Urban Mobility India Conference & Expo

Digital India
Power To Empower

सत्यमेव जयते
Ministry of Urban Development
Government of India

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Institute of Urban Transport (India)

PROCEEDINGS OF UMI 2015

8th Urban Mobility India Conference & Expo 2015

Transforming Mobility for Liveability

November 24-27, 2015, New Delhi

Institute of Urban Transport (India)

www.urbanmobilityindia.in

Preface

The National Urban Transport Policy of the Government of India, 2006 (NUTP), inter-alia,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. As part of NUTP enunciations, the Ministry of Urban Development, Government of India has taken two important steps to develop the capacity of officials in cities for improving urban mobility.

- Organizing an Annual Conference-cum-Exhibition on 'Urban Mobility' at New Delhi or in any other city every year under the brand Urban Mobility India (UMI) for dissemination of information and to facilitate exchange of ideas.
- According recognition to good urban transport initiatives taken by cities / other agencies by giving awards to selected good practice projects.

The 8th edition of the Urban Mobility India (UMI) Conference was held from 24th to 27th November, 2015. The theme of the conference was "Transforming Mobility for Liveability". The event was organized at the Manekshaw Centre, Dhaula Kuan, New Delhi, by the Institute of Urban Transport (India) New Delhi. It was attended by more than 1200 participants,including about 70 foreigners and 100 students from various schools of planning, comprising urban transport experts, practitioners, resource persons, researchers, scholars and senior government officials from 23 states across India and from 25 foreign countries including the United States of America, Australia, U.K., Canada, Egypt, Spain, France, Japan, Malaysia, Netherlands, Singapore, Sweden and United Nations etc. Representatives from 23 state governments, several urban local bodies, parastatals as well as academia, students, non-governmental organizations (NGOs) and private sector participated in the conference. About 6% of participants were foreign nationals, 8% students, 36% from private sector and 50% from government organizations.

As part of the Conference, IUT also coordinated a Research Symposium which was organized on 25th and 26th of November in which selected research work in the field of urban transport and the same was disseminated through 22 presentations.

An exhibition was also organized as part of the event at which 24 exhibitors including 9 international and Media Partners participated. The participating organization showcased their best practice. The participating manufacturing companies showcased latest technologies & state of the art products on Urban Transport.

The Conference and Expo was inaugurated on 24th of November by Shri M.Venkaiah Naidu, Hon'ble Minister for Urban Development, Housing & Urban Poverty Alleviation and Parliamentary Affairs, Government of India. He delivered an inspiring inaugural address. Key Note address was delivered by Mr. Shashi Verma, Director of Communication, Transport for London and Shri Durga Shanker Mishra, Additional Secretary, Ministry of Urban Development, Government of India welcomed the gathering at inaugural session. After the inaugural session, a Special Session for invited delegates from State Govts. on "Smart Mobility Solution in Cities" was organized by the MoUD. It was chaired by Shri Babul Supriyo, Hon'ble Minister of State for Urban Development, Housing and Urban Poverty Alleviation, Govt. of India.

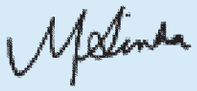
After 4 days of knowledge sharing and exchange of ideas through 15 Technical Sessions, 6 Round Table Discussions, 3 Plenary Sessions and 1 Panel Discussion, the conference concluded on 27thof November, 2015. The Valedictory function was graced by Shri Babul Supriyo, Hon'ble Minister of State for Urban Development, Housing and Urban Poverty Alleviation Government of India. The following events added attraction to the conference.

I) A Quiz Competition on Urban Transport issues was organized for students as well as delegates on the second and third day of the conference.

II) Everyday a multi-coloured Newsletter containing highlights of the previous day deliberations and pictorial view of participants was published and circulated in the conference.

III) A video on urban mobility scenario in India released at Inaugural Session was shown on all the 4 days in the exhibition area.

All these exercises generated a lot of enthusiasm and were appreciated by the participants. The Conference and Expo was well received by the participants and sponsors. In the valedictory session, Awards for Excellence in urban transport projects planned and implemented by city and state authorities were given by the Hon'ble Minister of State for Urban Development and Housing & Urban Poverty Alleviation, Govt. of India. Proceedings and outcomes of the conference are presented in this document. Detailed presentation of technical papers / UMI pictures and proceedings are available at www.urbanmobilityindia.in



(Mukund Kumar Sinha)
Officer on Special Duty (UT) &
Ex-Officio Joint Secretary
Ministry of Urban Development
&
Officiating Director General
Institute of Urban Transport (India)
March, 2016

Contents

Important Outcomes

UMI-2015
Transforming Mobility for Liveability
(Outcomes and Proposed Action)

S. No	Outcomes	Action needed
1.	New metro alignment should lead the city expansion plan, because the city will follow the metro.	Advisory by MoUD
2.	Metro under construction or planning in various cities should consider building of green stations and other climate resilient initiatives as taken by DMRC.	Advisory by MoUD
3.	City has to provide for cycle tracks, walkways, balanced parking, efficient public transport, complete streets to improve its liveability.	Advisory by MoUD
4.	Cable Car / Ropeway can be used as a major transport mode particularly in Hilly Areas and congested localities.	Advisory by MoUD
5.	E-Rickshaw should be made more safe, regulated and institutionalised. Infrastructure facilities in terms of charging stations, parking areas, routes rationalisation, stops etc. need to be provided.	Study under taken by IUT
6.	Collaboration is required between various modes of public transport in the city so that one mode of public transport can serve as substitute for another mode in case of emergency or breakdown.	Advisory by MoUD
7.	Works within and close to Metro Rail System should be implemented as part of MRTS project.	Advisory by MoUD
8.	Financial incentives and infrastructure are essential for promotion of electric vehicles which provide the largest benefits for air quality in cities.	Advisory by MoUD
9.	Performance of the roads be linked to the road executing agency rating for the future projects.	Advisory by MoUD

10.	Given India's large growing two wheeler market, there exist a significant potential for scaling up electric two wheelers.	Note by MoUD / IUT
11.	Digital technology is more demand oriented and has to be adapted in the legal framework by accelerating transition.	Note by MoUD / IUT
12.	The new urban paradigm should have compact city, urban mixed use and reduced consumption of non-renewable energy and emission of greenhouse gases.	As part of MoUD schemes
13.	Instead of laying congestion charges on private modes why not incentivise public transport – by making expenses on public transport as tax-free.	Note by MoUD / IUT
14.	The concept of universal design can play a key role in bringing environmental and accessibility goals together.	Advisory by MoUD
15.	Urban planning approach should pay special attention towards creation of better built environment for disabled people.	Advisory by MoUD
16.	More use of Information Technology in public transport for transparency, monitoring, efficiency and providing real time information.	Advisory by MoUD
17.	Role of Mini bus in Urban transport is important particularly in cites in the range of 5 lakh population as mode of transport and as feeder bus for metro rail and for improving connectivity from city centres to suburbs.	Advisory by MoUD
18.	Child friendly mobility may be assessed on the basis of safety and comforts, infrastructure, mode of mobility, inclusiveness and education and awareness.	Study under taken by IUT
19.	Urban Gains to be captured appropriately while implementing Public Transport Projects.	Advisory by MoUD
20.	The Computer application using software like VISSIM for transport modelling should be used to its fullest potentials while preparing transport projects.	Advisory by MoUD

Inaugural Session

At the inaugural session of Urban Mobility India (UMI) 2015 Shri Durga Shanker Mishra, Additional Secretary, Ministry of Urban Development, Government of India gave a brief background of the annual Conference-cum-Expo organised by the Institute of Urban Transport and supported by Ministry of Urban Development with an aim to strengthen the Government's capacity building efforts in the country. He highlighted the importance of the theme of the Conference "Transforming Mobility for Liveability" and the sub-themes which were to be deliberated upon in 1 Panel Discussion, 3 Plenary Sessions, 15 Technical Sessions, 6 Round Table Discussions (Conference Programme at Annexure-I). He also mentioned that a Research Symposium having 6 Concurrent Sessions will be organised where budding transport professionals and researchers from the academic field will make presentations on the well-researched subjects of topical interest. He added that one of the Round Table Discussion will cover Leaders Forum of the city officials would make presentation on live urban transport projects which will be reviewed by the experts. He elaborated that one of the key features of the event would be conducting Quiz Competition for students as well as delegates during the coffee break. He also highlighted that the theme of the Conference "Transforming Mobility for Liveability" is apt and timely when the Ministry of Urban Development has taken up flagship programmes on Smart Cities, AMRUT, Housing for All which focuses on creating better quality of life in cities and efficient transport system which is the fulcrum of Smart City. To make the cities liveable, mobility issues need to be addressed on priority basis.

While delivering the keynote address, Mr. Shashi Verma, Director of Communications, Transport for London highlighted the financial and operational efficiencies of transport system in London which could be imbibed in planning and opertation of public transport system in Indian cities. He pointed out that in the last twenty years no new road has been

Addl. Secy, Delivering Welcome Address

Mr. Shashi Verma Delivering Key Note Address

constructed in the city of London even though the number of vehicles have increased and the ridership in the existing transport has also increased.This has been managed through the use of ITS, Common Mobility card and other such initiatives. Business areas which are the direct beneficiaries of transport system has been tapped to support investment in transport funding. Oyster card launched in 2003 is a huge success and is ussed in all public transprot modes in London.

Inaugurating the 8th Urban Mobility India Conference cum Exhibition on Transforming Mobility for liveability Shri. M Venkaiah Naidu, Hon'ble Minister for Urban Development, Housing and Urban Poverty Alleviation and Parliamentary Affairs said the rapid pace of urbanization taking place in India has been highlighted at different forums and issues that emerge out of such urbanizations have been engaging the attention of the government.

The theme of the Conference "Transforming Mobility for Liveability" is of special significance in view of the 100 cites taken up under Smart City Mission and 500 cites under AMRUT. He said the policy of the government as highlighted by the Hon'ble Prime Minister from time to time is for transforming the country and as such the theme of the Conference is very much in line with the government thinking. Even after 68 years of independence we are facing the problem of basic services in many of our cities. Urban Local Bodies are not in a position to

Inaugural Address by the Hon'ble Minister

Hon'ble Minister at the Exhibition

Hon'ble Minister Inaugurating the Exhibition

raise the resources locally. They have to look inward and adopt a transparent and accountable model. They should plan for future keeping in view the pace of urbanization. We should look forward toSmart City and AMRUT Missions, which are major initiatives in this direction as a model of advance planning.

We should encourage urban mobility planning in an integrated manner where all modes of transport should form part of an integrated transport plan. 100 smart cities will be the torch bearer for development of all the cities as smart cities in the long run. Efforts should be made to curb the increase of private vehicles which have adverse impact on congestion, safety, health and effectiveness of public transport. The experiences show that the metro travel is more comfortable and if good public transport is developed by the cites it will attract more ridership along with better planning.We will have to change our mind-set and leave the personal car in favour of public transport. He gave an example of American cities where high occupancy vehicles are preferred than single car user. As has been mentioned in Smart City and AMRUT programme we should provide cycle tracks and walkways at least in all our new roads. He mentioned that 330 km of metro routes are in operation while 600 km of metro routes are under consideration.

Seeing the success story of Delhi metro, many cities are taking up metro rail projects. Highlighting the challenges of urban transport in cities in terms of motorization, mixed traffic, congestion, air pollution, lack of inter-modal integration etc., he suggested adoption of proper integration of various transport modes and holistic traffic planning & management.

He highlighted several issues for priority attention such as vertical growth in cities with higher FAR, segregation of mass rapid transit corridors, effective management of traffic using ITS technologies, effective parking policies with reasonable charges, restriction on private vehicles, proper selection of MRTS, integration of IPT, NMT with public transport, creation of Unified Metropolitan Transport Authorities, proper choice of fuel, etc. This Conference is an excellent opportunity for Mayors and other city officials to understand the best practices available in India and abroad.

He expected that the 4 day conference will come out with the actionable points and recommendations that could be circulated to all the stakeholders. He appreciated the shuttle service and carpooling scheme which could be taken up in all the major cities. The existing agencies in Delhi like DTC, DMRC, NDMC and MCD should sit together and work out a plan

Audience at the Inaugural session

Hon'ble Minister releasing the IUT publications

Dignitaries on Dias showing the released publications

for last mile connectivity. In the end he said such conferences should not be held in Delhi only but be decentralized and accordingly announced that the next UMI – 2016 may be held at Ahmedabad and UMI- 2017 be held at Hyderabad.

Earlier the Hon'ble Minister inaugurated the exhibition and visited various pavilions which have showcased the latest development in transport technology and services. On this occasion the following publications and 2 CDs were also released by the Hon'ble Minister:-

- ITS in Public Transport & BRTS
- Freight Management Toolkit
- City Wide Multi-Modal Integrated Transport Plan
- Appraisal Criteria Checklist for Urban Transport Project – Toolkit
- Specification for National Common Mobility Card
- CD on Indian Urban Mobility Challenges- the past, present and future.
- CoP 21

Shri Mukund Kumar Sinha, Officer on Special Duty & ex-Officio Joint Secretary, Ministry of Urban Development proposed a vote of thanks. He thanked all the dignitaries, delegates, participants as well as the members of the Organising Committee. (Composition of the Organising Committee is given at Annexure-II).

Vote of thanks by OSD & ex-Officio JS MoUD

Special Session on Smart Mobility Solutions in Cities

After the inaugural session, a special session for Mayors was organised on "Smart Mobility Solutions in Cities" by the Ministry of Urban Development. The Session was Chaired by Shri Babul Supriyo, Hon'ble Minister of State for Urban Development & Housing and Urban Poverty Alleviation. About 20 Mayors and Chief Executive Officers along with other senior officers of city corporations participated in the special session. In his opening remarks the Hon'ble Minister stated that smart mobility is a core infrastructure for development of smart cities. An innovative combination of progressive ideas and advanced technologies can give safe, reliable and efficient mobility solutions in making the city smart and liveable. In this session 4 presentations from Adelaide (Australia), Karnal (Haryana), South Delhi Municipal Corporation and Indore (M.P.) were made highlighting the smart initiatives taken up by them in improving the mobility situation in their respective cities. In Karnal, every tuesday is observed as car free day. Municipal Corporation is working on the idea of providing seamless eco-friendly mobility with first and last mile connectivity. Efforts are being made to make e-rickshaw a major mode of public transport. They have developed a mobile based App to dial an e-rickshaw. E-rickshaw is helping in creating jobs and

Hon'ble MoS chairing the special session

reducing pollution. In Indore, steps have been taken to improve the infrastructure through smart initiatives in terms of smart signalling system, disabled friendly transport, use of GPS, off board ticketing, automated sliding doors on buses, free Wi-Fi, bicycle sharing system, etc. South Delhi Municipal Corporation is working on parking facilites and developing multi-level car parking. Additional Secretary, Urban Development indicated policy initiatives taken up by the Ministry of Urban Development with regard to sustainable and smart transport system. He cited

Participants at the special session

Hon'ble MoS interacting with Mayors at the special session

the examples of London and Bogota where transit facilities have been provided sucessfully. The need is to figure out what exactly will work in a specific city. Intervening the discussion Mr. Shashi Verma enquired from the Mayors what exactly is being done for pedestrian infrastructure which is very important for smooth walking. Concluding the Session Hon'ble Minister emphasized on the development of non-motorized transport infrastructure including walkways and cycle tracks on priority basis integrating it well with the Public Transport System.He said government policies and plans need to be carefully implemented at local body level. Municipal Corporations should dream big and make the cities better. Mr. R. K. Singh, Director (UT) MoUD proposed a vote of thanks.

Vote of thanks by Director (UT)

Glimpses of Mayors Session

Plenary Sessions

Plenary Session 1:

Innovations in Metro Rail

Indian Cities are witnessing tremendous urban growth which has resulted in high travel demand. But due to poor service quality of public transport, its share is declining and the share of private cars is increasing. Therefore, in order to support such high level of travel demand, there is a need to develop sustainable mass transit systems in cities. Rail technologies like Metro, Mono and Light Rail are the most cost intensive mass transit systems in the long run. In India, the first metro system was developed in the year 1980s in Kolkata, followed by Delhi. Since then, a number of metro projects have become operational, these metro projects call for incorporating innovative ideas to ensure its proper functioning and improving productivity as well as achieving operational efficiency. Latest innovation in metro rail include Virtual Ticketing Agents, ticketless travel, high speed rail and hyper speed rail, rail loyalty scheme, providing passenger friendly environment, digital signage's, etc. The session had a special focus on sharing the experiences about various innovations in metro rail system with the expectations that the lessons learnt would help those cities which propose to implement similar projects.

Chairperson :

- **Mr. Durga Shanker Mishra,** Additional Secretary, Ministry of Urban Development.

Moderator :

- **Mr. Mukund Kumar Sinha,** OSD (UT) and ex-Officio Joint Secretary, Ministry of Urban Development.

Panelists :

- Mr. Elias George, M.D., Kochi Metro Rail Limited.
- Mr. Mangu Singh, M.D., Delhi Metro Rail Corporation
- Dr. Roger Allport, Hon'ble Senior Research Fellow, Railway and Transport Strategy Centre, Imperial College, London.
- Mr. Naveen Kumar, Director Finance, Bangalore Metro Rail Corporation Ltd.
- Mr. Gerald Olliver, Sr. Transport Specialist and Transport Cluster Head, World Bank.

Rapporteur :

- Mr. Ashutosh Kothari, Planner.

Highlights of Discussion

- 18 Tier-II cities in India are building or planning metros.
- Of the 200 odd metros worldwide, only a handful make profit.
- Metros are built for their positive externalities.
- It reduces road gridlock and urban pollution.
- The decision making protocol in the Indian metro system strengthens existing commute lines, into the CBD instead of opening up the city.
- In Kochi, UMTA ordinance approved by the state government confers authority for the integration of transportation modes, revenue raising and common command and control.
- State Government of Kerala has approved Water Transmission Scheme for Public Transport on Kochi's backwaters.
- Efforts are being made to enhance the metro experience to migrate car users to public transport.
- For seamless transportation and last mile connectivity city water bus project, model footpath in the city, public bicycling pathways and bike sharing systems are being promoted.
- The front end of seamless transportation – the "Kochi one" App and Smart Card are being proposed as part of IT Framework. This would be a metro ticket as well as an e-wallet/Credit Card.
- Vision for urban transport in Kochi is "One Network – one timetable – one fare with optimum public investment.
- In Delhi metro a maximum of 3.2 million ridership was recorded on 28th August, 2015 while average ridership is 2.7 million passengers a day.
- Average ridership increased by 122% in last five years.
- Delhi Metro Rail Corporation has taken following climate resilient initiatives:-
    - Light weight regenerative type rolling stock.
    - Compensatory tree transplantations.
    - Recharging the ground water.
    - Use of fly ash in concrete.
    - Solar power.
    - Recycling of Water.
    - LED Lighting.

Chairperson addressing the session

- MRTS is the most energy efficient mode of transport.
- While the passenger KMs for the Year 2014-15 have increased by 10.47% as compared to 2013-14, traction energy has increased by5.10% only.
- Phase-III Stations and Receiving sub-Stations are built as green buildings.
- DMRC received the highest category of certification viz "Platinum" for its recently inaugurated 12 stations in June and September, 2015.
- There is a net reduction in GHG emission from all operational phases since 2012-13.
- Delhi metro has been certified by the UN as the first metro rail-based system in the world to get carbon credit for its contribution in reducing pollution level in the city.
- It has contributed 1.11 million CERs (Certified Emission Reduction) from Modal Shift Project and 0.22 million CEREs from Regenerative Breaking Project so far.
- A study by Central Road Research Institute, New Delhi shows that in Phase I and II of Delhi Metro about 3.90 lakh vehicles were off the road daily in 2014.
- Findings of the research study undertaken in respect of London and Sao Paulo suggests that authorities should create conditions for metro operators to deliver predictable success.
- For innovative financing the challenge is to make the cities having metros to finance the needed infrastructure by capturing a portion of these

gains and to channelise them into infrastructure finance.

- Bengaluru Metro Rail Corporation Ltd. (BMRCL) has successfully used debt instruments and land based financing of infrastructure projects.
- Increment in land values arising out of metro rail has a multiplier effect to infrastructure investment and urban economic growth.
- Some of the instruments used by BMRCL are:-
  - Increase in Floor Space Index (FSI) for all properties falling along the metro corridor.
  - Levy a cess and surcharge at market value on land and building in new areas of development.
  - Use of Transfer of Development Right in lieu of cash compensation to the land looser.
  - Premium FSI over the normal FSI subject to the payment of premium fee of 15% of the guidance value for residential and 20% for non-residential usage.

Dignitaries on Dias at the session

- International Experiences in innovation in metro rail system include:-
  - Density aligned with transit as in case of London and Tokyo.
  - Land value capture around transit modes like London tube, Zheng-Zhon line 3.
  - Project delivery methods and bundling and PPP financing.
  - Innovative technology in terms of boring machines, fully automated train control, evacuation system, contactless fare card system, universal accessibility at all stations, etc.

Key Issues

- A new paradigm required for metro decision making where new metro alignment should lead the city's expansion plan, because the city will follow the metro.
- Metros under construction or planning in various cities should consider building of green stations and other climate resilient initiatives as taken up by DMRC.
- Benchmarks should be made to assess the operation of metro system. If the metro system is not operating optimally then how to improve its operation.
- The focus in metro system should be on improving services and not on building infrastructure.
- 3V framework in terms of location value, market value and mode value is important in planning and development of metro system.
- Several sources of revenue need to be tapped to its full potentials viz.:-
  - Vacant land charges
  - Betterment levies
  - Cess on new development
  - Cess on fuel
  - Parking taxes
  - Congestion charges
  - Auction based motor vehicle registration, quota system etc.
  - FSI incentives and premium F.S.I.

Audience at the session

Plenary Session 2:

Financing and Technology for Low Carbon Transport

The session is part of a series of 4 sessions coordinated by UNEP DTU Partnership for Promoting the Low Carbon Transport in India project that have a common theme of addressing climate change. Reducing emissions from transport is largely related to making the right choices for technology and infrastructures. Financing of transport infrastructures though largely led by public finances would also require leveraging of private finances. Climate finances in addition can provide the incentives for directing investment towards a sustainable and low carbon path.

Chairperson :

– Mr. Dipak Dasgupta, Additional Director (India) Global Climate Fund Board and Chair Investment Committee.

Moderator :

– Mr. P. R. Shukla, Professor, Indian Institute of Management, Ahmedabad.

Panelists :

– Mr. Peter Hiiliges, Director, KfW Development Bank
– Mr. Jorge Rogat, Project Manager, UNEP Technology Needs Assessment Project, UDP
– Ms. Annett Baessler, Counsellor of Economics and Environmental Affairs, German Embassy, New Delhi.
– Shri Sudesh Kumar, Ex-Member Electrical, Railway Board and ex-Officio Secretary, Government of India.

Rapporteur :

– Mr. Subhash Dhar, UNEP

Highlights of Discussion

KfW supported climate friendly urban mobility projects in the pipeline are:-

- Integrated public waterways project at Kochi.
- Integrated BRT system at Chennai, Coimbatore and Bengaluru.
- Metro Rail Project at Nagpur.
- KfW provides finance investment and project-related advisory services in terms of know-how, loans, technical assistance and project preparation.
- UNDP - DTU partnership help in assessing the needs of funding for technology transfer in the transport sector as well as technology needs assessment.

Opening Remarks by the Chairperson

- It can take a set of country driven activities leading to the identification, selection and implementation of environmentally sound technologies to decrease CO_2 emission (mitigation) and to decrease vulnerability to climate change (adaptation)
- Countries like Bhutan, Cambodia, Lebanon, Sri Lanka, and Vietnam have prioritised transport as one of the sectors in need of mitigation measures.

Key Issues

- Systematic development of Public Transport gives a fillip to economic growth in a city.
- Funding agencies should make aware the borrowing agency about the need and potential of urban transport project in terms of emission reduction.

Panelists on the Dias

Plenary Session 3:

Transforming Urban Transport for Creating Liveable Cities

"Liveable Cities" refer to the cities having a good quality of life and healthy social, physical and economic environment. Some initiatives in terms of sustainable urban transport include equitable mobility, complete streets, liveable neighborhood, urban green space, safe, seamless, affordable and efficient public transport system.

Recent WHO statistics revealed that Indian Cities are the most polluted in the world. To this end transportation plays a major role. The existing transport system in Indian cities is suffering from the poor accessibility and mobility, lack of infrastructure, more focus on automobiles rather than walking and cycling, missing street links, inadequate multimodal integration for first and last mile connectivity, poor landscaping and missing open spaces. This session discussed various approaches to improve the efficiency of transport to have higher liveability score for Indian cities, one of which could be - introduction of Green Integrated Transport System in Indian Cities.

Chairperson :

- Mr. K.K. Sharma, Chief Secretary, Delhi

Moderator :

- Mr. B.I. Singal, Former Director General, IUT

Presenter : -

- Ms. Kamala Ernest, Programme Officer, UNEP
- Prof. Shivanand Swamy, Executive Director, CEPT University
- Mr. Stephen Yarwood, Ex-Mayor, Adelaide, Australia.
- Mr. S. K. Lohia, CEO, Indian Railways Stations Development Corporation.

Rapporteur :

- Mr. Ashutosh Kothari, Planner

Highlights of Discussion

- Liveable cites need basic facilities and the most important is the good accessibility.
- There is, however a need to define a liveable city.
- A recent example of a traffic jam in China stretched more than 62 miles (100 kms) which is a record in itself of poor accessibility.
- As Lewis Mumford said adding highway lanes to deal with traffic congestion is like loosening your belt to cure obesity.
- A developed country is not a place where the poor have cars, it is where rich ride the public transport.
- New technologies have been developed to collect data on temperature, ambient light, power monitoring, motion audio and video, radiation, wind & rainfall, particulate matter, pressure, humidity etc.
- New technologies can help collect data in cities on

parking, car counting, vehicle speed, surveillance, unattended objects, street activity, movement details, queue length, dwell time, event counting and street amenity.

- Less cars means less traffic, less pollution, nicer streets, better movement of resources, more jobs.
- Driverless cars with sensors and backup systems are evolving fast and will be a reality in next few years.
- BRT projects are neglected as compared to metro projects even though BRT is much cheaper.

Key Issues

- A city has to provide for many aspects of urban transport to improve its liveability viz.
  - A cyclist and pedestrian friendly city.
  - A city with good public transport.
  - A city that supports sustainable travel.
  - A city with efficient support services.
  - A city with balanced parking.
  - A traffic calmed and an accessible city.
  - A city with great streets for people.
  - Sharing cars is better than everyone owning one.

Chairperson Opening remarks

Participants at the session

Panelists on the Dias

Panel Discussions

Panel Discussion1:

Mitigating Climate Change through Initiatives in Urban Transport.

Coordinated by UNEP:-

This Session is a part of a series of 4 Sessions coordinated by UNEP-DTU Partnership for Promoting Low Carbon Transport in India project that have a common theme of addressing climate change. The panel discussion highlighted the increasing importance of cities in addressing climate change and how they can solve other immediate challenges of air pollution, congestion, mobility and inclusiveness conjointly while addressing climate change issues.

Chairperson :

- Mr. D.S. Mishra, Additional Secretary, Urban Development, Ministry of Urban Development.

Moderator :

- Mr. Shobakar Dhakal, Energy Field of Study, Asian Institute of Technology, Thailand.

Panelists :

- Mr. Subhash Dhar, Senior Economist, UNDP-DTU Partnership.
- Mr. Shashi Verma, Director of Communication, Transport for London.
- Dr. Geetam Tiwari, Professor, Indian Institute of Technology, Delhi.
- Dr. DarshiniMahadevia, CEPT University.

Rapporteur :

- Mr. Jorge Rogat, Project Manager, UNEP

Highlights of Discussion

- Under business as usual conditions, trip length and trip rate may increase with time, however, there will be variations according to the city size.
- Mitigation strategies for urban transport could be (i) improving non-motorised transport; (ii) change in urban structure; (iii) improving public transport; and (iv) technological changes.
- NMT is the dominant mode of transport in all cities.
- Existing use of the public transport in Indian cities is high.

- Cities where formal bus services do not exist motorised two wheeler and informal para-transit service dominates the motorised transport modal share.
- With increasing use of personal motorised vehicles the consumption of energy also increases.
- For improving NMT infrastructure, key elements are (i) reservation of right of way; (ii) intersection treatments; (iii) traffic calming strategies; and (iv) eyes on street.
- Key elements for improving public transport system are (i) route optimization; (ii) scheduling; (iii) location and design of bus stops; (iv) bus priority and (v) vehicle design.
- In transport, inclusiveness supports the notion of accessibility.
- Inclusive transport is one that transforms lives through providing access (physical and otherwise) to opportunities in life for all irrespective of income, social background and abilities.
- In small and medium towns the proportions of walkers and cyclists are more than 50%.

Key Issues

- Though the trip rates and trip length are low in Indian Cities they will increase in future with rapid urbanisation.
- Urban structure, public transportation, and NMT strengthening can change the travel demand in a significant fashion and therefore, reduce CO_2 emissions.
- Public transport improvement strategy must include development of safe space for pedestrians, bicycles and dedicated lanes for buses and safe road crossing facilities for bus commuters.
- Inclusiveness to be integral part of city planning and not an afterthought.

Panelist on the Dias

Chairperson addressing the session

Audience at the session

Technical Discussions

Technical Session 1:

Transport Modelling

Coordinated by PTV Group:-

The PTV Group provide software and consulting services for transport, logistics and geomarketing. The Group plan and optimize all the modes which move people and goods worldwide in terms of transport routes or sales structure, private or public transport. The range of products includes software and services data components and consulting and research services. In this Session, the discussion focused on the above aspects in the transport sector particularly transport modelling.

Chairperson:

- Mr. Thomas Schwerdtfeger

Presenters:

- Mr. Sonal Ahuja, PTV Group
- Mr. Abhishek Patil
- Mr. Arun Savi and
- Mr. SairamDesari, DIMTS Ltd.

Highlights of Discussion

➢ PTV has developed following traffic software:

- PTV - VISUM- Network modelling large scale, national, regional and local transport network development and demand modelling.
- PTV - VISUM-Detailed microscopic modelling of individual vehicles covering all modes of transport - multimodal micro-simulation.
- PTV-VISWALK-Advanced microscopic pedestrian simulation - both inside and outside building.
- PTV-VISTRO- - A solution for all traffic analysis needs.
- PTV-OPTIMA - Real time traffic simulation model, based on offline strategic modal (PTV-VISUM) fused with real time data.
- PTV - Balance - Outline traffic signal adaptive network control - model based.
- PTV - SAFETY- management tool for accident analysis prevention.
- There are over 5000 organisations and 15000 users in about 170 countries who are using PTV software.
- Use of micro simulation for optimisation of road alignment and junction control in respect of northern peripheral road and urban extension road connecting Dwarka (Delhi) and Gurgaon showed four possible options with pros and cons.
- Inference drawn from this analysis of the

above case study showed that option I is less feasible from the safety and traffic point of view as it has negligible turning radius.

- On the other hand option 4 have more benefits from the traffic maneuvering and safety point of view.

Chairperson addressing the session

Key Issues

- Computer software like VISIM can be helpful as a tool to evaluate the alternative options in the traffic maneuverer point.
- Computer software application are helpful to arrive at right decision during policy and planning stage of urban transport projects to avoid any conflict at later stage.
- Micro simulation may be made part of the safety audit studies in case of junction design.

Audience at the session

Technical Session 2:

Land use Transport Integration for Liveable cities.

Traditionally cities in India were having high density with mixed land use pattern, however, the pattern changed over time and from 1970 onwards they were planned as low density segregated land use zones. This lead to an increased travel demand with long trip lengths and thereby resulted in a need to develop huge transport infrastructure at a very high cost and rapid motorisation. The growth of urban population has put enormous pressure on land in our cities, which is scarce and has competing demand of various usages. With rapid growth of urbanization resulting in increasing socio-economic and environmental challenges, it is important to revisit the existing development approaches in terms of integrating land use and transport such as transit oriented development. The presentations were made to share the experiences of various cities so as to know that how they went about land use Transport Integration for liveable cities and to draw the lessons which would help other cities proposing to implement similar projects.

Chairperson :

- Mr. S. K. Lohia, CEO, Indian Railway Stations Development Corporation.

Presenter :

- Mr. P.S. Uttarwar, Former Additional Commissioner (Planning), Delhi Development Authority
- Ms. Promita Roy, Dy. Director (Architecture), UTTIPEC, DDA
- Dr. Johannes Fiedler, Head of Research, Doppelmayr Urban Solutions (Austria)
- Dr. Talat Munshi, Associate Professor, CEPT
- Mr. Mukul Goel, Founder of Three Global Rivers.

Rapporteur :

- Ms. Ruchita Bansal, Programme Manager.

Highlights of Discussion

- In Master Plan for Delhi 2021 Transit Oriented Development Policy (TOD) designates a maximum of 500 m wide belt (approximately 5 minutes walking distance) on both sides of centre line of the MRTS Corridor as TOD Zone.
- TOD Zone is shown as a new land use category which allows flexibility in mix of various possible uses with the exception of polluting and potentially hazardous uses.
- The following development control norms are suggested in TOD Zone

Chairperson initiating the discussion

FAR and Density

- Maximum Ground coverage – 40% for integrated scheme of minimum size of 1 ha.
- In case of MRTS/Government Agency the minimum plot size for development shall be 3000sqm.
- For integrated scheme a maximum FAR of 400.
- A maximum density of 2000 persons per hectare (PPH).
- Mandatory EWS FAR of 15% over and above the maximum permissible FAR.
- All residents residing in that scheme area shall have to be accommodated within the same scheme.
- In Karkardooma TOD project (East Delhi Hub) the entire development has to be with a minimum 3 star gold rating as per approved rating agency and as such appropriate rebate in the property tax may be applicable.
- In TOD projects, traffic impact assessment has to be done before implementation.
- Land use pattern in TOD projects requires 20% land for transport and circulation, 20% for public open spaces.
- Before launch of National Urban Transport Policy 2006, situation on ground was different which now is changing fast.
- As regards rope way system La Raz is the largest ropeway networks with a longest ropeway connection between El Alto and La Raz (South America).
- Initially cable transport was used for tourism purpose but now it is a major transport mode in some of the Latin American Cities.
- As part of the transport and land use interaction first, public transport infrastructure in consolidated areas is enhanced which is then followed by incremental land use change through retrofitting.
- In another scenario public transport infrastructure is conditional for such change.

Key Issues

- TOD facilitates complete ease of access to the transit facility, thereby inducing people to prefer to walk and use public transportation over personal modes of transport.
- Initially the concept of cable network was used for tourism but now it is emerging as a major transport mode in Latin America.
- Cable car can solve congestion problem to some extent in cities as an important transport mode.
- Cable car is a low capacity mode.
- Cable car has influenced the change of land use along its route in South American countries where the system is in operation.
- Revised Toolkit on comprehensive mobility plan and studies of Rajkot, Vishakhapatnam and Udaipur are useful for preparation of low carbon mobility plan and integration of land use and transport.
- There is positive correlation between population density, job density and connectivity.

Panelists in interacting mode

Technical Session 3:

Designing Streets for Children.

Urbanization has also led to rapid motorization. In fact, the growth rate in the number of vehicles has been much faster that the population. Yet, more than 60% of the trips in Indian cities happen through walking, cycling and public transport including intermediate public transport (IPT). It is therefore, important that adequate space is provided to these modes. The National Urban Transport Policy also emphasized on equitable allocation of road space, however, in reality most of the roads in our cites are designed for cars with limited or no space for pedestrians, NMT and dedicated lanes for public transport. It is, therefore, important to focus on reclaiming the streets for the citizen as envisaged in NUTP, 2006 objective i.e., "Moving People rather than Vehicles". The session deliberated on all such issues.

Chairperson :

- Mr. Shashi Verma, Director of Communication Transport for London.

Presenters :

- Ms. Kanika Kalra, Urban Transport Expert (IUT)
- Mr. Ashish Rao Ghorpade, Regional Executive Manager ICLEI
- Ms. Sanskriti Menon, Programme Director, Centre for Environment Education.
- Ms. Susan Wothaya Gichuna Programme Assistant (UNEP)

Rapporteur :

- Ms. Himani Jain, Director Meta Urban.

Highlights of Discussion

- Equity in road space is easy to talk about but hard to enforce.
- Walkers outnumber people using vehicles in every Indian city.
- During the last 3 decades (1981-2011) population in India increased by 2.4 times while vehicles increased by 26 times and the number of traffic fatalities by 5 times.
- In Delhi, private vehicles transport is less than 13% of daily commuters while it occupies 90% of the road space.
- With improved walking conditions people are willing to walk longer to reach a public transport station thus extending the last mile connectivity.
- NMT users account for over half of all road fatalities in metro cities.
- Electric rickshaws serve as feeder service to public transport in metro cities.
- They are used as public transport in small and medium towns and also mode of transport for tourist places.
- Regulatory and other mechanism for operation of E-rickshaws in various cities are evolving.
- Study undertaken by IUT has revealed that users prefer to use e-rickshaws mainly due to easy availability and accessibility, comfort level, low fare and time saving.
- Picture in African countries is different:
  - Africa has only 2% of world's vehicle population but has the highest (16%) road death per km in the world.
  - Majority of the citizens in Africa walk or cycle but quality of NMT infrastructure is poor.

- NMT policy is one of the enabling conditions necessary to redress the negative investment cycle in transportation infrastructure.

Key Issues

- There is need to shift towards eco-mobility in step up approach from walking to cycling to public transport and to shared or rented car.
- Eco- mobile city is as good as liveable city.
- From users perspective e-rickshaw should be made more safe, regulated and institutionalised.
- Infrastructure facilities in terms of charging stations, parking areas, routes, stops etc. needs to be provided.
- For proper operation of e-rickshaw an institution in the form of Special Purpose Vehicle with statutory backing may be set up at State or city level.
- Raising awareness and continuous sensitization on the importance of NMT is necessary for policy makers and citizens.
- NMT should be integrated with other transport system e.g. BRT for greater efficiency.
- Street designing process should involve the community and different users before its implementation so as to make it a high quality public deliberation.

Panelists on the Dias

Audience at the session

Opening remarks by Chairperson

Technical Session 4:

Traffic Engineering

Coordinated by PTV Group:-

The PTV Group provides software and consulting services for transport, logistic and geo-marketing, optimising the transport infrastructure and services which move people and goods worldwide.The range of products includes software and services and all other aspects related to public transport and traffic engineering. This session discussed the issues related to traffic engineering:

Chairperson :

- Mr. Palllavit Saraf, WS Atkins (I) Pvt. Ltd.

Presenters :

- Mr. Sonal Ahuja, PTV Group
- Mr. Ashish Chandra, PWC. India

Highlights of Discussion

- VISSIM software has been used for analysing multi-level car parking taking into consideration the ramp placement, ticketing booth placement, parking availability information, impact on external road network and internal circulation.
- Modelling of multi-level car park in VISSIM enables the designers to visualise the parking challenges posed by the traffic circulation pattern.
- It stimulates real time display of available parking spaces.
- One can see visual representation of parking levels and ramps, queues on ramp and entry and exist points.
- Various ticketing options can be tested in terms of queues and delays as well as parking level allocations in terms of queues and delays.
- PTV-VISTAD analyse and validate the accident data base in terms of clarification, site of accident, description of accident, personal and vehicle data.

Key Issues

- VISSIM application allows frequent changes at concept design stage for multi-level car park and one can develop small templates for group of parking lots.
- All these parking lots can be combined at different levels with ramp to get complete model.

Audience at the session

- The accident data are systematically displayed in a pragmatic and intuitive format based on more than 30 years of experience with police office in Germany
- Crash data is to analyse and to identify the black spots and to suggest measures to tackle the problem of black spots.
- PTV-VISUM Safety generates a heat map based on user accident data to focus road safety accident programme on the significant areas e.g. cyclists.
- As part of network safety management it enables to make road safety impact assessment, blackspot management and smart traffic management.
- PTV-OPTIMA key functions are traffic data fusion, traffic state estimation and traffic state forecast under usual conditions and with incidents.

Presenter making a presentation.

Technical Session 5:

Buses in Cities: New Challenges, New Solutions

Governments all over the world are looking for sustainable ways to improve safety on roads and environmental protection while meeting the citizens mobility needs at affordable cost and in short travel time. Buses are instrumental in effectively achieving the sustainable mobility objectives. In fact they are the first form of public transport in cities. However, the sector has been neglected as revealed by various studies over the years and the share of buses in total number of registered vehicles in the country has declined to as low as 1%. Initiatives have been taken by the central government in 2009 and 2013 to give a fillip to the sector by giving grants as part of a stimulus package for purchase of buses. However, the initiative could benefit few cities only. Therefore, a radical shift is needed in the policy and perception of the decision makers to promote city buses on priority in all class-I cities having a population of one lakh and above. All these issues were discussed in the session sharing national and international experiences.

Chairperson :

- Dr. M. Ramachandran, Former Secretary, Ministry of Urban Development

Presenters :

- Mr. Alok Jain, Head of Planning and Development, The Kowloon Motor Bus (1933) Ltd., Hong Kong.
- Mr. Abhijit Sarkar, Chief (Road Transport), DIMTS.
- Dr. Manish Gupta, V.P. and Director, Xerox Research Centre, India.

Rapporteur :

- Mr. Ashutosh Kothari, Planner

Highlights of Discussion

- Hong Kong with an area of 1104 sq. km and population of 7.3 million has the railways, buses, minibuses, taxis, ferries and trams as the modes of public transport.
- Buses and railways account for 73% of public transport.
- The total transport system is comprised of 88% public transport and 12% private transport.
- Railways cover most of the region in Hong Kong.
- There are five franchised bus operators and all are private companies with no subsidies from government.
- In all there are 3800 buses operating on 400 routes.
- Different modes of transport collaborate in accepting Octopus Card – an electronic payment.
- Over 99% of Hong Kong people possess an Octopus Card having 13 million daily transactions. This card has been extended to non-transport use since 2000.

Dignitaries on the dias viewing the presentation

- There is collaboration between different modes of transport. For instance, if there is a breakdown of railway in some section, in short notice bus service is enhanced as substitute to railway.
- In case of breakdown of road traffic, passengers turned to underground transport.
- Hong Kong has an active emergency transport coordination centre.
- Hong Kong future plan is to have new development in terms of collaboration among railway, bus with low emission and promotion of walking and cycling, minimise wasteful duplication and provide enough customer choice.
- In Delhi, 50% of people use public transport. Majority trips are less than 10 kms.
- Cluster bus scheme in Delhi is revamping the bus system under public-private-partnership. The scheme is based on gross cost model. This follows unified time table with Delhi Transport Corporation to ensure reliable service and eliminate unhealthy competition.
- Routes are clustered into 657 bus routes distributed into 17 clusters so as to leverage network synergies.
- Public operator (DTC) and private operator to share fleet in the ration of 50:50.
- DIMTS is Programme Manager of Cluster Bus System for integrated management, supervision and monitoring of fleet owning route concessionaries service and fare collection management.
- DIMTS has Operation Control Centre with ITS capability for GPS based Real-time Automatic Vehicle Location System, Electronic Ticketing Machine and Bus Management System.
- City multi-modal transportation App provides for point-to-point trip planning bridging first and last mile connectivity.
- This App is convenient to use, personalised to users' preference, certified in payments, trusted application and dynamic in operation.

Key Issues

- Collaboration is required between various modes of public transport in the city so that one mode of public transport can serve as substitute for another mode in case of emergency or breakdown.
- Paradigm shift is required in bus system from self-sustenance to handholding.
- For improving city bus operations the need is to have better coordinated transit interchange points which can ensure seamless transition from one transport mode to another.
- Terminals with passenger facilities to be developed at potential location like railway stations, airports and other major locations.
- Common ticketing across all transport modes.
- Design of passenger queue shelter should be universally accessible and bus docking should be friendly.

Chairperson addressing the audience

Audience at the session

Technical Session 6:

Urban Rail Transportation: Shaping The Future Cities.

Indian cities are growing at a very high pace. Today we have about 20 cities which have a population of more than 2 million and another 33 cities would soon cross the mark. Along with the growth in population size, the cities are also experiencing a boom in economic activities, which has resulted in a greater need for mobility. Today more and more cities are investing in high capacity rail based urban transport system to facilitate growth, accommodate ever-growing numbers of commuters and to alleviate traffic congestion. Most of these 20 cities have either implemented a rail based system or planning to do so. Though the rail transit system have significant impact up to few kilometers (3-5 km), the focus of the transit authorities have been limited to the rail network and its operation and do not go beyond the stations. This session highlighted on all these issues.

Chairperson :

- Mr. Mukund Kumar Sinha, OSD (UT) &Ex-officio Joint Secretary, Ministry of Urban Development.

Presenters -

- Mr. Subodh Kumar Gupta, Director (Projects), Mumbai Metro Rail Corporation Ltd., (MMRCL)
- Dr. Pawan Kumar, Associate Planner TCPO
- Mr. Amit Singh, Co-foundder, Shuttle
- Mr. Satish Kumar Gupta, Chief Project Advisor, National Payment Corporation of India.

Rapporteur :

- Mr. Namit Kumar, RITES.

Highlights of Discussion

- In 12 metropolitan cities metro rail projects are either in operation or are under construction or at a planning state.
- In another 11 cites metro rail projects are being planned in near future.
- Core emphasis on the technological aspects like gauge, underground or elevated, rolling stock, smart card, signaling systems etc. have now practically settled.
- Urban transport is inherently multimodal which has to be integrated at various levels viz. physical, network, inter change facilities, fare, information, institutional, etc.
- The focus of metro rail should now be more on making the rail network more meaningful to the users to holistically improve the quality of travel and thereby quality of life.
- LRT is Light Rail Rapid Transit characterised by exclusive right of way, advanced train control system, short headway capability and floor level boarding.
- Tram is a sub-category of LRT rather than distinct transport mode.
- LRT can be a good feeder mode for close transit system such as metro, monorail, sub-rail, etc.
- In Indian cities LRT (train) at grade level can reduce congestion at central business district, employment center etc. by replacing minibus, auto, cycle rickshaw, etc.
- It will also reduce demand for parking lots, vehicular pollution and revitalise public open space.
- It may fulfil the requirement of missing link in the network.
- Toyama city has been featured as one of the

five compact cities in the world by OECD by revitalisation of public transport (Tram).

- The Manchester Metro link Tram system was the catalyst for the boom in UK Tramway construction.
- Cities in India are grappling with congestion. About 7 million man hours are lost in Delhi due to congestion. Average speed in Bengaluru is 10 Km/hour.
- About 30% of all traffic congestion is caused by drivers looking for parking space in cities.
- Metro rail in Delhi has solved corridor problem but what about first mile and last mile connectivity.
- The need is to integrate single tap booking, seamless alignment and integrated payments.
- Smart Shuttle has developed solutions for demand forecasting, route design based on traffic pattern, reducing congestion, predictable travel time computation modelling traffic conditions.

Key Issues

- Share of public transport on an average should be aimed at 60% of motorised trips and 35% of total trips including walk.
- Enhanced commuter experience would draw more and more users towards public transport particularly facilities within the metro system, in the close vicinity of the system and around the system at city level.
- Within the metro system provision of platform screen doors (PSD's) increased provision of lifts and escalators, improved architectural finishes and use of station facilities for cultural activities will make the system more attractive.
- Works within system and close to the system should be implemented as part of the MRTS project.
- Separate and sufficient budget to be provided to ongoing MRTS projects for big ticket integration works to make travelling seamless and urban living better.
- In Indian cities LRT (Tram) at grade level can be developed insmall and medium towns to fulfil the requirement of missing links in the public transport network.

Opening remarks by the Chairperson

Panelist viewing the presentation

Audience at the session

Technical Session 7:

Real Time Traffic Modelling

Coordinated by PTV Group:-

PTV Group provides software and consulting services for transport, logistics and geo-marketing in terms of transport routes, sales structure, private or public transport, movement of people and goods. In this session computer modelling application for real time traffic data was discussed by the experts.

Chairperson :

- Mr. Rohan Modi, CEPT University.

Presenters :

- Mr. Hari KirhnaGaddam
- Mr. Mohit Kumar Singh
- Ms. Lakshmi Devi Vanumu
- Mr. K. Ramachandra Rao, Department of Civil Engineering, IIT, Delhi
- Mr. Rishi Ahuja, Sunovatech Infra.

Highlights of Discussion

- Rail based transit systems are one of the most efficient and economic system which offer shorter travel and are expected to enhance Public Transport share.
- Density, walking distance and transfer time at stations can be taken as performance assessment tool.
- Taking Maninagar railway station, as case study, a methodology developed to assess transit station capacity using micro simulation model.
- A qualitative measure level of service is generally used for the performance assessment.
- Data for speed of passenger on station was collected which varies with group behaviours, luggage characteristics, gender and age.

Audience at the session

- Through "Viswalk as an add-on-module in Vissim", it is possible to simulate high volume of pedestrian traffic and analyse only pedestrian situation or interaction of pedestrian traffic and vehicular traffic.
- Passenger input is just outside of the station area. If location changed then it may affect density at bottlenecks.
- As part of methodology for Model Development, modelling public transport infrastructure should take into consideration railway tracks, public transport lines, public transport stops waiting area and platform edge, stairs and supporting infrastructure.
- Modelling Boarding – Alighting Volumes should take into consideration passenger input, passenger composition, speed, boarding volume and alighting volumes.
- The output of the model revealed that infrastructure at station is underutilised i.e. platform, foot overbridge, etc.

Key Issues

- VISSIM is an important tool to analyse pedestrian infrastructure in terms of capacity, bottlenecks and alternative analysis.
- VISSIM can be used for (i) analysis of decision making area; (ii) analysing of ITS improvement and pedestrian infrastructure for the station; (iii) evacuation study for station and (iv) alternative analysis for physical integration of railway station and BRTs Station.

Technical Session 8:

a) Strategies for Low Carbon Transport
b) Fuel Economy and Alternative Fuels and Vehicles.

Coordinated by UNEP:-

This Session is a part of series of 4 sessions coordinated by UNEP DTU Partnership for Promoting Low Carbon Transport in India project that have common theme of addressing climate change. This particular session in this series laid down the key strategies that would require to be implemented at the national and local level to achieve the development objectives in terms of reduction of CO_2 emissions from the transport sector. The second part expands on improved fuel economy of road transport vehicles and alternative fuels and vehicles which can achieve a low carbon transition. The session shared global, regional and national experiences.

Chairperson :

– Ms. Kamala Ernest, Programme Officer, UNEP

Presenter :

– Mr. Subhash Dhar, Senior Economist UNEP-DTU Partnership

Promoting Low Carbon Transport in India project by UNEP-DTU partnership provided an analysis and the know how necessary to create an effective policy environment for low carbon transport at national and city level.

Highlights of Discussion

- A low carbon transport transition is possible in India through following initiatives and interventions;-
  - Electricity cleaning including the uptakes of electric vehicles and the decarbonisation of electricity in India's power grid.
  - Carbon Dioxide reduction from implementation of stringent fuel economy targets.
  - Sustainable mobility such as metro and BRT systems along with improved integration of NMT modes, the use of feeder buses and a higher share of rail in intercity transport.
  - Biofuel penetration facilitated through national policies and enabling mechanisms as well as carbon price.
  - Intervention in the freight transport sector through the implementation of dedicated freight corridor, demand reduction for coal freight etc.

- Chile adopted a mandatory fuel economy labelling scheme in 2013 and taxation scheme in 2014 that puts a tax on less efficient and polluting vehicles based on CO_2 and NOx ratings.
- Mauritius adopted a fee-bate scheme in 2011 that puts a fee on cars above 158 CO_2 g/km and rebate for cars with CO_2 ratings from 91 to 157 CO_2 g/km. It helped in improvement in fuel economy and increase in sale of new hybrid vehicles.
- Vietnam adopted voluntary fuel consumption limits for light duty vehicles and motorcycles in 2013 and fuel economy labelling for new domestically assembled and imported cars.
- Kenya adopted an age based taxation system that will raise the tax for imported second hand vehicles older than 3 year 150% and reduce tax to 30% for vehicles younger than 3 years.
- Clean Air Asia is an international NGO that promotes air quality and livable cities by translating knowledge to policies and actions that enable the Asia's 1000+ cities to reduce air pollution and greenhouse gas emission from transport, energy and others sectors.

8b) Fuel Economy and Alternatives Fuels and Vehicles:

Chairperson :

– Dr. Oliver Lah, Wuppertal institute

Presenter :

– Ms. Kamala Ernest, Programme Officer, UNEP/Global Fuel Economy Initiative (GFEI)
– Mr. Partha Bosu, Indian Director and South Asia Liaison clean Air Initiative, Asia
– Mr. Subhash Dhar, Senior Economist UNEP Risoe Centre

Rapporteur :

– Ms. Priyanka De Souza UNEP

Highlights of Discussion

➢ The existing policies for fuels and vehicles are as under:-

- Building fuel economy standards will start in 2017.
- Fuel efficiency improvement standards in cars up to 10% to be implemented by 2017 and of 20% by 2022 as compared to 2010 levels.
- There will be phased implementation of vehicles and fuel quality norms in the country.
- National policy on biofuels proposed blending targets of 20% of biofuels both for bio-diesel and bio-ethanol by 2017.
- National Electric Mobility Mission Plan suggests phase wise strategy for investments in R&D, power and electric vehicle infrastructure.
- 20% blending of biofuels benefit job creation especially in rural areas and provide energy security through oil saving and fuel mix diversification.
- Key barriers for Electric Vehicles are (i) Charging infrastructure; (ii) battery costs and (iii) driving range.

Key Issues

➢ A growth in vehicles is inevitable for India.

➢ Transport Sector can transit to a pathway consistent with 2^0C scenario and five wedges like electricity cleaning, fuel economy, sustainable mobility, biofuel penetration, freight transport, which can deliver the reductions in CO_2 emission of 13 billion tons from 2010 to 2030.

➢ Global Fuel Economy Initiative (GFEI) has been able to support about 35 developed and developing countries in developing and strengthening fuel economy polices.

Panelist making presentation

Panelist listening to the views of participant

- UNEP is also now starting activities to promote electric vehicles with an initial focus on electric 2-3 wheelers.
- Supply side measures provide the bulk of CO_2 emission reduction.
- Financial incentives and infrastructure essential for success of supply side change.
- Electric Vehicle provide the largest benefits for air quality in cities.
- Electricity cleaning is essential for low carbon transport.

Dignitaries on the dias

Technical Session 9:

Inclusive Usage of Road Space

Cities of all sizes across the country are facing severe congestion. Congestion is often attributed to the increase in number of vehicle, however there are other factors such as mismanagement of road space which too contributes largely to it. Incomplete development of Right of Way, rampant encroachment of footpaths, service lanes and carriageway, on street parking and stopping of vehicles are some of the major causes which add to the chaos on roads. This is resulting in reduced speeds, idling of vehicles, accidents and road rages. The focus of cities have often been on adding road space rather than managing the existing infrastructure effectively to utilize the capacity optimally. All these issues were deliberated in the session

Chairperson :

– Mr. R.K. Singh, Director (Urban Transport), Ministry of Urban Development.

Presenters :

– Dr. Akshay Kumar Sen, Deputy General Manager (Economics) and Fellow HSMI, HUDCO
– Dr. K. Ravindra, Central Road Research Institute.
– Mr. Hazari Lal, Director, The United Traffic and Parking Association.
– Ms. Sonila Metushi, Policy Officer, Passenger Transport and Taxis, International Road Transport Union.

Rapporteur :

– Mr. Mohit Dev, Ph.D. Student IIT Roorkee.

Highlights of Discussion

- Average vehicle speed during peak hour in many Indian cities is as low as 10 Kmph.
- Number of vehicles per 1000 population has increased from 192 in 1991 to 411 in 2011 in Delhi. In 2013-14 the total vehicle in Delhi were reported at 82.93 lakh.
- Delhi adds almost over 1500 vehicles each day on its roads.
- In the last 15 years, bus ridership has decreased by about 40% whereas number of personal trips per day increased by more than 25% during the same period.
- Major transport problems in Delhi are:-
  - Growing congestion.
  - Increasing air pollution.
  - Increasing road accidents.
  - Rising carbon emissions
  - In-appropriate management of urban land use and transport.
  - Free Road use leads to congestion trap.
- In 2014, 1.39 lakh deaths were reported in road accident in India which account for 10% of world road deaths.
- Road accidents victims include 7% above 65

Opening remarks by Chairperson

years, 53% between 25-65 years, 32% between 15-24 years and rest below 14 years.

- In the road accidents, 67% is human factors, 24% is road environment factors 4% is vehicle factors and the rest are other factors.
- A study by CRRI observed that drivers are generally exceeding the design/posted speed limits.
- In horizontal alignment, short radius needs to be avoided and the need is to break the monotony of straight section.
- In vertical alignment the accident rate reduces considerably when grade difference is less than 4%.
- Sharp horizontal curvature should not be introduced on top of crest curve.
- As per ASSOCHAM study, in 1980 the number of buses per one lakh population were 57 which have now dropped to 25 buses only and the quality of buses have also gone down.
- Collective land transport is the backbone of sustainable, seamless, affordable and inclusive mobility for all.

Key Issues

- Road space is indeed one of the few example of a good or service which market forces have left relatively unscathed.
- The problem of inclusive use of road space needs to be handled at three levels viz. (i) engineering approach, (ii) physical planning approach and (iii) economic approach by optimising pricing of road use to internalise transport externalities.
- Safe geometric design elements should consider (i) horizontal alignment; (ii) Vertical alignment; (iii) cross section elements and (iv) sight distance considerations.
- Road safety does not depend on one single cross section element but on the combination of various cross sectional elements like shoulders, carriageway, foot path, cycle tracks, slide slopes, side drain, camber super-elevation gradient etc.
- Accidents are increasing day by day. For tackling this problem a multi-pronged strategy targeting drivers behaviour, road designs and vehicle is required.
- Performance of the roads be linked to the road executing agency rating for the future projects.
- Smart Parking Enforcement Policy approach needs to be followed i.e. skill parking management by trained people, technology-using smart parking and management technology, enforcement-trained officers to enforce the parking regulation and price to be charged as parking fee based on real estate value.
- Action plan for improvement of public transport system should focus on better governance, high quality infrastructure, innovation, incentives for private funding, sustainable mobility system, users charges, improving service quality, building image of the system and regular evaluation and monitoring.

Dignitaries on the dias

Audience at the session

Technical Session 10:

Climate Resilient Urban Transport - I

The transport sector is not only a vital enabler of economic activity and social connectivity but is also the second largest and one of the fastest growing energy end-use sectors, accounting for 23% of global energy-related greenhouse gas emissions. The Urban Electric Mobility Vehicles Initiative (UEMI) of UN-Habitat phases out conventionally fueled vehicles and aims at increasing the share of electric vehicles in total volume of individual motorised transport in cites to at least 30% by 2030. However, the high uptake and adoption of electric vehicles depend on a number of factors, such as: advances in vehicle and battery technologies and reduction in cost of production, the availability of charging infrastructure, increased awareness of citizens and an enabling policy environment and incentive provided by governments including city governments. In India, an ambitious target of putting 5 million electric and hybrid vehicles per year on the road by 2020 has been set under the National Mission for Electric Mobility (NMEM). In addition to supporting the industry, NMEM seeks to create a significant positive impact on the health index of the country by promoting zero pollution electric vehicles and reducing the dependence on fossil fuel. FAME India – Faster Adoption and Manufacturing of Hybrid and Electric vehicles in India – is a part of the National Mission for Electric Mobility. The scheme envisages providing a support of Rs.795 crore in the first two fiscal years starting with the current year, to promote eco-friendly vehicles, offering incentives on electric and hybrid vehicles to the extent of Rs.29,000 for bikes and Rs.1.38 lakh for cars. This session deliberated on climate resilient urban transport issues.

Chairperson :

– Mr. Mukund Kumar Sinha, OSD (UT) and E.O. Joint Secretary, Ministry of Urban Development.

Presenters :

– Mr. Gopal Kartik, Head Strategy and Business Planning, Mahindra Reva Electric Vehicles Pvt. Ltd.
– Dr. Minal Pathak, Assistant Professor, CEPT University.
– Mr. Askhay B.D., Uber India Head of Public Policy.

Rapporteur :

– Ms. Neomi Blandine Desguin, UN-Habitat

Highlights of Discussion

- Uber is a technology company that provides module application for riders to connect with transportation providers registered on their platform.
- It works on three basic principles:-
  - Request i.e. tap to select location there
  - Ride which is an input and tells the driver about the destination
    and
  - Rate – provide immediate feedback after each ride.
- The service is quick or timeless, reliable and accountable.
- Uber has partnered with the Government of Rajasthan, Punjab, Telangana to introduce and promote ridesharing and to peer to peer transportation in the States.
- Uber is encouraging the use of electric vehicles to promote environment friendly transportation to reduce the impact of climate change.

- National policies and programmes which focus on climate resilient transport system are as under:-
  - India's Climate Change Plan (INDC) focuses on vehicle efficiency and clear fuel use.
  - The Faster Adoption and Manufacturing of Hybrid and Electric Vehicles in India (FAME India) scheme formulated as part of National Electric Mobility Mission Plan 2020 (NEMMP) to promote faster adoption and manufacturing of hybrid and electric vehicles in the country by providing incentives.
  - Vehicle Fuel Efficiency Program – beginning in April, 2016 to set the efficiency targets for new cars.
- In National Electric Mobility Mission Plan,fuel saving of 2.2.-2.5 million tones is expected by 2020.
- Challenges for electric vehicles are of four types namely market, technical, infrastructure and policy.
- The global industry is experiencing a rapid growth in sales as well as in product offerings.
- Even 0.5% land area of Delhi (NCT) if covered with solar, can generate required energy for the national mission.

Key Issues

- With emerging application technology like UBER App the future of transportation will be greener, cleaner and more efficient because of fewer cars and more shared rides.
- Ridesharing is the deployment of existing underutilised private vehicles to provide rides.
- Given India's large growing two wheelers market, there exist a significant potential for scaling up electric two wheeler.
- Financial support, incentives and infrastructure can increase the share of electric vehicles.
- Shift away from oil and contribute to energy security.
- If electricity is decarbonised, electric vehicle can also be a significant option for CO_2 mitigation.
- Five pathways to affordability in the electric vehicle:
  - Lightweight construction
  - Efficient drivetrains
  - Appropriately sized battery
  - Green efficient manufacturing.
  - Derivatives for lowering service and ownership costs.
- Electric vehicle in use are 50+ seat buses, 17-25 seat mini buses, 4+1 seat taxis, metro feeder buses run for Delhi metro, city taxis, etc.
- Companies in India are already adopting Electric Vehicles for upgrading from IC based vehicles to Electric vehicles. The electrical vehicle industry and market in India is nascent and evolving.
- Appropriate technology, clear market focus and strong government support can enable strong penetration and leadership in affordable electric vehicle mobility.

Presentation in the session


Audience at the session

Technical Session 11:

a) Facilitating Intercity Transport
b) Facilitating Rail for Intercity Transport

Coordinated by UNEP:

This Session was part of a series of 4 sessions coordinated by UNEP DTU Partnership for Promoting Low Carbon Transport in India project that have a common theme of addressing climate change. The session focused on the strategies for intercity transport both for freight and passenger traffic. Since rail is considered a more sustainable form of transport, the session had a focus on current policies for promoting rail and how the climate change can impact rail infrastructures and approach for adapting to climate change.

11 a): Facilitating Intercity Transport

Chairperson :

– Mr. B. K. Tripathi, Member Secretary, National Capital Region Planning Board.

Presenters :

– Mr. P.R. Shukla, Professor, Indian Institute of Management (IIMA), Ahmedabad.

Highlights of Discussion

- Enhancing the share of rail in total land transportation from 36% to 45%.
- Dedicated Freight Corridors will reduce 457 million tonnes of CO_2 over a 30 year period.
- Proposed high speed rail corridor between Ahmedabad and Mumbai will connect large and intermediate cities.
- The proposed rail corridor will increase the share of rail and reduce the energy demand.
- While connecting small and medium cities it will promote a balanced regional development.
- Large infrastructure project, such as the proposed Dedicated Freight Corridor (DFCs) are critical drivers of the national economy and have major implications for achieving sustainability and low carbon development goals.
- Climate change shall exacerbate over the century. Hence, impact probability and costs on the infrastructure would increase significantly in later years.
- World over, Regional Rail System have evolved by integrating the regional railways into the urban system.
- Suburban services have to operate right into the beating heart of the cities.
- For example high speed rail in Berlin is both the intercity and regional routes. It enters and crosses the inner city and have seamless interchange facilities at major stations.
- Other examples are London over ground, Paris Resean Express Regional (RER), Bay Area Rapid Transit (BART) San Francisco.
- Integrated Transport Plan for National Capital Region 2032 has proposed Regional Rapid Transit System (RRTS).
- This will be hi-speed rail based commuter transit system with seated accommodation for regional passenger traffic. It will run 100 kms in 60-70 minutes.
- This will be well integrated with Delhi Metro, Indian Railways, ISBT and Airport.

- In all, the plan has proposed 8 corridors of which three are being taken up on priority i.e. Delhi-Alwar (180 kms), Delhi-Panipat (111 Kms) and Delhi-Meerut (90 Kms).
- These BRTS corridors will provide various economic benefits. Users will have fuel cost savings, time cost savings and saving in capital cost of vehicle.
- The non-user of the system will also be benefitted in terms of reduction of congestion and associated reduction in vehicular operating cost and time cost.
- The community as a whole will have benefit in respect of reduced environmental pollution and saving in investment on alternative transport network.
- These three lines will have commercial operation within the next 10 years.
- A National Capital Region Transport Corporation (NCRTC)has been incorporated on 21st August, 2013 for designing, developing, implementing, financing, operating and maintaining RRTS in NCR.

11 b) Facilitating Rail for Intercity Transport:

Chairperson :

– Dr. Manoj Singh, Advisor (Transport), Niti Ayog.

Presenters -

– Mr. B. K. Tripathi, Member Secretary, National Capital Region Planning Board.

– Ms. Atshushi Koike, professor Koke University

Rapporteur :

– Ms. Minal Pathak, Asstt. Professor, CEPT University.

Highlights of Discussion

- Large population of the country (1.25 billion), higher growth in GDP, increasing urbanisation with more than 50 million plus cities, steadily increasing disposable incomes, internal migration, etc. are the major factors promoting passenger travel demand.
- Land based passenger mobility has increased from 102 billion passenger km (BPKM) in 1950-51 to 7817 BPKM in 2010-11 and is estimated to increase to 12987 BPKM by 2020-21.
- In Indian Railways, passenger has multiple segments –commuter, passenger, intercity long-distance, etc.
- In 2010 road shared about 58% of freight transport and the rest was rail transport.
- Thrust areas in rail network for the next 5 years are doubling of railway line (11,000 kms) new line (1,500 Kms), electrification (10,000 kms), Gauge Conversion (2,500 kms).
- Of the total originating passenger of about 8,397 million in 2013-14, 54% are sub-urban passengers and rest are non-suburban passengers.
- The sub-urban passenger travel an average distance of 37 kms per day.
- In Japan the first high speed rail started operation in 1964 between Tokyo and Osaka.
- Japan Maglev train breaks world speed record with 600 km/h test run.
- The purpose of Japanese High Speed Rail project is to achieve high economic growth, regional development for regional equity issues and environment friendly for climate change.
- High speed Rail Project plays the role of inter-regional passenger transport.

Key Issues

- Increased investment for improving the efficiency of railways and building high speed corridors are a way to address the declining rail share in total intercity transport kilometres.
- Increased share of rail delivers a very sizeable reduction in energy consumption in the long term and, therefore contributes to energy security.
- Freight is smaller but has growing share within the transport sector. Sustainable logistics have an impact on the final energy demand from transport, especially in the long run.
- Transport infrastructure is long life assets exposed to weather conditions. Climate change can add to the in-situ climate risk.
- It is wise to incorporate future climate conditions during the design stage and also include the expected future climate change in operation and safety plans.
- If consistent economic growth of 7-10 per cent per annum is to be achieved over the next 20 years, there is a pressing need for expansion of railway for both freight and passenger traffic.
- High Speed Rail projects are effective investments not only nationally but also locally as seen in Japan.
- High Speed Rail System investment decreases CO_2 emissions in transport sectors.

Panelists interaction

Chairperson addressing the session

Technical Session 12:

Making Fast Growing Cities more liveable with ITS

Intelligent transport systems are advanced applications which aim to provide innovative services applicable to different modes of transport and traffic managements. ITS also helps in data collection with some of its applications. These applications enable various users to be better informed and make safer, more coordinated, and smarter use of transport networks.Considering the importance of ITS in improving the image of transport system, the objective of this session was to bring out the overall applications of ITS in planning, management and operation of transport systems.

Chairperson :

– Dr. Sudhir Krishna, Former Secretary, MoUD

Presenters -

– Mr. Deepak Kumar M, Divisional Traffic Officer, Karnataka State Road Transport Corporation.
– Ms. Priscilla De Coninck, Urban Transport Specialist, AFD
– Ms. Susan Harris, CEO, ITS Australia and Board Member ITS World Congress.

Rapporteur :

– Mr. Mohit Dev, Ph. D. Student IIT Roorkee.

Highlights of Discussion

- With the application of ITS overall efficiency of the traffic system could be improved by providing access to the real time data.
- ITS helps in improving the safety by reduction in accidents.
- Application areas of ITS are as under:-
  - Traffic management and control.
  - Tolling
  - Road pricing
  - Road Safety and law enforcement
  - Public transport travel information and ticketing
  - Driver information and guidance
  - Freight and Fleet management
  - Vehicle safety
- Karnataka State Road Transportation Corporation has implemented Intelligent Transport System at Mysore city under GEF-SUTP Programme.
- It is the first of its kind demonstration project in India for the entire fleet of city bus services in the history of Indian State Transport Undertakings.
- Major components of the Mysore Project are as under:-
  - Real time Passenger Information System (IPS)
  - In vehicle display system
  - Automated voice announcement system
  - Central Control Station
  - Automatic Vehicle location system
  - Enterprise Management System
  - MIS Reports
  - Training
  - The project covers 500 buses, 105 bus shelters, 45 platforms and 6 bus terminals.
- The key features of the operation are real time tracking of buses, dynamic scheduling of buses, schedule/route/bus stop modifications, real time

Opening remarks by the Chairperson

trip and schedule monitoring, GIS interface, SMS alerts for management, etc.

- ITS application has benefitted the commuters, management and the society in a large way.
- Commuters are benefitted to have real time information, announcement for next bus stop, reduced waiting time, comfortable trip planning, value added SMS and exclusive commuter portal
- Management is benefitted by having real time tracking of buses, dynamic scheduling of buses, decision enabling MIS reports, driving behaviour analysis and tool to defend motor vehicle claim cases.
- Society in general is attracted to promote the public transport usage which is an environment friendly initiative. It can have immediate access to accident/incident information.
- Beyond ITS traditional technologies other digital innovations are also making inroads in transport planning for IPT mapping transport planning with mobile data.
- For example digital mapping through urban engines replay real time bus traffic in Sao Paulo.
- Moovit application is for multimodal itinerary planner.
- Digital Matutus help in IPT network mapping in Nairobi (Kenya).
- Mobile data is being used for Transport Planning in Ivory Coast.
- There is a need to adapt rapid changes in digital technologies by accelerating access to mobility.
- In India regulatory framework is weak and needs to be strengthened.
- The objective should be to increase productivity without huge investment.

Key Issues

- The new digital technologies are more demand oriented and no longer offer oriented. The client relationship being the core business.
- Banks, mobile operators, data miners and internet players are the new comers in this field.
- The business models have to be from capitalistic to collaborative.
- In this process private and public identities are merging in terms of privacy and data ownership
- The entire process has to be adapted in the legal framework by accelerating transition.
- Financial viability of ITS is also important in terms of social and environment viability.

Audience at the session

Dignitaries on the dias

Technical Session 13:

Climate Resilient Urban Transport-II

The transport sector is a vital enabler of economic activity and social connectivity. It is the second largest and one of the fastest growing energy end-use-sectors, representing 23% of global energy-related greenhouse gas emissions. The Urban Electric Mobility Vehicles Initiative (UEMI) of UN-Habitat phases out conventionally fueled vehicles and aim to increase the share of electric vehicles in the total volume of individual motorised transport in cities to at least 30% by 2030. However, the high uptake and adoption of electric vehicles depend on a number of factors, such as: advances in vehicle and better technologies and reduction in costs of production, the availability of charging infrastructure, increased awareness of citizens,enabling policy environment and incentives provided by governments including city governments. In India an ambitious target of putting 5 million electric and hybrid vehicles per year on the road by 2020 had been set under the National Mission for Electric Mobility (NMEM). In addition to supporting the industry, NMEM seeks to create a significant positive impact on the health index of country by promoting zero pollution electric vehicles and reducing the dependence on fossil fuel. FAME India- Faster Adoption and Manufacturing of hybrid and Electric vehicles in India – is a part of the National Mission for Electric Mobility. The scheme envisaged providing a support of Rs.795 crore in the first two fiscal years starting with the current year to promote eco-friendly vehicles, offering incentives on electric and hybrid vehicles to the extent of Rs.29,000 for bikes and Rs.1.38 lakh for cars. The session focussed on all these aspects of electric vehicles and urban mobility.

Chairperson :

- Mr. Ambuj Sharma, IAS, Additional Secretary, Ministry of Heavy Industries and Public Enterprises.

Co-Chair :

- Mr. R.K. Singh, Director (Urban Transport), MoUD.

Presenters :

- Mr. Wybren Van der Vaart, Founder& CEO Asia Electric, European Business and Technology Centre, Mumbai.
- Dr. Kulwant Singh, Regional Advisor, UN-Habitat
- Dr. Tapan Sahoo, Vice-President, Synergy Between Transport Modes and Technology (R&D) Maruti Suzuki

Rapporteur :

- Ms. Neomi Blandive Desguin, UN-Habitat.

Highlights of Discussion

- In the city of Amsterdam there is vast network of electric public chargers with dedicated charging/ parking locations.
- There are fiscal incentives for semi-public and private charging infrastructure.
- In India introduction of electric vehicles requires charging infrastructure with unified charging format across locations.
- Charging infrastructure needs to be used by multiple users. It includes payment on public charging, transparency on charging locations and

recouping capex investments by high utilization of chargers.

- It will also lead to large demand for energy and as such scheduled loading of electric vehicles will be required to avoid overload. It should enable the customers to have transparency in regulating the energy consumption.
- Charging solutions can be had at home, office, on the road and in town.
- National Mission for Electric Mobility (NMEM) covers all vehicle segments (2W, 3W, 4W, LCV, Buses) and full range of Electric Vehicles (Mild/ strong/hybrids, PHEV, EV).
- NMEM activities are market creation through incentives scheme, pilot fleet deployments for public transportation, charging infrastructure for electric drive vehicles, technology platform and vehicle testing and homologation infrastructure.
- The Mission has an ambitious target of 6-7 million sales of E.V. in 2020. Which is expected to save 9,500 million liters of crude oil equivalent to Rs.62,000 crore.
- Mission will support generic technology projects in terms of various type of battery and EV kits.
- Mobility flows are the key dynamics of urbanisation with the associated infrastructure constituting the backbone of urban form.
- Urban population use more per capita energy.
- 70% of GHG emissions attributable to urban areas.
- Reducing emissions is crucial for restricting global warming to 2 degree Celsius above pre-industrial levels.

Key Issues

- E.V. urban bus recovers breaking energy with silent operation in populated areas having centralised charging facility.
- It has no local pollution with extremely low noise and vibration.
- The new paradigm in urban mobility should be access – the ultimate objective of all transportation – to goods, services, people and amenities thereby bringing people and places together.
- The new urban paradigm should have compact city, urban mixed uses and reduced consumption of non-renewable energy and emission of greenhouse gases.
- Electric mobility can promote low carbon economic growth.
- The electric mobility initiative is linked with the smart cities initiatives to improve the public transport provision.

Panelists in interaction mode

Memento being presented to Panelists

Technical Session 14:

Financing Transport in Future Cities

Cities are witnessing rapid growth in size and population which has created a need to develop urban transport infrastructure, especially public transport that can meet the mobility needs of the people. However, to provide adequate transit facilities and to operate and maintain the same, large scale investments are needed. The resources available with transit agencies are limited and hence they need to evolve new strategies for development, operation and maintenance of public transport. Further, cities are venturing into development of infrastructure without understanding their financial implications. It is, therefore, important that the financial impact of providing public transport system need to be evaluated and innovative solutions to make public transport services financially viable should be followed for improving safety of public transport, modernizing city bus services & providing integration between various modes, etc. The session focused on examples presenting efficient ITS model which have been implemented in other cities, and possible solution, which can likely be effectuated for Indian city scenario.

Chairperson :

- Mr. B.I. Singal, Former Director General, IUT.

Presenters :

- Mr. Prasanna Patwardhan, Managing Director, Prasanna Purple.
- Mr. Sharad Mohindru, Transport Consultant
- Mr. Arnaud Dauphin, AFD

Rapporteur :

- Mr. Ashutosh Kothari, Planner

Highlights of Discussion

- The choice of the public transport mode is a key decision for cities.
- The decision is mostly based on initial cost of the mode.
- The ongoing operation, maintenance, repairs and replacement cost are different for different modes.
- For example, the life of rail transit vehicles is nearly 30 years and its capacity 3 times (240) compared to a city bus which has a life span of just 10 years and a capacity of 80 only. Thus, bus will need to be replaced 3 times in the life span of a rail coach and will provide only 1/3rd capacity.
- If these costs are not taken into account the choice may prove to be costly in the long run.
- Hence "Life Cycle Cost of the mode" should be integral to mode choice.
- IUT study has calculated the life cycle cost (LCC) of five MRT modes namely Metro Rail, Mono Rail, Light Rail (separately for at grade and elevated), Bus Rapid Transit and City bus Services.
- A hypothetical case of a 20 km corridor having a phpdt of 15,000 was assumed for each mode.
- The LCC was presented for 30 year life cycle for each mode.
- The results of the study were then applied to real life scenarios.
- The study revealed that LRT (at grade) has the least life cycle cost per seat of Rs.15.26 lakh.

- Life cycle cost of metro rail is high because it is a high capacity mode, much beyond the assumption of 15,000 PHPDT taken for the study.
- City bus service is appropriate in corridors with low demand levels of up to 5,000 phpdt.
- In high demand level corridors beyond 30,000 PHPDT, Metro rail is the only proven choice.
- Between 5,000 and 15,000 phpdt, choice lies in three modes LRT, Monorail and BRT; A detailed 'alternate analysis' is needed before selecting the mode.
- Between 15,000 and 30,000 phpdt, elevated LRT is perhaps the only proven choice.
- The following factors are affecting the growth of city Bus Service:-
  - Orphan status.
  - No facilitation or monitoring
  - Poor implementation of NUTP
  - Not a priority sector
  - Lack of integrated transport planning with other services.
  - High interest on funding.
  - Unviable fare structure and delayed revision.
  - Unhealthy competition by IPT
  - No viability gap funding to private operator
  - Heavy taxes
  - Low asset utilisation
  - High cost of maintenance.
- Traffic congestion is caused by vehicles not by people.
- Traffic is only one of the side effects of growth.
- Urban transport congestion arises from the fact that a lot of people want to reach same place at the same time.
- India is the second largest producer of two wheelers and buses.
- Ride and save system if implemented, would not only benefit the lower middle class but also cater to upper middle group of the community.
- The proposed system can be implemented with a common mobility card.
- This card has to be a photo ID Card linked with PAN number and would be a common public transport card which can be used in all public transport modes available in the city (metro/bus/ local train)

Opening remarks by Chairperson

- At the time of income tax return at the end of the year all the expenditure made on public transport can be accessed to take a tax rebate.
- Taxi and Auto can also be included in the incentive scheme with varying percentage of rebate.

Overall Benefits of Ride and Save:-

i. Efficiency – an incentive will be effective where it encourages or can be targeted to encourage a modal shift from private to public transport. The incentive can be variable, high in peak hours on week days and low in lean hours and weekends.

ii. Visibility – an incentive will be visible when commuters are aware of the incentive each time they travel from home to work using public transport.

iii. Equity – an incentive will be equitable when it delivers a consistent benefit to commuters regardless of the income level.

iv. Simplicity – an incentive will be simple when it is administratively easy to deliver (from a government or employer perspective) and to receive (from a commuter perspective).

SOME INTERNATIONAL EXPERIENCES

- Australia – Tax incentive for Public Transit

  The policy recommends the following reform measures for the taxation of passenger transport:
  - The provision of tax-free fringe benefits for commuting costs, applicable to public

Panelist making a presentation

transport fares and park-and-ride costs.

- Tax incentives for employers A) in CBD areas offering flexible work hours and B) in decentralised areas offering public transport incentives.

➢ Ireland – Tax Credit for Public Transit

- The Tax Saver Commuter Ticket Scheme was established in Ireland in 2000 as an incentive for workers in some parts of the country to use public transport.
- The scheme is not confined to state-owned forms of public transport and can include private operators if they are approved transport providers.
- This incentive is seen as a positive way to encourage more people to avail of public transport in Ireland and to reduce traffic congestion.
- The employers and employees participating in the scheme sign a contract with each other agreeing to participate.
- Employees can save up to 52% of travel costs as a result of tax.

➢ Brazil – Salvadorde Bahia – Financial Mechanisms.

- International bidding process.
- Fixed amount of public financing disbursed on milestone-based payment during the construction (8 milestones)
- A minimum ridership threshold is guaranteed by the owner in the tender documents (500 000px/day)
- Bid evaluation based on the level of remuneration requested by the concessionaire to balance the project.
- Concessionaire able to get concessional loans form BNDES- Brazil development bank.
- Traffic adjustment mechanisms (based on consumer and energy index) and demand risk sharing (+/- 10%, 10-24%, +25%).

➢ Peru – Lima Metro Line 2 – Financing mechanisms

- International bidding process
- 60 deferred payment certificates during 15 years to the Concessionaire as compensation for the works performed.
- Concessionaire use its certificate to borrow money form the Bank and secure the reimbursement by the payment streams.
- Bid evaluation based on the remuneration requested by the concessionaire to balance the project.
- Remuneration based on services offered (train. km) with quality of services requirements.

Participant asking the question to the Panelist

What can we learn?

- PPP for mass transit transport could be feasible and financially sustainable.

➢ Technical

- Private: Technical risks borne by the concessionaire: design optimization, construction, geological, interface management, completion date, etc.
- Public: Land acquisition and clearance, resettlement, archaeological risks.

- Milestone-based payment, incentive for concessionaire to speed up construction

➢ Financing structure

- More than 60% of financing should be public (Investment, Bonds, IFIs,)
- Public funds should be committed and secured.
- Milestone-based cash payments to secure private sector financing and allow concessionaire to get its own financing or issue project bids.
- IFIs involved for both public funding and also for the concessionaire

Key Issues

➢ Life cycle cost reduces in all cases as the design demand level increases.

➢ Life cycle cost of city bus is the lowest which has limited capacity.

➢ LRT (at grade) has the lowest life cycle cost among all modes at all demand level.

➢ Life cycle cost of elevated LRT is less than BRT above 15000 phpdt and Metro at all levels.

➢ Monorail is cheaper than metro rail up to 15000 phpdt

➢ Metro rail is cheaper than monorail above 15000 phpdt.

➢ This can have win-win situation for all the stakeholders i.e. users, revenue authorities, environmentalists, government, city planners.

➢ We need to have a smarter policy for a smart mobility and it could be called as Ride and Save.

➢ Migration between modes is a natural phenomenon but can we retain existing public transport users and also make other mode users to shift to public transport?

➢ Why to levy congestion charging on private mode? Why not incentivise public transport?

➢ At present the tax slabs of the Government of India has a tax free component known as conveyance allowance, which is not dedicated to public transport.

➢ This component if excluded from the salary component and rather all the spending on public transport to be made tax free with pre-defined capping can attract more patronage. This will retain the existing public transport trips and encourage positive modal shift from two wheelers and cars.

➢ Make providing Public Transport a mandatory function of ULB.

➢ Provide Legislative powers to UMTA.

➢ Make City Mobility plan to move people not automobiles.

➢ Make integrated plan for all modes of transport together.

➢ Develop modern passenger and depot infrastructure at strategic location. Develop better pedestrian and bicycle infrastructure for last mile connectivity.

Audience at the session

- Define Automated, Structured Fare Revision formula.
- Bring public transport under priority sector.
- Make use of information technology extensively.
- Provide performance based viability gap funding.
- Stable regulatory environment with long term commitments for both construction and operation.
- Need strong players (mostly civil works companies) who are able to gather financing and lead construction and operation
- Sophisticated and complex structure and arrangements need good financial advisors for both public and private sides.
- Contract negotiation should start during the procurement process (need to create a competitive dialogue with bidders).
- Ridership and fares risks should be borne by the public with a minimal ridership threshold and a risk sharing mechanism in case of major demand variation.
- Remuneration/tax incentive to early start operations.

Panelists in an interaction mode

Technical Session 15:

Metro System: Planning and Technology

As per 12th Five Year Plan and the National Transport Development Policy Committee (NTDPC) Report in view of heavy passenger trips, metro rail system is suggested in cities having more than 2 million population. As on date metro rail system is in operation in 6 metro/mega cites, while it is in planning stages in many cities. It is observed that in most of these cities the metro system is not properly aligned with existing land use structure and activity nodes. Although they have achieved the peak hour ridership but off peak hour ridership is not up to the expected level. Further, metro system need to be fully integrated with functions, land use, economic nodes and travel behaviour in and around cities. Similarly, in the operation of metro system technical snags are also reported particularly in terms of electric signals, synchronization of PIS audio and video display systems, multimodal integration for first and last mile connectivity, improvement of accessibility to stations and development around stations. The existing infrastructure at stations has limited scope for expansion. The metro system has to explore the possibility of conservation of electricity, more use of non-conventional energy and recycling of water used for cleaning and maintenance of the system. Application of advance ITS has to be made for realising its full potential in improving the efficiency of the metro system. As such the discussion in this session focused on integration of planning and technology for improving the efficiency of the metro system.

Chairperson :

- Mr. D. S. Mishra, Additional Secretary, (Urban Development) MoUD.

Presenters :

- Mr. Bharat Salhotra, Managing Director, India and South Asia Alstom Transport.
- Mr. Brijesh Dixit, M.D. Nagpur Metro Rail Corporation Ltd.
- Mr. Manoj Goyal, IRSEE General Manager (Systems) MEGA

Rapporteur :

- Mr. Mohit Dev, Ph. D. Student IIT Roorkee.

Highlights of Discussion

- Based on the traffic volume and capacities, heavy metro for phpdtof 40000 and above, medium metro for phpdt of 15000-40000 and Light metro/ Train/BRTS for phpdt of 8000-20000 need to be considered.
- PHPDT trends show a slow growth in cities like Nagpur where it is expected to increase from PHPDT 10000 in 2010 to 17900 by 2041.
- While in a city like Chandigarh trends show a tremendous growth form PHPDT 7000 in 2010 to 35000 by 2041.
- In cities expected to have 5 times traffic growth integrated multimodal transport needs to be considered.
- Alstom, a railway multi-specialist has a complete range of system, equipments and services for metro rail in terms of rolling stock, infrastructure, signaling, services and turnkey solutions.
- Alstom is associated with metro projects in Chennai, Kochi, Lucknow, Bangalore and Delhi.
- The first train driven using electricity was in Germany in 1879.

- London underground railway started running electric train in 1890 with 630 V DG.
- The first AC traction in railway was introduced in Switzerland in 1899.
- AC motors could provide variable speed with change in frequency.
- 25 KV AC traction system are being used in Delhi, Mumbai, Chennai, Jaipur, Lucknow and Hyderabad metro.
- 750 V DC traction system are used in Kolkata, Kochi and Ahmedabad metro.
- Selection of appropriate design and technology for both Traction & Auxiliary power – including stations & other buildings, can help in energy conservation.
- Rolling stock – Light weight and Energy efficient capable of regeneration of energy by converting unutilized kinetic energy to electricity and feeding it back to the gird.
- Generation and use of renewable sources of energy like Solar Energy.
- Metros are heavy Energy consumers. Roof Tops can be planned and designed for PV solar installation right from the inception to avoid retro fitment costs. There exists an opportunity to install solar roof in Elevated Metros.
- Due to solar energy costs coming down rapidly & conventional energy costs going up due to input costs, there exists a business case for solar roof tops.
- Central Government policies are incentivizing the usage of renewable energy.
- For energy security of a Metro Rail the best strategy is to adopt it from inception stage for maximizing generation and minimizing cost.
- Adoption of green building norms to permit maximum natural lighting and minimize requirement of air –conditioning.
- Using green building materials for indirect saving of energy.
- Lifts and escalators with 3 phase VVVF gearless drives.
- Use of energy efficient fittings like LED lighting, energy efficient transformers, motors etc.

Opening remarks by Chairperson

- Use of different circuits (33%, 66% & 100%) and automatic sensors for switching on & switching off lights as per requirement.
- Nagpur Metro Rail Corporation Ltd. is going to be the first metro, which is planning introduction & use of solar power right from inception stage.
- NMRCL proposes to set up Roof top solar power project in phases, inline with the growth in annual energy demand.
- A 14 MW Solar Roof top project with an overall investment of –INR 100 crore is planned in phase-I for which preparation of DPR is under progress.
- NMRCL would source 65% of its total energy requirement from implementation of 14 MW Solar Roof top while the balance 35% would be sourced from the grid.
- Metro-link Express for Gandhinagar and Ahmedabad (MEGA) Co. Ltd. has adopted a stable, tested, and reliable metro technology i.e. light capacity metro system to cater PHPDT of 15000 to 25000.
- Metro Link Express For Gandhinagar Ahmedabad Company Limited (MEGA) has proposed to use latest tested technology in all its major system comprising (i) rolling stock (ii) Signaling (III) telecommunication (iv) traction power and (v) track.
- In rolling stocks grade of automation 3 and grade of automation 4 technology are being used.
- Signaling and train control system ensures safe and efficient movement of trains. Communication

based train control (CBTC) system signaling solution is adopted.

- Telecommunication system covers all the strategic locations such as stations, depots etc. to provide necessary channels for voice/data/video signals for management and operation including security.
- MEGA has considered 750 V DC third rail for the project due to the following reasons:-
  - No visual intrusion in city skyline.
  - No electromagnetic interference.
  - Less clearance is required in tunnel and passing under bridges.
  - To overcome the possibility of electrocution to daily commuters, MEGA is proposing PS Ds in station area.
  - Mega has adopted ballast less track on viaducts and tunnels. However, in depot yard area, ballasted track will be adopted.

Key Issues

- Both the systems (AC & DC traction system) have their pros and cons and a more detailed study is required for adoption in Indian Metros. Need for standardisation in this regard is still being debated.
- Metros in India may consider adoption of 25 KV AC or 750 DC keeping in view:-
  - Level of Ridership – Heavy, Medium, Light.
  - Route in the city –Elevated or underground.
  - Local conditions – Climatic, Geographic etc.
  - Aesthetics and Environmental Conditions peculiar to the area of the city.
  - Economic Viability based on Capital & Maintenance Costs.

Panelists in an interaction mode

Audience at the session

Round Table Discussions

Round Table1:

Disabled Friendly Transport

Supported by CBM :

An accessible transportation system acts as a pathway for economic and social participation for all citizens. The ongoing urban revolution and need for a matching public transport system present a huge challenge and opportunity. Lack of access and barriers to urban transport impacts marginalized sections that include not just people with disabilities' but also people with reduced mobility, children and elderly. Access and mobility are important for stepping out of poverty and ensure participation of people with disabilities in economic, social and political processes.

The Persons with Disabilities (Equal Opportunities Protection of Rights and Full Participation) Act 1995, under the Sections 44, 45 and 46, provides for non-discrimination in participation,access to roads and built environment. The Department of Empowerment of Persons with Disabilities (DEPwD), Ministry of Social Justice and Empowerment, has launched this year the Accessible India Campaign (Sugamya Bharat Abhiyan), as nation-wide campaign for achieving universal access. The campaign targets three separate verticals for achieving universal accessibility, namely the "built environment, transportation ecosystem and information & communication ecosystem". The session sensitised delegates and participants on the accessibility needs of people with disabilities and others with mobility restrictions such as the elderly (Universal accessibility) and shared experiences for making accessible transportation for all.

Chairperson :

- Mr. T.D. Dhariyal, Advisor CBM

Moderator :

- Mr. Ramanathan, CEO, Sama Foundation and General Secretary, CBR India Network.

Presenter :

- Mr. Madhizhagan, Senior Programme Officer CBM
- Ms. Nagarathna, Senior Programme Officer CBM
- Mr. Jay Kumar, Programme Officer CBM
- Mr. Shiva Mohan, Programme Officer CBM
- Mr. Anil Aneja, Prof. Department of English D.U.
- Mr. Abdul Razak, HoD, School of Planning and Architecture, Vijayawada.
- Ms. Shanti Auluck, Chairperson, Muskaan (NGO)

Rapporteur :

– Ms. Sonal Agrawal, Transport Planner – SUTP, PMU

Highlights of Discussion

- In India 26.8 million people are recorded as persons with disability (2011).
- About 5% of Indians are aged 50 years or above. UN predicts that by 2050 about 536 million Indians will be aged 50 or above.
- Universal accessibility will benefit:
  - Persons with temporary ailment
  - Senior citizens
  - Pregnant women
  - Families with young children
  - Persons carrying heavy luggage
  - Persons with disabilities
- Accessibility of transport is not always a priority in transport planning and implementation.
- Access to Public transport is a challenge in Indian cities in terms of barriers to reach bus stands, non-stoppage of buses at the platform, non-audio announcement, usability and safety.

Key Issues

- The need is for transforming mobility for liveability.
- With increasing number of people in the age of 60 and above (about 177 million by 2025) and 70 million persons with disability making transport accessible should be the top priority.
- Sensitization of drivers, conductors and designers is important.
- Standards to be followed for bus stand.
- Audio announcement and visual display to be ensured by all bus/bus stands/platforms.
- Appropriate ramps to be made at bus stands.
- Government to promote accessible taxi service.
- Coordination between vehicle operators and those maintaining pedestrian and transport infrastructure.
- The concept of universal design can play a key role in bringing environmental and accessibility goals together.
- The Delhi metro modal can be replicated for providing barrier free access to disabled persons.
- Strict penalties for pathway obstructions whether caused by individuals or institutions.
- Make the traffic apps accessible.
- Urban planning approach should pay special attention towards creation of barrier free built environment for disabled people.

Chairperson on the Dias

Audience at the session

Round Table 2:

Enabling Rural Public Transport

Supported by UMTC:-

In India, more than 70 percent of the population is concentrated in rural and suburban areas. The rural population predominantly consists of low income households with very low personalised vehicles and is almost dependent on the available bus transportation system. The socio-economic growth of the rural areas is completely dependent upon the availability of the quality transport system which is vital for overall development of the country. Despite ample opportunities for improvement of rural bus transportation in India over several decades it has not drawn adequate attention from transportation professionals and policy makers.

In order to transform the rural public transportation, there is need for an organised public transport system which is well planned, regulated, sustainable and cater to the needs of the different segments and purposes of rural people.

This session focused on deliberating key issues encompassing institutional, organizational, financial and infrastructure aspects and ways and means to provide and make rural public transport a big success in India.

Chairperson :

– Mr. Rajesh Bhushan, IAS, Joint Secretary (RC) and Director General NRRDA, Ministry of Rural Development, Government of India.

Moderator :

– Mr. D.B. Srinivas, vice-President, Technical, UMTC

Presenters :

– Mr. Laghu Parasar, Sr. Manager, UMTC.
– Mr. Ranjan Datta, Assistant Manager, UMTC.

Highlights of Discussion

- In India 68% population lives in rural areas (2011).
- About 75% of new factories and 70% of manufacturing jobs were created in rural areas during the last decade.
- Core level of movement requirements in rural areas are:
  - Health
  - Education
  - Agricultural markets
  - Non-farming business
  - Water
- Rural roads comprise over 85% of road networks of the country.
- It provides access to employment and activity needs.
- Rural transport has the following elements:
  - Vehicle type supply and maintenance
  - Financing and sustainable O & M.
  - Subsidy mechanism
  - Permit and license
  - Operation
  - Skill and development

- Monitoring and feedback
- Role of stakeholders

Key Issues

- Rural Transport provide more opportunity to the people in addressing their fundamental needs and as such it should follow a more integrated approach.
- Operational viability of rural transport is a key concern due to dispersed demand.
- Small vehicles (8-12 seaters)/Mini bus system will be more conducive to rural road geometry and last mile connectivity.
- It will be environment friendly compared to conventional buses, if bus load factors are not high.

Opening remarks by Chairperson

Panelists in an interaction mode

Audience at the session

Round Table 3:

Role of IT for Efficient Bus Operations and Enhanced Traveller's Satisfaction

Supported by Trapeze:

In today's world bus transport systems play an important role in the development of the country. Many factors such as mobility, environmental and energy objectives place demands on public transport systems.

In this Session thoughts have been shared on the important role played by Information Technology in bus operations to meet the demand of business and social life enhancing traveller's satisfaction. The Session provided an opportunity to discuss the available best practices being adopted by numerous public transportation world-wide for increasing their internal & operational efficiencies and enhancing traveller's experience. This session was helpful in creating knowledge pool where all facets of IT enabled public transportation were discussed which could further be utilized for benefits of all.

Chairperson :

– Mr. Bill Delaney, M.D. Trapeze Group Asia Pacific.

Moderator :

– Mr. Vivek Ogra, Director – Technology and Innovation, VB Soft.

Presenter :

– Mr. Mel Pecen GM (ERP Solutions) Trapeze Group Asia Pacific

– Mr. Parsanna Patwardhan, Chairman and Managing Director, Parsanna Purple Mobility Solution Pvt. Ltd.

– Mr. Ravikant R Deshpande, Dy. General Manager (Traffic Operations), Brihan Mumbai Electric Supply and Transport Undertaking.

Highlights of Discussion

- Basic parameters of running schedule include (i) number of buses; (ii) running time; (iii) interval; (iv) first bus/last bus; (v) relief point for staff; (vi) origin and destination control points and (vii) capacity of terminus.
- Since creating multiple plans manually is time consuming, there is a need for computerised planning and scheduling software.
- Process of use of software includes the following steps:
  - Creation of origin/destination
  - Create stops
  - Create paths on the map
  - Create depots
  - Create Z-paths (to track dead run)
  - Create timetables.
  - Vehicle linking to timetable
  - Create crew scheduling
  - Running reports land statistics
- Problems in Bus Operation are as under:-
  - Inconsistent reporting.
  - Poor quality information
  - Timelines

- Expensive-many manual processes and too many people.

➢ Integration of systems and introduction of technology to assist management of business would be a good strategy to improve the system.

➢ Data should be captured at a single point with easy information access. The system should be integrated with external application.

Key Issues

➢ Use of computer software for scheduling help in achieving optimum due of 8 hours.

➢ Future infrastructure planning and upgradation is easier with computer software than manual approach.

➢ Technology, policy direction andmanagement commitment and organisational charge would go a long way in improving the system.

➢ Information technology in public transport can be helpful in the following manner:-

- Authority:
  - It will bring transparency to the system.
  - It will ensure timely compliances.
  - It will make it easy to monitor quality of service.
  - It will improve safety and security.
- Operator
  - It will improve efficiency.
  - It will make controlling easy
  - It will allow timely corrections.
- Passenger:
  - It will allow Passengers to plan their travel.
  - It will provide Passengers real time information.

Panelists in an interaction mode

Audience at the session

Round Table 4:

Optimisation of Urban Bus Transport through 'True Blue" Mini Buses.

Supported by Force Motors:-

Our country today is at an inflection point of Urbanization. Under the guidance of our Hon'ble Prime Minister, a Smart Cities Mission Program has been kicked off wherein 100 nominated Smart Cities will compete to become the most ideal Urbanised Habitats. "Efficient Urban Mobility & Public Transport" is one of the core infrastructure elements of the Mission.

Over the past 5 years Urban Transport Planning has been more skewed towards the unnecessary use of bigger buses, which have ultimately dented the profitability of operators, added to already predominant inconvenience of passengers due to infrequent bus services & traffic situation. The mini buses have not received the due credit for being the most efficient method of transportation especially in small urban agglomerations (with less than 0.5 million population).

Force Motors has been a pioneer in the field of providing mobility solutions for the past 6 decades. Our iconic products like Matador, Minidor, Traveller & Trax have become generic brands associated with men and material movement. Delivery promise of product, performance and reliability is experienced by lakhs of customers and is a benchmark today.

The Force Traveller Smart Citi Bus is one such product, developed for modern urban transport. Built with cutting edge technologies like Monocoque Construction, Dual Mass Fly Wheel (DMFW) and All Wheel Disc Brakes, the product is an epitome of performance, comfort &safety. It is the most ideal solution delivering expectations of all stakeholders. This session gave a new paradigm to the topic of optimizing urban transport through a True Blue Minis Bus like Force Traveller Smart Citi Bus.

Chairperson :

- Mr. Mukund Kumar Sinha, OSD (UT) & E.O. JS, Ministry of Urban Development.

Moderator :

- Mr. Kishor Nathani, Sr. Vice President, UMTC

Presenters -

- Mr. Ashutosh Khosla, President, Sales and Marketing, Force Motors.

Rapporteur :

- Mr. Jaydeep Desai, Divisional Manager (Marketing and Product Planning) Force Motors.

Highlights of Discussion

- India may move in any direction of the developed world with increasing urbanisation level. The role of mini buses cannot be overlooked.
- The importance of Mini Buses in improving utilisation factor, reducing initial cost and improving operating efficiency is not fully realised.
- Actually, Mini Buses have a big role in the modern urban transport scenario.
- For small and medium cities Mini Buses will have a greater role to play for urban transport.
- True Blue Mini Bus meet the expectations of various stakeholders namely (i) Operator; (ii) Passenger; (iii) Society and (iv) the Government.
- Presently it is meeting the latest Bus Specification–II norms of the Ministry of Urban Development and is upgradable to B.S.V and B.S. VI standards.
- The all new traveller Smart Citi Bus caters to the modern needs of urban mobility in India in terms of performance, reliability, best in class fuel economy, safety, comforts and elegance.

Key Issues

- Role of Mini Buses in urban transport is important in the following situations:
  - A principal mode of urban transport in cities in the range of 5 lakh population.
  - Feeder routes for mega cities with strong metro rail network.
  - Ride sharing services with bus aggregators
  - Improved connectivity from city centres to suburbs.

Opening remarks by Chairperson

Panelist making presentation

Audience at the session

Round Table 5:

Leaders Forum

Under the leaders forum, the projects and studies assigned to the officers of the state government as part of the leaders Programme in Urban Transport Planning and Management of Ministry of Urban Development, Govt. of Indian and the World Bank were reviewed by expert reviewers. The programme was organised by the Centre of Excellence in Urban Transport, CEPT University. Officers associated with the projects and studies made presentation on the projects in terms of structure of the project, objectives, scope and limitations, current status, interim suggestions and way forward for further action on the project. This session was devoted to leader's forum where 4 presentations were reviewed by expert reviewers.

Chairperson :

- Mr. Mukund Kumar Sinha, OSD(UT) and EO J.S., Ministry of Urban Development.

Reviewer :

- Mr. S.K. Lohia, CEO, Indian Railways Stations Development Corporation
- Prof. Sanjay Gupta, School of Planning and Architecture, New Delhi
- Mr. A.S. Lakhra, Visiting Faculty, CEPT
- Prof. Sewa Ram, School of Planning and Architecture, New Delhi
- Ms. Napur Gupta, Senior Transport Specialist, World Bank
- Mr. Jaideep, Director (Electrical) Railway Board, GoI
- Mr. Laghu Prashar, Sr. Manager, UMTC
- Mr. Sudesh Kumar, Ex- Member Electrical Railway Board &Ex.Officio Secretary, Government of India
- Mr. R.K. Singh, Director (UT), Ministry of Urban Development
- Ms. Preeti Soni, UNDP

Moderator :

- Prof. Shivanand Swamy, Executive Director, CEPT University.

Presenter:	Paper Title
1. Ms. R Anusuya Ms. R. Meena	Improving the Accessibility to the Metro Station through different Modes-case study Vadapalani Metro Station, Chennai.
2. Mr. Shrish G. Aradwad	Route Rationalisation in Navi Mumbai.
3. Mr. Prashant Mishra	Study of E-rickshaw to ensure Safety, Reliability, Quality and Option for Charging.
4. Mr. Shravan Hardikar	Establishment of Green, Affordable and efficient Bus Transport System in Nagpur.

Highlights of Discussion

1) Improving the accessibility to the Metro Station (Vadapalani Metro Station Chennai)

- Due to space constraints all modes of access to station cannot be given equal opportunity.
- Hierarchy has been established to provide a rational among the pedestrian improvement, parking demand and other proposals.
- Providing too much parking is detrimental to the share of public transport.
- Higher population density and good average income level in the study area results in increase of traffic.
- 90% of metro users surveyed were happy with the metro system and felt comfortable.
- 56% felt footpath around station is bad with obstruction.
- 72% felt that road crossing is not safe.
- 83% rated the cycling infrastructure as very poor.
- 62% non-Metro users expressed that once the system is integrated with the existing MRTs and suburban Rail system they would use metro.
- 51% felt that bus fare is cheaper than metro.
- For safe and comfortable pedestrian movement, suggestions regarding improvement of footpath, connecting the pedestrian missing link, at grade facility for pedestrian crossing, FOB/Subway and shifting of utilities obstructing the movement of pedestrian have been given.
- Dedicated cycle track facility and bicycle parking are suggested for non-motorised transport.
- About 52 existing MTC bus routes needs to be reorganised to avoid buses to compete with metro.
- IPT running parallel to metro corridor to be reorganised to make it a more useful feeder services.
- Area requirement for parking needs to be computed.
- A concept plan given for multimodal integration for accessibility.

Presentation by city officials

2) Route Rationalisation in Navi Mumbai

- Route Rationalisation is done based on the following parameters;-
  - Passenger demand.
  - Operation performance.
  - Last mile connectivity.
  - Multimodal integration.
- Criteria followed for route rationalisation is as under:
  - Merging/deviation of routes.
  - Minimising the overlap of routes.
  - Extension/curtailment of routes.
- Methods for augmenting the existing bus services suggested increased frequency on existing routes and new proposed feeder routes.
- Rationalisation of route based on above criteria showed encouraging results in terms of improved frequency, reduced operational cost and improved manpower and vehicle productivity.

3) Study on E-rickshaw

- E-rickshaw is emerging as one of the most widely used forms of intermediate pubic transport or paratransit.
- Problems associated with e-rickshaw are as under:
  - Carry more passenger than designed for. It is designed for4-5 passengers but carry 6-8 passenger.

- Drivers without training and license.

➢ Transport Authorities of several states and cities have issued circulars/orders to register e-rickshaw as per amended Central Motor Vehicle Act.

➢ Need to increase awareness about better, reliable technical options and quality consideration.

➢ Maximum speed 20-25 kmph.

➢ Quick recharge options for e-rickshaw at petrol pumps.

4) Establishment of Green, Affordable and Efficient Bus Transport System (Nagpur)

➢ Mode share of public transport in Nagpur is around 15%.

➢ Problems with public transport are related to:

- Operational inefficiency
- Insufficient service
- Poor maintenance of fleet
- Customer dissatisfaction
- Poor revenue loss for NMC as well as operation

➢ New Model for bus service operation suggests the following:-

- Termination of existing operator contract.
- Case for separating revenues from service delivery.

Panelists reviewing the presentation

- Mix of own staff coupled with consultants/ operators.
- Role of management and intelligent transport service.
- New contracting structure
- Running of green bus on hybrid, ethanol, bio-CNG.
- Fare rationalization.
- PPP mode for financing

➢ Setting up of Unified Nagpur City Transport Authority (UNCTA)

Round Table 6:

Child Friendly Mobility

Indian cities lack inclusive urban transport as all sections and segmentsof the society do not find the same convenience and comfortable particularly the children and differently abled people. In 2013, total traffic accidents (Road Accidents) deaths recorded in India were 1,37,423 of which 5.31% were children (below 14 years) (Source: National Crime Records Bureau, Ministry of Home Affairs). Child Friendly mobility assumes importance in the context that as per 2011 census 41.1% population is in the age group of 18 years and below. Children have different needs than adults because of their age, growth and development. They are more vulnerable to adverse effects of traffic, and hence this study is undertaken by IUT with the intension to make a better understanding of travel needs of children. This Session dwelt on the format, approach and contents of the study to enlist the views of the delegates and participants.

Chairperson :

- Mr. R.K. Singh, Director (UT), Ministry of Urban Development.

Moderator :

- Ms. Sonia Arora, Urban Transport Expert, IUT.

Presenter :

- Ms. Vijaya Rohini Kodati, Urban Transport Planner, IUT
- Ms. Revathy Pradeep, Urban Transport Planner, IUT

Rapporteur :

- Mr. Imran BashaSoudagar, Urban Planner, PWD, Delhi

Highlights of Discussion

- Children below 18 years comprise two fifths of the total population.
- Urban transport system is not completely inclusive as the child mobility needs are almost neglected.
- National Urban Transport Policy, 2006, National Transport Development Planning Committee, 12th Five Year Plan, National Mission on Sustainable Habitat have highlighted policy issues regarding public transport and non-motorised transport, intelligent transport system, concerns of road safety and security and inclusiveness.
- However, the area regarding child friendly mobility is least researched and needs to be considered at planning and design stage.
- National Road Safety Policy,2010, among other aspects emphasises on road safety education for school and college going students.
- The recent flagship missions on Smart Cities and AMRUT have also highlighted on enhancing the amenity value of cities by creating and upgrading green spaces, parks and recreation centres especially for children.
- The study taken up by IUT is based on case study of 4 cities selected on the basis of size, structure, topography and demographic characteristics.
- Schools selected for primary survey are both private and government and their locations were either near the arterial road or inner roads.
- Other primary and secondary data in terms of road inventory, user's opinion, accident incidences,

infrastructure etc. were collected, compiled and analysed.

- Preliminary analysis of data revealed that 50% of children commute to schools by cycle and by walking but road infrastructure is not safe for them.
- Children are forced to use unsafe transport mode.
- Average trip length of private school children (5.8 km) is higher than government school children (3 km).
- Rate of girl child dropouts is increasing due to unsafe public transport.
- No traffic management in the vicinity of the schools – before/after school hours.
- More than 75% schools do not have traffic awareness programs.
- 82% of government schools are located in interiors without any safe accessibility.
- The children in hill cities have to walk at least 3 km to access any transport mode.
- Schools located in interiors won't be accessible in case of emergency.
- Child friendly mobility may be assessed on the basis of safety and comfort, infrastructure, mode of mobility, inclusiveness and education & awareness.
- Checklist of the study is very comprehensive.

Chairperson and Moderator viewing the presentation

Participant posing a question

Audience at the session

Research Symposium

INTRODUCTION

The **Research Symposium on Urban Transport** was held on 25th and 26th November, 2015 at the 8th Urban Mobility India Conference and Exhibition 2015. It was the sixth Research Symposium being held at UMI. The symposium provides a platform to highlight the current research carried out by academia and research institutes in urban transport, especially by young researchers pursuing post graduate or Ph.D programs. The objective of research symposium is to:-

- Encourage young researchers working in various facets of urban transport to present their research work and provide them an opportunity for networking with fellow researchers and professionals.
- Enhance capacity building of young researchers in the field of urban transport and
- Contribute towards building up of research data base, its dissemination and identification of thrust areas for research in the country.

Young researchers 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

Extended abstracts of about 500 words for the research symposium were invited online. After receiving the abstracts the same were sent for peer review to the members of Technical Committee of Research Symposium. The symposium was co-ordinated by the Institute of Urban Transport (India). Young researchers working in the areas of urban transport were invited to submit abstracts on any of the following themes:

- Accessibility and Gender in Urban Transport
- Demand Assessment and Management
- ITS for Urban Mobility
- Multi-Modal Integration in Urban Transport
- Public Transport Planning
- Sustainable Land Use Planning and Transport
- Traffic Impact Assessment
- Traffic Management, Engineering and Road Safety
- Transportation and Climate Change
- Urban Freight Management

Each abstract was given to peer review to three reviewers/members of Technical Committee not affiliated to author's institution and were requested to evaluate on a scale of 1 to 10. The scores so assigned were averaged

out on weighted average method and a final score was arrived at for selection. In all 85 abstracts were received from various institutions across the nation out of which 41 were shortlisted for submission of full paper.

The full paper 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 assessed 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, in case the paper is accepted, at least one of the authors will register and attend the conference to present the work.

These 41 full papers were again evaluated by the reviewers/members of Technical Committee for selecting the final papers that can be presented at the Conference. The selected 23 authors were asked to make presentation at the Research Symposium at the UMI 2015 Conference out of which 22 papers were presented.

The shortlisted papers for the presentation were clubbed under the following six themes based on the subject of the papers:

1. **Public Transportation**
2. **Pedestrians, Gender and Mode Choice in Transport**
3. **Multi-Modal Integration in Urban Transport**
4. **Land Use Planning and Mass Transit**
5. **Traffic Impact Assessment and Engineering**
6. **Urban Freight and Climate Change in Transportation**

The research symposium was conducted in six sessions which were moderated by a Chair and Co- Chair as detailed out below:

Research Symposiums – 1:
Public Transportation

Chair: **Dr. Sanjay Gupta,** SPA, New Delhi ***Co-Chair:*** **Mr. Ramakrishna,** UMTC , Delhi	
Author / Presenter	**Institution**
Maitry Shah	CEPTUniversity, Ahmedabad
Bipin R. Muley	National Institute of Technology, Warangal
Ar. Rahul Tiwari	School of Planning and Architecture, Bhopal
Sharmistha Roy	School of Planning and Architecture, New Delhi

Summary

In this session four papers on the subject were presented.

1. Analysing Passenger Perceptions of Public Transport a Case Study of BEST, Mumbai
2. Planning for Feeder Bus Services Using Visum : Case Study of Mumbai
3. Analysis of Performance Evaluation for Bus based Public Transport with reference to Service Level Benchmarks
4. Revitalization Strategies for Urban Circular Railway System in a Metropolitan City: Case Study - Kolkata

Research Symposium – 2:
Pedestrians, Gender and Mode Choice in Transport

Chair: **Dr. P.K. Sarkar,** SPA, New Delhi ***Co-Chair:*** **Ms. Himani Jani,** Transport Consultant	
Author / Presenter	**Institution**
Naina Gupta	School of Planning and Architecture, Vijayawada
Sobhana Patnaik	Visvesvaraya National Institute of Technology, Nagpur
NisthaTripathi	Indian Institute of Forest Management, Bhopal

Summary

The following three papers on the subject were presented.

1. Mode Choice Model for Tourist Travel
2. Why and When Pedestrians Walk on Carriageway in Presence of Footpath? – A Behavioral Analysis in Mixed Traffic Scenario in India
3. A Study of Active Commuting among Urban Indian Population through Gendered Lens

Research Symposium – 3:
Multi-Modal Integration in Urban Transport

Chair: **Dr Vinay Maitri,** SPA, New Delhi ***Co-Chair:*** **Mr. Sharad Mohindru,** Transport Consultant	
Author / Presenter	**Institution**
Anannya Das	School of Planning and Architecture, New Delhi
Christy Ann Cheriyan	CEPT University, Ahmedabad
Sagar Patni	Visvesvaraya National Institute of Technology, Nagpur
Rohan Modi	CEPT University, Ahmedabad

Summary

The session had four papers on the subject

1. Planning for First and Last Mile Connectivity of Mass Transit Users in Urban Areas
2. Assessment of Transit Transfer Experience: Case of Bangalore
3. Towards achieving Multimodal integration of Transportation Systems for Seamless Movement of Passengers - Case study of Hyderabad
4. Evaluating Station Facilities through Simulation

Research Symposium - 4:
Land Use Planning and Mass Transit

Chair: **Dr. G.C. Joshi,** NIT, Surat ***Co-Chair:*** **Mr. Dinesh Arora,** AECOM, Delhi	
Author / Presenter	**Institution**
Vivek Khurana	CEPT University, Ahmedabad
Sarath KT	CEPT University, Ahmedabad
Ramya Sithara	School of Planning and Architecture, New Delhi
Sandhya Dameniya	School of Planning and Architecture, New Delhi

Summary

The session had four papers on the subject

1. Financing Transit Development through Land Value Capture - Assessing Value Capture Mechanisms for MRTS
2. The Impact of Transit Corridor on NMT: A case of Ahmedabad BRTS
3. Public Transport Development Strategies for Emerging Metropolis- A Case of Noida
4. Implication of Smart Growth Strategies in Residential Neighbourhoods on Sustainable Mobility - Case Study Delhi

Research Symposium – 5:
Traffic Impact Assessment and Engineering

Chair: **Dr.Sewa Ram,** SPA, New Delhi ***Co-Chair:*** **Mr Rakesh Kaul,** SREI New Delhi	
Author / Presenter	**Institution**
Dawda Nandan Haridas	The Maharaja Sayajirao University of Baroda, Vadodara
K. Dhamodharan (Presented by Mr. Thanasekaran R)	Anand Institute of Higher Technology, Chennai
Revathy Pradeep	School of Planning and Architecture, New Delhi
Jagadheeswari. S (Presented by Mr. Thanasekaran R)	Anand Institute of Higher Technology, Chennai
Mayank Dubey	School of Planning and Architecture, New Delhi

Summary

The session had five papers on the subject

1. Crash Risk Analysis for Vulnerable Road Users for Urban Streets- A Case Study of Vadodara
2. Road Curve Accident Prevention System
3. Study of Critical Gap and its Effect on Entry Capacity of A Roundabout in Mixed Traffic Conditions
4. Artificial Intelligence Approach for Optimizing Traffic Signal on Urban Transport Network
5. Correction Factor for Fundamental Equation of Traffic Flow along Merging Section in Mixed Traffic Conditions

Research Symposium – 6:

Urban Freight and Climate Change in Transportation

Chair: **Mr PiyushKansal,** RITES, Delhi ***Co-Chair:*** **Ms. Akshima T Ghate,** TERI, New Delhi	
Author / Presenter	**Institution**
Baveena K.V.	School of Planning and Architecture, New Delhi
Shweta Khatri	CEPT University, Ahmedabad
Arti Roshan Soni	Indian Institute of Technology Bombay, Mumbai

Summary

The session had three papers on the subject

1. Sustainable Urban Freight Distribution Strategy For Metropolitan City of Kochi
2. Mitigating Greenhouse Gas Emissions from Passenger Transportation Modes and Patterns with the Existing Policy Framework in Ahmedabad
3. Greenhouse Gas Emission Forecast for Mumbai's Transportation System

Awards

All the sessions were well received and interactive. Based on the evaluation by chair and co-chair of the sessions three best papers were selected. The awards were given away by **Shri Babul Supriyo,** Hon'ble Minister of State for Urban Development, Housing and Urban Poverty Alleviation at the Valedictory Session of the conference to the following researchers

1. BEST PAPER	**Sharmistha Roy** for her paper on *Revitalization Strategies for Urban Circular Railway System in a Metropolitan City: Case Study –Kolkata*
2. FIRST RUNNER UP	**Baveena K V** for her paper on *Sustainable Urban Freight Distribution Strategy for Metropolitan City of Kochi*
3. SECOND RUNNER UP	**Sobhana Patnaik** for her paper on *Why and When Pedestrians Walk on Carriageway in Presence of Footpath? – A Behavioral Analysis in Mixed Traffic Scenario of India*

Glimpses of Research Symposium

Exhibition

The expo is a special feature of UMI to disseminate and showcase the latest development in urban transport technology and systems, implementation of best transport projects, propagation of innovative ideas, presentation of research in the topical areas of interest in urban transport and exchange of good urban transport initiatives and practices in the field. In all, 32 sponsors and 24 exhibitors (Annexure III & IV) participated in the exhibition and exhibited their products, technology, projects and the transport systems for wider dissemination. The exhibition was inaugurated by Shri M. Venkaiah Naidu Hon'ble Minister for Urban Development, Housing & Urban Poverty Alleviation and Parliamentary Affairs, Govt. of India on 24th of November, 2015. Eight foreign companies participated in the expo and showcased their products and technologies. A large number of participants and invited guests visited the expo area. The latest technology particularly the modern buses and computer systems helping in traffic management were the special attraction. Exhibitors had received a lot of specific queries from the participants to solve the urban transport problems in their respective cities.

On the whole the expo was received well both by the participants and the visitors. A glimpse of expo area clearly shows the keen interest taken by the delegates in various pavilions of the exhibition.

Hon'ble Minister and some delegates having a round of the Exhibition





Hon'ble Minister and some delegates having a round of the Exhibition

Valedictory and Closing Session

Shri Durga Shanker Mishra, Additional Secretary, Ministry of Urban Development welcomed the dignitaries and participants. He highlighted the large scale participation of delegates, both national and international, presentation of technical and research papers; exhibition of products and knowledge portals; presentation of live projects in leader's forum and key messages which emerged out of the 4 day conference.

A brief summary of the proceedings of the conference was presented by Shri M.L.Chotani from IUT (India).

Shri Madhusudan Prasad, Secretary, Urban Development, Ministry of Urban Development launched the theme of UMI-2016 Conference – cum- Exhibition "Planning Mobility for City's Sustainability". The UMI-2016 conference will be held on 8th-11th November, 2016 at Mahatma Mandir, Gandhinagar, Gujarat. In his address the Secretary mentioned that rapid motorization has resulted in increased air pollution. Uncontrolled air pollution has adversely affected the health of people and the quality of life in cities. As is reported, Delhi having about 9 million registered vehicles has acquired the dubious distinction of being the fourth most polluted city in the world. The suspended particulate matters (both respirable and non-respirable), is disturbingly high in many cities.

The conventional ways to solve transport problems through construction of flyovers and widening of roads have only fuelled the growth of motorized vehicles reducing non-motorized

Welcome address by Addl. Secretary (UD)

Presentation of summary of proceedings

Address by Secretary (UD)

transport and public transport use. Increase in private car users is one of the major contributors to the growth in greenhouse gas emissions and is detrimental to the environment. The answer is to provide improved better quality and efficient public transport as well as non-motorized transport network and reduce the need for travel.

The Ministry of Urban Development has taken certain policy initiatives and programmes to address the problems of urban mobility. The National Urban Transport Policy launched by the Ministry of Urban Development in 2006 has advocated a major shift from personal vehicles to public transport and promotion of non-motorised transport.

The Ministry has also assessed the impact of various schemes launched by the Ministry in various cities. For instance the BRTS development across 16 cities in the country provide reliable and affordable mobility to the people. The assessment shows that the ridership has increased along almost all the major BRTS corridors. In 7 operational BRTS projects there is substantial reduction in carbon dioxide emissions on the whole. The BRTS concept has gained momentum during the last couple of years and it is expected that the scale of development would increase during the next decade.

Audience at the valedictory session

With regard to the impact of Metro Rails, Delhi was the first to set up such a system which has expanded its network to the satellite towns of Noida, Gurgaon, Ghaziabad and Faridabad. This system has a ridership of 2.6 million passengers per day which has increased by 156% during the last five years. The success story of Delhi Metro has led many cities to develop similar systems, as such metro systems are either in operation or at various stages of construction in 11 cities. The sustainable urban transport project of the Ministry has estimated that every km of footpath development help in reducing 15 tons of carbon dioxide. The impact of intelligent transport system implemented across various cities including Mumbai, Delhi, Ahmedabad, Mysore, Bangalore, Pune Chennai and Hyderabad have shown good results in terms of operation of city bus system and traffic improvement. It has also helped in reduction of accidents as well as travel time. Ministry of Urban Development has initiated a national level scheme of capacity building in urban transport planning. It enhances the understanding of urban transport problems and their appropriate solutions. He said that India is a large country with diversities across the regions, states and cities. There is no single set of solutions which can be applied universally across the country. The demonstration projects implemented as part of the Sustainable Urban Transport Project of the Ministry has indicated that the same type of projects can have varying impact in the cities.

On this occasion, the Hon'ble Minister of State for Urban Development and Housing and Urban Poverty Alleviation gave away the awards for excellence in urban transport projects planned and implemented by city and state authorities.

Award for Best City Bus Service was given jointly to:-

i. Cluster Based City Bus Project of Chhattisgarh (SUDA and Municipal Corporation, Raipur) and Organised City Bus Service in Small and Medium towns (KSRTC)

ii. Best NMT Project award was bagged by Rajkot Municipal Corporation for its Bi-cycle Sharing Project (cycle rental project).

iii. Best Intelligent Transport System Project award was given to BEST, Mumbai for Computerised Duty Schedule.

In the category of Best Initiative for Improved Road Safety project there were joint winners namely:-

i. Bhopal Traffic Police for Better Traffic Better Bhopal as "Behtar Traffic Behtar Bhopal" and

ii. Gurgaon Police for "Let us Talk about Road Safety" Campaign.

In addition, special awards for the commendable initiatives were also given to the following agencies:

(a) Transport Department, Government of Sikkim for City Bus Service

(b) Jaipur Metro Rail Corporation for Metro Rail Phase I

(c) AICTSL Indore for Public Bicycle Sharing in Indore

(d) Municipal Corporation Coimbatore for Car-free day

(e) NOIDA for Highway Traffic Management System on Noida Expressway

The best exhibitor awards were given to Mumbai Metro Rail Corporation, Nagpur Metro Rail Corporation and Force Motors.

In his valedictory address, Shri Babul Supriyo, Hon'ble Minister of State for Urban Development and Housing and Urban Poverty Alleviation highlighted the vision for changing India for betterment under the leadership of Hon'ble Prime Minister Shri Narendra Modi.

Veledictory address by Shri Babul Supriyo

He said that the public transport will only be considered successful when rich and affluent people will leave their car at home and use public transport. He also mentioned that carpooling system should be propagated in the cities.

He mentioned that rapid urbanization that has been taking place in our country since 1980s has led to increased motorisation which has posed serious problems of mobility in the cities. Congestion and traffic jams are a common sight in the cities which make it difficult to move from one place to another. The priority need is to deal with the urban mobility problems in a sustainable manner that helps our cities grow to their true potential. Theme of this year's Conference "Transforming Mobility for Liveability" is in line with the context of development of Smart Cities and AMRUT programme initiated by our Ministry.

Holistic approach for urban transport planning would be necessary for finding out lasting solutions to make our cities smart and liveable in the long run. Most of the cities particularly the small and medium ones are dependent on Intermediate Public Transport modes like tempos, minibuses, e-rickshaws, shared taxies etc. which needs to be regulated and integrated with city bus services and other transit systems.

With climate change and increasing greenhouse gas emissions due emphasis needs to be given to green transport in terms of technology and infrastructure. Urban Local Bodies and State Transport Corporations should make the optimum use of the Intelligent Transport System for improving the efficiency and effectiveness of public transport system as has been done in Bengaluru and Mysore. Capturing the urban gains and monetising of urban land would go a long way in augmenting the financial resources for development of public transport. Transit Oriented Development policy announced by our Ministry for Delhi could be made use of in other cities for viability and effectiveness of mass transit system.

Effective mobility and efficient transport system is one of the important components of Smart Cities Mission which emphasises walking, cycling and public transport as the primary means for mobility and the personal motor vehicles being actively discouraged. Encouraging non-motorised transport by reclaiming road space for pedestrians and cyclists as also envisaged in the National Urban Transport Policy and Smart Cities and AMRUT programme would not only provide safe environment but will have positive effect on the health with reduced pollution.

The current Urban Mobility Conference which is the eighth in the series provides an important platform to bring together urban transport professionals and practitioners, policy makers and decision takers, academics and researchers, technology and service providers industry and business houses and other experts and stakeholders both national and international

to enable them to share their views and experience in urban transport sector. I hope the deliberations during the last four days have enriched the officials and other stake holders with fresh knowledge and ideas.

I hope that this Conference would continue to be organised in the coming years with much greater success in other cities also. I look forward to the urban transport community to assemble again next year to deliberate similar relevant and topical issues.

Ms. Kanika Kalra, Urban Transport Expert, IUT proposed a vote of thanks to all.

Vote of thanks by Ms. Kanika Kalara

Hon'ble Minister of State giving away the awards for the best projects

Annexures

Annexure I : Detailed Conference Programme

Time (hrs)	Hall 1 (Ashoka)	Hall 2 (Taber)	Hall 3 (Talwar)	Hall 4 (Shamsher)
Day 1 (24th November, 2015)				
1630 – 1700	Inauguration of the Exhibition			
1700 – 1830	***Inaugural Session*** • Welcome Address by Shri Durga Shanker Mishra, Additional Secretary (UD), Ministry of Urban Development • Release of Video on Urban Mobility Scenario in India • Key note address by Shri ShashiVerma, Director of Communications, Transport for London (TfL) • Release of publications for Urban transport by Chief Guest • Inaugural address by Shri M. Venkaiah Naidu, Hon'ble Minister of Urban Development, Housing and Urban Poverty Alleviation and Parliamentary Affairs, GoI • Vote of Thanks by Shri MukundSinha, OSD(UT) & E.O. Joint Secretary, Ministry of Urban Development			
1830 – 2000	***Special Session for Mayorsand Chairpersons– Smart Mobility Solutions in Cities*** **Chairperson -** *Shri Babul Supriyo, Minister of State for Urban Development and Housing and Urban Poverty Alleviation, Ministry of Urban Development, GoI* **Presenter–** • Experience in Improving Urban Mobility in Indian Cities– Karnal, Delhi and Indore • Experience in Improving Urban Mobility in Adelaide - Mr Stephen Yarwood, Ex-Mayor, Adelaide, Australia			
2000 onwards	*Dinner Reception*			

Day 2 (25th November, 2015)				
0930 – 1100	***Research Symposium1 - Public Transportation*** **Chairperson -** *Dr. Sanjay Gupta, Professor, School of Planning and Architecture, New Delhi* **Co-Chairperson -** *Mr. S. Ramakrishna, Vice President, UMTC* • Analysing Passenger Perceptions of Public Transport a Case Study of BEST, Mumbai – *Ms Maitry Shah* • Planning For Feeder Bus Services Using Visum : Case Study Of Mumbai, India – *Mr Bipin R. Muley* • Analysis of Performance Evaluation for Bus based Public Transport with reference to Service Level Benchmarks - *Ar. Rahul Tiwari* • Revitalization Strategies for Urban Circular Railway System in A Metropolitan City: Case Study -Kolkata – *Ms Sharmistha Roy* **Rapporteur:** *Ritumoni Sonowal, Transport Planner, DULT*	***Research Symposium 2 – Pedestrians, Gender and Mode Choice in Transport*** **Chairperson –** *Prof. (Dr.) P.K. Sarkar, Head of Department (Transport Planning), School of Planning and Architecture, New Delhi* **Co-Chairperson –** *Ms Himani Jain, Director, Meta Urban* • Mode Choice Model for Tourist Travel – *Ms Naina Gupta* • Why and When Pedestrians Walk on Carriageway in Presence of Footpath? – A Behavioral Analysis in Mixed Traffic Scenario of India – *Ms Sobhana Patnaik* • A Study of Active Commuting among Urban Indian Population through Gendered Lens – *Ms Nistha Tripath*i	***Technical Session 1 – Transport Modelling (coordinated by PTV Group)*** • Welcome and Introduction – Mr Thomas Schwerdtfeger • What is New in PTV Visum 15, PTV Vissim 8 & Introducing PTV Vissim Mesoscopic Simulation – *Mr Sonal Ahuja, PTV Group* • Use of Micro Simulation for Optimization of Road Alignment and Junction Control – *Mr Abhishek Patil, Mr Arun Savi and Mr Sairam Dasari, DIMTS Ltd.*	***Research Symposium 3 - Multi-Modal Integration in Urban Transport*** **Chairperson –** *Dr. VinayMaitri, Professor, School of Planning and Architecture, New Delhi* **Co-Chairperson –** *Mr. Sharad Mohindru, Transport Consultant* • Planning for First and Last Mile Connectivity of Mass Transit Users in Urban Areas – *Ms. Anannya Das* • Assessment of Transit Transfer Experience: Case of Bangalore – *Ms. Christy Ann Cheriyan* • Towards achieving Multimodal integration of transportation systems for seamless movement of passengers - Case study of Hyderabad – *Mr. Sagar Patni* • Evaluating Station Facilities through Simulation- *Mr. Rohan Modi*
1100 – 1130	*Tea & Coffee Break/ Networking Break/ Transport Quiz*			

	Session I Theme – Greater Accessibility			
1130 – 1300	***Technical Session 2 – Land Use Transport Integration for livable cities*** **Chairperson -** *Mr. S.K. Lohia, CEO, Indian Railways Stations Development Corporation* • Transit Oriented Development – UTTIPEC Karkardooma Project – *Mr P.S. Uttarwar, Former Addl. Commissioner, DDA* • Opening new land use options by cable transport: the Latin American cases – *Dr. Johannes Fiedler, Head of Research with Doppelmayr Urban Solutions (Austria)* • Land use policies and transport indicators: LCMP Scenarios for Rajkot – *Dr Talat Munshi, Associate Professor, CEPT* • Affordable Housing Franchise in India – *Mukul Goel, Founder of three Global Rivers* **Rapporteur –** *Ms Ruchita Bansal, Program Manager*	***Technical Session 3 – Designing Streets for citizen*** **Chairperson -** *Shri Shashi Verma,* Director of Communications, Transport for London (TfL) • Role of E-rickshaw in Indian Cities – *Ms Kanika Kalra, Urban Transport Expert, IUT* • Non-Motorized Transport: An element of urban roads – *Mr Ashish Rao Ghorpare, Regional Executive Manager, ICLEI* • Street Design with People - *Ms. Sanskriti Menon, Program Director, Centre for Environment Education* • Share the Road (StR) programme – *Ms Susan Wothaya Gichuna, Programme Assistant, UNEP* **Rapporteur –** *Ms Himani Jain, Director, Meta Urban*	***Technical Session 4 – Traffic Engineering (coordinated by PTV Group)*** • Multi-Level Car Park using VISSIM – *Mr Pallavit Saraf, WS Atkins (I) Pvt Ltd.* • Real Time Traffic Modeling & Road Safety – *Mr Sonal Ahuja, PTV Group* • Case for Integrated Transport Planning of National Highways - *Ashish Chandra, PWC India*	***Round Table Discussion 1– Disable Friendly Transport (supported by CBM)*** **Chairperson –** *Mr. T. D. Dhariyal, Advisor, CBM* **Moderator –** *Mr. Ramanathan, CEO, Sama Foundation & General Secretary, CBR India Network* **Presenters –** • *Mr. Madhizhagan Senior Program Officer, CBM* • *Ms. Nagarathna, Senior Program Officer, CBM* • *Mr. Jaykumar, Program Officer, CBM* • *Mr. Shiva Mohan, Program Officer, CBM* • *Mr. Anil Aneja, Prof.Dept of English, DU* • *Mr. Abdul Razak, HoD SPA Vijayawada* • *Ms. Shanti Auluck, Chairperson, Muskaan (NGO)*
1300 – 1430	*Lunch/ Visit to Exhibition*			

	Session II Theme – Transforming Public Transport			
1430 – 1600	***Technical Session 5- Buses in Cities: New Challenges, New Solutions*** **Chairperson –** *Dr M. Ramachandran, Former Secretary, MoUD* • Integration of the bus service with other public transport modes and networks – *Mr. Alok Jain, Head of Planning and Development, The Kowloon Motor Bus (1933) Ltd, Hong Kong* • Promoting sustainable public-private partnerships model in city bus service – *Delhi cluster bus – Mr Abhijit Sarkar, Chief (Road Transport), DIMTS* • Using data analytics to improve scheduling of buses – *Dr. Manish Gupta, VP and Director, Xerox Research Center India* **Rapporteur –** *Mr Ashutosh Kothari, Planner*	***Technical Session 6 – Urban Rail transportation; Shaping the future Cities*** **Chairperson –** *Shri. M.K. Sinha, OSD (UT) & E.O.J.S., MoUD* • Planning for MRTS in Metropolitan City - *Mr. Subodh Kumar Gupta, Director (Projects), MMRCL* • Revival of LRT in urban areas: Case study Hiroshima – *Dr Pawan Kumar, Associate Town & Country Planner, TCPO* • Smart Commute-Technology enable first and last mile connectivity solution – *Mr. Amit Singh, Co-founder, Shuttle* • National Common Mobility Card - *Shri Satish Kumar Gupta, Chief Project Advisor, National Payment Corporation of India* **Rapporteur –** *Mr Namit Kumar, RITES*	***Technical Session 7 – Real Time Traffic Modelling (coordinated by PTV Group)*** • Evaluating Station Facilities through Simulation – *Mr Rohan Modi, CEPT University* • Calibration of VISSIM for Roundabouts using Genetic Algorithm – *Mr Hari Krishna Gaddam, Mr Mohit Kumar Singh, Ms Lakshmi Devi Vanumu & Mr K. Ramachandra Rao, Department of Civil Engineering, I.I.T. Delhi* • From Simulation to Virtual Reality – *Mr Rishi Ahuja, Sunovatech Infra.* • Interactive Session on Future Development	***Round Table Discussion 2 - Enabling Rural Public Transport (supported by UMTC)*** ***Chairperson –*** *Shri Rajesh Bhushan, IAS, Joint Secretary (RC) & Director General, NRRDA, Ministry of Rural Development, Government of India* ***Moderator -*** *Shri D B Srinivas, Vice President - Technical, UMTC* ***Presenter 1 –*** *Shri LaghuParasar, Sr. Manager, UMTC* **Presenter 2 –** *Shri RanjanDutta, Asst. Manager, UMTC*
1600 – 1630	*Tea & Coffee Break/ Networking Break/ Transport Quiz*			
1630 – 1800	***Plenary Session 1 – Innovations in Metro Rail*** **Chairperson–** *Shri D.S. Mishra, Additional Secretary, Urban Development, Ministry of Urban Development* **Moderator–** *Shri M.K. Sinha, OSD (UT) & E.O.J.S., Ministry of Urban Development* • Multi Modal Integration, Smart Mobility Card and PPP in Metro Projects- *Shri. Elias George, MD, Kochi Metro Rail Ltd.* • Innovations in Climate Resilience & Technology - *Shri Mangu Singh, MD, Delhi Metro Rail Corporation* • The Operator's Story: Initial Findings of the Study, including Insights into Innovative Funding and Financing- *Dr Roger Allport, Honorary Senior Research Fellow, Railway and Transport Strategy Centre, Imperial College, London* • Innovative Financing through Debt Instruments – *Shri M. Naveen Kumar, Director of Finance, Bangalore Metro Rail Corporation Ltd.* • International Experience in Innovations in Metro Rail – Mr. Gerald Ollivier, Senior Transport Specialist and Transport Cluster Leader, World Bank **Rapporteur–** *Mr Ashutosh Kothari, Planner*			

Day 3 (26th November, 2015)				
0930 – 1100	***Technical Session 8 (coordinated by the United Nations Environment Programme, UNEP) –*** ***8a - Strategies for low carbon transport*** • Opening Remarks – *Ms Kamala Ernest, Programme Officer, UNEP* • UNEP Transport Project : Key Messages followed by release of publications – MrSubashDhar, Senior Economist, UNEP DTU Partnership ***8b - Fuel Economy and Alternative Fuels and Vehicles*** **Chair :** Dr. Oliver Lah, Wuppertal Institute • Global trends in fuel Efficiency - *Ms Kamala Ernest, Programme Officer, UNEP/Global Fuel Economy Initiative (GFEI)* • Harmonizing fuel economy in the ASEAN region – *Parthaa Bosu, India Director and South Asia Liaison, Clean Air Initiative (CAI) Asia* • Alternative Fuels and Vehicles: Co-benefits and Co-costs for India – *Mr Subash Dhar, Senior Economist, UNEP Risoe Centre* **Rapporteur–** Ms Priyanka De Souza, UNEP	**Research Symposium 4 - Land Use Planning and Mass Transit** **Chairperson -** *Dr. G.C. Joshi, Professor, SVNIT, Surat* Co-Chairperson – Mr Dinesh Arora, AECOM • Implication of Smart Growth Strategies in Residential Neighborhoods on Sustainable Mobility - Case Study Delhi – *Ms Sandhya Dameniya* • Financing Transit Development Through Land Value Capture - Assessing Value Capture Mechanisms for MRTS – *Mr Vivek Khurana* • Public Transport Development Strategies for Emerging Metropolis- A Case of Noida – *Ms Ramya Sithara* • The impact of Transit Corridor on NMT: A case of Ahmedabad BRTS – *Mr Sarath KT*	***Research Symposium 5 – Traffic Impact Assessment and Engineering*** **Chairperson -** *Dr.Sewa Ram, Professor, School of Planning and Architecture, New Delhi* **Co-Chairperson –** *Mr Rakesh Kaul, Vice President-Infrastructure Advisory, Srei Infrastructure Finance Limited* • Crash Risk Analysis for Vulnerable Road Users For Urban Streets- A Case Study of Vadodara – *Mr. Dawda NandanHaridas* • Road Curve Accident Prevention System – *Mr. K. Dhamodharan* • Study of Critical Gap and Its Effect on Entry Capacity of A Roundabout in Mixed Traffic Conditions – *Ms Revathy Pradeep* • Artificial Intelligence Approach for Optimizing Traffic Signal on Urban Transport Network - *Jagadheeswari. S* • Correction Factor for Fundamental Equation of Traffic Flow along Merging Section in Mixed Traffic Conditions – *Mr Mayank Dubey*	***Research Symposium 6 - Urban Freight and Climate Change in Transportation*** **Chairperson –** *Mr. PiyushKansal, Group General Manager,* Urban Transport Division, RITES **Co-Chairperson** *– Ms. Akshima T. Ghate, Fellow, TERI* • Sustainable Urban Freight Distribution Strategy For Metropolitan City of Kochi – *Ms. Baveena K V* • Mitigating Greenhouse Gas Emissions from Passenger Transportation Modes and Patterns with the Existing Policy Framework in Ahmedabad – *Ms. Shweta Khatri* • Greenhouse Gas Emission Forecast for Mumbai's Transportation System – *Ms. Arti Roshan Soni*
1100 – 1130	Tea & Coffee Break/ Networking Break			

	Session III theme – Efficient & Livable Environment			
	Panel discussion 1: Mitigating Climate Change through initiatives in Urban Transport (coordinated by UNEP) **Chairperson–** *Shri D.S. Mishra, Additional Secretary, Urban Develop-ment, MoUD* **Moderator:** *Mr. ShobakarDhakal- Energy Field of Study, Asian Institute of Technology, Thailand* • UNEP Transport Project : Key messages on urban transport - *Mr Subash Dhar, Senior Economist, UNEP DTU Partnership* • Technology – *Shri Shashi Verma, Director of Communications, Transport for London (TfL)* • Mobility – *Dr Geetam Tiwari, Professor, Indian Institute of Technology Delhi (IITD)* • Inclusiveness – *Dr Darshini Mahadevia, CEPT University* **Rapporteur –** *Jorge Rogat, Project Manager, UNEP Technology Needs Assessment Project, UDP*	***Technical Session 9 – Inclusive Usage of Road Space*** Chairperson – *Shri. R.K. Singh, Director (Urban Transport), MoUD* • Congesting Charging a means to manage the existing road usage – *Dr Akshay Kumar Sen, Deputy General Manager (Economics)& Fellow HSMI, HUDCO* • Improving road safety through effective design principles – *Dr K. Ravidra, CRRI* • Management of On-street Parking – *Mr Hazarilal, Director, The United Traffic and Parking Association* • All India Smart Move High Level Group – *Sonila Metushi, Policy Officer - Passenger Transport & Taxis, International Road Transport Union* **Rapporteur–** *Mr Mohit Dev, PHD Student, IIT Rourkee*	***Technical Session 10 – Climate Resilient Urban Transport - I*** Chairperson - Shri M.K. Sinha, OSD (UT) & E.O.J.S., MoUD • Rising to the Challenge: A brief survey of emerging Indian EV industry- Mr. GopalKartik, Head - Strategy and Business Planning, Mahindra Reva Electric Vehicles Pvt Ltd • Electric Vehicle Scenario for India –DrMinalPathak, Assistant Professor, CEPT University • Digitising Transportation for a Sustainable Future – Mr Akshay BD, Uber India, Head of Public Policy **Rapporteur**– *Ms Noemi Blandine Desguin, UN Habitat*	***Round Table Discussion 3 - Role of IT for efficient bus operations and enhanced Traveller's satisfaction (Supported by Trapeze)*** **Chairperson –** *Mr. Bill Delaney, MD, Trapeze Group – Asia Pacific* **Moderator –** *Mr. VivekOgra, Director – Technology and Innovation, VB Soft* **Presenter –** • *Mr. Mel Pecen, GM (ERP Solutions), Trapeze Group – Asia Pacific* • *Mr. Prasanna Patwardhan, Chairman & Managing Director, Prasanna Purple Mobility Solutions Pvt. Ltd* • User Experience by BEST – *Mr. Ravikant R. Deshpande, Dy. General Manager (Traffic Operations), Brihan Mumbai Electric Supply and Transport Undertaking. (BEST)*
1300 – 1430	Lunch/ Visit to Exhibition			

	Session IV Theme - New and Innovative Ideas			
1430 – 1600	***Technical Session 11 (coordinated by UNEP) –*** ***11a – Facilitating Intercity Transport*** • **Chair : Shri B K Tripathi, Member Secretary, National Capital Region Planning Board** • UNEP Transport Project : *Key messages - P.R. Shukla, Professor, Indian Institute of Management Ahmedabad (IIMA)* ***11b Facilitating rail for intercity transport*** • Intercity Passenger & Freight transport –DrManoj Singh, Advisor (Transport), NitiAayog • Metropolitan Regional Rail Transport– *Shri B K Tripathi, Member Secretary, National Capital Region Planning Board* • Japanese experiences in High Speed Rail – *Ms Atsushi Koike, Professor, Kobe University* **Rapporteur–** *Minal Pathak, Asst. Professor, CEPT University*	***Technical Session 12 –Making Fast Growing Cities more Livable with ITS*** **Chairperson –** *Dr Sudhir Krishna, Former Secretary, MoUD* • The role of ITS in Improving the Safety of Public Transport – *Mr. Deepak Kumar M, Divisional Traffic Officer, KSRTC* • Transport & Data : a Digital Revolution in the Transport Sector - *Ms. Priscille De Coninck, Urban Transport Specialist, AFD* • ITS in Australia- implementation issues/challenges and learnings in Indian context - *Ms. Susan Harris, CEO, ITS Australia and Board Member ITS World Congress* **Rapporteur–** *Mr Mohit Dev, PHD Student, IIT Rourkee*	***Technical Session 13 – Climate Resilient Urban Transport - II*** **Chairperson –** *Shri. Ambuj Sharma I.A.S. Additional Secretary, Ministry of Heavy Industries and Public Enterprises* **Co-chair –** *Shri R.K. Singh, Director, MoUD* • Developing a model for widespread Charging infra-structure – *Mr. WYBREN van der VAART, Founder & CEO, ASIA Electric, European Business & Technology Centre, Mumbai* • Urban Electric Mobility Initiative – *Dr Kulwant Singh, Regional Advisor, UN – Habitat* • Synergy between Transport Modes and Technology – *Dr.Tapan Sahoo, V.P. (R&D) Maruti Suzuki* **Rapporteur–** *Ms Noemi Blandine Desguin, UN Habitat*	Round Table Discussion 4 - Optimization of Urban Bus Transport through "True Blue" Mini Buses (Supported by Force Motors) Chairperson – Sri M.K. Sinha, OSD (UT) & E.O.J.S., MoUD Moderator -Mr. KishorNathani, Sr. VP, UMTC Presenter -Mr. AshutoshKhosla, President – Sales & Marketing, Force Motors Rapporteur – Mr. Jaydeep Desai, Divisional Manager (Marketing & Product Planning), Force Motors
1600 – 1630	Tea & Coffee Break/ Networking Break/ Transport Quiz			
1630 – 1800	***Plenary Session 2*** **– Financing /Technology for Low carbon transport** ***(coordinated by UNEP)*** **Chairperson :** *Shri DipakDasgupta, Alternate Director (India) Global Climate Fund Board & Chair Investment Committee* **Moderator :** *P.R. Shukla, Professor, Indian Institute of Management Ahmedabad (IIMA)* **Panelist** • Mr Peter Hilliges - Director, KfW Development Bank • Mr. Jorge Rogat, Project Manager, UNEP Technology Needs Assessment Project, UDP • Mrs AnnettBaessler, Counsellor of Economics and Environmental Affairs, German Embassy, New Delhi • MrSudesh Kumar, Ex- Member Electrical Railway Board &Ex.Officio Secretary, Government of India Conclusion and closing remarks –UNEP **Rapporteur –** *SubashDhar,Senior Economist, UNEP DTU Partnership*			

Day 4 (27th November, 2015)				
0930 – 1100	***Plenary Session 3 – Transforming Urban Transport for Creating Livable Cities*** **Chairperson –** *Shri. K.K. Sharma, Chief Secretary, Delhi* **Moderator –** *Shri B.I. Singal, Former Director General, IUT* **Panelist –** • Ms Kamala Ernest, Programme Officer, UNEP • Prof ShivanandSwamy, ED, CEPT University • Mr Stephen Yarwood, Ex-Mayor, Adelaide, Australia • Mr S.K. Lohia, CEO, Indian Railways Stations Development Corporation **Rapporteur –** *MrAshutosh Kothari, Planner*			
1100 – 1130	Tea & Coffee Break/ Networking Break			
	Session V Theme – Beyond Transport Nodes			
1130 – 1300	***Technical Session 14 – Financing Transport in future cities*** **Chairperson –** *Shri B.I. Singal, Former Director General, IUT* • Financial sustainability of city bus service – *Mr Prasannna Patwardhan, Managing Director, Prasanna Purple* • Public Transport Incentive Scheme – Ride n Save – *Mr Sharad Mohindru, Transport Consultant* • Innovative financing schemes for urban transport in Brazil and Peru, key findings for Tier-I and II cities in India – *Mr. Arnaud Dauphin, AFD* **Rapporteur –** *Mr Ashutosh Kothari, Planner*	***Technical Session 15 – Metro Systems: Planning and Technology*** **Chairperson –** *Shri D.S. Mishra, Additional Secretary, Urban Development, MoUD* • Managing the metro revolution in India – *Mr. Bharat Salhotra, Managing Director, India & South Asia, Alstom Transport* • Selection of Traction systems &Energy Conservation in Metro Systems – *Shri Brijesh Dixit, MD, Nagpur Metro Rail Corporation Ltd* • Selection of Systems at Planning stage of Metro Rail Project - *Shri Manoj Goyal, IRSEE, General Manager (Systems), MEGA* **Rapporteur –** *Mr Mohit Dev, PHD Student, IIT Rourkee*	***Round Table Discussion 5–Leaders Forum*** **Chairperson:** *Shri M.K. Sinha, OSD (UT), Ministry of Urban Development, Government of India* **Reviewers:** Mr. S.K. Lohia,Prof. Sanjay Gupta, Mr. A.S. Lakhra, Prof. Seva Ram, Ms. Nupur Gupta, Mr. I.C. Sharma, Mr. Jaideep, Mr. Laghu Prashar, Mr. Sudesh Kumar, Mr. R.K. Singh and Ms. PreetiSoni **Moderator:** Prof. Shivanand Swamy, Executive Director CoE UT, CEPT University • Improving the accessibility to the Metro Station through different modes presented- Ms. R .Anusuya, Ms. R. Meena • Route rationalization presented –Shri Shirish G. Aradwad • Study of e-rickshaws –recommendations to ensure safety, reliability, quality- Shri Prashant Mishra • Establishment of green, affordable and efficient bus transport system in Nagpur presented- Mr. Shravan Hardikar	***Round Table Discussion 6–Child Friendly Mobility (Organized by IUT)*** **Chairperson –** *Shri RK Singh, Director (UT), MoUD, GoI* **Moderator –** *Ms. Sonia Arora, Urban Transport Expert, IUT* Presenter – Ms. Revathy Pradeep, Urban Transport Planner, IUT Ms. Vijaya Rohini Kodati, Urban Transport Planner, IUT

1300 – 1415	***Valedictory Session*** • Welcome Address by *Shri Durga Shanker Mishra, Additional Secretary (UD), Ministry of Urban Development* • Presentation of the summary of proceedings of the Conference by *Shri M.L. Chotani,Institute of Urban Transport (India)* • Launch of UMI 2016 by *Shri Madhusudan Prasad, Secretary, Ministry of Urban Development* • Address by *Shri Madhusudan Prasad, Secretary, Ministry of Urban Development* • Presentation of Awards for Excellence in Urban Transport & Urban Mobility Awards by *Shri Babul Supriyo, Minister of State for Urban Development and Housing and Urban Poverty Alleviation, Ministry of Urban Development, GoI* • Valedictory Address by *Shri Babul Supriyo, Minister of State for Urban Development and Housing and Urban Poverty Alleviation, Ministry of Urban Development, GoI* • Vote of Thanks by *Ms. Kanika Kalra Institute of Urban Transport (India)*
1415 – 1530	Lunch

Annexure II : Organizing Committee Members

Shri Mukund Kumar Sinha, OSD (UT) & Ex-officio JS – Chairman IUT ..... Chairperson
Shri R.K. Singh, Director (UT), MoUD ..... Member
Director Finance, MoUD ..... Member
Dr. S. Gangopadhyay, Vice President, IUT ..... Member
Dr. Anvita Arora, Vice President, IUT ..... Member
Dr. K. Ravindra, Hony. Secretary, IUT ..... Member
Dr.Vinay Maitri, Hony. Jt. Secretary, IUT ..... Member
Shri Rakesh Kaul, Hony. Treasurer, IUT ..... Member
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Shri Vishnu Mathur, SIAM ..... Member
Shri I. C. Sharma, NPM, SUTP ..... Member
Shri Jagan Shah, Dir. NIUA ..... Member
Shri M. L. Chotani, Member Governing Council ..... Member
Shri K. S. Saha, Consultant, IUT ..... Member
Shri C. L. Kaul, ES& Officiating DG, IUT ..... Member
Ms. Kanika Kalra, UT Expert IUT ..... Member
Shri Bhanu Chander Dabbikar, RDO, IUT ..... Member
Shri Sandeep Sharma, Sr. Manager, (A&C), IUT ..... Member
Ms. Reena Arora Srivastava, Manager (UMI) ..... Member

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11	SUTP
12	Volvo
13	FIME
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Knowledge Partners	
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2	PTV Group

Annexure IV : List of Exhibitors

S. No.	Name of Exhibitor
1.	Nagpur Metro Rail Corporation Ltd.
2.	Delhi Metro Rail Corporation Limited
3.	Titagarh Wagons
4.	Mumbai Metro Rail Corporation
5.	Jaipur Metro
6.	MEGA Co. Limited
7.	Allison Transmission India Pvt. Ltd.
8.	Karnal Municipal Corporation
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17.	AICTSL
18.	PTV Group
19.	GIRO
20.	TSS-Transport Simulation Systems SL
21.	Goal Systems
22.	SUTP
23.	Institute of Urban Transport (India)
24.	Force Motors

Annexure V : Abbreviations and Acronyms

ADB	-	Asian Development Bank
AFD	-	AgenceFrançaise de Développement (French Development Agency)
AMRUT	-	Atal Mission for Rejuvenation and Urban Transformation
APSRT	-	Andhra Pradesh State Road Transport
ASCI	-	Administrative Staff College of India (Hyderabad)
ASRTU	-	Association of State Road Transport Undertaking
ASSOCHAM	-	Associated Chambers of Commerce and Industry of India
BAU	-	Business as Usual
BEST	-	Bombay Electric Supply and Transport
BMRCL	-	Bangalore Metro Rail Corporation Ltd.
BMTC	-	Bangalore Metropolitan Transport Corporation
BPKM	-	Billion Passenger Kilometres
BRT	-	Bus Rapid Transit
BRTS	-	Bus Rapid Transit System
CAA	-	Civil Aviation Authority
CBM	-	Christian Blind Mission
CCTV	-	Close Circuit T.V.
CEO	-	Chief Executive Officer
CEPT	-	Centre for Environment Planning and Technology (Ahmedabad)
CER	-	Certified Emission Reduction
CMP	-	Comprehensive Mobility Plan
CNG	-	Compressed Natural Gas
COE	-	Certificate of Entitlement (Singapore) / Centre of Excellence
COP-21	-	Conference of Parties
CRRI	-	Central Road Research Institute
DFC	-	Dedicated Freight Corridor
DIMTS	-	Delhi Integrated Multi Modal Transit System Ltd.
DMFW	-	Duel Mass Fly Wheel
DMRC	-	Delhi Metro Rail Corporation
DPR	-	Detailed Project Report
DTC	-	Delhi Transport Corporation
DULT	-	Directorate of Urban Land Transport
ERP	-	Electronic Road Pricing
EWS	-	Economically Weaker Section
FAME India	-	Faster Adoption and Manufacturing of Hybrid and Electric Vehicle India
FAR	-	Floor Area Ratio
FIR	-	First Information Report

FSI	-	Floor Space Index
GDP	-	Gross Domestic Product
GEF	-	Global Environment Facility
GFEI	-	Global Fuel Economy Initiative
GHG	-	Green House Gases
GIS	-	GesellschaftZusammenarbiet (German Institute)
GPS	-	Global Positioning Systems
HCNG	-	High Pressure Compressed Natural Gas
HDV	-	High Density Vehicle
HOD	-	Head of Department
HOVs	-	High Occupancy Vehicles
HSMI	-	Human Settlement Management Institute
HUDCO	-	Housing and Urban Development Corporation
ICLEI	-	International Centre for Local Environmental Initiatives
ICT	-	Information communication and Technology
IDFC	-	Infrastructure Development Finance Company
IIT	-	Indian Institute of Technology
IPT	-	Intermediate Public Transport
IT	-	Information Technology
ITDP	-	Institute for Transport and Development Policy (USA)
ITS	-	Intelligent Transport System
IUT	-	Institute of Urban Transport (India)
JnNURM	-	Jawaharlal Nehru National Urban Renewal Mission
JTPA	-	Japan Transport Planning Association
KfW	-	KreditanstaltfürWiederaufbau (German government-owned development bank)
KSRTC	-	Karnataka State Road Transport Corporation
LCC	-	Life Cycle Cost
LMATA	-	Lagos Metropolitan Area Transport Authority (Lagos)
LPG	-	Liquefied Petroleum Gas
LRT	-	Light Road Transit
LTA	-	Land Transport Authority (Singapore)
MCD	-	Municipal Corporation of Delhi
MD	-	Managing Director
MMRCL	-	Mumbai Metro Rail Corporation Limited
MMT	-	Million Metric Tons
MoUD	-	Ministry of Urban Development
MRT	-	Mass Rapid Transit
MTSU	-	Mumbai Transport Support Unit
NCRPB	-	National Capital Region Planning Board
NDMC	-	New Delhi Municipal Council
NGO	-	Non-Governmental Organisation
NMEM	-	National Mission for Electric Mobility
NMT	-	Non-Motorized Transport
NRRDA	-	National Rural Roads Development Agency

NTDPC	-	National Transport Development Policy Committee
NUTP	-	National Urban Transport Policy
OECD	-	Organisation for Economic Corporation and Development
OSD & E.O. JS	-	Officer on Special Duty & Ex-Officio Joint Secretary
PHPDT	-	Peak Hour Peak Direction Traffic
PMV	-	Personal Motorized Vehicles
PPH	-	Persons per Hectare
PPHPD	-	Passengers per hour per Direction
PPP	-	Public – Private – Partnership
PSD	-	Platform Screen Doors
R&D	-	Research & Development
RITES	-	Rail India Technical and Economic Services Ltd.
ROW	-	Right of Way
RRTS	-	Regional Rapid Transit System
RTIDF	-	Rajasthan Transport Infrastructure Development Fund
RWA	-	Resident Welfare Association
SLoCaT	-	Sustainable Low Carbon Transport
SPA	-	School of Planning and Architecture
SPVs	-	Special Purpose Vehicle
STUs	-	State Transport Undertaking
SUTP	-	Sustainable Urban Transport Project
TCPO	-	Town and Country Planning Organisation
TDM	-	Travel Demand Management
TDR	-	Transferable Development Rights
TERI	-	The Energy and Resources Institute
TOD	-	Transit Oriented Development
TRIPP	-	Transport Research and Injury Prevention Programme
TTMC	-	Traffic and Transit Management Centres (Bangalore)
UEMI	-	Urban Electric Mobility Vehicles Initiative
UK	-	United Kingdom
UMI	-	Urban Mobility India
UMTA	-	Unified Metropolitan Transport Authority
UN	-	United Nation
UNEP-DTU	-	United Nations Environment Programme - Division of Technology
UTTIPEC	-	Unified Traffic and Transport Infrastructure
VC	-	Vice Chairman
VP	-	Vice President
WHO	-	World Health Organisation
WRI	-	World Resource Institute (Washington)

Annexure VI : List of Partners, Coordinators and Supporters in various Sessions

Coordinated by UNEP:-

- Panel Discussion1: Mitigating Climate Change through Initiatives in Urban Transport
- Technical Session 8: a) Strategies for Low Carbon Transport and b) Fuel Economy and Alternative Fuels and Vehicles.
- Technical Session 11: a):Facilitating Intercity Transport b) Facilitating g Rail for Intercity Transport

Coordinated by PTV Group:-

- Technical Session 1:- Transport Modelling
- Technical Session 4:- Traffic Engineering
- Technical Session 7:- Real Time Traffic Modelling

Supported by CBM:-

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Supported by UMTC:-

- Round Table2:- Enabling Rural Public Transport

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- Round Table3:- Role of IT for Efficient Bus Operations and Enhanced Traveller's Satisfaction

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- Round Table4:- Optimisation of Urban Bus Transport through 'True Blue" Mini Buses.

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Proceedings prepared by **Shri M. L. Chotani,** Consultant IUT
Assisted by **Ms. Shabnam Rana,** IUT

Institute of Urban Transport (India)
1st Floor, Anand Vihar Metro Station Building,
Entry adjacent to Gate No 1,
Delhi - 110 092 (INDIA)

Tel.: (+91) 11 66578700 - 709
Fax.: (+91) 11 66578744
E-mail: umi@iutindia.org
Web: www.urbanmobilityindia.in