Proceedings of UMI 2012

Institute of Urban Transport (India)

Preface

The National Urban Transport Policy of the Government of India, 2006 (NUTP), lays strong emphasis on building capabilities at the state and city level to address problems associated with urban transport and lays down the guidelines for developing sustainable urban transport systems as well.

The Ministry of Urban Development, Government of India has taken two important steps to encourage cities to reform their city transport:

Organizing an annual conference-cum-exhibition on 'Urban Mobility' at New Delhi every year (UMI) for dissemination of information and to facilitate exchange of ideas;

According recognition to good urban transport initiatives by giving awards to selected good practice projects.

The Ministry of Urban Development (MOUD), Government of India; held the annual conference cum exhibition on "Smart Mobility" from 5th to 8thDecember 2012 at New Delhi, India. The event was organized at the Manekshaw Centre, Dhaula Kuan, New Delhi, India, by the Institute of Urban Transport (India) New Delhi. It was attended by approximately 1100 participants, comprising urban transport practitioners, resource persons, researchers, scholars and senior government officials from 21 countries, including The United States of America, Australia, Singapore, Korea, France, Germany etc. Additionally, there were representatives from 18 state governments and several urban local bodies and para-statals as well as academia, students, nongovernmental organizations (NGOs), and representatives from the private sector also. 13% of r all participants were foreign nationals, and 14% were students. E Representatives from the private sector added another 23% while that from the government organizations, 51%.

Urban Mobility India 2012 was preceded by a research symposium on 5th December, at which selected research work in the field of urban transport was disseminated in the form of 30 presentations and 11 display posters. . This symposium was coordinated by IIT Chennai.

The conference and expo were inaugurated on 6th December by Hon'ble Minister for Housing & Poverty Alleviation, Government of India, Shri Ajay Maken. Key note speakers included Ms Susan Kurland, Assistant Secretary for Aviation and International Affairs, United States of America, Dr R.K. Pachauri, Director General, TERI, Shri A.P. Mishra, Member

Engineering, Railway Board, Mr A.K. Upadhyay, Secretary, Ministry of Road Transport and Highways.

After 3 days of knowledge sharing and exchange of ideas through 12 technical sessions, 12 round table discussions and 3 plenary sessions, the conference concluded on 8th December 2012. The valedictory function was graced by Shri Kamal Nath, Hon'ble Minister for Urban Development and Parliamentary Affairs, Government of India.

Contents

A. Executive Summary of Important Outcomes

Advisory	
Outcome	Action By
1. There is a need for a road safety plan at National, State and Local government levels concentrating on casualty reduction targets. Urban road codes have been prepared and issued by the ministry. Enforcement of these codes needs to be given attention - SERVICE	MoUD/State Govts.
2.Public transport should involve more private companies and responsibility to be shared equally between the private company and government - SERVICE	Local Govt/State Govt/MoUD
3. The government agencies or bodies should explore and define the potential land value, especially in urban concentrations - new concepts should be studied, tested and implemented to improve the financial strengths urban public transport systems to improve sustainability. - INFRASTRUCTURE	Local Govt./State Govt.
4. Basic training on urban transport issues and their handling needs to be disseminated to the enforcement agencies and ground staff. – CAPACITY BUILDING	State Govt/MoUD/IUT
5. Mobility planning must take into account low carbon initiatives. - PLANNING	MoUD/State Govt./Local Govt.
6. Urban road safety audits need to be done more vigorously than before, and if not undertaken so far, to be initiated on a regular and timely basis by an appropriate agency	State Govt/Local Govt
7. Route rationalizing for CBS and all other informal modes is necessary and desirable to ensure feeder services as these are s important and integral to MRTS planning.	Local Govt./State Govt.
8. Need to engineer, educate and enforce technological solutions – Government to play a critical role in advising the way forward to cities in instituting optimum level of ITS through extensive research and capacity building programs – CAPACITY BUILDING	MoUD/IUT
9. Creation of UMTAs has taken place. However there is widespread ambiguity on its purpose and functions. There is priority need for adequate capacity building program focusing on	MoUD/IUT

the way forward for the UMTAs to successfully become functional. - CAPACITY BUILDING	
10. Alternative mass transit options need to be explored by appropriate studies and research. Options like LRT – surface rail, trams, monorail need to be reconsidered, especially in the light of ground conditions and past experience - SERVICE	IUT
11. Although City bus transport is a critical means of public transport in Indian cities, the system needs to be holistically planned. Norms and standards need to be established and implemented for support infrastructure, like depots and terminals with as much rigor as increase and improvements in the strength of the bus fleet. – INFRASTRUCTURE	State Govt./Local Govt.
12. Major problems faced by operators are lack of infrastructure such as depots and bus stands and running of parallel operations of other private services. That should be addressed.	State Govt./Local Govt
13. Taxes on public transport vehicles to be removed since buses pay more taxes than private vehicles -	State Govt.
14. In case of bus operations, efforts be made to increase the revenue per km.	
Cities are running out of space and cannot afford to have unlimited parking areas. 'To cater to the parking problem, the pragmatic solution is to "price parking properly". Also, the parking policy should discourage long term parking.	State Govt./Local Govt

B. Research symposium

Introduction

The third research symposium on urban transport was held on 05th December, 2012 at the 5th Urban Mobility India Conference and Exhibition 2012 at the Manekshaw Centre, New Delhi. The symposium was a platform to highlight the current research carried out by academia and research institutes in urban transport, especially by young researchers, in their post graduate and Ph.D programmes. The purpose was to:

Encourage young researchers working on various facets of urban transport and provide an

opportunity for networking.

Improve the quality of research through peer review process, and Contribute towards database compiled by the Institute of Urban Transport, New Delhi to identify the gaps for future research funding.

Young researchers (undergraduate, postgraduate and Ph.D level students) working in the area of urban transport were invited to submit abstracts based on the work carried out by them as part of their academic/research work.

Call for Papers and Selection

The third research symposium on urban transport was coordinated by IIT Madras under the aegis of Ministry of Urban Development. Young researchers working in the areas of urban transport were invited to submit abstracts on any of the following themes:

1. Urban Land Use and Transport
2. Traffic Management and Operations
3. Accessibility and Safety
4. Public Transport
5. Transport and Environment
6. Non-Motorised Transport
7. Traffic modelling and Simulation
8. Intelligent Transportation Systems

Extended abstracts not exceeding 1000 words, clearly stating the objective of the paper, key results and accomplishments, the significance and the advancement over previous work were invited for review following a given timeline. Papers were selected based on their originality, timeliness, significance, relevance, and clarity of presentation. It was notified that submission of a paper should be regarded as a commitment that, should the paper be accepted, at least one of the authors will register and attend the conference to present the work.

Each abstract was assigned to three reviewers not affiliated to author's institution. The reviews were conducted online based on double-blind review. The review was carried out objectively based on the following four criteria, each on scale of 1 (min) to 5 (max) marks

- Clarity

- Originality
- Innovation
- Usefulness

Thus each reviewer could award a maximum of 20 marks (4×5=20); each abstract was assessed for a maximum of 60 (20×3=60) marks. The abstracts were arranged in descending order based on the marks obtained and first 29 abstracts were chosen for the paper presentation and next 11 abstracts were chosen for poster presentation, with an aim to give exposure to maximum numbers of young researchers, of the country's highest level conference on the urban transport.

In addition to the objective assessment, the reviewers also gave their valuable comments for improvement of the quality of the abstracts, which were conveyed to the authors along with the acceptance note and further instructions for the submission of papers/posters. The lists of authors for paper and poster presentation are contained in the annexures at the end of this report.

Proceedings of Research Symposium

Opening Session	
Dr. Sudhir Krishna	Secretary, MoUD
Shri. S.K. Lohia	OSD (UT) , MouD
Dr. Lelitha Devi Vanajakshi	Asst. Professor, IIT Madras
Dr. P. K. Sikdar	President, ICT Pvt. Ltd. and Former Director, CRRI

India needs to localise urban transport technologies. Dr Krishna urged authors of papers to write in public forums as well. Further, he requested CoEs to network with other local region institutes and suggested that institutes share research articles. Shri Lohia informed that next year, this symposium will be coordinated by School of Planning and Architecture (SPA), Delhi.

Plenary Discussion Summary

In this session**,** Prof. (Dr.) Sanjay Gupta of SPA, Delhi presented his views on urban transport and way ahead. He also brought out the challenges of urban transport. He listed the key thrust areas of research in urban transport as:

- Inter-linkages of transport with urban development/land use planning

- Impact of demographic and technology changes on mobility and urban transport
- Emphasis on Non-Motorized Transport (NMT) in research activities
- Mobility management through ITS
- Freight innovation
- Easy to use decision support tools
- Setting up of National Urban Transport Information System (NUTIS)

His recommendations were:

- Make research better accessible
- Inter-disciplinary approaches
- Emphasis on practical experiments/pilots
- Training and exchange of experiences
- Dedicated research funding
- More CoEs are needed

Technical sessions were organized into four sessions (two each in parallel)

Technical Session 1

Technical Session 1: Transportation Planning Chair: Prof. CSRK Prasad, NIT Warangal	
Author	**Institution**
Sneha Rapur	DULT, Bangalore
Sreela. P.K.	NIT Calicut
Madhu Singh	DULT, Bangalore
Sreelekha. M.G.	NIT Calicut
G.Vishwanath	IIT Madras
Sameep Arora	EMBARQ India
Akshay Mani	EMBARQ India

Summary

In this technical session, seven papers were presented by the authors. This session covered papers related to transportation planning. The papers presented were:

1. Community based Neighbourhood Accessibility Planning: A Case Study of

Malleshwaram, Bangalore

2. Mode Choice Behaviour of Urban Dwellers for Commute to Work
3. What is a Compact City? How could it be measured?
4. Spatial Analysis of Road Transport System
5. Joint Models for Analysis of Household Trip Frequency and Vehicle Ownership in Chennai
6. Demand Responsive Scheduling: A Methodology for Optimization of Public Transport Operations
7. A Case Study of the Auto-Rickshaw Industry in Mumbai

Technical Session 2

Technical Session 2: Public Transport Chair: Prof. K. Gunasekaran	
Author	**Institution**
Vijayshree Pednekar	CEPT University
Krishna N.S. Behara	BITS Pilani
Sreelakshmi R.	DULT, Bangalore
Rahul Nair	IBM Research, Ireland
S. R. S. Sirisha	Institute of Urban Transport (India)
S. M. Hassan Mahdavi	IIT Delhi
Jayatheja A.	iTrans Pvt. Ltd., New Delhi

Summary

In this technical session, seven papers were presented by the authors. This session covered papers related to public transportation. The following papers were presented:

1. Barriers in Fare integration of Public transport systems
2. Estimating Perceived Inadequacy of Public Transportation for a Residential Area in Jaipur
3. Performance Evaluation of City Bus Services for TIER-II cities
4. Coordinating City-wide Multi-Modal Transit Services in Mumbai
5. Enhancement of Transit Ridership - A Case Study on Delhi Metro
6. A Review of Bus Route Network Design Procedures using Multi-objective

Evolutionary Algorithms

7. Optimization of Hyderabad Bus Network using Visum

Technical Session 3

Technical Session 3: SUSTAINABLE TRANSPORTATION Chair: Prof. Shivanand Swamy	
Author	**Institution**
Taral Shukla	CEPT University
Dr. Anne Matan	Curtin university
S. ShekharBabu	IIT Bombay
Megha Kumar	SPA, Delhi
Megha Aggarwal	Institute of Urban Transport (India)
G. S. Sasane	IIT Bombay

Summary

In this technical session, six papers were presented by the authors. This session covered papers related to sustainable transportation. The papers presented were:

1. Organizing the Role of the Intermediate Public Transport (IPT) Sector: Focus On Auto-rickshaw Services
2. Urban Walkability: The Urban Design Contribution
3. Safety Evaluation of an Uncontrolled Intersection using Surrogate Safety Measures
4. Environmentally Sustainable Transport Performance Index for Residential Neighbourhoods
5. Car Restraint Policies for Mega-Cities, Case Study – Delhi
6. Sustainable Approach in Vehicle Routing for Regional Solid Waste Transport System: MMR, A Case Study

Technical Session 4

Technical Session 4: ITS and Simulation Chair: Prof. MVLR Anjaneyalu, NIT Calicut	
Author	**Institution**
Ram Kumar	Aarvee Associates Pvt. Ltd., Hyderabad

Jithin Raj and Sunny Raja Varma	IIT Madras
Satayakumar M.	CEG, Trivandrum
Ramesh V and Anuj Sharma	IIT Madras
R. Nithyanandhan	Anna University, Chennai
A. Gowri	IIT Madras
SaiVikas Gazula	IIT Madras

Summary

In this technical session, seven papers were presented by the authors. This session covered papers related to ITS and simulation. The papers presented were:

1. Corridor Improvements using VISSIM Microscopic Simulation Tool
2. Evaluation and Application of Image Processing Sensors under Indian Conditions
3. Estimating Traffic Congestion and Level of Service on Urban Roads using GPS Data
4. Performance Comparison of a Radar Based Traffic Sensor
    - Smart sensor HD for Indian and American Traffic Conditions
5. Design of Vehicle Actuated Signal for a Major Corridor in Chennai using Simulation
6. Flow Characteristics of Heterogeneous Traffic With and Without Adherence to Lane Following
7. Advanced Traveller Information Systems Qualitative Display of Level of Congestion under Indian Conditions

Panel Discussion

Prof. Jose Holguin-Veras of Rensselaer Polytechnic Institute, New York, USA highlighted the importance and challenges of freight transportation. Dr.S. Gangopadhyay of CRRI, New Delhi stressed that we need to focus on

- Sustainable Public Transport
    - Integration
    - Quality
    - Terminals
    - Feeder services
    - Sustainability
- NMT
- ITS applications
- Safe mobility

Shri. Tara Shanker of DeitY, New Delhi, highlighted ITS as a potential solution to several

urban transportation problems. He stressed the need for indigenous ITS technologies. Prof. Jose Holguin-Veras impressed the need to integrate various systems. To sum up, it would be reasonable to say that the way ahead in urban transport research is to focus on the following topics:

- Urban Transportation Planning and Modelling
- Network Modelling and Optimization
- Traffic Congestion Mitigation
- Traffic Management Measures
- Traffic Engineering and Simulation
- Capacity of Roads and Level of Service
- Intelligent Transportations Systems(ITS)
    - Architecture, Standards, Evaluation
- Public Transportation
    - Including Integration and Sustainability
- Non-Motorized Transport(NMT) Issues
- Parking Issues
- Road Safety
- Urban Road Infrastructure
- Environmental Issues
- Capacity building in urban transport needs simultaneous attention.

C. Inaugural Session

While welcoming participants Mr. Sanjeev Kumar Lohia, Officer on Special Duty (Urban Transport) and ex-officio Joint Secretary, MOUD-India, gave the background of the UMI and its purpose in strengthening the Government's capacity building efforts in the country. He explained the theme of the conference and introduced the sub themes which were to be addressed through various technical sessions and round table discussions during the 3 day conference.

Dr Sudhir Krishna, in his welcome address, stressed that the most challenging impact of urban growth and rising income levels in cities is the mobility crisis, and that even though a significant number of initiatives have been taken up in this region, much is still required to be done in a collaborative endeavor to secure the rapidly urbanizing cities to be as livable in comfort, clean, energy-efficient, and sustainable as possible.

In his special address, Dr R.K. Pachouri, Director General, TERI laid emphasis on the deterioration of environmental conditions due to speedy urbanization of cities. He emphasizes that transport is a key element in the GHG emissions and that it needs to be urgently addressed with alternative means of green travel, fuel technology and smarter management.

Hon'ble Minister, Housing and Poverty Alleviation, Shri Ajay Maken shared his experiences in being actively involved in reforming Delhi's public transport sector in the late 90s. He also spoke on the success of several government programs such as the JnNURM and dwelt on the usefulness of the NUTP in pursuing efficient urban transport carefully and responsibly in Indian cities. He also launched four guidebooks for wider use by practitioners of sustainable urban transport, which included the Code of Practice – Urban Roads, Toolkit for Public Bicycle Sharing, a Study on Metro versus Monorail, and a Study on Life Cycle Cost Analysis of Five Urban Transport Systems. These books/documents were prepared by TRIPP, ITDP and IUT respectively. .

Delivering the keynote address was Ms Susan Kurland, from the Department of Aviation, United States of America. She expressed the importance of spread of awareness of and on the burning issues of urban mobility not just in United States but across all countries of the world which are facing climatic threats of varied degrees.

In his keynote address, Mr A.P. Mishra, Member Secretary, Railway Board spoke of the importance of Railways in contributing to urban transport and insisted on the need for greater levels of integration between the two.

The key note address given by Shri A.K. Upadhyay, Secretary also expressed the need for integration of railways into urban transport. He elaborated on the criticality of urban rail in contributing to city's mobility needs.

Concluding the opening session, Dr. Sudhir Krishna, Secretary for Urban Development, MOUD-India, encouraged that a systematic approach needs to be developed and applied with various policy measures to promote sustainable urban mobility. These would include,

but not limited to, the improvement of public transport service, on parking including advertisements, transit-oriented development, land-use and transport integration, provision of alternative modes to motorized transport, establishment of a dedicated urban transport fund, implementation of various road pricing policies, and higher taxation on private cars to mention but a few.

Dignitaries on the dais at the Inaugural Session

Over 500 guests attended the Inaugural Session

Guests seated in Zorawar Hall at the Inaugural Session

Release of books by Hon'ble Minister Shri Ajay Maken

D. Joint Plenary Sessions

Joint Plenary Session 1: Role of Ministry of Railways; Suburban, Regional & Metro Rail

NUTP motivates building of people centric urban transport solutions instead of focusing on improving the conditions for private motor vehicles. It has identified a wide spectrum of public transport technologies ranging from high capacity and high cost technologies like the underground metro systems to high capacity and low cost bus rapid transit systems. Owing to new governmental policies and initiatives, state government with cities that have population of more than 2 million can opt for Metro or mono-rail network for intra-city travel. MoUD has decided to consider proposals and approve metro or mono-rail for some cities like Lucknow, Jaipur, Kanpur, Patna, Ahmedabad, Pune, Surat, etc. The role of Ministry of Railways would be significant as the Vision 2020 of Indian Railways state that Indian Railways has significant core competence for development of metro rail services as it has all the capabilities to execute such projects with substantial cost reduction. Therefore, this session aimed at discussing in detail the role of Ministry of Railways in helping for developing metro or light rail transit system.

Session Chair: Shri. A.P.Mishra, Member, Engineering, Railway Board

Rapporteur: **Shri.** Durga Prasad Sunku, UMTC

The speakers at this session included: -

Speaker Name	S.No	Presentation Title
Shri. Rakesh Saxena, MD, Mumbai Rail Vikas Corporation	1	Need of Urban & Regional Rail based Transit
Smt . Jayaseelan, Member Secretary, NCRPB	2	Regional Rapid Transit System(RRTS) for NCR
Shri. N.K.Kumar, Chief General Manager, Chennai Metro	3	Chennai Metro – An Overview

Presentation Summary

Presentation 1

- An average trip length of 23.8 km was observed in Mumbai for suburban train mode which is very significant and shows the importance of sub urban train system in Mumbai
- Indian Railways operate suburban train services in Delhi, Kolkata, Chennai, Mumbai and Hyderabad cities
- MRVC successfully completed its role in MUTP-1 and progressing for MUTP-2
- Integrated Planning with other modes of transport like metro, mono rail etc is required for sustainable urban transport
- Transit Oriented Development needs to be explored for funding options

- Finally the "Power of Collaboration" is required for sustainable urban transport

Presentation 2

- A sustainable transport system should have integrated PT services
- No bypasses exist in Delhi/NCR region even though there is a lot of external to external traffic passing through Delhi
- 3 RRTS corridors finalized for implementation
- The passenger ridership will be more than 16 lakhs per day for RRTS in the year 2016
- Transit Oriented Development areas around the corridor have been identified
- There are substantial huge economic benefits of RRTS, if implemented
- l Government related approvals might delay the completion of RRTS by target date
- Integration of RRTS with Delhi Metro is necessary and desirable
- Inclusion of RRTS corridors in the Master Plans for the identified cities

Presentation 3

- In Chennai, buses carry 58 lakhs, sub urban trains 9 lakhs, MRTS 1 lakh passengers per day
- Once implemented Metro is estimated to carry 7.7 Lakhs Passengers per day in the year 2016
- 55% of the identified metro corridors are planned underground
- The project cost is approx 14600 crores
- How to use TOD techniques to help financing is a challenge in Indian cities
- Factors likely to delay the targeted commissioning of metro are largely government related approvals, financing & land acquisition
- Integration of all modes with metro is planned for Chennai Metro

Speakers at the Plenary Session

Presentation being made at the 1st Plenary Session

Joint Plenary Session 2: Codes for Urban Roads

Indian Road Congress (IRC) has around 15 codes related to urban roads. These are almost 13-15 years old, and only two of these codes have been revised post-1990. The existing codes do not reflect the requirement of safety of all types of urban road users. These do not conform to the requirements of r the National Urban Transport Policy – 2006 (NUTP), which clearly states that emphasis has to be on designing the cities for people and not for vehicles. Therefore, the codes for urban roads need to be reviewed in order to disseminate design for dedicated infrastructure for different road users. This session focused on discussing the shortcomings of the present codes, and planning & design standards for revising the existing codes.

Session Chair: Mr Patankar

Co-Chair: Dr. D. P. Gupta

Rapporteur: Hemant Chaurasia, UMTC

Speakers at this session included: -

Speaker Name	S No	Presentation Title
Mr. Ashok Bhattacharya	01	Street Design Guidelines
Dr. Dinesh Mohan	02	Road Safety
Dr. L. R. Kadiyali	03	Street Design and Urban Mobility

Presentation Summary

Presentation 1

- Overview of street designs, safety attributes, design guidelines and success stories
- Implementation and systematic change being done in street light guidelines in our country from time to time.
- Guidelines are adopted by various institutions such as PWD, CPWD, MCD and NDMC for implementation. Further the codes being currently developed are being considered by cities of Mumbai and Hyderabad for implementation.
- Providing climatic comfort, universal accessibility and public utilities, reduction of heat island effect & storm water management, pedestrian friendly and PT friendly designs are the main key principals. However these need to include as commuter safety and comfort as well.
- The successfully implemented cases include IP road, Vikas Marg and Lodi road in Delhi city.

Presentation 2

- The comparative case of use, effectiveness and priority of Metro rail, city bus, and

CNG auto and tricycle rickshaw was presented.

- Problems and solutions are interrelated. To select an appropriate mode of commuting, we should always set our priorities basis on the user's perspective.
- Rather than promoting mass rapid transit systems in our cities, use of city bus, three wheelers, cycle rickshaws and walking should be promoted.
- Indian Road Congress codes should be suitable modified considering the speed, safety, accessibility and comfort parameters.
- Implementation of well-designed roundabouts should be done to improve the mobility attributes with safety.

Presentation 3

- Increasing number of private vehicles, increasing urbanization, increasing number of commuters and reduction of available natural resources to support the mobility
- More focused and detailed studies are required related to mass rapid transit systems (rail based and road based) to implement the system and ensure optimum ridership.
- There is a need for innovative ideas and solution with well-developed approach and methodology to improve the country wide situation in urban transport.

Key Highlights

- Focus must be on having more interactive sessions, seminars and workshops at national and international level to make and enhance the outputs as user friendly.
- Encourage the exercises of street auditing in two ways namely; planning and safety audit and quality audit for our road network.
- More focus to be given towards road side hawkers, road side activities, right of way of roads, speed limits in urban areas, driver education, training programs, essential elements/support infrastructure for urban roads and a set level of our IRC codes to improve the safety, comfort, planning and designing of our roads.
- An important aspect is what, where and how the required corrections are made.
- Key suggestion was to prepare one unified national level code for all roads by incorporating the expertise, technology and various tools.

Speakers at the Plenary Session

Dr L.R. Kadiyali making a presentation

Joint Plenary Session 3: Smart Cities and Intelligent Transport Systems

A lot of cities in India have made huge investments to develop metro rail networks, modernize road infrastructure, improve the quality of public transport and introduce a variety of innovative features, but the problems of congestion and pollution still persist. Transport management systems and software tools have been effective to curtail traffic woes in a lot of mega-cities of the world. Intelligent Transport Systems (ITS) offers features like traffic prediction, analytics and decision support, traveler information, advisory services, ticketing and fare collection, roadside sensors, radio frequency tags, GPS to help monitor and manage transport more effectively. Smart cities drive sustainable economic growth and prosperity for their citizens. Their leaders have the tools to analyze data for better decisions, anticipate problems to resolve them proactively and co-ordinate resources to operate effectively. In such scenarios ITS offers collection & analysis of extensive data collected every day and smart solutions for the transport system. Therefore, this plenary session aimed at emphasizing the importance of ITS in planning and managing of transport system for Smart cities.

Session Chair: Mr Arun Maira, Member Planning Commission

Rapporteur: Swati Khanna, UMTC

Speakers at this session included: -

Speaker Name	S No	Presentation Title
Mr T.R. Seth	01	Building sustainable cities to build a sustainable future
Mr Raghupathy	02	Oral presentation on ITS technology
Mr R Damodar	03	How cities can lead the way into a prosperous and sustainable future

Presentation Summary

Presentation 1

- Three major components – Quality of life, economic and environment features.
- Major challenges in cities- how to grow, remain competitive and manage finances
- Mobility consumes 28% of energy; therefore, there is need for well networked systems.
- Transit oriented development is the key to new growth- systems like E-bus, and integrated route planning will be the key to smart cities

Presentation 2

- ITS needs to do mapping, analysis and prediction from the available database

- Thus there is need for a traffic information hub
- Use of cloud technology is potent.
- Involvement of all possible stakeholders in the ITS planning for a city is desirable and necessary

Presentation 3

- Infosys is working on integrating about 100 towns in Karnataka as part of a smart development project
- Innovations in technology, institutional development is necessary to sustain smart systems
- For developing smart cities, focus on power, health, transport and mobility, telecom, water and finance are a necessary and inescapable

Key Highlights

- We have possibilities, need is to convert contention to collaboration and intention to implementation
- Role of government is primary in providing a flexible, intelligent system for people to include in their own requirements
- Need for a more interactive and user friendly system
- System needs to be created together with support from institutional setup so as to engineer, educate and enforce technological solutions.

E. Technical UMI Sessions

UMI 1A: Institutional Development

Indian cities face several transport related challenges. The deteriorating conditions of urban transport sector can be primarily attributed to the lack of clarity in the roles and responsibilities of the multiple organisations managing urban transport and little coordination amongst them. In 2006, the central government in its National Urban Transport Policy (NUTP) recommended the setting up of Unified Metropolitan Transport Authorities (UMTAs) in all million plus cities to facilitate better co-ordinated planning and implementation of urban transport programmes & projects and integrated management of urban transport systems. In this context the session threw light on the topic and dwelt on – understanding the challenges in implementing UMTAs, identifying means to successfully constitute such a body and empower such institutions and to build their capacity and enable learning from best practices.

Session Chair: Dr. Ramachandran, Ex Secretary (MoUD), GoI

Rapporteur: Ms Akansha Sharma, TERI University

Speakers at this session included: -

Speaker Name	S No	Presentation Title
K. Dhananjaya Reddy	1	Unified Metropolitan Transport Authority (UMTA) Experiences from Hyderabad
Ms V Manjula	2	Experience with UMTA under executive order (Bangalore)
Mr Choong Yeol	3	Institutional Development of KOTI

Presentation Summary

Presentation 1:

- Till 2004 only city buses dominated the transport sector but now the problem envisages increasing motorized percentages for personalized vehicles. This is being accompanied by a decrease in non-motorized percentages
- The problem in Hyderabad stands at connectivity, making more pedestrian facilities and coping up with the increasing demand.
- Three tier strategies ranging from short to long term right from 1-10 years is being implemented.

UMTA is not just taking initiatives to improve the traffic signal through virtual loop system, detection of offenses and also by introduction of CNG but it is also trying to cater to the issues by creating a database along with integrating between land use transports.

Presentation 2:

- The region –which- has seen diversified growth patterns beginning with textiles, venturing into manufacturing and finally seeing the light of the day with IT sector boom.
- This has lead not just to advent of metro but also to increase in the use of personalized vehicles.
- The current issues must address "mobility for all" along with a clear picture as to who the authority should be for what, with well laid out functions.
- BMLTA has been moving aggressively to achieve planning, monitoring and coordination and it is still working its way out through efficient land use planning, along with battling the demand side issues.
- A common legislative act like that of Singapore can help ease the functioning instead of multiple authorities having their own acts.

Presentation 3:

- Development of KOTI: has seen an increasing interest, of which statistics are a proof.
- In 1986 there were just 39 people which now have grown to 2011.
- It has laid stress on human oriented transport along with strengthening capacity. The transformational process from poverty to prosperity can be largely attributed to the reliance and use of the transport model that is based on financing transport infrastructure, making timely transport investments and using ICT for public transport.
- Today the road network stretch in Seoul, South Korea stands at 3912 km and it has also focused on green growth along with taking into account transport sociology by making Bus oriented transport its main focal point.
- That is why it is enriching the future by screening harmony among humans, environment and transport.

Key Highlights

- UMTA concept has taken root but on the basis of experience so far, a lot of issues still need to be addressed to make these organizations function better.
- The challenge still remains as to how effectively and expeditiously decisions can be taken and how effectively complete, reliable and current data and information can be sourced.
- Efforts to be focused towards more integration of transportation modes.

- There needs to be training of associated personnel, city officials and at the same time building further capacity at the state and local level.

Speakers on Stage

Presentation on Bangalore by Ms V Manjula

UMI 1B: Financing

Rapidly growing Indian cities are facing the challenge to meet the ever increasing mobility needs of the population. Such needs can be met only through expanding the public transport infrastructure at a fast pace. But, being constrained by resources, most of the cities are unable to do so, leading to a large demand-supply gap. Therefore, there is an urgent need to step up investments in the transport sector and cater to the rising mobility needs of the population. Conventionally, government has been playing the role of the key stakeholder and has been bearing the capital cost for developing transport infrastructure, and providing huge subsidies for running transport services. Fare-box revenue and revenue from some other commercial activities, like revenue from advertisements become secondary financing instruments for transport projects. The conventional financing approach puts strain on the already constrained government exchequer. Thus, there is a need to develop innovative financing mechanisms, which not only ensure timely availability of financial resources but also free the government from the strain of providing huge financial resources for transport projects. Given the massive investment requirements for urban transport sector, the discussion in this session aimed to discuss and deliberate on innovative mechanisms for financing transport projects in Indian cities.

Session Chair: Dr O.P. Agarwal, Senior Urban Transport Specialist, World Bank

Co-chair: Mr. R. Mandal, CEO, Srei, Advisory

Rapporteur: Mr Hemant Chaurasia, Senior Officer, UMTC

Speakers at this session included: -

Speaker Name	S No	Presentation Title
Prof. Peter Newman	01	Transit Oriented Development as a financing tool
Mr. P. G. Chandramohan	02	Financing model for buses
Dr. O. P. Agarwal	03	Resource Generation Policy

Presentation Summary

Presentation 1

- Brief introduction about TOD and its feasibility in various cities.
- Presentation covered evolution and characteristics of traditional walking cities like Delhi, Mumbai, Kolkata; historical aspects of cities, transit cities, automobile cities and future cities
- Corridor development along MRTS, valuation of PT, modal integration, value capturing through PPP, exploration of real estate property along PT corridors etc. have been the main tools to implement TOD in cities like Hong Kong, Seoul, Singapore, Perth, Melbourne and Dancoster.

Presentation 2

- Focus on issues of existing demand and supply of bus based PT facilities in Indian cities.
- Provision of single step entry, better driver facilities, passenger infotainments, on board GPS, better aesthetics (interior, exterior), easy access to disabled commuters, and passenger comfort are some of the features in rolling stocks/buses which are the emerging trends to provide better commuting services.
- Transport Network developments through various models (Hub & Scope, Trunk & Feeder), Rapid Bus Transit systems (BRT/S-BRT), innovative fuel options (hybrid fuel, hydrogen fuel, CNG), advanced vehicle maintenance, common mobility card etc are the areas of focus in bus transport.
- Sri Lanka (SLCTB), Delhi (DTC, DIMTS) and Lagos (LAMATA) are successful models which may be referred to for implementation in Indian cities.

Presentation 3

- Preparation, construction and operation & maintenance are main three levels in urban public transportation.
- Owner's fund, TA grants and venture capital can be explored at the preparation level; equity, loans, subordinate debt and supplier's credit in construction level; fares/fees, taxes / levies, property income and subsidies can be explored at the operation & maintenance level
- The main gaps in urban transport finance are fare affordability, attractive service quality provisions, practical difficulties in charging for use of roads & footpaths and non-recovery of cost through fare/fee. Privatization to provide better services, a little compromise in service quality, increase the fare/fee, exploitation of property attributes and improving efficiency through PPP (in LRT, Metro, roads), private (in parking, premium PT services) and public (in railways, metro, buses) are suggestive of measures to generate resources.
- Other resources may include taxation (gas/fuel tax, transportation tax, betterment levy, vehicle ownership tax, congestion charges, toll and parking fee) as in San Francisco & (Nantes, commercial exploitation of land value) as in Hong Kong and station naming rights

Key Highlights

- Administrators, technical experts, bureaucrats, designers and planners should look for a practically feasible option for improving the public transport financing.
- The government agencies or bodies should effectively explore the potential of land value and the variety of ways to raise resources on a sustainable basis.
- New concepts should be studied, tested and implemented to enable improvement to financially unsustainable urban public transport systems.
- The various successful models or measures should be relied upon at policy levels to fill the gaps in transport financing and provide appropriate solutions or tools.

Dr O.P. Agarwal making a presentation on Resource Generation Policy

Audience at the Session

UMI 2A: Parking

Explosive growth in new vehicle registrations in Indian cities has led to massive parking problems. Lack of space for parking is leading to encroachment of limited road space, aggravating the congestion on roads. The gravity of the situation can be understood from the fact that about 1200 vehicles are being added to Delhi roads daily. According to r the conventional planning approach, it is assumed that generously planned parking spaces would cater for and provided. However, from experience world over it has emerged that excessive parking does also add to problems as it incentivizes the use of personal vehicles. Parking strategies can be instrumental in inducing modal shift from private vehicles to public transport systems, thereby offering an effective solution to transport related issues like traffic congestion, safety, etc. Thus, this session focused on discussing approaches required to address the issue of increasing parking demand in Indian cities.

Session Chair: Sh. Praveen Kumar Tripathi

Rapporteur: Seema Singh

Speakers at this session included: -

Speaker Name	S No	Presentation Title
Ms Shreya Gadepalli	1.	Park it right
Ms Anumita Roy Chowdhury	2.	Parking Policy – Case Study Delhi
Mr. Pranav Poddhar	3.	Mechanized Car Parking Technologies

Presentation Summary

Presentation 1

- There is an unending parking demand if provided free of cost and will generate more demand in future. As it is, the existing demand is not met.
- Parking is often considered a public good and the government continues to supply it to vehicle owners.
- Based on the experience in different countries and elsewhere, parking fees should be used to manage demand. Further the parking revenues should be used to improve streets and other public transport related infrastructure etc.

Presentation 2

- Short term users dominate parking lots. If priced well, can prove helpful in discouraging car use.
- Several parking demand management strategies including multi-level car parking, parking fees etc. have failed in the case of Delhi due to improper local area planning, discrepancies in rates and rejection by the public.

- Necessary public policy and public outreach and awareness about parking management and the related benefits is important.

Presentation 3

- Automated systems like 2 stack, puzzle parking etc. are very useful in places where space is a constraint and where required no. of car spaces cannot be accommodated conventionally eg. Hotels, malls, etc.
- Benefits – user friendly, easy installation, have low operational costs, faster parking and retrieval times etc.
- Useful in residential areas and mixed use areas, where in and out times are staggered over time.
- All automated systems installed till date in India have recorded not more than 20% utilization mainly due to improper area planning.

Key Highlights

- Cities are running out of space and cannot afford to have unlimited parking areas. 'To cater to the parking problem, the pragmatic solution is to "price parking properly". Also, the parking policy should discourage long term parking.
- It is important to prioritize bicycling and walking as a strategy to manage parking demand. Promote multi modal transportation on a priority basis.
- If at all, parking is to be provided, at appropriate pricing, integrated automated solutions can be opted for, but should be accompanied with proper area planning.

Ms Shreya Gadapalli from ITDP

Mr Pranav Poddar

UMI 2B: Improving urban road safety

Globally, India witnesses the highest number of deaths due to road accidents with more than 100,000 lives lost due to road fatalities and an even higher number of injuries recorded every year. The fatalities have been increasing at a rate of 8-9% every year in the past 7 years. In 2010, the number of deaths due to road accidents was as high as 1.6 lakhs against 1.25 lakhs in 2009, a 28% increase in one year. In 2007, the Indian government passed a Bill called the "National Road Safety and Traffic Management Bill" aiming at increasing the safety levels on road in the country. However, not much has improved on Indian roads as far as road related fatalities and injuries are concerned. The discussion in this session largely centred on – design of urban roads to improve road safety, problems in implementing safe road designs, regulations for road safety – enforcement, implementation and management and finally case studies demonstrating strategies leading to improved safety levels or reduction in fatalities.

Session Chair: Dr. P.K.Sarkar, SPA, Delhi

Rapporteur: Sandip Sinha

The speakers at the session included: -

Speaker Name	S No	Presentation Title
Prof. Geetam Tiwari	1	Design of urban roads to improve safety
Satyendra Garg	2	Problems in improving road safety
Dr.S.M.Sarin	3	Developing road safety policy for road engineering department

Presentation Summary

Presentation 1

- In the last few years, with huge roadways projects like golden quadrilateral & development of NHs, the rate of fatal traffic incidents has become conspicuous.
- Road infrastructure should not be developed in accordance with vehicle perspective, but in accordance with pedestrian perspective.
- Shortest path taken strategy should be the answer to reduce road accidents & enhanced number of road crossings should be provided.
- Non-motorized travelling to be encouraged by providing separate lanes for NMTs & pedestrian priority areas have to be recognized and so displayed by using different simple techniques like rumble strips, small roundabouts
- The message to the car drivers to be conveyed is that urban public and municipal roads are not the place for fast driving.

Presentation 2:

- Road accidents occur in India due to irresponsible issue of driving licences to undeserving candidates.
- That fitness certificates are given to commercial vehicle without due and adequate inspection and often for monetary considerations.
- Intensive action against non-sensitive causes will help the safety issues to reduce but strengthening of penalty structure is the major lookout for policymakers.

Presentation 3

- To ensure that road safety gains a prominent place in transport policy & decision-making processes.
- Provision of suitable organizational setup for road safety. An institutional mechanism road safety engineering unit.
- Need for a road safety plan at National, State and Local government levels concentrating on casualty reduction targets.
- Encouragement of R&D culture and development of successful highway safety programs.
- Road Safety Audits to be done regularly to ensure road safety.

Dr S.M. Sarin and Prof P.K. Sarkar as Speakers

Dr S.M. Sarin making his presentation

Presenting a memento to Prof P.K. Sarkar

Prof Geetam Tiwari making her presnetation

UMI 3A: Mass Transit Systems - Technology

Mass transportation performs important economic, social, and environmental functions in cities. Every city needs an efficient and effective mass transit system to improve mobility and accessibility. A good knowledge of the existing and emerging technologies is required for selecting technology suited for the city, based on – demand requirements, safety considerations, topography, funds availability and the capacity of industries to locally manufacture and supply technology(s). The National Urban Transport Policy lays emphasis on adopting newer and cleaner technologies for urban transport. But the lack of funds/resources and lack of local technologies makes it difficult for the best suited technology to be selected and implemented. The discussion in this session focused on the principles that should be guide the selection of the mass transit configuration and matrix as also the technology for cities, different latest innovative technologies around the world, their applicability to Indian cities and the capacity of our institutions and industries to implement/provide these technologies locally.

Session Chair: Mr Satish Kumar, DMRC

Co-chair: Ms. Christine Bost, Mayor,Eyzne, France

Rapporteur: Megha Kumar

Speakers at the session included: -

Speaker Name	S No	Presentation Title
Mr. CV Kamesh	1	Hitachi: Monorail Solutions
Ms. Christine Bost	2	Transport Planning for Bordeaux
Ms. Samira Israne	3	Tramway revival in France and perspectives for India
Ms. Anna Marie Damgaard Kristensen	4	The evolution of road-time information systems & other technologies in Global Rail Metro Projects

Presentation Summary

Presentation 1

- Focus on the features of monorail solutions provided by Hitachi.
- Monorail could serve as a trunk or a feeder system,
- It can also cater to wide range of demands (between 5,000-50,000 pphpd),
- The monorail system has many advantages such as cheaper cost and lesser construction time, flexibilitye, suitable for congested areas, ability to negotiate steeper gradient etc.
- The system has potential to provide effective mobility solution in Indian cities.

Presentation 2

- The planning and transport approach adopted by the city of Bordeaux, discussed.
- The aim of the approach was to develop the city as an attractive metropolis, with its own living, working, and breathing places and where people do not waste time in commuting.
- With this vision, a high quality, multi-modal transport system was proposed that the multi modal transport of the city includes included buses, trams, bikes, water buses, transport on demand, etc.
- It is expected that implementation of the proposed plan would enhance the urban environment of the city.

Presentation 3

- The presentation discussed the evolution of transport system of Paris.
- It also discussed various legislative acts which support the current transport systems in Paris.
- The presentation showed that revival of the tram system in Paris enhanced the vibrancy of the area's leading to better environment and economic conditions.
- It was suggested that tram system is well suited for Indian cities and therefore could play an important and effective role catering to mobility needs of people.

Presentation 4

- In this presentation various technology solutions provided by the FOCON group were explained which largely laid emphasis on the ole that technology can play in enhancing efficiency and performance of a public transport system.

Key Highlights

- Cleaner technology is available which suit different types of cities, and which can be used without disturbing the existing setting of the city.
- For Indian cities, there several clean public transport solutions available e.g the LRT, monorail, etc. However it is advisable that these transport solutions be evaluated for their compatibility and suitability to the local conditions and resource availability
- Real-time information system can also serve an important function in enhancing the efficiency of public transport systems thus leading to enhanced mobility.

Speakers of the Session

UMI 3B: Use of New Technologies to Mitigate the Impact from Transport Related Air and Noise Pollution

In an urbanizing world, the impact of cities on economics is well known. Less well-acknowledged is their contribution to pollution – local and global. Two particularly egregious impacts are on both air and noise quality. This session l focused on technologies and policy mechanisms that can mitigate these effects and at the same time provide better and more sustainable transport services. Some of the topics discussed included: noise mapping, source apportionment studies and other simulation tools that can monitor and assist in forecasting pollution. The discussion in this session focusses on the tried and tested technologies. Case studies from EU were highlighted to explore opportunities for collaborative work.

Session Chair: Mr. S. Gangopadhyay

Co-Chair: Ms. Anumita Roy Chowdhury

Rapporteur: Dibyendu Sengupta

Speaker Name	S No	Presentation Title
Lorenzo Meschini	1	Online traffic forecast to support real-time pollution management
Fabrizio Arneodo	2	Impact on pollution reduction through traffic forecast, monitoring and control
Stefano Caprio	3	Advanced Engine Technologies for meeting fuel economy and pollution challenges
Hugo Dias	4	Reducing the environmental impact of Public Transport: the case for Optimizing Operations
Nicolas Duchene	5	Environmental impact of transport: Greenhouse gases, noise and local air quality
Dr. Jaafer Gaber	6	Energy and Vehicle Technologies: Key challenge, examples and case scenarios
Giovanni Cipolla	7	Towards a green and sustainable transportation system: the scientific involvement of Politecnico di Torino

Presentation Summary
Presentation 1 • Traffic pollution evaluation and control system models at different stages. Environmental models overview which includes emission models and dispersion and concentration models & packages. Description of European experiences on simulation – based environmental decision support systems

- **Presentation 2**Overview of work at Traffic Operation Centre (TOC) in Turin
- Overview of how TOC operations can be applied from metropolitan level to regional level
- Description of real time monitoring of pollution

Conclusion - that reliable traffic management system can also be a good way to monitor air pollution

- **Presentation 3**Challenge - to preserve environment while sustaining transport for commuting
- Overview of global outlook in terms of GHG emissions/km of travel
- Overview of propulsion strategy, engine efficiency optimisation, SI engines
- Conclusion – Spark Ignition and Compression Ignition engine capability continues to converge; hybrid & Fuel Cell technology continues to mature

Presentation 4

- The best intermediate solution between infrastructure improvements & increase in vehicle efficiency is mass transit systems
- Improve the core – optimizing operations
- Value proposition – best way to do more and better – with less resources and more information

Presentation 5

- Overview of environmental impact assessment
- Two broad categories – global level (GHG reductions); local (noise and air quality)
- Overview of EU initiatives – EU ETS directive, noise and air quality directives
- Initiatives in France – Bonus/malus and pastille systems; new law to be enacted in October 2013
- Local initiatives
- Overview of Airport case studies

Conclusion – strong political commitment; local actors also to take initiative

Presentation 6

- Overview of European Commission roadmap for next decade
- Strategies – intelligent energy storage technologies; electric mobility; aftermarket & nomadic devices in vehicle

- Overview in ALPSTORE

Overview of “Freshmile” electric mobility program and V2G strategies

Presentation 7

- Environmental issues – global challenge
- Paradigm shift – urban vehicle – not just a private car
- Overview of driverless cars
- Overview of importance of energy with the help of Internet and ICT
- Back to the future approach – going back to electric mobility after ICE experiment

Key Highlights

- The overview of different technologies is excellent.
- To help these technologies gain a footing in the Indian market, policy and regulatory mechanisms need to be proposed and implemented in a correct manner.

Speakers of the session

UMI 4A: Mass Transit Systems

Mass transit systems offer a highly sustainable transport solution for meeting mobility needs of people. They move large number of people at high speed, often employing efficient fuel technology, thus providing high levels of mobility in an eco-friendly manner. The mass transit systems are also an affordable transport choice for people who do not have many mobility options. In spite of the important role that the mass transit systems can play in the Indian cities, the development of such systems has remained largely neglected because of the huge capital investment and institutional capacity required to manage them. The National Urban Transport Policy's emphasis on people's mobility has led to the recognition of mass transit systems as a key solution for addressing the mobility related issues in Indian cities. The session elucidated on suitability of different mass transit system options for different types of cities, varying in terms of their city size, urban form and structure, network pattern, topography, etc. The theme also deliberated on routing, scheduling, demand estimation, land use transport integration, integration with other modes to enhance accessibility, efficiency, convenience, and other such issues related to successful operations of mass transit systems.

Session Chair: Mr G.P. Garg

Rapporteur: Debajeet Baruah

Speakers at the session included: -

Speaker Name	S No	Presentation Title
Mr. Herve Beaudet	01	Planning and Scheduling for PT operations optimisation
Mr. Jitender Tyagi	02	Precaution to ensure timely completion of large infrastructure projects
Ms Anjlee Agarwal	03	PT – Accessible and Inclusive

Presentation Summary

Presentation 1

- The presentation included overview of the activity of the French company Lumiplan, the importance of planning and scheduling in the effective and proper operation of bus system
- Emphasis on the importance of route planning, crew scheduling and resource management to support decision making of policy makers and operators.
- Presentation of case study of Penang, Malaysia and Lumiplan's new project in Hassan & Mysore, Karnataka.

Presentation 2

- Emphasis on the importance of organisation structure, corporate culture and

management development programs as major inputs for timely completion of projects.

- The importance of detailed project reports, realistic timeframe setting, planning before approval and efficient funding systems as steps towards timely completion of projects highlighted.

Presentation 3

- Introduction of the organization named Samarthyam and description of its various activities.
- The speaker endorsed the efforts made by DMRC in providing universally accessible stations.
- That India has the highest population of disabled people was emphasized and hence pleaded for planning for diverse users of public transport.
- The work of Samarthyam in the Hyderabad and Bangalore metros highlighted and assertion that awareness and advocacy be promoted to make the country universally accessible

UMI 4B: Travel Demand Management

Rapidly growing urban population together with increased economic activities and city sizes has resulted in increasing demand for urban mobility. The increase in passenger mobility demand in Indian cities has not been matched by an equal increase in supply of transport infrastructure and services. This has resulted in increased usage of private vehicles and decline in the use of public transport and NMT in cities, a trend that has resulted in increased problems related to traffic congestion, deterioration of air quality, increase in numbers of road fatalities and accidents, loss in economic productivity, etc. In the urban areas, the conventional approach to transport planning addresses these problems by enhancing the supply of transportation infrastructure and services which offers only a temporary solution to the traffic problems of the cities. Instead the travel demand management strategies need to focus on modifying e travel behaviour in order to reduce the negative externalities related to transport. The discussion in this session focussed on the issues and opportunities that TDM measures hold for solving the traffic problems in Indian cities. The session also indicated the kind of TDM measures that Indian cities should start considering for implementation.

Session Chair: Mr Phanindra Reddy, IAS

Co-Chair: Prof Sewa Ram, SPA, Delhi

Rapporteur: Megha Kumar, TERI

Speakers at the session included: -

Speaker Name	S No	Presentation Title
Mr Arvind Kumar	1	Road Pricing Issues
Mr Mohinder Singh	2	TDM: Case study Singapore
Mr Jeanne Pierre	3	The Grand Paris Transport Project

Presentation Summary

Presentation 1

- Concepts of TDM and successful examples of TDM around the world introduced and discussed
- In the Indian context, only toll roads were the existing examples of road pricing.
- The need for reforms in the Motor Vehicles Act due to ambiguities to toll rates was reflected.

Presentation 2

- The successful implementation of TDM strategies in Singapore was presented
- That land use and transport integration is the key to development of Singapore was noted.

- The concept evolved in the first master plan developed in 1972 continued in the subsequent master plans of 1991 and 2001.
- The plan focusses on enhancing walking facilities, reducing dependency on motor cars and on high density development around transit centres.
- Both push and pull measures adopted extensively.
- Thus, apart from developing an extensive public transport system, push measures like higher cost of vehicle ownership and charging of road usage, were also adopted.

Presentation 3

- With the aim to maintain and further improve the quality of life in the Paris metropolis, the project 'The Grand Paris Transport Project' initiated.
- The goals of the project were to develop extensive public transport network in the metropolis, to undertake TOD, and to reduce pollution and urban sprawl.
- Plan also focused on integration of different transport systems proposed for the city and the surrounding areas.

Key Highlights

Poor public transport infrastructure and NMT infrastructure are the chief deterrents in the implementation of TDM measures.

It is high time for Indian cities to consider and enforce suitable TDM measures.

UMI 5A: Public Bus Transport

Indian cities are witnessing tremendous urban growth generating high travel demand. To support such high levels of travel demand, there is need to augment the public transport systems in cities. One of the most cost–efficient options among different types of public transport systems is the public bus transport system, as it runs on the existing roadway facility, and offers service at lower cost per passenger km. The city bus services in the Indian cities are often unreliable, run at low frequency, with inadequate route density, and lack proper infrastructure. Given the importance of public bus transport systems in meeting the mobility needs in Indian cities and the challenges faced, this session focused on – need for improving bus systems, identifying ways to augment bus service in cities, identifying suitable model for running public bus systems in Indian cities, and smart solutions available for the public bus transport system, and the mix that can address better than before the urban transport problems of Indian cities.

Session Chair: Mr.S.K.Jaghadhari, Vice President, IUT
Rapporteur: Mr. Sandip Sinha, UPES

Speakers at the session included: -

Speaker Name	S No	Presentation Title
Mr.N.Manjunath Prasad	1	Viable city bus service in small cities
Mr.Amit Bhatt	2	Bus Karo +

Presentation Summary

Presentation 1

- In the small city of Tumkur near Bangalore, the city bus service initiative commenced operations after the 1997 reforms. From February 2011, it stood on with one depot 51 buses with a cost recovery margin of 0.20 rs/km.
- The city has seen approx 20% modal shift from private to public by the city commuters.
- This became possible because of better than before frequency, reliability, safety & comfort provided by the bus services accompanied with economical affordable fares.
- KSRTC made this happen with proper market segmentation, modern IT initiatives & effective support infrastructure.

Presentation 2

- Under JNNURM 60 cities were awarded with 15 thousand buses.
- A few cities which did not have operating experience, faced difficulties in implementation and in the understanding of how to generate revenue, performance

monitoring, route rationalisation, service optimisation etc.

- The initiative called ''bus karo" taken by a NGO named Embarq provided a three layered solution to the cities.

The layers were 'talking transit': it is a workshop series that convenes PT agencies in order to discuss various aspects, 'mentoring transit': this involves assisting PT agencies in implementing pilot projects, and 'learning transit': it develops & disseminates material documenting Indian and International best practices.

Key Highlights

Demand of urban mobility is increasing.

Better support infrastructure is required to meet enhanced and increasing demands.

The Tumkur model under JNNURM is a good example for effective public transport through bus services in smaller cities.

UMI 5B: Transit Oriented Development

Transit Oriented Development (TOD) promotes a mix of land uses and densities intended to maximize access to public transportation. This typically involves development of a mixed-use neighbourhood within walkable distance designed to maximize access to, and promote use of public transportation, with an emphasis on pedestrian circulation and accessibility, often with a public transit station as its nuclei. The concept of TOD is being embraced by a growing number of cities as part of a strategy for accommodating growth without diminishing liveability. The National Urban Transport Policy (NUTP), 2006 emphasizes the need for efficient public transport along with an integrated land use-transport policy. Although Indian cities are investing in mass transportation systems, transport planning is still disjointed from land use and is essentially car oriented. This session focused on the opportunities and challenges for leveraging transit infrastructure and transit oriented development to create sustainable communities in urban India.

Session Chair: Mr. P.S. Rana, Patron, IUT

Co-Chair: Mr. Rajeev Malhotra, Chief Regional Planner, NCR Planning Board

Rapporteur: Mr. Satyam Singh, UPES

Speakers at the session included: -

Speaker Name	S No	Presentation Title
Amber Dubey	1	Innovative options for sustainable urban mass transport systems in India
Adren Rehman	2	Financing – Transit Oriented Development
Martin Kolly	3	TOD study for existing metro corridor between Chhattarpur and Arjangarh for Phase II of the Delhi metro network

Presentation Summary

Presentation 1

- India urgently needs an efficient urban public transport network.
- Upgradation of urban transportation cannot be delayed any further.
- Government has planned for 4 trillion investments in urban transportation.
- Private sector must respond.
- Priority must be given to determine suitable alternative option

Presentation 2

- Definition of TOD
- Details of Amsterdam City
- Value Captured TOD should lead to improved quality of life.

- Multiple sources of funding like private, public, infrastructure funds, etc.
- TOD is a process and not a project.

Presentation 3

- Presentation of conceptual master plan for Transit Oriented Development along Metro Corridor frm Chattarpur and Arjangarh
- The study presented included the TOD recommendations along the selected corridor with a focus on impacts of the development, financial feasibility and way forward.

Key Highlights

- The most efficient mode of transport is railways.
- Green field cities with a holding capacity of 3-4 lakhs of population should be promoted. This would result in optimum travel demand and distance.
- Awareness and desirability of regional development be taken into account.

UMI 6A: Ecomobility in Indian Cities

Eco-mobility concept promotes travel through integrated, socially inclusive, and environmentally-friendly transport options. The eco-mobility approach highlights the importance of public and non-motorized transport and promotes an integrated use of all modes in a city such that there are relatively lower emissions as compared to the personal automobiles powered by fossil fuels. In India, initiatives like incentivizing of electric vehicles & NMT, and development of integrated multi-modal transit systems to reduce pollution by improvements in public transit have already started and can play a major role in promoting eco-mobility. The discussion in this session included – the concept, vision, approach and perceived challenges for promoting eco-mobility in Indian cities, and lessons from best practices that may be replicable in Indian context.

Session Chair: Dr Sudhir Krishna, Secretary, MoUD

Co-Chair: Mr I.P. Gautam, PS (UD), Gujarat

Rapporteur: Ms Laasya Bhaqvatula, ICLEI South Asia

Speakers at the session included: -

Speaker Name	S No	Presentation Title
Emani Kumar	1	Introduction to Ecomobility
Kim Dongha	2	Ecomobility, Vision, Approach and Roadmap for the city of Changwon, Korea
Manfred Breithaupt	3	Ecomobility as precondition for Livable cities
Talat Munshi	4	Accessibility of jobs for the Urban Poor - Case study of Ahmedabad

Presentation Summary

Presentation 1

- Definition and description of ecomobility
- Ecomobility alliance by ICLEI – service oriented structure, collective learning exercises, peer-to-peer exchanges, joint activities and cities help each other to reach self-set goals
- Ecomobility World Festival 2013 for cities to experience ecomobility
- Introduction to NMT projects in India with ICLEI, I-Trans supported by Shakti Foundation

Presentation 2

- Introduction to Changwon – 1st planned city of Korea and a leading industrial hub
- Challenges for Changwon city have been in managing increasing traffic, illegal parking etc
- Changwon's environmental policy aims at reducing GHG emissions to 3.1 Million Ton by

2020. Hence focus is on NMT, increasing modal share of bicycles, and PT.

- Changwon's bike sharing scheme has been successful and has resulted in saving 7000 tonnes of Co2

Presentation 3

- Ecomobility refers to sustainable transport
- In general, 10-25% of the urban land use is devoted to road transport however due to dominance of vehicles and vehicle oriented infrastructure, there is hardly any space left for people.
- A liveable city is a city that provides a high quality of life for its citizens
- Ecomobility means People Oriented Transport, which is Affordable Accessible (by all), Equitable, Environmentally friendly, Energy efficient, Low Carbon, people oriented, attractive and has a positive effect on the city and its inhabitants.
- Main components of ecomobility includes: Public Transport with priority over all other modes on the road , non-motorised transport , creating/conserving public space, public transport integration, TDM measures and better vehicle and fuel technology support.
- World's best systems include Public bike scheme in Paris, pedestrianisation of Stroget in Copenhagen, Improved public space leads to increased quality of life in Seoul, BRT in Guangzhou, etc.). All these have been developed with high levels of political support.

Presentation 4

- Urbanization has already led to substantial increase in urban slum population
- Transport plays an important role in the levels of mobility and socio-economic participation in any given society.
- The ultimate goal of transport policy is to improve accessibility.
- The percentage of housing categorized as slum increased from 17.2% in 1961 to 25.6% in 1991 in Ahmedabad
- A 3D GIS analysis concluded that BRT systems can make substantial contribution to improved accessibility of the urban poor provided that they form a network covering a large spatial extent of land mass. Individual corridors contribute only marginally.
- Investing in cycling infrastructure to enable feeding the BRT will enhance its potential and provides enormous gains in potential job accessibility for all poor sections of society.
- BRT systems are able to compete with regular bus systems that operate throughout the

city. • Integrating land use and transport planning offers clear benefits in reducing travel time and enhancing potential accessibility.
Key Highlights
• Feeder service planning is as important as MRTS planning and should be given suitable and visible weightage. • India is politically driven, good projects last because of strong political will and hence the way forward must capitalize on this

F. Round Table Discussion

Round Table 1 : Energy and Climate Change Issues with Sustainable Transport Strategies

The aim of this session was to explore strategies and approaches related to transportation, energy, and climate changes; climate goals in terms of energy security, investment, economics, and liveability; the role of institutional players in advancing fuels and vehicle technology, low-carbon cities, and more efficient goods movement; ways of communicating energy and climate challenges. The sub-themes for round table discussion were–low carbon mobility planning and inclusive growth strategies for sustainable mobility, and green freight management system, parking enforcement, bicycle & pedestrian infrastructure integration, etc.

Chairperson: Mr. Manfred Breithaupt, GIZ

Moderator: Mr. Debyendu Sengupta, EBTC

Rapporteur: Ankita Bhatnagar, UPES

Speaker Name	S No	Presentation Title
Mr.Manfred Breithaupt	1	Towards low carbon urban transport
Mr. Vedant Goyal	2	Case study : Green Freight India Program

Presentation Summary

Presentation 1

- The presentation highlighted the urgent need for change due to basic problems of traffic growth such as increasing carbon emissions, ambient local air pollution, safety impact, social exclusion to mention just a few.
- These aspects affect livability scale, i.e. the (high) quality of life for its citizens.
- Liveability is affected by the direct transport related factors (infrastructure, accessibility, quality of architecture, urban design, public transportation, public places, etc.) and other factors (safety / crime, schools & education, recreation, political stability, availability of goods / services, economic / business conditions). Vienna, for example, holds the first place as far as quality of living is concerned which can be attributed due to its public transport system that gives it an edge over other cities in economic, social and ecological parameters.
- Key is to avoid (carbon enhancing transportation modes), shift (to energy efficient modes) and improve (through technological advancement).

- Solution lies in enhancing public transport and secure better integration, using non-motorized transport, creating public spaces, through supportive land use policies and car restriction measures.

Presentation 2

- DHHL is a major logistics player while GIZ offers public transport consultancy keeping environmental sustainability as its focus area.
- The common focus area for both entities is developing a standardized monitoring mechanism for integrating low carbon footprints into the operational areas of DHHL through green freight mechanism and creating a carbon conscious society.
- The main values that this Go Green initiative promotes are transparency, efficiency, enthusing employees for a greener future, and creating value and leadership as a CSR strategy.
- With a timeline set till 2014, it has to be achieved through dialogue, technology transfer and defining a well-planned road map to deal with challenges such as fragmentation, reactive industry, and institutional framework and so on.

Key Highlights

- Adaptability of the envisioned roadmaps and initiatives in the Indian context.
- Creation of bicycle infrastructure, pedestrian pathways
- Increasing corridor capacity
- Importance of biofuels and renewable energy for driving transport system in future.
- Pricing issues related to biofuels, ethanol and alternate options
- Need of specific plans for large (Tokyo as a standard benchmark) as well as small cities (Copenhagen).
- Handling peak hour traffic and last mile connectivity
- Incentivisation for usage of carbon minimising transport modes

Round Table 2 : S-BRT A smart way to move

S – BRT is the next generation of smart transit that promises to provide alternative to private vehicles while being economically competitive. S BRT is the integration/ combination of traffic management control systems, which offer intelligent transportation technology platforms along with the benefits of BRT system which ensures reliable performance. BRT systems are being implemented in several Indian cities like Ahmedabad, Surat, Hubli-Dharwar and Rajkot. The potential of S-BRT technologies in India are enormous but challenging in terms of implementation. The focus of the discussion in this round table was on – the potential of S-BRT in Indian context, additional costs related with S-BRT, and whether smart technologies maximize ridership adequately by ensuring high quality and frequency of services.

Chairperson : Dr Sudhir Krishna, Secretary MoUD

Moderator: Prof Shivanand swamy, Executive Director, CEPT University

Rapporteur: Megha Kumar,TERI

Speaker Name	S No	Presentation Title
Prof Shivanand Swamy	1	"BRT in India: A new way to move"

Presentation Summary

Presentation 1

- Most Indian cities are characterized by dense city cores, with ring radial road network structure, leading to non-uniform travel demands.
- For such cities SBRT offers an attractive and effective mobility solution. SBRT means small or sustainable BRT systems and has the potential to provide a whole range of mobility solutions for different cities in India.
- These can serve not only as main line haul (Trunk) systems, but also as efficient feeder systems. A hierarchy of BRT systems can be developed in the form of Full BRT, BRT and Light BRT system.
- It is also desirable to develop more contextual and innovative BRT solutions, rather than relying solely on standard BRT designs.
- One of the neglected aspects in planning BRTS is the integration of BRTS with other modes, in terms of operational as well as design integration.

Key Highlights

- The SBRTS concept has the potential to offer solution to wide range of mobility needs in different Indian cities, as it can be employed not just as a trunk system but also as feeder

to high capacity system as well.

- Seamless integration of BRTS with other modes is required, especially facilitating walking and cycling
- To efficiently utilize the SBRT System, it would be important to evolve its design, planning and other technical parameters, more contextually, rather than following standards and set approach.

Round Table 3 : Cities operating bus services - How can financial viability be improved

Most public transport units in India have been suffering huge financial losses and are not able to recover even the operating cost from the fare box. Overall, persistent losses have been seen in the currently operating bus service systems, owing to increasing input costs (fuel, maintenance, etc.) and declining productivity. The problem is aggravated due to the waste of resources, avoidable and unnecessary vehicle operating costs, wasted time, and environmental degradation. Keeping in view the socio-economic conditions of the people, fares are also kept low as a measure of social equity. As a result, most public transport organizations are unable to recover their operating costs. Financial inefficiency has in fact, led to poorly operated systems. This compromise on the quality of the service that is offered. To address these issues, the session aimed to raise further consciousness on financial losses of urban bus public transport in India, the issues and challenges faced by the city governments in improving productivity of the city bus services and the potential solutions to address these problems.

Chairperson: Dr O.P. Agarwal, Senior Advisor, World Bank

Moderator: Mr Laghu Parashar, UMTC

Rapporteur: Debajeet barua, UMTC

Speaker Name	S No	Presentation Title
Laghu Parashar	1	Cities Operating Bus Services: How can their financial viability be improved?

Presentation Summary

Presentation 1

- Financial viability of city bus system is possible as shown by KSRTC in Bangalore.
- It is not essential that all public organisations operating buses suffer losses and that all private operators make profits.

Key Highlights

- It is possible to secure profits with appropriate institutional setup and decisive management frequency and reliability is very essential for passenger patronage
- Tumkur and Gulbarga are small towns where 50 buses each are operated and the organizations concerned reap profits (gross). Incentives given to drivers and conductors at end of each day, viz. percentage of daily profit. Sustainability of operations means that all present and future costs of the operations should be sustained by revenue generated.
- Costs should be controlled in order to be sustainable. Staff cost needs to be controlled and ways found to reduce manpower cost

- While cost per kilometre generally remains the same, the earnings per km vary immensely. Hence measures to increase revenue per km wherever possible should be planned, prepared and implemented as a continuing activity.
- Bus scheduling and planning is important to maximise earnings. Earnings from other possible sources should also be maximised.
- Major problems faced by operators are lack of infrastructure such as depots, bus stands and the running of parallel operations of other private services. That should be addressed on priority.
- Risk should not be laid entirely on private sector and should be apportioned equitably with the public STU also.
- Technology is not used effectively, GOS systems and ETMs are available but not used for improving operations
- Non-viable routes should be monitored and served; accordingly, route lengths should be pragmatically planned.
- Public transport should involve more private companies and responsibility le should be apportioned with the private sector also as public transport is a public good
- Taxes on public transport vehicles are minimized since buses pay more taxes than private vehicles. This is one factor for high operating cost.
- Targets should be set for non-fare revenue so that more impetus is given to generating resources from other sources
- Incentives are given to public transport users such as tax benefits, reimbursements etc.

Round Table 4 : IPT in Indian Cities

Auto rickshaws have emerged as a popular mode for daily travel especially in small and medium size cities. These form an essential part of passenger public transportation services offering faster, flexible, door-to-door and affordable services to commuters. These provide last mile connectivity between the public transport nodes and the final destination, and complement other formal modes like BRT, Metro, etc. Despite their vital role, these are often neglected and are not considered integral to overall mobility framework. It is realized that this IPT mode if integrated with other modes has the potential in meeting future mobility needs in a more efficient manner. Various strategies need to be explored to integrate it with other modes. The discussion in this round table focused on giving due recognition to auto rickshaws as a travel mode as well as a feeder system in our cities and identify strategies to integrate IPT into our general urban transportation system.

Chairperson: Mr S. Raghunathan, ex - Chief Secretary, Delhi Government

Moderator: Ms Anuradha Bhawani, Country Head, Shell Foundation

Rapporteur: Ms. Megha Kumar, TERI

Speaker Name	S No	Presentation Title
Mr Akshay Mani, Embarq	1	Role of Autorickshaws in India

Presentation Summary

Presentation 1

- Auto-rickshaws contribute to the economy as well towards meeting mobility needs of people in the Indian cities.
- The rapid growth of this sector and their increasing mode share in the Indian cities.
- Auto-rickshaws are not just an important last mile connectivity solution but also provide users an alternate mode choice for occasional trips.
- Various challenges are faced with this mode and these challenges were appreciated from the perspective of drivers, passengers and cities.
- Further, the presentation cited 'social entrepreneurship' as an opportunity for this sector, as it offered economic, social, and environment benefits.

Key Highlights

- Some of the major issues in this sector were identified as lack of clear policy regarding permit system, ambiguity surrounding the numbers of permits to be granted, lack of infrastructure etc.
- Social entrepreneurs can play an important role in transforming the auto-rickshaw

sector. Role of angel investors as important entities and the social entrepreneurial models developed, and the need to be base these on revenue generating models were discussed.

- They can play significant role in adding value to this transport service by organising the fleet, fixing the fares, providing on-demand services, etc. Such value additions would not just enhance the passenger convenience but will also help in reducing pollution (due to vehicle idling, lack of infrastructure, etc), and more importantly increase the income levels of auto-rickshaw drivers.

Round Table 5: Complete street design and access to public transport

Trips by walking and cycling account from a third to a half of all trips in Indian cities. Non-motorised modes are also essential means of access to public transport systems. For example, nearly 60 per cent of passengers on Ahmedabad's Janmarg system access stations by foot. As cities expand their investments in high quality public transport systems, it is essential to provide high quality pedestrian environments to facilitate passenger access. These investments will help improve safety for existing users and are essential for cities that wish to expand the appeal of these mass rapid transit systems to new users who presently rely on private vehicles. This roundtable was focused on covering themes based on audit methods for identifying infrastructure gaps and prioritising non-motorised transport improvements, creating suitably intricate network of pedestrian-friendly streets to reduce walking times through the understanding of a few case studies of successful passenger access planning processes in Indian cities and finally complete street design in the Indian context.

Chairperson: Mr Sanjeeb Mishra, DIR, MRTS

Moderator: Mr Christopher Kost, ITDP

Rapporteur: Mr Satyam Singh, UPSE

Speaker Name	S No	Presentation Title
Sandeep Gandhi	1	Walking and Cycling access to PT "Street Design Principles"
Adarsh Kapoor	2	Planning for multi modal Integration at Delhi Metro Station (Vikas Marg)
Anvita Arora	3	NMT as a component of inter modality case study of HMR
Sam Mohammad Khany	4	Urban Design for Pedestrian Safety and Comfort

Presentation Summary

Presentation 1

- Objective and responsibilities with respect to cycling as IPT and street design principles.
- Know Your Client, Know Your Context, Know Your Basics, Know Your Challenges, Limitations, Set Your Principles were derived as major requirements

Presentation 2

- Emphasis laid on street design guidelines
- UTTIPEC Checklist should be followed.
- Planning should consider stack parking and multifunctional zones (vendor zone, public utility and NMT Stand)

Presentation 3

- HMR is compounded with inter modality of NMT.
- To provide the last mile connectivity and to increase passenger catchment area.
- Planning: Developing indicator for accessibility, demand destination, planning by design, stake holder consideration.
- Positive effect on city and metro

Presentation 4

- Creating walkable communities is a vision, not a technical strategy.
- Creating spaces for people, small scale plaza and gardens free, beautiful and unobstructable walkways.
- Public space first than building. Do not start with density but program

Key Highlights

- Perception of security is against the comprehensive development.
- Proper walk paths and cycling tracks and their beautification is needed in India. For this the design should be under consideration from the initial stages of planning
- Architectural view of the plan should be considered.
- Beautification requirements of clients, users and/or beneficiaries should be under factored into consideration early enough.
- Spreading awareness for public transport instead of increasing demand catering the present demand.
- Understanding the priority of the user, development should give back to public. Comparison of vision to actuality is necessary and desirable.

Round Table 6: JNNURM cities (SLBMs) - Experience with benchmarking

Cities have been the recipients of funds under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) for projects aiming to improve urban transport. To evaluate the impact of these projects in improving urban transport in the cities, the Ministry of Urban Development (MoUD) had published the Service Level Benchmarks (SLBMs) in 2009 to help cities measure the improvements in their urban transport systems and benchmark the performance. SLBMs have been formulated in a manner that city specific performance parameters can be defined and monitored to assess improvements in the quality of urban transport. With work being done in 12 pilot cities, the discussion in this round table was focused on the issues related to implementation of SLBMs and the way forward.

Chairperson: Mr. B.I. Singal, Director General, IUT

Moderator: Mr. R.K Singh, Director, Urban Transport, MoUD

Rapporteur: Mr. Satyam Singh, UPSE

Speaker Name	S No	Presentation Title
Ms Sonia Arora, Urban Transport Expert	1	Experience with Benchmarking SLBMs
Prof. Swami	2	SLBM in Urban Transport for Indian Cities

Presentation Summary

Presentation 1

- Introduced 10 indicators in SLBMS which are Public Transport, Pedestrian Infrastructure facilities, NMT facilities, and Usage of ITS facilities, Travel Speed, Road Safety, Availability of Parking Spaces, Pollution Control, Land Use & Transport Integration, and Financial Sustainability of Public Transport.
- Benefits: Helps to assess the impacts, identify shortcomings, and guide for future years, track improvements, replicate the process. The methodology adopted in conducting the data collection, analysis and formulation of benchmarks was also discussed.

Presentation 2

- Objective of SLBMs: Bring out a methodology to collect, analyse and convert the data into benchmarks.
- Focus area of the presentation: are any additions or modifications necessary in the 10 already identified indicators.
- Suggestions: multi modal integration to be added, parking spaces to be made mandatory for cities, financial sustainability of urban transport in general to be more

focused,

- Is there a need for ranking the cities? How to integrate the assessments?

Key Highlights

- All 10 indicators are equally important so reducing them is not the right path to take. In fact adding more indicators in due course of time after observing and analyzing the effects of already implemented indicators and evaluating them in the coming years will continue to be necessary

  Need to make one department responsible to execute the process of data collection, its analysis and formulation of benchmarks, instead of giving the responsibility to 10 different departments. If necessary an institutional amendment to be made. Framework for implementation to be made.
- Need for proper enforcement of traffic rules and regulations

Round Table 7 : Difficulties in Enforcement

The main objective of traffic enforcement by the traffic police is to ensure safety on the roads by preventing road users from committing offences. The pressing problems faced by traffic police in India include out-dated methods used for traffic regulation. The budgetary allotment for this cause is little and the scarce resources allocated are not always used optimally. As a result, the methods/ strategies used by the traffic police over many years have not been able to effectively change road user behaviour. Enforcement is not a stand-alone activity. A systematic approach backed by information and engineering measures needs to be adopted for road safety and enforcement to prepare ourselves for the future and make traffic enforcement cost-effective. The focus of the discussions in this session was on the new and innovative methods that can be used by the traffic police for enforcement of traffic rules and regulation in cities.

Chairperson: Mr. Satyendra Garg, Jt CP (Traffic), New Delhi

Moderator: Dr. Vinay Maitri, Prof, SPA, New Delhi

Rapporteur: Mr. Debajeet Baura, UMTC

Summary

Discussion

- The participatory component of implementation, enforcement and interaction by the Delhi Traffic Police through social media such as Facebook and Twitter, connecting with more than 1.5 lakh citizens highlighted. Additionally, the introduction of awareness campaigns through audio-visual media was also highlighted.
- The Heads of Traffic Police from West Bengal and Madhya Pradesh also agreed on the success of interaction with the public through social media.
- The attendees further emphasized to increase the penalties on violators of traffic rules, such that it acts as a deterrent for others to refrain from doing so.
- Lack of funds and a separate traffic police department in various states and cities was highlighted which makes it difficult to bring in any reforms.
- It was also brought to the notice of the forum that the traffic police is not involved in planning and engineering exercises /decision making in many Indian cities, thus ignoring the wealth of day to day experiences of the traffic police that can be relied upon while defining development regulations.
- Dr. Vinay Maitri suggested the preparation and implementation of ITS for all cities as a holistic roadmap and not a piecemeal project. This further energized the discussion with students and other participants giving suggestions on developing an integrated

system linking the Unique Identification Number system 'Adhaar', Traffic Data, Planning Data etc.

- The discussion also emphasised the need to enlarge education and awareness programs right from school level onwards to inculcate traffic mannerisms into the general mobility behavior of the people. Students from SPA Bhopal, representatives from UMTC, IBM and FICCI participated actively.

Key Highlights

- Social media is a great platform to interact with people, with enforcement agency being made aware of public grievances. With constant follow-up, faith of the people strengthens.
- Inclusion of complete ITS with encompassing both MV as well as NMT besides basic procedures such as issuing challans etc.
- ITS does not deter interactions between citizens and the enforcement agency
- Road Users Act in the pipeline
- Rights of pedestrians and non-motorized modes to be safeguarded

Round Table 8 : Urban bus specification - the essentials

The present city buses (public or private) continue to suffer from poor brand image, mostly remain non-user friendly, continue to be poorly designed, unfit for physically challenged persons, are fuel inefficient, non-ITS enabled and low on passenger comfort. With the focus on having a responsive public transport and passenger friendly facilities, it is intended to lay down minimum recommended specifications across the country to facilitate introduction of ITS enabled modern city bus service in cities. Therefore, through this round table discussion, an effort was made to establish the essentials of urban bus specifications, such that the idea can be sold to the public as a branded product and people can take pride in travelling by public transport.

Chairperson: Shri Anjum Parwez, MD, BMTC

Moderator: Mr Laghu Parashar, Senior Manager, UMTC

Rapporteur: Mr. Jaskaran Singh, UPES

Speaker Name	S No	Presentation Title
Mr Laghu Parashar	1	Urban Bus Specifications -II

Presentation Summary

Presentation 1

- To ensure improved comfort of driver & passengers.
- The windows & doors are standardized. Adoption of shifting edge technology & improved fuel efficiency.
- New bus variants were introduced under urban bus specification such as: standard, midi & mini buses.
- Certain features in buses under urban bus service such as wide gangway, wide doors and rear view camera made mandatory.
- Automatic transmission also installed in buses which has made bus journey smooth & safer.
- Facilities to help physically challenged citizens incorporated & buses covered under NUTP-2006 will be equipped with automatic ramp & kneeling.
- Buses having higher acceleration are encouraged (0.8m/s2), having life of 12 years or 10 lakh kilometers (whichever is earlier).
- Attention is paid to air conditioning system of the buses & vehicle health monitoring displays are installed to help in better maintenance of the buses

Highlights:

- Introduction of buses on NUTP-2006 has increased the quality of buses to a great extent.
- Structures of buses are made robust to ensure the safety of passengers & driver as well.
- Low floor buses have really helped senior citizens, children and differently enabled people to use bus as a mode of transport.
- Employing new technologies in buses has made buses more user & environment friendly.
- Earlier the buses used to be largely the mode of transport of poor people. By employing new innovative technologies, buses are able to attract high class gentry as well.

Round Table 9 : Congestion Pricing

Tremendous rise in vehicle population in the Indian cities is leading to several traffic problems like traffic congestion, pollution, reduction in travel speeds, road accidents, etc. One of the effective solutions to addressing these problems is congestion pricing or imposing road usage charges on vehicles. Such measures have been employed in different cities across the world. The basic concept behind congestion pricing is to force private motor vehicle users to use public transportation facilities during peak hours, and thus promote modal shift from private vehicles to public transit and encourage users of private vehicles to travel by alternate routes. The discussions in this round table was focused on exploring the possibilities of implementing congestion pricing schemes in Indian cities, searching suitable models of implementation, assessing resource and capacity requirements for effective implementation, and the measures required for building positive public opinion.

Chairperson: Mr Mohinder Singh, Dean, LTA, Singapore

Moderator: Mr R.K. Singh, Director, MoUD

Rapporteur: Mr.Pranay Shrivatshava

Presentation Summary

- Solution for congestion is pricing for congestion
- Aggressively encourage the use of public transport in peak hours
- In Singapore, area licensing scheme is used. Earlier when electronic registration was not available, manual methods were used. E.g. the vehicle owners/riders had to purchase a paper license which had color coding depending on various parameters. Nowadays electronic payment mechanism is used with the help of prepaid smart cards as the ones used in the DMRC.
- Benefits: Varied rates at different times; easy to pay the tax/toll as well as to receive the price; lower the congestion
- 4 types of systems such cordon an area, city system, area wide and corridor system which are identified for the congestion pricing
- Major issues : acceptability, technology availability and infrastructure required
- These measures are not for profitability, but to reduce congestion.
- For congestion pricing to be implemented:
    1. Extensive and sustained awareness drives should be undertaken to bring about acceptability among the people
    2. Public transport should be excellent
    3. Private Sector Companies can be incentivized for promoting awareness

4. Parking charges de incentives
Highlights: • In India congestion pricing is the need of the hour as all the major cities as well as city centers are overcrowded. • Development of infrastructure facilities takes time and by the time it is developed, congestion increases exponentially. There is no cause to further delay the implementation of congestion pricing. • It needs to be implemented and enforced right away. This could reduce the vehicular and traffic congestion in these cities considerably.

Round Table 1 0 : Low-carbon Comprehensive Mobility Plans (LCMP)- Sustainable mobility with lower carbon emissions

Under the project - "Promoting Low Carbon Transport in India' two main interventions, namely, development of a transport action plan at national level and, low carbon comprehensive mobility plans for up to four cities have been proposed. A methodology for preparing low-carbon comprehensive mobility plans (LCMP) for cities, which seeks to align development vision, economic growth, inclusiveness and climate agenda is being currently applied in Visakhapatnam, Rajkot and Udaipur. The Ministry of Urban Development (MoUD) facilitates and guides the project for the LCMP part by i) providing inputs into the methodology for developing LCMP, ii) advising in alignment of LCMP within the cities to make these compatible with the JNNURM funding requirements and iii) dissemination of the LCMP methodology, being tested in Visakhapatnam, Rajkot and Udaipur for wider dissemination and implementation by other cities in India. The discussion in this session focused on the experiences of project cities like Vishakhapatnam and Rajkot and also discussed the experiences of other cities which have implemented CMPs.

Chairperson: Mr B.I. Singal, Director General, IUT

Moderator: Mr Subhash Dhar, Senior Economist, UNEP Risoe

Rapporteur: Mr. Vedant, GIZ

Presentation Summary

- The project is all about how the city is focused towards low carbon emissions. However national level issues like Co2, vehicle technologies are covered.
- Case studies focused on fuel efficiency of vehicles and parameters and then identified different indicators for low carbon mobility plan.
- Three cities Rajkot, Udaipur and Vizag are covered under the project.
- Methodology- primary surveys conducted at Rajkot and Vizag, scenario analysis is based on business as usual and low carbon interventions. All results of analysis should then be related to requirement of that particular indicator in the city and followed by policy intervention through stakeholder consultations.
- 5 key levels are identified to reduce carbon levels which are sustainable mobility, sustainable logistics, and fuel economy, bio- fuels, EVs and electricity cleaning.
- Institutional mechanism required for ILUT.

Key Highlights

- Difference between CMP approach and LCMP approach.
- Institutional mechanism – need of strong and efficient institutional framework has been realized. To be incorporated in 12th five year plan

- Planning skills lacking - in India.
- Initiatives by IUT in association with UNDP have already commenced in the form of capacity building workshops.

Round Table 1 1 : Cities Developing Metro Rail – Access and Feeder Services

With the increasing focus on mass transit systems, a number of class-I cities in India are exploring the feasibility of introducing metro rail as a high capacity mass transit system. Cities like Delhi, Mumbai, Bangalore, Kolkata, Chennai, Hyderabad, Kochi, etc. are currently at different stages of t developing metro rail systems. A large scale mass transit system like metro rail has to be accessible to the commuters. This implies that metro stations should either be at walkable distance from homes/workplaces or connected by efficient and frequent feeder services. Expansion of metro influence zone beyond walking distance has to essentially rely on an efficient feeder system. Informal transport modes like mini-buses shared autos; cycle rickshaws can play a major role in providing the last-mile connectivity at important transit locations and meet the door-to-door mobility needs of citizens. At this round table deliberatons focused on seeking solutions for planning, designing and financing the appropriate models of feeder services for mass transit systems like the metro rail.

Chairperson: Mr K.K. Sharma, Advisor Chandigarh

Moderator: Dr Geetam Tiwari,Professor, IIT Delh

Rapporteur: Mr Arun C Mohan, UPES

Speaker Name	S No	Presentation Title
Dr. Geetam Tiwari	1	Public Transport Accessibility feeder to metro/BRT including the whole public transport accessibility

Presentation Summary

- When Short Trips are considered (3kms)
  1. Bicycles are the fastest, and then comes BRT and Metro at last because additional time is consumed due to interchanges, waiting, security checks, etc.
  2. Public Transport is all about access.
- When long Trips are considered (12kms)
  1. Metro is faster than BRT
  2. Metros should be complemented by road services.
- According to a survey done by DMRC
  1. Walking dominates all other feeder modes, followed by cycle-rickshaw and thereafter by auto-rickshaw, buses, cars, etc.
  2. All major feeder modes should be taken care of.
- Pedestrians tend to take surface crossings even though subways, over bridges, are provided - such behavior increases the potential for more accidents to occur. They prefer surface crossings. Better such preferences be taken into consideration and given

adequate priority during planning, rather than going in for new subways and /or over bridges to which there is generally pedestrian resistance.

- Road based systems in India are closed systems. They need to be made open systems as they will be attractive for short trips.
- Safety: Crossings to be given more importance. Reduce waiting time, and providing colorful and elevated crossings should be encouraged.
- There should be integrated plans when it comes to Urban Planning.
- Different agencies plan differently. An authority should be constituted which oversees the planning and implementation.
- Multi modal planning, coupling NMT with Metro is a necessity.
- Fares of feeder services are way higher than the metro fares. This has to be taken into account and dealt with.

Key Highlights

- Need for auditing of usage of private users in parking, as also total road spaces, footpath spaces.
- Collaboration of Urban Planners, Civil Engineers and Architects and Capacity building of junior levels is necessary and desirable.
- Need for city guidelines & single agency.
- Priority towards NMT and decided preference towards pedestrians is inescapable in the planning and implementation of urban mass transport system.
- Aggressive and sustained advertising of bicycle usage has to be undertaken and urban planners would do well to integrate both entities from the initial stages itself. Make metros the life lines and NMT & BRT the arteries.
- Capacity Building at all levels should be mandatory as well as implementing powers should be given to them. Making the surroundings of metro stations accessible for everyone should be made mandatory. And it should be enforced without fail.

Round Table 1 2 : Hill cities - Planning for urban mobility in Hill cities

The hillside city topographies are rugged and ecologically sensitive. Planning for hill cities require different approaches as these have geographical constraints like steep slopes, landslides, etc. Hill cities are characterized by narrow roads, linear corridor, and absence of public transport and scarcity of level land. The discussions in this round table had provided alternatives to vehicular mobility and the need to explore options for providing mobility services through rope ways/ cable cars/ gondolas, lifts etc. in hill cities.

Chairperson: Mr. H. K. Sharma, MD, Kolkata Metro Railway

Moderator: Mr H.K. Gupta, DM (Traffic), HSRTC

Rapporteur: Mr Pranay Srivastava, UPES

Presentation Summary

- Issues in mobility- geological constraints, steep slopes, landslides, hill development area, linked right of way, scale and size of vehicles.
- Public transits system like ropeways, BRT, Mini buses and taxies acting as major modes. Parking is also a very serious issue - due to paucity of land.
- Vertical mobility like elevator, escalators can be considered.
- Road network need be improved to minimize driver fatigue – buses with automatic transmission should be preferred.
- Use of chair type cable car can be introduced. Green transport infrastructure can be improved to discourage personal vehicles.
- PRT can be introduced in hill towns.

Key Highlights

- Before planning for transport in hills all available options should be looked upon for sustainable mobility.
- Transport infrastructure should be planned taking in consideration like ease of movement, environment friendly, safety etc.
- There is need to explore and identify new and improved methods that can cater to the need of urban hill station transport/commutation requirements.
- The new methods (such as ropeways, cycling/electronic bike, PRT, Mini buses, Shared cabs) should be designed with the perception and comfort of the local citizens and tourists as well.


nference & Expo 2012
Smart Mobility
December 5-8, 2012, New Delhi
MODERATOR

G. Valedictory & Closing Session

The valedictory function was graced by the Hon'ble Union Minister for Urban Development, Shri. Kamal Nath. Delivering the valedictory address, Shri. Kamal Nath, stated that India was preparing for massive urban transformation. The new growth story in India is about the growth of cities as more than half of the global population resides in cities. As India with 1.2 billion people begins to urbanize rapidly, - with a young mobile population of which over 30 per cent are in cities already - urban renewal and development has to become the policy priority of the Government of India. Acknowledging the current contribution to the national GDP by the urban population that is already of the order of more than 60 per cent of the national population and expected to reach 70 per cent soon, the minister stated that India is committed to building cities of hope and happiness that are livable, clean, energy efficient, and sustainable. While expressing concern over growing motorization, which is causing increasingly, avoidably more pollution, as also use of limited energy resources and high road fatalities and injuries as well, he urged the necessity for a concrete blueprint of planning and implementation to minimize with sense of urgency and further prevent the irreversible trend towards unsustainable cities. The minister also urged the need to include the poor in the urban and transportation planning in order to reduce and decrease the magnitude of social and economic impact of pollution and climate change in cities. While sharing the financing need for India's urban transport sector - more than US$20 billion per year for the next twenty years - he iterated the need to focus on innovative fiscal policies such as land monetization along high capacity mass transit corridors, transport tax and parking reforms (linking parking charges to the value of the land), and other tax reforms to meet the growing investment demand in this sector. The NUTP of India focuses on the mobility needs of the people, equity, integrated land-use and transport planning, cycling, and walking. In order to facilitate public transport in mega-cities on high demand corridors, the Ministry has taken up metro rail projects in several major cities of India with a model of 50-50 ownership of and cost sharing between the central and state government. Several BRT projects in major Indian cities have also been taken up under JNNURM. Along with the 12th Five-Year Plan, India is also finalizing the National Habitat Standards (NHS) to guide investment and planning of urban transport. Steps will also be initiated for benchmarking of

urban transport in various cities in accordance with Standard Service-Level Benchmarks adopted by the Ministry in 2009.

The salient features, content and outcomes of the proceedings of the UMI 12 were also presented at the valedictory. This was followed by the launch of the theme for UMI 13. The theme for the next conference titled "Transforming Cities with Transportation" was presented to the gathering. A host of sub themes were presented which included, inclusivity in transport, transit oriented development, ecomobility in cities, non-motorized mobility and health, intelligent transport systems, freight management, transport governance, buses for all, rapid transit systems, tourist mobility management, feeder planning, transport and urban environment, managing travel demand, safety and security, innovative transport planning, parking demand management, policy and enforcement. The valedictory concluded with the presentation of the first flyer for UMI 13 to the audience.

Hon'ble Union Minister for Urban Development Shri. Kamal Nath with other eminent panellists

ANNEXURE I: Detailed Conference Programme

Urban Mobility India Conference cum Exhibition 2012 - Program

Theme – "Smart Mobility"

DAY 1 (5th December 2012) – Research Symposium

08:00 Onwards	Registration
9:00 – 9:40 OPENING SESSION	
09:00 – 09:05	Welcome Address by Shri. S.K. Lohia, OSD(UT) and ex-officio Joint Secretary, MoUD
09:05 – 09:10	Introduction to the Symposium - Dr. Lelitha Vanajakshi, IIT Madras
09:10 - 09:25	Keynote address by Dr. P. K. Sikdar, President, ICT Pvt. Ltd. and Former Director, CRRI
09:25 – 09:40	Inaugural Address by Dr. Sudhir Krishna, Secretary, MoUD
PLENARY SESSION: Research in urban transport in India - Which way?(09:45 to 10:25) Introductions : Dr. Gitakrishnan Ramadurai, IIT Madras	
09:45 – 10:05	Dr. Gitakrishnan Ramadurai, IIT Madras
10:05 – 10:25	Dr. Sanjay Gupta, Professor, SPA, New Delhi
10:25 – 10:45	**Tea & Poster Session**
ORAL SESSIONS (10:45 – 12:45)	
Session 1: Transportation Planning Session Chair: Dr. P. K. Sikdar, President, ICT Pvt. Ltd. and former Director, CRRI	**Session 2:** Public transport Session Chair: Prof. K. Gunasekaran, Anna University
• Community Based Neighbourhood Accessibility Planning: A Case Of Malleshwaram, Bangalore - Sneha Rapur, Sylvia Prakash • Mode Choice Behavior Of Urban Dwellers For Commute To Work - Sreela, Jijin, Anjaneyalu • What Is A Compact City? How Could It Be Measured? - Madhu Singh, H.M. Shivanand Swamy	• Barriers In Fare Integration Of Public Transport Systems – Vijayshree Pednekar, H. M. Shivanand Swamy • A Composite Index to Measure the Perceived Inadequacy of Public Transportation For A Residential Area In Jaipur - Krishna N. S. Behara, Shriniwas S. Arkatkar, Ashoke K. Sarkar • Performance Evaluation Of City Bus Services For Tier-II Cities -

• Spatial Analysis Of Road Transport System - Sreelekha. M. G., K. Krishnamurthy, Anjaneyulu MVLR • Joint Models For Analysis Of Household Trip Frequency And Vehicle Presence In Chennai City - G. Viswanath, Karthik K. Srinivasan • Demand Responsive Scheduling: A Methodology For Optimization Public Transport Operations – Sameep Arora, Prashant Bachu • Case Study Of The Auto-Rickshaw Sector In Mumbai - Emma Shlaes, Akshay Mani	Sreelakshmi R Pillai, N. Nawaz • Coordinating City-Wide Multi-Modal Transit Services In Mumbai - Rahul Nair, Fabio Pinelli, Francesco Calabrese • Enhancement Of Transit Ridership– A Case Study On Delhi Metro - S R S Sirisha, A K Sharma • A Review Of Bus Route Network Design Procedures Using Multi-Objective Evolutionary Algorithms - S. M. Hassan Mahdavi, K. Ramachandra Rao, Geetam Tiwari • Optimization Of Hyderabad Bus Network Using VISUM - Jayatheja A, Prasad CSRK, Markus Sator
12:45 – 14:00	**Lunch & Poster Session**
ORAL SESSIONS (14:00 – 16:00)	
Session 3: ITS and Simulation Session Chair: Prof. Anjaneyalu, MVLR	**Session 4:** Sustainable Transportation Session Chair: Prof. Shivanand Swamy
• Corridor Improvements Using VISSIM Microscopic Simulation Tool - Ram Kumar, Prasad CSRK, Reith • Evaluation And Application Of Image Processing Sensors Under Indian Conditions - Jithin Raj, Sunny Raja Varma, Ramesh, V., LelithaVanajakshi • Estimating Traffic Congestion and Level Of Service On Urban Roads Using GPS Data - Satyakumar. M, Anil. R, and Shehna Basheer • Performance Comparison Of A Radar Based Traffic Sensor – Smart sensor Hd For Indian And American Traffic Conditions - Ramesh, V., Jithin Raj, LelithaVanajakshi, Shuo Wang, Anuj Sharma, Laurence Rilett • Design Of Vehicle Actuated Signal For A Major Corridor In Chennai Using	• Organizing The Role Of The Intermediate Public Transport (IPT) Sector: Focus On Autorickshaw Services –Taralshukla, Manjiri Akalkotkar • Urban Walkability: The Urban Design Contribution - Anne Matan, Peter Newman • Safety Evaluation Of An Uncontrolled Intersection Using Surrogate Safety Measures - P. Vedagiri, S.ShekharBabu • Environmentally Sustainable Transport Performance Index For Residential Neighbourhoods - Megha Kumar, Sanjay Gupta • Car Restraint Policies For Mega-Cities, Case Study – Delhi –Megha Aggarwal, Sanjay Gupta

Simulation - S.Nithya, D.Senthurkumar, R.Nithyanandhan, K.Gunasekaran • Flow Characteristics Of Heterogeneous Traffic With And Without Adherence To Lane Following - G. Sarishka, A. Gowri, R. Sivanandan • Advanced Traveller Information Systems Qualitative Display Of Level Of Congestion Under Indian Conditions - SaiVikas; Pavitra Tejaswi; Rini J G; Prabhas; Varaprasad	• Sustainable Approach In Vehicle Routing For Regional Solid Waste Transport System: MMR, A Case Study - G. S. Sasane, S. L. Dhingra, P. Vedagiri
16:00 – 16:30	**Tea & Poster Session**

PANEL DISCUSSION - AGENDA FOR RESEARCH IN URBAN TRANSPORT IN INDIA (16:30 – 17:25)

Moderator: Sri. R. K. Singh, MoUD

16:30 – 16:45	Dr. Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, NY, USA
16:45 – 16:50	Sri. Tara Shankar, Dept. of Elec. and Info. Tech. (DeitY), GoI
16:50 – 16:55	Dr. S. Gangopadhyay, Central Road Research Institute (CRRI)
16:55 – 17:30	Discussion
17:30 – 17:35	Conclusion - Dr. R. Sivanandan, IIT Madras
17:35 - 17:40	Vote of Thanks - Ms.Kanika Kalra, Institute of Urban Transport (IUT)

DAY 2 (6th December 2012)

09:30 – 12:00 INAUGURAL SESSION	
09:30 – 09:35	Welcome Remarks by Shri S.K. Lohia, OSD(UT) and ex-officio Joint Secretary, Ministry of Urban Development, Govt. of India
09:35 – 09:45	Address by Dr Sudhir Krishna, Secretary, MoUD

09:45 – 09:55	Release of manuals, booklets for Urban transport
09:55 – 10:10	Key note address; Ms. Susan Kurland, Assistant Secretary for Aviation and International Affairs, US
10:10 – 10:20	Special Address: Dr R. K. Pachauri, Director General, TERI
10:20 – 10:35	Inaugural address : Shri Ajay Maken, Honorable Minister for Housing and Poverty Alleviation
10:35 – 10:50	Key Note address; Shri A.P. Mishra, Member Engineering, Railway Board
10:50 – 11:05	Key Note address; Shri A.K. Upadhyay, Secretary, Ministry of Road Transport and Highways
11:05 – 11: 10	Vote of thanks – Mr R. K. Singh, Director (UT)
11:10 – 12:00	**Opening of the exhibition by Honorable Minister for Housing and Poverty Alleviation& Tea/Coffee Break**
PLENARY SESSION 1 - Role of Ministry of Railways; Suburban, Regional and Metro rail (12:00– 13:30) Chairman: Shri A.P. Mishra, Member Engineering, Railway Board Co-chair: Shri Kul Bhushan, Member Electrical, Railway Board Rapporteur: Mr Durga Prasad Sunku, Asst. Manager, UMTC	
12:00 – 12:10	Rakesh Saksena, MD, Mumbai Railway Vikas Corporation
12:10 – 12:20	Ms Jayaseelan, Member Secretary, NCRPB
12:20 – 12:30	Mr N.K. Kumar, Chief General Manager (PF), Chennai Metro
12:30 – 13:30	Discussion
13:30 – 15:00	**Lunch**

PARALLEL SESSIONS (15:00 – 16:30)

Session IA: Institutional Development Chairman: Dr. Ramachandran, Ex Secretary (MoUD), GoI Rapporteur: Ms Ishita Chauhan,	**Session 1B: Financing** Chairman: O.P.Aggarwal Co-chair: Mr R. Mandal, CEO, Srei Advisory	**Round Table 1: Energy and Climate Change Issues with sustainable Transport Strategies** Chairman: Mr Manfred Breithauft, GIZ Moderator: Mr Dibyendu Sengupta,	**Round Table 2: S-BRT A smart way to move** Chairman: Mr Sudhir Krishna, Secretary (UD), MoUD Moderator: Prof. Shivanand Swamy,

Research Development Officer, IUT	Rapporteur: Mr Hemant Chaurasia, Senior Officer, UMTC	EBTC Rapporteur: Ankita Sharma, UPES	Executive Director, CEPT University Rapporteur: Ms Megha Kumar, TERI
Experience with UMTA under Legislation – K. Dhananjaya Reddy, Additional Commissioner (Planning), Greater Hyderabad Municipal Corporation	Resource Generation Policy – Mr O.P. Agarwal, Senior Advisor, World Bank		
Experience with UMTA under Executive Order – Ms Manjula, Commissioner, DULTA	TOD as a financing tool - Prof. Peter Newman, Professor of Sustainability, Curtin University, Australia		
Institutional Development of KOTI – Mr Choong Yeol (Peter) Ye, Vice President for Planning & Administration, The Korea Transport Institute	Financing model for Buses - Mr P. G. Chandramohan, Special Director (Pricing & PCE), Ashok Leyland and R.N.Rao, Ashok Leyland		
Q&A / Open Discussion	Q&A / Open Discussion		
16:30 – 17:00	**Tea/Coffee Break**		
PARALLEL SESSIONS (17:00 – 18:30)			
Session 2A: Parking Chairman: Shri Praveen Kumar Tripathi, Chief Secretary, GNCTD Rapporteur: Ms Seema Singh, TERI	**Session 2B: Improving Urban Road Safety** Chairman : Prof. (Dr.) P.K. Sarkar, Professor, SPA, New Delhi Rapporteur: Mr Jaskaran Singh Soni, UPES	**Round Table 3: Cities operating bus services - How can financial viability be improved** Chairman: Mr.O.P. Agarwal, Senior Advisor, World Bank Moderator: Mr Laghu Prashar, UMTC Rapporteur: Mr Debajeet Barua, Asst. Manager, UMTC	**Round Table 4: IPT in Indian Cities** Chairman: Mr S. Raghunathan, ex-Chief Secretary, GNCTD Moderator: Ms Anuradha Bhawani, Country Head, Shell Foundation Rapporteur: Ms. Megha Kumar, TERI
Parking Policy – Case Study Delhi – Ms Anumita Roychowdhury, Executive Director, Policy Research & Advocacy, Centre for Science and Environment, New Delhi	Design of Urban Roads to improve Road Safety - Prof. Geetam Tiwari, IIT Delhi		
Europe's Parking U-turn – Ms	Problems in Implementation to		

Shreya Gadepalli, Regional Director, Institute for Transportation and Development Policy (ITDP)	Ensure Road Safety - Mr Satyendra Garg, Jt.CP (Traffic), New Delhi		
Mechanized Parking - Mr. Pranav Poddar, Suvidha Parklift, India	Developing Road Safety Policy for Road Engineering Departments– Dr. S.M. Sarin, Former Director, CRRI, India		
Q&A / Open Discussion	Q&A / Open Discussion		
19:35 onwards	**Welcome Reception hosted by Hon'ble Minister of State (Urban Development)**		

Day 3 (7th December 2012)

PARALLEL SESSIONS (09:30 – 11:00)			
Session 3A: Mass Transit Systems – Technology Chairman: Mr Satish Kumar, Director, DMRC Co-Chair: Ms. Christine Bost, Mayor, Eyzne, France Rapporteur: Ms Megha Kumar, TERI	**Session 3B: Use of New Technologies to Mitigate the Impact from Transport Related Air and Noise Pollution** Chairman: Dr. S. Gangopadhyay, Director, CRRI Co-chair: Ms Anumita Roychowdhury Rapporteur: Mr Dibendhu Senguptha, EBTC	**Round Table 5: Complete street design and access to public transport** Chairman: Mr Sanjeeb Mishra, DIR, MRTS Moderator: Mr Christopher Kost, , Institute for Transportation and Development Policy (ITDP) Rapporteur: Mr Satyam Singh, UPSE	**Round Table 6: JNNURM cities (SLBMs) - Experience with benchmarking** Chairman: Mr R.K. Singh, Director (UT), MoUD Moderator: Prof.Shivanand Swamy, Associate DIrector, CEPT Rapporteur: Ms Anindita Ghosh, Transport Planner, IUT
Mono Rail as a public transport system - Mr C.V. Kamesh, General Manager, Hitachi	General Motors Powertrain Europe - Mr. Stefano Caprio, Global Chief Engineer and Program Manager SDE & xSDE, M Powertrain, Europe		

Tramway revival in France and perspective for India – Ms Samira Israne, Public Affairs Manager for India & Oceania, Directorate for European and International Affairs, France	Online traffic forecast to support real-time pollution management: methodologies and experiences – Mr Lorenzo Meschini, CEO, SISTeMA srl		
The Evolution of Real-Time Information Systems and other Technologies in Global Rail and Metro Projects – Ms Anna Marie D. Kristensen, The Business Innovator / Challenger, Luminator Technology Group	Reducing the Environmental Impact of Public Transport: the case for Optimizing Operations– Mr Hugo Marques Dias, Business Developer, SISCOG - Sistemas Cognitivos, Portugal		
	Towards a Green and Sustainable Transportation System: The scientific involvement of Politecnio di Torino - Dr. Giovanni Cipolla, Development & Engineering Center for Energy in Torino (DECET) President & GM-PoliTo Institute for Automotive Research & Education (IARE) Director Torino, Italy		
	Technological trends for better impact of transport on environment - Dr. Jaafar Gaber		
	Impacts on pollution reduction		

	through traffic forecast, monitoring and control- Mr. Fabrizio Arneodo, Head of R&D Department, 5T (Italy)		
	Environmental impact of transport: greenhouse gases, noise and local air quality- Mr. Nicolas Duchene, envisa		
Q&A / Open Discussion	Q&A / Open Discussion		
11:00 – 11:30	**Tea/Coffee Break**		
Plenary Session 2 - Code for urban roads (11:30 – 13:00) Chairman: Mr Patankar, Regional Director (Roads) Co-chair: Dr D.P. Gupta Rapporteur: Ms Deepti Jain, IIT Delhi			
11:30 – 11:40	Shri. Ashok Bhattacharjee, Director (Planning), Member Secretary/ UTTIPEC		
11:40 – 11:50	Dr Dinesh Mohan, IIT Delhi		
11:50 – 12:00	Dr L.R. Kadyali,		
12:10 – 13:00	Discussion		
13:00 – 14:30	**Lunch**		
PARALLEL SESSIONS (14:30 – 16:00)			
Session 4A: Mass Transit Systems	**Session 4B: Travel Demand Management**	**Round Table 7: Difficulties in Enforcement** Chairman –Mr Satyendra Garg, Jt CP	**Round Table 8: Urban bus specification - the essentials** Chairman - Shri Anjum Parwez,MD,

Chairman: Shri G.P. Garg, Senior Advisor, UMTC Rapporteur: Mr Debajeet Barua, Assistant Manager, UMTC	Chairman: K. Phanindra Reddy, IAS Co-chair: Prof. Seva Ram, Head Of Department (Transport Planning), SPA, New Delhi Rapporteur: Ms Megha Kumar, TERI	(Traffic), New Delhi Moderator: Dr Vinay Maitri, Prof, SPA, New Delhi Rapporteur: Ms Swati Khanna, Assistant Manager, UMTC	BMTC Moderator: Mr Laghu Parashar, Senior Manager, UMTC Rapporteur: Mr Durga Prasad Sunku, Asst. Manager, UMTC
Planning and Scheduling Solutions for Public Transport Operations Optimization In the Indian context - Mr. Herve Beaudet, CEO Asia, Lumiplan	Road Pricing in Urban Areas – Experience of Western Europe – Mr Arvind Kumar, Advisor,Ministry of Transport & Highways, GoI		
Precautions/ steps to be taken to ensure timely completion of large infrastructure projects – Learnings from Delhi - Shri. Jitendra Tyagi, Director (Works), DMRC	TDM - Singapore Case Study – Mr Mohinder Singh, Dean, LTA, Singapore		
Public Transport: Accessible and Inclusive for Disabled and the Elderly - Anjlee Agarwal, Executive Director & Access Consultant, Samarthyam	Mega Urban Transport Project for the Greater Paris - Dr Jean-Pierre Deghaye, Administrator, CODATU		
Q&A / Open Discussion	Q&A / Open Discussion		
16:00 – 16:30	**Tea/Coffee Break**		
PARALLEL SESSIONS (16:30 – 18:00)			

Session 5A: Public Bus Transport Chairman: Mr S.K. Jagdhari, Vice President, IUT Rapporteur: Mr Sandip Sinha, UPES	**Session 5B: TOD** Chairman: Dr PS Rana, Patron, IUT Co-chair: Mr.Rajiv Malodra, Chief regional planner, NCR planning Board Rapporteur: Mr.Satyam , UPES	**Round Table 9: Congestion Pricing** Chairman: Mr Mohinder Singh, Dean LTA Moderator: Mr R.K. Singh, Director, MoUD Rapporteur: Mr Hemant Chaurasia, Senior Officer, UMTC	**Round Table 10: Low-carbon Comprehensive Mobility Plans (LCMP)- Sustainable mobility with lower carbon emissions** Chairman: Mr B.I. Singal, Director General, IUT Moderator: Mr Subhash Dhar, Senior Economist, UNEP Risoe Rapporteur: Mr Vedant, GIZ
Viable City Bus in Small Cities - Mr N Manjunath Prasad, MD, KSRTC	Assessment of innovative options for developing financially sustainable Urban Mass Transport Systems in India - Amber Dubey, Partner & Head-North India Infrastructure Advisory, KPMG		
Bus Karo + - Mr. Amit Bhatt, Strategy Head, Embarq, India	Financing Transit Oriented Development in India - Dr. Adnan Rahman, Director, International Division, Cambridge Systematics		
	Transit Oriented Development (TOD) - Study for Existing Metro Corridor between Chattarpur to Arjangarh of Delhi Metro Project of Phase II - Mr. Martin Kelly, Principal Land Planning, Urban Design and Environmental Specialist and Harshita Sharma, Transport modeller, Capita Symonds		
Q&A / Open Discussion	Q&A / Open Discussion		

20:00 onwards	**Dinner**

Day 4 (8th December 2012)

PARALLEL SESSIONS (09:30 – 11:00)			
Session 6A: Eco-mobility in Cities Chairman: Dr. Sudhir Krishna, Secretary, MoUD Co-chair: Shri. I P Gautam Pr.Secretary(UD), Gujarat Rapporteur: Ms Laasya Bhaqvatula, ICLE,I South Asia	**Session 6B: Fuel technologies – State of Practice and advancement in India and learning's from EU** Chairman: Mr S. Raghunathan, Ex Chief Secretary, Delhi Co-chair: Mr K.K. Gandhi, Executive Director (Technical), SIAM Rapporteur: Mr Dibendhu Senguptha, EBTC	**Round Table 11: Cities Developing Metro Rail – Access and Feeder Services** Chairman: Mr K.K. Sharma, Advisor Chandigarh (TBC) Moderator: Dr Geetam Tiwari, Professor, IIT Delhi Rapporteur: Mr Arun C Mohan, UPES	**Round Table 12: Planning for urban mobility in Hill cities** Chairman: Mr.H.K.Sharma, MD ,Kolkata Metro Railway Moderator: Mr H.K. Gupta, DM (Traffic), HSRTC Rapporteur: Mr Pranay Srivastava, UPES
Ecomobility vision, approach and roadmap - City of Changwon - Mr. Kim, Director for the EcoMobility Division, City of Changwon, Korea	NCG , Biofuel & other clean Technolgies from Torino Piemonte Italy– Mr Marzio Bianchi, a Senior Technical Consultant, CEIPIEMONTE		
Eco-mobility as a precondition for liveable cities – Manfred Breithauft, GIZ	Emerging Technical Developments in Cellulosic Feedstock and Liquid Biofuels- Jai Upalla		
Accessibility to Jobs for the Urban Poor - A case study of Ahmedabad – Mr Talat Munshi, Associate Professor, CEPT University	Development of Alternative Fuel Engines - Prof. L. M. Das, Professor, IIT Delhi		

Are Cities in India ready for Sustainable Transportation Initiatives: a focus on NMT – Department of Heavy Industries, MoHI & PE, GoI			
Q&A / Open Discussion	Q&A / Open Discussion		

11:00 – 11:30	**Tea/Coffee Break**
Plenary Session 3 - Smart cities and ITS (11:30 – 13:00) Chairman: Mr Arun Maira, Member, Planning Commission Rapporteur: Ms Swati Khanna, Assistant Manager, UMTC	
11:30 – 11:40	Mr Tilak Raj Seth, SEIMENS
11:40– 11:50	Mr C.N. Raghupathi, VP and Head India business, INFOSYS
11:50– 12:00	Mr.Dhamodaran Ramakrishnan, Director, Smarter Planet Solutions, IBM
12:00 – 13:00	Discussion
VALEDICTORY SESSION (13:00 – 13:30)	
13:00 – 13:15	Presentation of the summary of proceedings of the Conference – Ms Ishita Chauhan, Research Development Officer, IUT
13:15 – 13:25	Valedictory Address by Shri Kamal Nath, Hon'ble Minister for Urban Development
13:25 – 13:30	Launch of UMI 2013 and Vote of Thanks by Shri B.I. Singal, Director General, Institute of Urban Transport (India)
13:30 – 15:00	**Closing Lunch**

ANNEXURE II: List of Organizing Committee Members

S.No.	Name
1	Shri S.K.Lohia, Chairman, OC
2	Shri R.K.Singh, Dir (UT)
3	Shri S.K.Jagdhari, Vice President,IUT
4	Shri Gangopadhyay, Vice President, IUT
5	Shri Vinay Maitri, Hon. Joint Secretary, IUT
6	Shri K. Ravindra Hon. Secy, IUT
7	Shri Rakesh Kaul, Hon, Treasurer,IUT
8	Shri R.Srinivas, TCPO
9	Shri M.L.Chotani, Member
10	Ms. Sonia Arora, IUT, ember
11	Ms. Kanika Kalra, IUT, Member
12	Shri Sandeep Sharma, IUT, Member
13	Shri C.L.Kaul, Executive Secretary, IUT
14	Ms. Romi Roy, UTTIPEC, Member
15	Shri Rajiv Choudhary, Member

ANNEXURE III: List of Exhibitors

S. No.	Name of Company	Items Displayed
1	Sunovatech India	VISSUM & VISSIM Software
2	Y&H E&C	GPS Equipment of various kinds
3	IUT	Publications
4	CIDCO	Projects displayed electronically (by video)
5	Volvo	New Bus technologies
6	Masstrans	Electronic ticket machine and card reader displayed
7	Kerberon Automations	Information on Bicycle sharing scheme
8	Traffic Infratech (VIS)	Publications
9	DMRC	Route maps, Brochures, phasing chart
10	Ozone Overseas Pvt. Ltd.	Road infrastructure and infrastructure models
11	Trapeze Group	Various ITS techniques shown in brochures
12	Allison Transmission India Pvt. Ltd.	System technology shown
13	Citilabs Inc.	Cube software data displayed
14	KSRTC	Bus models and Various ITS techniques used in Metro shown
15	BMTC	
16	Ashok Leyland	Bus technology techiniques displayed
17	Honeywell	Eye screening machine shown
18	Jaipur Development Authority	Jaipur Metro and BRTS models shown
19	SUTP	Publications
20	Navi Mumbai Municipal Corp.	Projects displayed electroniocally
21	MMRDA	Projects displayed electroniocally and 3D model of Monorail shown
22	EBTC (European Pavilion)	

Annexure IIIa

EBTC Companies: UMI – 2012 Exhibition
FRANCE
1. ALSTOM
2. AIF- Association of Railway Industries
3. CERTIFIER- Railway Certification Agency
4. DENY FONTAINE
5. EGIS RAIL
6. EURAILTEST
7. EUROVIA- TRAVAUX FERROVIARES
8. FOREST LINE
9. KEOLIS
10. LUMIPLAN
11. SCOMA S.A.S FRANCE
12. VISIONOR
13. VOSSLOH COGIFER
14. Yellow Window Design Consultants
15. ENVISA
16. UNIVERSITÉ DE TECHNOLOGIE DE BELFORT-MONTBÉLIARD (UTBM)
17. CCI
18. ETF
ITALY
19. Politecnico Di Torino
20. Ceipiemonte
21. Mecaprom
22. SISTeMA srl – PTV GROUP
23. 5T srl - TELEMATIC TECHNOLOGIES TRANSPORT TRAFFIC TORINO
24. DECET
25. General Motors Powertrain Europe Srl
26. Indo Italian Chamber Of Commerce (IICCI)
GERMANY
27. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

PORTUGAL
28. SISCOG - Sistemas Cognitivos, SA
IRELAND
29. Enterprise Ireland
30. Globetech
31. Nicholas O'Dwyer and Co. Ltd.
POLAND
32. PBH Z.NIZIŃSKI
BELGIUM
33. IDMS

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5	KOLKATA METRO
6	PCMC
7	Surat Municipal Corp.
8	UNEP -(Round Table)
9	SHELL INDIA - EMBARQ (Round Table)
10	UMTC
11	JAIPUR DEV. AUTHORITY
12	DULT
13	HYD. METRO
14	UJJAIN MUNI. CORP.
15	Delhi Devlopment Authority,UTTIPEC
16	SIAM
17	ITDP
18	AICTSL, INDORE
19	MOTT
20	RITES
21	CIDCO
22	Bhopal Muni. Corp.
23	BMTC
24	DMRC

Annexure IV - List of Reviewers for Papers Selection - Research Symposium

1. Dr. Lelitha Devi IIT Madras
2. Prof. R. Sivanandan IIT Madras
3. Dr. Karthik K Srinivasan IIT Madras
4. Prof. A. Veeraragavan IIT Madras
5. Dr. Gitakrishnan R IIT Madras
6. Dr. M. V. L. R. Anjaneyulu NIT Calicut
7. Dr. K. Gunasekaran Anna University, Chennai
8. Dr. Nisha NIT Trichy
9. Dr. Anil R CEG, Trivandrum
10. Dr. H. S. Jagadeesh BMS, Bangalore
11. Dr. Vedagiri IIT Bombay
12. Dr. Mallikarjuna C IIT Guwahati
13. Ms. S. Sunitha NIT Trichy
14. Dr. Satya Kumar NIT Trichy
15. Prof. Partha Chakroboty IIT Kanpur
16. Dr. Krishna Moorthy NIT Calicut
17. Mr. H. S. Sathish BMS, Bangalore
18. Dr. Samson Mathew NIT Trichy
19. Dr. AshishVerma IISC Bangalore
20. Dr. Shriniwas S Arkatkar BITS Pilani
21. Dr. Priya CEG, Trivandrum
22. Dr. Indrajit Ghosh IIT Roorkee
23. Dr. Rahul Nair IBM Research, Ireland
24. Dr. K. P. Subramanian Anna University
25. Dr. Manjiri Akalkotkar CEPT University
26. Dr. Swapan Kumar Deb IIT Kharagpur
27. Dr. Dhingra IIT Bombay
28. Dr. Charisma Choudhary Bangladesh University,
29. Dr. Anuj Sharma University of Nebraska Lincoln
30. Dr. Shivanand Swamy CEPT University
31. Dr.Partheeban St. Peters College, Chennai
32. Dr. Annie Matan Curtin University

33. Dr. Lakshmi Sundaram Anna University, Chennai
34. Dr. Moses Santhakumar NIT Trichy
35. Dr. D. R. S. Gupta SPA, Delhi
36. Dr.Geetam Tiwari IIT Delhi
37. Dr. Gopal R Patil IIT Bombay
38. Dr. Tom V Mathew IIT Bombay
39. Dr. Kalaga RamachandraRao IIT Delhi
40. Dr. C. S. R. K. Prasad NIT Warangal
41. Dr. A. K. Sharma SAP, Delhi
42. Dr. Swaminathan Gurumurthy Honeywell Technologies, Bangalore

ANNEXURE V – List of Authors Selected for Paper Presentation

S. No	Name of Author and Affiliated Institution	Title of Paper
1.	Sreelekha.M.G. NIT Calicut	Spatial Analysis of Road Transport System
2.	Sreela P.K, *NIT Calicut*	Mode Choice Behavior of Urban Dwellers for Commute to Work
3.	Dr. Anne Matan *Curtin University*	Urban Walkability: The Urban Design Contribution
4.	Ramesh & Anuj Sharma *IIT Madras & University of Nebraska*	Performance Comparison of a Radar Based Traffic Sensor - Smartsensor Hd for Indian and American Traffic Conditions
5.	Sasane G. S IIT Bombay	Sustainable Approach in Vehicle Routing for Regional Solid Waste Transport System: MMR, A Case Study
6.	B. Ramkumar *Aarvee Associates Pvt. Ltd., Hyderabad*	Corridor Improvements using Vissim a Microscopic Simulation Tool
7.	Sneha Rapur *DULT, Bangalore*	Community based Neighbourhood Accessibility Planning, A Case of Malleswaram
8.	Behara, Krishna *BITS Pilani*	A Composite Index to Measure the Perceived Inadequacy of Public Transportation
9.	Jayatheja A *iTrans Pvt. Ltd., New Delhi*	Case Study on Options to Improve Bus Network in Hyderabad
10.	Nithyanandhan R *Anna University, Chennai*	Design of Vehicle Actuated Signal for a Major Corridor in Chennai City using Simulation
11.	Ms. TaralShukla *CEPT University*	Organizing the Role of the Intermediate Public Transport (IPT) Sector : Focus on Autorickshaw Services
12.	G.Vishwanath *IIT Madras*	Joint Models for Analysis of Household Trip Frequency and Vehicle Presence in Chennai City
13.	Sreelakshmi R *DULT, Bangalore*	Performance Evaluation of City Bus Services for Tier-Ii Cities
14.	Madhu Singh *DULT, Bangalore*	What is a Compact City? How Could it be measured?
15.	Ms. Megha Kumar *SPA, Delhi*	Environmentally Sustainable Transport Performance Index for Residential Neighbourhoods
16.	SaiVikas Gazula *IIT Madras*	Advanced Traveler Information Systems Qualitative Display of Level of Congestion Under Indian Conditions
17.	Rahul Nair *IBM Research, Ireland*	Coordinating City-wide Multi-Modal Transit Services in Mumbai
18.	A. Gowri *IIT Madras*	Flow Characteristics of Heterogeneous Traffic With and Without Adherence to Lane Following
19.	S.Shekhar Babu	Safety Evaluation of an Uncontrolled Intersection

	IIT Bombay	using Surrogate Safety Measures
20.	Sunny Raja Varma & Jithin Raj *IIT Madras*	Evaluation and Application of Image Processing Sensors Under Indian Conditions
21.	Megha Aggarwal *Institute of Urban Transport (India)*	Car Restraint Policies for Mega-Cities, Case Study - Delhi
22.	S. R. S. Sirisha *Institute of Urban Transport (India)*	Enhancement of Transit Ridership - Case of Delhi Metro
23.	Sameep Arora *EMBARQ India*	Demand Responsive Scheduling
24.	Akshay Mani *EMBARQ India*	Case Study of the Auto-rickshaw Industry in Mumbai
25.	S. M. Hassan Mahdavi *IIT Delhi*	A Review of Bus Route Network Design Procedures using Multi-objective Evolutionary Algorithms
26.	Vijayshree Pednekar *CEPT University*	Organizing the Role of the Intermediate Public Transport (IPT) Sector: Focus On Autorickshaw Services
27.	Satayakumar M. *CEG, Trivandrum*	Estimating Traffic Congestion and

ANNEXURE VI – List of Authors Selected for Poster Presentation

S.No	Name of Author and Affiliated Institution	Title of Poster
1.	Anil, R. and Sivakumar, B. *CEG Trivandrum*	Travel Time Estimation and Prediction Using Mobile Phones: A Cost Effective Method for Indian Cities
2.	Anjana, S., Deepa, S. and Anjaneyulu, M.V.L.R *NIT Calicut*	Accident Modification Factors for Safety Evaluation of Signalised Junctions in Urban Areas
3.	Jainal Shah *CEPT University, Ahmedabad*	Feasibility of Park and Ride Systems in Indian Cities
4.	Mariya Khatoon *IIT Delhi*	Probabilistic Modellingof Pedestrians' Delay and Risk at a Free Left Turn: Delhi, India
5.	Pradeep Chaitanya, J. and Arjun Kumar, T. *Mumbai Metropolitan Region Development Authority*	Speed Contours: A Unique Way to Represent the Mobility of an Urban Road Network
6.	Kalaanithi, S. and Nirmal Kumar *Anna University, Chennai*	Devising Traffic Management for Congested Mesolevel Network Using Simulation
7.	Anvi Maniar *CEPT University, Ahmedabad*	Impacts of Intrusion of Movement of Trucks in Urban Areas
8.	Achal S Khilani *SPCE, Mumbai*	Public Bicycle Rental System for a Precinct of Mumbai: South Mumbai
9.	Jinson J Koottungal *SUTP, India*	Planning For Integrated Seamless Travel at Transport Interchanges
10.	Dr. V. Lelitha Devi *IIT Madras*	Travel Time Estimation in Urban Arterials using Location Based Data
11.	Minachi, C. *Anna University, Chennai*	Before and After Evaluation of Treatment at Signalized Urban Intersections