go on to become part of India's urban fabric (though at the time it was introduced, it was very much of a luxury good). Though there are no comprehensive statistics on vehicle ownership; in the 1960s India was estimated to have had a car ownership of one per thousand people which increased to three per thousand in the eighties [3].

The 90s saw significant upheavals (positive and negative) in the arena of urban transportation. The transportation sector attracted significant investment over the years and the total FDI in the transportation sector has attracted a total of \$ 3 billion in the period of 1994 to 2005 [4].

The setting up of a large number of automobile manufacturing factories in India and, the easy access to credit combined with a new and emerging middle class with significantly high disposable incomes led to a huge surge in personal vehicle ownership all over India, and specifically in select urban areas where this new middle class resides.

TABLE I: TOTAL NUMBERS OF REGISTERED MOTOR-VEHICLES (IN THOUSANDS IN SELECTED CITIES OVER THE YEARS)

Cities	1995	1996	1997	1998	1999	2000
Ahmedabad	510	572	631	686	739	799
Bangalore	796	900	972	1130	1332	1550
Chennai	768	812	890	975	1056	1150
Delhi	2432	2630	2848	3033	3277	3423
Hyderabad	557	764	769	887	951	N.A.
Jaipur	368	405	449	492	542	598
Kolkata	561	588	588	664	N.A.	N.A.
Mumbai	667	724	797	860	911	970
Nagpur	198	213	239	270	298	331
Pune	358	412	468	527	568	593

Source: K.S. Singh- Review of Urban Transportation in India [5].

Roads were built to accommodate these larger numbers, but typically in an ad-hoc and reactive manner [6]. In terms of public transport infrastructure in urban areas, large investments up to 2005 were generally limited to the four metro cities (Delhi, Mumbai, Calcutta and Chennai). Delhi was serviced by buses run by the municipal corporation; Calcutta moved on a mix of public buses, trams and a metro line, much of which was constructed in the 1970s; Chennai had a public bus system complimented by a suburban rail system; and much of Mumbai used the extensive suburban railway system, with a public bus system proving feeder services [7]. In addition to the public transportation systems in these cities, dedicated public bus services operated in only 13 other cities as of this date [5].

#### B. Institutional Framework

Urban transportation in India is governed by different agencies across different levels of government (central, state and city). Though transportation by legislation is a state subject [5], the experience of urban transportation planning and implementation shows otherwise. A study by a leading transport consultant reveals how different agencies across different levels of government shape various facets of urban transportation.

TABLE II: AGENCIES AND THEIR ROLE IN URBAN TRANSPORTATION

Role	Ag
Urban Transportation Planning	-Ministry of Urban Development -Development Authority/State Government
Road Transport	-State Government -State Transport Undertakings -Ministry of Road Transport & Highways
Roads	-Public Works Department/State Government -Ministry of Road Transport & Highways -Municipalities

Source: Wilbur Smith- Institutional Framework for Urban Transport [6].

The chart above is just a sampling of the different components of urban transportation and the different agencies in-charge. There are more than 25 agencies [8] managing over 20 components of urban transportation in India [9].

In 2006, the Government of India created the NUTP with a view to reform urban transportation. Some of the salient features with respect to reform of the institutional framework include:

1. Integrated land use and transport planning
2. Investments in public and non-motorized transport
3. Coordinated planning for urban transport

4. Innovative financing methods to raise resources
5. Establish regulatory mechanisms for a level playing field [10]

As a method of financing changes needed in the largest cities under the NUTP, JNNURM was launched in December 2005. JNNURM required a reform-based mission for Central Financial Assistance to Urban Local Bodies and conditioned urban transportation project funding to institutional reforms like setting up a Unified Mass Transit Authority (UMTA), setting up a dedicated transport fund at state and city level, transit-oriented development policy, creating a comprehensive mobility plan, and setting up a Special Purpose Vehicles (SPV) for managing public transport [10].

The creation of the NUTP and JNNURM, though modest, represent important steps in harmonizing the urban transportation institutional framework to create comprehensive and sustainable transportation policies and plans for cities. However, while the NUTP lays out a reasonable policy with forward looking bureaucratic changes, many, perhaps most, of the changes have not been applied or effectively enforced. Moreover, especially in the case of the JNNURM mission, these represent attempts but do not ensure actually implemented nor enforceable regulations.

In further movement forward, in February 2010, the National Transport Development Policy Committee (NTDPC) sought to create a unified transport policy for the whole country (urban and rural). It builds on and extends the principles of the NUTP. The Committee has constituted several working groups to study different aspects of transportation, which are: (1) Needs assessment; (2) Financing mechanisms for urban transport needs; (3) Energy and Environment; (4) Capacity Building and Database; (5) IT applications; (6) Accessibility, Safety and Security; and (7) Institutional Framework and Legislation. This committee continues its work at the date of writing this paper [11].

To summarize, urban transportation in India is in its infancy and though there are several agencies which are responsible for urban transportation which make decision making confusing, there are concrete attempts being made to create a better institutional framework.

#### IV. URBAN TRANSPORTATION IN BANGALORE

##### A. Overview

Bangalore is one of the fastest growing cities in India. In the last decade, its population has seen an increase of over 46%, and according to the 2011 census, Bangalore's population currently stands at 9.5 million [12]. Bangalore's vehicular population, too, has seen tremendous growth over the past few years. As seen in the figure below, the numbers of two- and four-wheelers

have seen dramatic growth for close to a decade, and this growth is projected to continue.

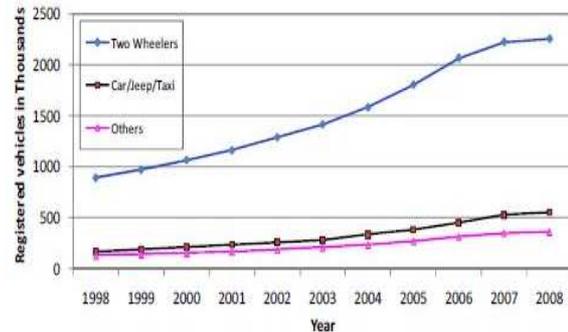


Fig.1. Bangalore's vehicular growth over the years. Source: Wilbur Smith - Bangalore mobility indicators 2008 [13].

To keep pace with the increasing number of vehicles, the state government and its various agencies have come up with various solutions to increase the supply side of transportation. These include widening over 90 roads [14]; constructing flyovers [15]; increasing the number of municipally-run bus services; and investing in new mass transit projects like the Bangalore Metro, Mono-Rail, and a Bus Rapid Transportation System (BRTS).

While the intention of the authorities is to ease congestion, some of the implemented solutions, namely road widening, constructing flyovers and signal-free corridors, have principally served the interests of private vehicle owners. These projects also undermine support for mass transit projects as they tend to reduce the incentive for relatively powerful upper middle class citizens to make use of mass transit.

The investments in the mass transit systems themselves have not taken off as smoothly as expected. The Bangalore Metro Rail is plagued by cost over-runs and delays in completion [16] [17], while the Mono-rail has been kept on hold because of a fault in the bidding process [18]. Even worse, these different agencies are competing with each other instead of collaborating to create a comprehensive multi-modal transport solution for the city.

The next section details the institutional framework of urban transportation in Bangalore; highlights how different agencies interact with each other; and shows some of the challenges which emerge as a result of these interactions.

##### B. Institutional framework of urban transportation: Bangalore

Bangalore has one of the most diverse institutional frameworks in India when it comes to urban transportation. There are different agencies managing

individual aspects of urban transportation. In 2005, the institutional framework of urban transportation in Bangalore was as follows:

- The Bruhat Bangalore Mahanagar Palike (BBMP) – the municipal corporation responsible for the upkeep, maintenance, and development (widening) of local roads.
- The Bangalore Development Authority (BDA) – responsible for planning and execution of city based development projects. It also prepares city development plans (Master Plans) and the blueprints for city development. Despite having no significant expertise in city transport and traffic planning, BDA still plays a very active role in road construction, especially flyovers.
- The Bangalore Mass Rapid Transit Ltd (BMRTL) – develops and implements mass transit systems.
- A similar role is played by Karnataka Road Development Corporation Limited (KRDC) for roads.
- Karnataka Urban Infrastructure Finance Corporation (KUIDFC) – monitors and disburses World Bank and Asian Development Bank funds for urban transportation.
- In addition to the agencies mentioned above, there are multiple organizations that deal with other aspects of urban transportation [19].

While this list captures the institutional framework broadly, there are aspects that have since significantly changed after 2005. For instance, the BMRTL is not mentioned; instead agencies like the Bangalore Metro Rail Corporation Limited (BMRCL) and Bangalore Airport Rail Link Ltd (BARL) are found. The BDA, the apex planning authority for Bangalore, now finds itself competing with the Bangalore Metropolitan Regional Development Authority (BMRDA).

The institutional framework of urban transportation in Bangalore is constantly evolving, much like the city and its region themselves. A revised current institutional framework based on recent research by the author is given below.

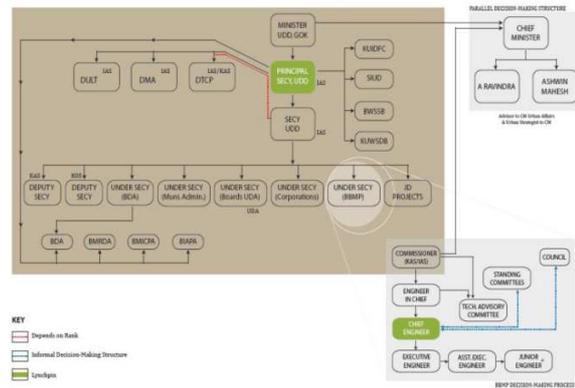


Fig 2: Institutional structure of urban transportation in Bangalore

### C. Unpacking Bangalore's transportation institutional framework

This section explains Fig 2, above, in an attempt to lay out the functions of the different agencies involved in transport planning in Bangalore.

The Urban Development Department (UDD) of the Government of Karnataka is the apex agency for urban transportation planning in Bangalore (among other cities/towns/rural areas in Karnataka). While other agencies like the BDA, BMRDA, BBMP, BMRCL, etc. fulfill their mandate, they ultimately have to report to the UDD. The Minister in Charge is the Principle Secretary for the UDD and is ultimately responsible for urban transportation across the state including Bangalore and serves as an officer of the Indian Administrative Service<sup>1</sup> and the point-person when it comes to urban transportation planning. What gives the UDD such power is that the funding for almost all transportation projects must come from and be approved by this Department? Also, the Principal Secretary for UDD is part of the governing council of many of the organizations mentioned above and can directly influence project processes and outcomes. Yet another vital cog in the urban transportation process is the Department of Urban Land Transport (DULT). The DULT, established to comply with the institutional reforms mandated by the NUTP and JNNURM, is given the responsibility of coordinating all land-based transportation systems. On paper, any transport project for the city must be approved by the DULT, in conjunction with all agencies and stakeholders responsible for Bangalore's transportation.

The BBMP (the city corporation) plays a vital role in maintaining and developing the transport infrastructure. The agency is responsible for road expansion and maintenance. KUIDFC also plays an active role in urban transportation planning in Bangalore and other cities in

<sup>1</sup> The Indian Administrative Service officers are the country's top ranked bureaucrats.

the state. Apart from being the nodal agency for monitoring development projects, KUIDFC has also prepared Bangalore's Comprehensive Traffic and Transportation Plan (CTTP). That document forms the basis for many mass transit projects underway.

Yet another agency that has started asserting itself in recent times is the Infrastructure Development Department (IDD). While not strictly responsible for urban transportation, it has been instrumental in pushing the mono-rail. Apart from these agencies, the Chief Minister (who is the apex politician in the state) has appointed two special advisors who have their own preferred projects. However, it is difficult to assess their influence and impact [20].

Even with the above description of the institutional framework, it is still not very clear how urban transportation projects are actually decided. There is no one document that charts the course of urban transportation projects or one that reports progress on them. As noted, most of the decision making lies with state-level agencies, with city-level agencies lacking in power and resources. Most importantly, and especially worrisome, is the lack of transparency surrounding any project. No one quite knows how much money is being invested, where it is coming from, or for which project it is destined. Urban transport funding comes from a blend of sources, and it is difficult to track the funds. For example, JNNURM projects for large cities such as Bangalore are supposed to receive 35% from the central government, 15% from the state government, and 50% from the city government, but cost overruns typically are absorbed by the city government [21]. Future work will analyze this in more detail to attempt to map and track these funds.

## V. CRITIQUE OF CURRENT STRUCTURE

In this section, we critique the current institutional structure in an effort to highlight possibilities for our suggestions to improve it – to better serve citizens -- in the following section.

A. **Multiple agencies with multiple/conflicting mandates** – While the issue of multiple agencies is not new, we believe that focusing on the details of specific case -- Bangalore – allows us to gain valuable insight. For example, the role played by the BBMP vs. that of the BMRCL shows the cross purposes at which many of these groups work. While the role of the BMRCL is to create a metro-rail to promote public transit, BBMP has a mandate of improving and widening roads which leads to more private vehicles on the road. While these goals need not be completely at odds with each other, the non-coordinated approach by which separate

decisions are taken, rather than a more holistic approach, hurts the city.

- B. **Lack of inter-agency coordination** - The DULT is mandated to coordinate land-based transportation projects. However, whenever the DULT calls for meetings with personnel from different agencies, not all agencies send key functionaries. A look at the minutes of key meetings reveals that in almost all meetings, some key official is missing. Why? Interview research reveals multiple reasons which include mundane lack of communication (for example, invitations sent by snail mail that often arrive after the meeting occurred) and conflicting meeting times. But the most disturbing reason that emerges is the refusal of some agency heads to send personnel to meetings if the person chairing the meeting is of a junior rank to them. Thus they do not feel obliged to send their even more lowly ranked people. Only recently, when the DULT head was of a similar rank or above, did all agency heads send their personnel. In addition, though it should coordinate projects, it has no funding carrots or regulatory sticks to wield in this effort [20].
- C. **Multiple plan documents** - Yet another problem is the existence of multiple planning documents which form the basis of transportation projects. Thus while the BBMP holds the Revised Master Plan – 2015 as the document which decides what projects, including urban transportation plans, should be implemented in Bangalore, DULT holds the CTTP as their primary document on which to base urban transportation projects. To add to this confusion, the BMRDA recently commissioned the Comprehensive Traffic and Transportation Study (CTTS) for the Bangalore Metropolitan Region. Thus the city now has three master planning documents which different agencies interpret in their own ways.
- D. **Lack of accountability of citizens** - Apart from the lack of financial transparency, perhaps more disturbing is the lack of public engagement which these public interest projects are supposed to undertake. Although there are multiple laws which mandate that urban transportation planning must be decentralized with local civic groups in-charge of city based projects, such an effort has never been conducted in earnest. The state and central governments continue to dominate while making a token effort to involve cities. Even when transportation projects are decided by city authorities, they seldom involve citizens in any kind of consultations. It is part of the larger culture of non-engagement which needs to be broken to be

consistent with the reputation of the world's largest democracy.

## VI. ATTEMPTED INSTITUTIONAL IMPROVEMENTS

This section analyzes recent attempts to improve the institutional structure in Bangalore, and points to further changes which can lead to better and more responsive policy.

### A. Institutional Improvements

One of the best things that the NUTP and JNNURM did for urban transportation was to mandate the establishment of an Urban Mass Transit Authority (UMTA) to coordinate all land-based urban transportation projects. Accordingly, the DULT was set up for Karnataka and the Bangalore Metropolitan Land Transport Authority (BMLTA) for Bangalore. This has led to development of a comprehensive transport plan for the city. In the case of the BMLTA, different subgroups have been initiated. These include inter-modal bus terminals, a parking policy, and an infrastructure, commuter rail system, an external development and infrastructure charges, and code and guidelines for roads and their facilities [22].

Although DULT and BMLTA do not have the legislative approval to conduct the business for which that they were established, they are attempting to harmonize the institutional framework and make it more sustainable and comprehensive. By having regular meetings with different agencies, they are spreading the message of sustainable transportation. They also have regular interactions with different civil society/stakeholder groups to allow them an opportunity to give their inputs on transportation planning for the city, and regularly commission studies by these groups. In many cases, these then form part of their official documents which are then circulated to different agencies. This apparently small step of coordination and communication represents a huge leap forward for transport policy within Bangalore.

### B. Civil Society Engagement

Any robust institutional framework should allow and encourage citizen/stakeholder participation in project planning. Bangalore boasts of a vibrant civil society engagement specifically in the arena of urban transportation. Examples of this include:

1. Praja promoting the commuter rail [23]
2. Ride a Cycle Foundation promoting cycling and other forms of non-motorized transportation (NMT) [24]
3. Hasiru Usiru promoting NMT, safer sidewalks, and

### a BRTS [25]

All the groups mentioned above have petitioned various levels of government for the creation of a comprehensive transportation plan for Bangalore. However limited the opportunity might have been, these groups have not lost hope. In quite a few cases, where projects which should not have been implemented were implemented nevertheless, these groups have gone to court and argued (with a fair deal of success) for better solutions. In many cases, they themselves have come up with alternative and less invasive transportation solutions.

It is only recently that city and state level governments have started taking note of these groups and listening to them. The dominant official paradigm, however, still is one where decisions are taken in an authoritarian manner without any consultations whatsoever. That culture needs to change.

## VII. CONCLUSION AND FUTURE WORK

This paper has mapped the confusing and non-transparent institutional structure of urban transport policy making in Bangalore, India. We show that the city and its citizens have limited direct input, and that state and central government agencies wield significant power in designing policies.

Future work will continue to delve into the details of decision making, with additional analysis on specific processes, especially as they relate to financial transparency and financial implications. In addition, additional case studies of other large Indian cities will be undertaken.

## REFERENCES

- [1] O. Roncevalles. (2006, March 26). –Public Goods, Common Pool Resources, Natural Monopoly, and Institutions: An Unrecognized Relationship (Or How to Define an Institution)
- [2] E. Ostrom. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, Cambridge, 1990
- [3] J. Dargay, D. Gately & M. Sommer (2007, no date). –Vehicle Ownership and Income Growth, Worldwide: 1960-2030. New York University, Department of Economics. Available: [http://www.econ.nyu.edu/dept/courses/gately/DGS\\_Vehicle%20Ownership\\_2007.pdf](http://www.econ.nyu.edu/dept/courses/gately/DGS_Vehicle%20Ownership_2007.pdf)
- [4] Department of Industrial Policy and Promotion. (2005, no date). *India: Sectors attracting highest FDI inflows*. Ministry of Commerce and Industry, Government of India, New Delhi. Available: [http://dipp.nic.in/fdi\\_statistics/India\\_top\\_sectors.pdf](http://dipp.nic.in/fdi_statistics/India_top_sectors.pdf)
- [5] K.S. Singh. Review of urban transportation in India, *Journal of Public Transportation*, Vol. 8, No. 1, 79-97, 2005.
- [6] Wilbur Smith Associates. *Institutional framework for urban Transport*. Ministry of Urban Development, Government of India, Delhi. 2007.
- [7] J. Pucher, N. Korattyswaroopam & N. Ittyerah. The Crisis of Public Transport in India: Overwhelming Needs but Limited Resources, *Journal of Public Transportation*, Vol. 7, No. 4, 1-20, 2004.

- [8] Ministry of Environment & Forests MoEF (No Date). -Transport. Government of India, New Delhi, Available: <http://envfor.nic.in/divisions/ic/wssd/doc2/ch5.html>
- [9] B.I. Singhal. Institutional framework for urban transportation, in NTDP – Second National Consultation Workshop for Working Group on Urban Transport. Ministry of Urban Development, Government of India, June, 2011.
- [10] S. Swamy. Estimating urban transport investment requirements, in NTDP – Second National Consultation Workshop for Working Group on Urban Transport. Ministry of Urban Development, Government of India, June, 2011.
- [11] National Transport Development Policy Committee. Second National Consultation Workshop for Working Group. Ministry of Urban Development, Government of India, June, 2011.
- [12] P. Bose. (2011, April 7). Population boom: At 46.68%, Bangalore tops urban districts. Business Standard. Available: <http://www.business-standard.com/india/news/population-boom-at-46-68-bangalore-tops-urban-districts/431302/>
- [13] Wilbur Smith Associates. Bangalore mobility indicators 2008 – Draft final report. Directorate of Urban Land Transport, Government of Karnataka, 2008.
- [14] Citizen Matters News Desk. (2009, December 9). List of roads being widened in Bengaluru. Citizen Matters, Bangalore. Available: <http://bangalore.citizenmatters.in/articles/view/1617-list-of-roads-to-be-widened->
- [15] Bangalore Development Authority BDA (No Date). -Completed Projects. Bangalore Development Authority, Bangalore. Accessed on June 13, 2011. Available: <http://www.bdabangalore.org/completed.htm>
- [16] S. Sukhija. (2011, May 24). Delay in Metro work to cost You Rs 50 lakh a day. Mid-Day. Available: <http://www.mid-day.com/news/2011/may/240511-BMRCL-Metro-Ye-diyurappa-tunnel-boring-machine-Bangalore.htm>
- [17] Deccan Herald News Service. (2011, March 30). Lack of rail safety clearance caused Metro launch delay. Deccan Herald. Available: <http://www.deccanherald.com/content/150175/lack-rail-safety-clearance-caused.html>
- [18] S. Senthilir. (2011, May 10). Monorail halts in its tracks. Times of India. Available: [http://articles.timesofindia.indiatimes.com/2011-05-10/bangalore/28011\\_1\\_monorail-project-chief-secretary-consortium](http://articles.timesofindia.indiatimes.com/2011-05-10/bangalore/28011_1_monorail-project-chief-secretary-consortium)
- [19] Energy and Infrastructure Unit – South Asia Region. Towards a discussion of support to urban transport development in India. World Bank, 2005.
- [20] Directorate of Urban Land Transport - DULT. (2011, March). Interview with the author. Unpublished. Bangalore, Karnataka.
- [21] High Powered Expert Committee for Estimating the Investment Requirements for Urban Infrastructure Services– HPEC. (2011, March). -Report on Indian urban infrastructure and services. Available <http://niua.org/projects/hpec/FinalReport-hpec.pdf>
- [22] Directorate of Urban Land Transport DULT. (2011, June). -Sub groups of BMLTA. Directorate of Urban Land Transport, Bangalore. Available: <http://stg1.kar.nic.in/urbantransport/bmlta-subgroups.html>
- [23] N. Chandra, K.B. Syed, S. Dyamannavar & S. Sankaran. Bengaluru commuter rail service – A call to action. Praja. 2010.
- [24] Hasiru Usiru. (2010, no date). BBMP elections – People’s manifesto –Mobility. Hasiru Usiru. Available: <http://praja.in/en/blog/murali772/2010/01/06/peoples-manifesto-mobility>
- [25] Team DNA. (2011, May 1). -With Re1 bicycle rides, Bangalore University puts its feet on the green pedal Daily News and Analysis, Bangalore. Available: [http://www.dnaindia.com/bangalore/report\\_with-re1-bicycle-rides-bangalore-university-puts-its-feet-on-the-green-pedal\\_1538089](http://www.dnaindia.com/bangalore/report_with-re1-bicycle-rides-bangalore-university-puts-its-feet-on-the-green-pedal_1538089)