CiSTUP News Letter

Centre for infrastructure, Sustainable Transportation and Urban Planning, Indian Institute of Science, Bangalore , INDIA

Volume - 4, Issue - 1 July 2013

A Vehicle for Analytical Thinking to Improve the Unique Urban Issues

Message by Prof. P. Balaram President of CiSTUP Executive Council & Director of IISc:

Newsletters are the medium through which every organization is kept informed about the developments that are taking place periodically. I am very glad to note that CiSTUP has been regularly coming out with its NEWSLETTER and has been a very good instrument in disseminating the activities carried out by them.

The matter that is inside the Newsletter should ignite a spark in people who happen to read it. The feedback that comes to CiSTUP giving suggestions might help the NEWSLETTER to assess its quality and also the contribution that it is making to the readers. We should not forget the little pictures that can help fill up space in a small article as long as it pertains to what we are writing about

Browsing through the Newsletter I find that the planners at the center are carrying out diversified projects in the main areas of CiSTUP. The suggestions/ideas coming out of these, I am confident, will try to bring out change in the infrastructure, transport related issues.CiSTUP has also been having good representation in various agencies that are touching the lives of citizens.

I have been following the events that were reported in the Newsletter and observed that the centre has been focused on all the key areas that have been envisaged at the time of its conceptualization.

My heartiest Congratulations and best wishes to the team of CiSTUP for carrying out an excellent work.

Contents of News Letter:

Edited by : Prof. T. G. Sitharam

Published by : Center for infrastructure, Sustainable Transportation and Urban Planning (CiSTUP), Indian Institute of Science, Bangalore-560012

MESSAGE BY PROF. T. G. SITHARAM Chairman CiSTUP Indian Institute of Science Bangalore-560012

The newsletter continues to be a vehicle for promoting fluent communication among all members of the centre and its stake holders in the area of interest

I spent some time going through the articles and I felt that these issues have to be shared among all of us so that some solutions can be evolved for implementation. I did find that there is a wealth of information in the projects/seminars/workshop that is carried out at the centre and its worthwhile sharing these with the readers.

Our Newsletter which came out with its 1st Issue 1st Volume in September 2009, has established itself as a federating medium to strengthen and push forward the growing research community on Sustainable Transportation/Urban Planning and the related subjects.

In this issue, you will read about the events held as a part of the Foundation Day 4th Anniversary.

We had Prof.Dinesh Mohan, Henry Ford Professor, Indian Institute of Technology, New Delhi as the speaker for our Foundation day lecture series. Prof. H P Khincha former Vice Chancellor VTU was our Chief Guest for the seminar on “CiSTUP Past, Present & Future” organized as a part of the foundation day events. “Mobilicity 2013: FORUM FOR SUSTAINABLE BENGALURU”- was jointly organized by CiSTUP, DULT, PRAJA as a part of these events.

A Workshop on “Air Quality Monitoring & Modelling” was held on 22nd March 2013. This workshop was planned to highlight CiSTUP’s commitment to undertake an integrated approach towards sustainable transportation and urban planning, while safeguarding environmental assets in our cities. Coverage of the external activities participated by CiSTUP members and few of the articles written are published in this issue. Open presentation was held for reviewing the projects supported by CiSTUP. So far more than 50 projects have been executed by the faculty of IISc on several topics through CiSTUP. Our planners have also carried out more than 25 projects and brought many recommendations impacting the city. We have helped in many of their committees and contributed extensively for DULT, KSRTC, BMTC and Govt of Karnataka.

For the past few years, CiSTUP Newsletter has played a critical role in conveying an overview of various activities at the centre. Excelling in advancement and transfer of knowledge is only possible through maintaining a strong research culture. An institution can achieve a competitive status if and only if it has a significant presence in contributing to the advancement of the goals/vision that it was created for. The aim of our Newsletter will be to keep its readers widely interested in basic and applied research, and to promote interaction and collaboration among researchers from different fields with the implementing agencies. CiSTUP is seeking to move away from formal and structured presentation of research activities; instead, we would like to provide the researchers an opportunity to actively contribute to the newsletter.

I hope that you enjoy reading this newsletter as much as I enjoyed compiling it. Please feel free to contact us with any suggestions or comments.

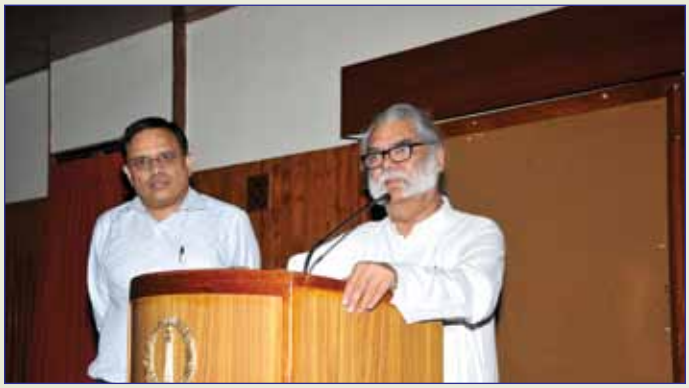
CiSTUP FOUNDATION DAY 4TH ANNUAL LECTURE DELIVERED BY

Prof.Dinesh Mohan Henry Ford Professor Indian Institute of Technology, New Delhi

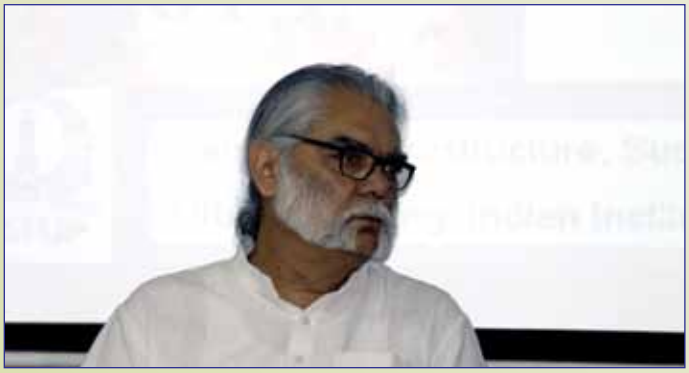
Date: 26th MARCH 2013 Venue: Faculty Hall, IISc.

Title of the Lecture: "Transport and Urban Design Issues in the face of global warming"

CiSTUP Foundation Day Lecture series has been instituted at Indian Institute of Science and it is planned annually during the Foundation Day celebrations (2nd January) of CiSTUP. The 1st Foundation Day lecture was delivered by Dr.M.Ramachandran, Secretary Ministry of Urban Development, Govt. of India, New Delhi & the 2nd Lecture was delivered by Prof. Jose' Manuel Viegas, Full Professor in Transportation at Institute Superior Tecnico, Lisbon, Portugal. The 3rd lecture was delivered by Prof.Kumares C Sinha , Edgar B. and Hedwig M. Olson Distinguished Professor of Civil Engineering in Purdue University. The 4th such lecture was delivered **by Prof. Dinesh Mohan, PhD, Henry Ford Professor for Biomechanics and Technology, Indian Institute of Technology Delhi.**



Prof. Dinesh Mohan earned his undergraduate degree B. Tech (Hons.) from the Indian Institute of Technology, Bombay in the year 1967. He received a Masters degree (M. S in Mechanical and Aerospace Engineering) from the University of Delaware, Newark in 1970. Thereafter, Prof. Mohan earned a PhD from the University of Michigan, Ann Arbor in 1975.



Prof. Dinesh Mohan is the Volvo Chair Professor Emeritus, Transportation Research and Injury Prevention Programme and Head, WHO Collaborating Center for Research and Training in Safety Technology. Was a member of several national level committees and boards, he has been a member of WHO Expert Advisory Panel on Accident Prevention. In the past he has worked at the Insurance Institute of Highway Safety, Washington, DC and the University of Michigan' s Transportation Research Institute. He has also been a consultant to the government departments in India, Nepal, Indonesia, Thailand, Bangladesh, Iraq and Libya. He is a member of several national and international professional societies such as National Safety Council, India and Member-American Society of Biomechanics. He is a recipient of numerous professional and academic awards and medals. He has been an instrumental architect of the Bus Rapid Transit System in India. Currently he is the Henry Ford professor for Biomechanics and Transportation Safety at IIT-Delhi. His research interest lies mainly in the domain of:

- Urban Transport and sustainability
- Road and Motor vehicle Safety
- Injury prevention and control
- Human Tolerance Biomechanics.

➢ Seminar on CiSTUP past, present & Future on 31st March, 2013

CiSTUP which came into existence in January 2009 celebrates its foundation day every year during January. This year the celebrations started off with a seminar on its past, present and future goals. Chairman CiSTUP, Prof. Sitharam in his keynote address made a presentation on the Smart City Strategies to Mitigate Rapid Urbanization : Key trends and Outlook.

He said that the new strategy is to encourage coordination among all modes, create sustainable communities, connect housing to employment locations, create more green jobs and shift from construction to maintenance as well! In conclusion he pointed out that Cities are the key – Smarter city solutions are the need of the hour –There is no one fixed solution for all cities – Planning, Funding, Governance dictate the method of adoption. He welcomed the Chief Guest for this event Prof.H.P.Khincha.

Prof. H P Khincha is currently a Professor at Indian Institute of Science, Bangalore. He was formerly vice chancellor of Vishwaraya Technical University, Karnataka. He had long stint at IISc Bangalore, where he worked as chairman in department of electrical engineering, divisional chairman of electrical sciences and CEO of society for Innovation & Development (SID). He is also a member of various committees of government of India. He is well known worldwide for his research work in electrical engineering. He also served as chairman of IEEE Bangalore section, and directors of many industries.

Mr. J. Satya Sai Kumar, Transport Planner CiSTUP gave details of the centres activities since inception and said that CiSTUP from the present agenda of Capabilities, ideas, Studies, Talent, Umbrella & Perseverence it is moving to the future in the areas of Capacities, innovative, Solutions, to Thought leadership, Uniqueness and Proactiveness.

Mr. Lokesh Hebbani, Transportation Planner, CiSTUP gave the details of the present works & projects that are being carried out by the centre. Ms. Jaya Dhindaw, Urban Planner CiSTUP gave an insight to the future projects that have been taken up.

Dr. Krisna Prapoorna Biligiri,Senior Research Fellow at CiSTUP made a presentation on "Sustainable Transportation Materials & Infrastructure – Roadway Technology" which is the study taken up by their team. Research will advance the state-of-the-art and knowledge one-step further in understanding the various aspects of pavement materials properties and associated pavement noise patterns for Bangalore. It could be used by different agencies and industry to show the benefits of the recommendations provided by the study for mitigating transportation-related noise, particularly, pavement noise in the city It is expected that the results may possibly be implemented by BBMP in about four months from the initiation of the project.

Dr.K.V.Gururaj,Urban Planner CiSTUP gave the details of the Bangalore 2012 Assessment by their team based on a Questionnaire based surveys conducted by them. The broad themes considered were:

1. Nativity
2. House ownership, house type & criteria for housing
3. Access to energy sources
4. Access to water, mode of disposal of waste water and solid waste
5. Access and Mobility
6. Access to healthcare, amenities and infra structure
7. Governance
8. Ecology

➢ Mobilicity 2013: FORUM FOR SUSTAINABLE BENGALURU"- Jointly organized by CiSTUP, DULT, PRAJA. On Wednesday, 06 March 2013

Venue: CiSTUP Conference Hall, Indian Institute of Science, SID Complex, Bengaluru.

Namma Bengaluru is facing significant urbanism challenge as never before effecting the environment, people and the economy as a whole. Crippling city infrastructure along with unbriddled growth of vehicles is a weak link to meet the needs of the residents and businesses. Today, the herculean peakhour commute on our congested roads and highways, gridlocked urban streets, unreliable and inconvenient public transportation system, in other words over crowded solo public bus transportation, is increasingly becoming a pain for mobility. In addition, increased Air Pollution, lack of affordable housing, spiraling land prices led to urban sprawl, lack of sufficient local financial resources, etc., are leading to the economic disruption of our beloved Bengaluru. These issues are calling for an urgent need for efforts, actions and to make Namma Bengaluru Livable and Sustain!!

In this connection, the Center jointly with Directorate of Urban Land Transport (DULT) and Praja Raag launched a "Mobilicity 2013: Forum for Sustainable Bengaluru" on 6th March 2013 as part of its 4th Foundation Day event inviting representation from all Bengaluru Stakeholders. The forum focused on the following four key themes:

- Moving Bengaluru
- Greener Bengaluru
- Cleaner Bengaluru
- Bengaluru Urban Sprawl

Together to help create Sustainable Bengaluru! To facilitate discussions and ideas a pre-online and on ground campaign surveys were conducted which formed a food for thought for the event. At the end, these deliberations and ideas were compiled and submitted to the respective stakeholders for needed action as an outcome of this event.

Prof. T.G. Sitharam, Chairman, CiSTUP welcomed the participants and the guests for the event .He gave a brief outline of what is the main purpose of holding this Mobilicity Forum.This was followed by the Keynote addess from The Chief Guest Madam V. Manjula, IAS, Commissioner, DULT, Govt of Karnataka .

There was a Presentation on "Sustainable Bengaluru Realty Vs Dream" by Shri. J. Satya Sai Kumar, Team Leader (Transportation & Cities), CiSTUP followed by the Presentation on Pre-campaign Citizen Survey Results on Sustainable Bengaluru by Shri. Pranav Jha, Praja Raag.

There was Parallel Group Sessions: Sustainable Bengaluru: Issues & Priorities-

Session 1: Moving Bengaluru-Conference Hall

Session 2: Greener Bengaluru-Meeting Hall

Session 3: Cleaner Bengaluru-Class Room

Session 4: Bengaluru Urban Sprawl-M.Tech Hall.

This was followed by another four parrallel group sessions on- Sustainable Bengaluru: Initiatives & Actors.There was Presentation on Forum Deliberations followed by Responses on Presentation from Participating Dignitaries. The event closed with vote of thanks and closing remarks.

Topics to be taken forward from this MOBILICITY Event are:-

1. Equitable allocation of Road Space.
2. Footpaths-Minimum width/Maximum Width
3. Parking Pricing Mechanisms-approval
4. Transport Demand Management.
5. Congestion Tax-pilot project
6. Second Vehicle registration-May be made tougher
7. Air Quality in Bangalore-lowest CO2 emission.
8. Urban Logistics.
9. Focus on Tier II cities.
10. SEZ's in outskirts of Bangalore.
11. Land use planning-Master Plan.-walk to work
12. Awareness programme-year long awareness.
13. Master plan is in the revision.

For further details log on to:
http://cistup.iisc.ernet.in/mobilicity.php

➢ Open house presentation of Research Projects for support Under Phas IV

CiSTUP has been encouraging research projects in its theme areas received from Faculty of IISc. The proposals received for the centre's support for the financial year 2013-14 were put for review on 5th March 2013 from 12 noon till 4.10 pm. The investigators made a presentation of their proposals in an open house which included the members of the committee formed to review these proposals.

The presentation was open to all. The presentations with the title of the project and the name of the investigator are given in the following table.

Sl. No	Title of the Project	Investigator	Department
1	"Performance valuation of public transport operations in Karnataka by using multivariate and non parametric techniques"	Prof. T.G. Sitharam	Civil Engineering CiSTUP
2	"Feasibility Study of Exhaust Thermoelectric Generator for Buses"	Dr. Himabindu.M-PI Dr. Pramod Kumar	Mechanical Engg
3	Pilot Testing and Design mprovement of small biogas plants for Household Urban Solid Wastes.	Dr.H.N.Chanakya	Center for Sustainable Technology
4	"Studies on the performance and Emission Characteristics of Hythane Operated Internal Combustion Engine for the Clean Urban Transportation"	Prof. R.T. Naik	Mechanical Engg.
5	Fabrication of Nanostructured Strain Sensor	Dr.S.Venugopal	Chemical Engg.
6	Static and Cyclic loading Characteristics of Geocell Reinforced Aggregates	Prof. Gali Madhavi Latha	Civil Engineering
7	"Assessment of Fatigue Crack Propagation in Concrete Beams and Columns of Bridges"	Prof.J.M.Chandra Kishen	Dept. of Civil Engineering
8	Assessment of Construction Technologies in Transportation Infrastructure for Developing and Managing the transportation system in Bangalore.	Prof.K.B.Akhilesh	Management Studies.
9	"Removal efficiencies of degraded organic contaminants present in the Municipal Solid Waste(MSW) of Bangalore city after treatment by clays".	Prof. P V Sivapullaiah	Dept. of Civil Engineering

➢ Project supported by CiSTUP-Phase I, II & III -Review in Open-house presentation

On 13th & 30th May 2013.

Reviews of all the project proposals that have completed its duration and also those which have completed one year were put through a review process. All the investigators made presentation in an open house, which included a review committee consisting of three faculty members from institute, one external faculty and the Chairman of CiSTUP, about their project work . This process was spread over two days on 13th & 30th May 2013 with a review of 21 projects

The review committee after listening to the work carried out and taking note of the deliverables recommended for closure of the following projects on completion of their duration. List of these projects giving the title and the name of the investigator is given hereunder.

CiSTUP Supported Projects closed on completion of their duration.

Sl.No.	Name of the Investigator/s with the name of the Dept.	Project Title
1	Prof.S.Asokan-Instrumentation	Structural Health Monitoring of Under-pass made from precast RCC boxes
2	Prof. R Srinivasan Dept. of Management Studies	Demand Management and Strategies for Improvement of Market Share of KSRTC on Selected Routes
3	Dr. P. Anabzhagan Dept. of Civil Engineering	Characterization of Rail Track Ballast fouling Using Ground Penetration Radar and Field Sampling
4	Prof.T.G.Sitharam Dept. of Civil Engineering	Underground Construction in Urban Areas:Field Data Analysis and Monitoring, Numerical Simulations and validation .
5	Prof.Shivapullaiah Dept. of Civil Engineering	Use of Solid Waste to Enhance Properties of Problematic Soils of Karnataka
6	Dr. R.T. Naik Dept. of Mechanical Engineering	Development of Bio-Hybrid Three-Wheeled Auto-Rickshaw for Urban Transportation
7	Prof.Jaywant H. Arakere-Engineering Dept. of Mechanical Engineering	Design for Thermal comfort using Ventilation and thermal mass.
8	Dr.T.V.Ramachandra Center for Ecological Science	Urban Sprawl in Tier-11 Cities of Karnataka: Analysis of Patterns, Process and Environmental Sustainability
9	PI: Dr. HN Chanakya- CST & Co PI:Dr. S.G. Sreekanteshwara Swamy- KSCST .	Management and Technology of Urban Solid waste leachate
10	Dr. P. Balachandra / Prof. B. Sudhakara Reddy Dept. of Management Studies	Benchmarking Bangalore city for sustainability
11	Dr. H N Chanakya-Center for Sustainable Technology	Enhancing Productivity and Economics of Small-scale Biodiesel Units

➢ Workshop on "Air Quality Monitoring & Modelling" On Friday, 22nd March, 2013 at CiSTUP, IISc.

Workshop commenced with the opening remarks by Mr.Lokesh Hebbani,Transport Planner explaining that Air pollution plays a major impact on human health, visibility and environment in our cities. Respiratory and cardiovascular illness and mortality are significantly higher in polluted cities. Besides human health implications air pollution also contributes to loss of economic productivity due traffic congestion, and additional costs to implement air pollution control strategies.

Monitoring the air quality will ensure the measures to be taken to control air pollution and enforce the laws and regulations. Modeling and assessment will help us to take judicious steps to reduce air pollution and ensure clean air to breath for all. This workshop was planned to highlight CiSTUP's commitment to undertake an integrated approach towards sustainable transportation and urban planning, while safeguarding environmental assets in our cities.

prof.t.g.sitharam,chairamn cistup welcomed the participants which was followed by a keynote address by chief guest Mrs.Ritu kakkar ,IFS, Director General, EMPRI.

The main speakers for the workshop and the title of their presentaion:

Dr. Rajasekar Murthy, Visiting Professor CiSTUP--- Urban AQ Monitoring and Modeling.

Dr. Madhusudhan, Central Pollution Control Board --- National Ambient Air Quality Monitoring and Assessment.

Dr. Parmila Goyal, Indian Institute of Technology, New Delhi—Assessment of air quality and vehicular traffic for Delhi.

Dr. RN Singh, National Geophysical Research Institute, Hyderabad--- Advection-Dispersion modeling of air quality data of Visakhapatnam bowl area.

Dr. Ramakrishna , National Environmental Engineering Research Institute (NEERI), Nagpur-- Air quality Modeling in environmental impact assessment studies of different sectors .

Dr. R.T. Naik, Mech Eng, IISc-- Performance and Emission Characteristics of Bio-diesel operated Internal combustion engine for Clean Urban transportation.

Mr. Mahesh Kashyap-- Emission Inventory. This was followed by presentations via skype from Sweden,France & Denmark as listed below;

Mr.Alexander Baklanov, Copenhagen, Denmark made a presentation through skype on Urbanization climate and air quality effects and interactions-Main achievements of MEGAPOLI

Leandra Cardulo, Swedish Meteorological and Hydrological Institute, Sweden---AIRVIRO – support tool for managing air quality data and models.

Nadege Blond, Centre national de la recherche scientifique, France- Air quality monitoring and modelling.

The workshop concluded with a group discussion . The outcome of discussions is summarised hereunder.

Bangalore is one of the fastest growing cities in Asia with a population of over 8 million and growing rapidly in all directions. With accelerated economic development and coupled with uncontrolled urbanization, the number of vehicles on the road has increased exponentially over the last ten years. The cities vehicular population is around 4.5 million, an increase of over 250 % in ten years and contributes 60-70- per cent of the pollution load to the environment. It is imperative, therefore, that air pollution control strategies for mobile sources are urgently needed to mitigate the negative impacts air quality on human health and environment in metropolitan Bangalore. This workshop provided an excellent opportunity to incorporate air pollution issues into ongoing CiSTUP's activities in urban planning, infrastructure planning and mobility. CiSTUP is well placed to take the initiatives and lead to integrate emerging urban

environmental issues, particularly the worsening air pollution in Bangalore due to tail pipe emissions from poorly maintained public as well as private vehicles. The concentrations of most of the criteria pollutants, particularly the Respirable particulate material, PM2.5, generally exceed the National Ambient Air Quality Standards as well as World Health Organization Standards for healthy urban living. Several scientific and technical papers were presented by both National and International experts covering air pollution emissions, monitoring, modelling, assessment and impacts on human health. Following the workshop presentations a round table discussions were held to formulate recommendations so that CiSTUP could follow up with GoK agencies responsible for improving the air quality in Bangalore by implementing appropriate air pollution control strategies. The expert group included two eminent medical professionals Drs. Venkatesh and Murali Mohan, who provided an overview of the health impacts of breathing poor air in Bangalore. The expert group strongly recommended setting up Bangalore Air Quality Management Cell (BAQMC) with the following objectives:

1. Develop a comprehensive Emissions Inventory of all sources
2. Develop an integrated air quality monitoring network (fixed monitoring stations andMobile monitoring) to provide a synoptic coverage air pollution concentrations and variability both in space and time.
3. Undertake air pollution control strategies such as an effective traffic management, vehicle and technology based emission reduction, public awareness/education on air pollution related safety, health impacts, economic loss due to congestion etc.,
4. Develop a frame-work for summarizing urban climatic factors responsible for transport, dispersion, mixing height, chemical transformations, in collaboration with India Meteorological Department, CMMACS
5. Develop appropriate predictive models for air quality index AQI) as a warning and regulatory mechanism when air quality exceeds NAAQS.
6. Undertake collaborative projects to assess poor air quality impacts on human health in association with Medical doctors.
7. Plan and conduct capacity building through training programmes, workshops/symposia and conferences.

For further details log on to:
http://cistup.iisc.ernet.in/airquality.php

➢ World Telecommunication and Information Society Day 2013

Role of Information & Communication Technologies (ICT's) in Improving Road Safety

The World Telecom Day celebrations were held at Centre for Development Of Telematics (C-DOT) on 17th May 2013 at their office in Electronics City, Bangalore.

Mr. Lokesh Hebbani, Transportation Program Manager at CiSTUP was invited as a guest speaker to give a presentation on Role of Information & Communication Technologies (ICT's) in Road Safety. Mr.Lokesh gave a detailed 30 minute presentation which covered successful best practices implemented around the world where traffic accidents and fatalities were significantly reduced by using state of the art ICT's. His presentation was highly appreciated by an audience of over 400 people. The Chief Guest at the event was Dr. M A. Saleem, ACP, Bangalore Traffic Police. He also gave an excellent presentation on use of ITS in Traffic Management in Bangalore City. Dr.A. Ravindra, IAS(Retd).Ex-Chief Secretary, Govt. of Karnataka, spoke at the event and suggested ideas for improving the traffic congestion problems in Bangalore City.

C-DOT is a Central Government funded Telecommunication and Development organization. They design and develop state of the art technologies, products and solutions to meet the Telecom needs of India, particularly of national importance in strategic sectors and rural areas.

The purpose of World Telecommunication and Information Society Day (WTISD) is to help raise awareness of the possibilities that the use of the Internet and other information and communication technologies (ICT) can bring to societies and economies, as well as of ways to bridge the digital divide. This year World Telecommunication and Information Society Day (WTISD-2013) focus was on the theme: "ICTs and improving road safety".

According to the Report of the United Nations Road Safety Collaboration (UNRSC) released by UN Secretary-General Ban Ki-moon, 1.3 million people die each year in traffic related accidents and another 20-50 million people are injured mainly in developing countries around the world. As a result, Governments and individuals suffer an estimated USD 518 billion in global economic loss. Driver distraction and road-user behavior, which includes "text messaging" and interfacing with in-vehicle navigation or communication systems while driving, are among the leading contributors to road traffic fatalities and injuries.

Road traffic safety is a global concern not only for public health and injury prevention but also to improve efficiencies in traffic management as a means of combating the effects of climate change. International Telecommunication Union (ITU) has been leading worldwide efforts in developing state-of-the-art ICT standards for Intelligent Transport Systems and driver safety that utilize a combination of computers, communications, positioning and automation technologies, including in-car radars for collision avoidance. ITU has also been developing standards for safe user interfaces and communication systems in vehicles as well as optimizing driving performance by eliminating unsafe technology-related distractions while driving. ITU Council adopted the theme "ICTs and improving road safety" for World Telecommunication and Information Society Day 2013, in accordance with Resolution 68 (Rev. Guadalajara, 2010). This theme is also in line with the UN General Assembly Resolution (A/RES/64/255) on improving global road safety which proclaims the period 2011-2020 as the "Decade of Action for Road Safety".

The ITU Council 2010 Resolution 1318 states that ICTs, including intelligent transport systems (ITS), provide mechanisms for vehicular and passenger safety; and the development of in-vehicle architecture and a Vehicle Gateway Platform (VGP) requires cross-sectoral collaboration within ITU and among World Standards Cooperation (WSC) partners. The president of ITU has invited all Members of the Union to take practical steps to further national and domestic policies, programs and/or educational initiatives in the use of ICTs to improve road safety, taking into account the risks associated with the unreasonable use of ICTs and driver distraction, as well as the benefits of ICTs and vehicular safety technologies, in order to improve global road safety.

The Action Plan adopted by ITU for "ICTs and improving road safety" are:

1. **Promote national policies to encourage the use of ICTs in enhancing road safety.**

   Call for action: Relevant government ministries and agencies should prioritize the implementation of policies that take into account ICT standards

to enhance road safety and promote awareness among road users of safety imperatives, particularly in avoiding distractions as a result of the proliferation of integrated in-vehicle ICTs and nomadic devices, including navigational information and electronic data communications devices.

ICT standards should also be leveraged to improve situational awareness of drivers by enabling roadway hazard warnings, in-vehicle signage, and other safety-related capabilities. Governments should promote awareness through public service media of the dangers of driver distraction arising from the in-vehicle use of communication, entertainment and positioning devices, especially "texting" while driving.

2. **Promote the development and use of Intelligent Transport Systems (ITS)**

   Call for action: Government agencies should promote the use of ITS to improve the safety, management and efficiency of terrestrial transport, and to reduce the environmental impact of road transportation. Adopt globally accepted standards in the ITS field to be able to provide multiple services, over multiple different platforms, while maintaining a simple-to-use interface that requires minimum intervention from the driver. Provide regulatory and financial incentives to industry for the development of vehicle-to-vehicle (V2V) and vehicle-to-infrastructure communications that will help prevent accidents.

3. **Action to eliminate unsafe technology-related distractions while driving.**

   Call for Action: - Develop new ICT-related techniques and technologies that can be used to reduce collisions associated with driver distraction. Promote mechanisms that can be used to manage information flow and message formats between the driver and the automotive cockpit. Develop mechanisms for coordination of components, subsystems, and applications to minimize driver distraction and workload. Develop design guidance for applications, devices, and systems that interact with drivers of road vehicles.

4. **Advocate harmonization of the 79 GHz frequency band for automotive radars**

   Call for action: Governments and industry worldwide should advocate adoption of a harmonized 79 GHz frequency band for automotive short-range high-resolution radar operations when the World Radio communication Conference 2015 considers allocation of the band 77.5-78 GHz to radiolocation services.

5. **Promote the development and use of safe user interfaces in vehicles**

   Call for action: Governments should promote awareness of safe user interfaces and hands-free devices in vehicles and promote quality standards for in-car communications. The automotive industry should improve and enhance in-car communications, focusing on quality parameters.

➢ ELEMENTS OF A GOOD PUBLIC TRANSPORT SYSTEM FOR INDIAN CITIES

By: Prof. T. G. Sitharam & Mr. Nikhil Menon

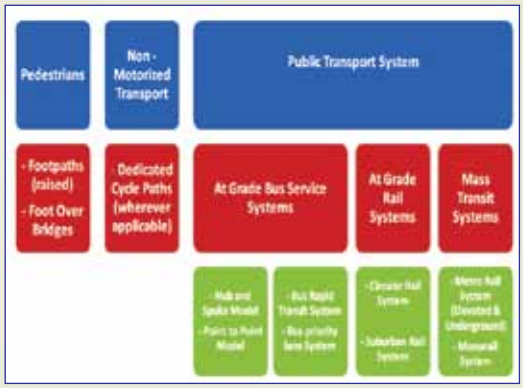
Urban India houses people from all strata of society – right from the lowest to the highest pedestals of the economic and social ladder. India presents a very unique challenge when it comes to planning - there is a share of citizens, who would find the tickets/fares of public transport unaffordable that they might be forced to look towards other non – motorized modes of transport. On the other hand, there is the other extreme of society, which might feel that the service provided to them by public transport is inadequate for their economic and social standing. This forces them to look into private and personal modes for their travel needs. Therefore, the contribution of public transport in the total travel market has been declining by the day, as the rise of others, including private and para transit modes have been taking up their share.

Public Transport faces several issues in the developing world, which are different from one city to another city (Vasconcellos, 2001).

In many Indian cities, It is seen that on an average the trip lengths in most of the Tier I/ Tier II cities is at

8kms. There is an upward trend for the Tier I cities and megacities and a slightly lower than average trend for the Tier II cities.

The average travel speeds are well below the prescribed city speed limits of 35 kmph. This is attributed to the large amount of congestion on the roads, owing to various deficiencies in the road infrastructure due to increase in the personalized vehicles. A possible Hierarchy in Transport Planning for urban mobility in India is as shown in schematic diagram (see Fig 1) below.



However, alternatively what exists on ground is different. Tier II cities in India does not have public transport system at all. It only has the common modes of para-transit that are taxi cabs, auto-rickshaws (tuk-tuk), and shared autos amongst other modes. Whereas the private modes of transport are largely the two – wheeled vehicles (bikes, scooters) and four – wheeled vehicles (cars). As the economic growth of the cities is increasing, people seek the most reliable mode of transport for their mobility needs and thus they depend more on private modes which is very evident in all the Indian cities. Indian mega cities are embracing the public transport systems particularly mass transit systems based on Metro rail. However, one needs to keep in mind need to effectively operate the other modes, such as at grade bus service system and at grade rail systems for urban mobility for catering the needs of the lower – middle income groups. They are the key for development of our cities. Urban mobility starts at the level of the Pedestrians. In order to ensure good patronage in the public transport systems, efforts need to be initiated from the pedestrian level.

This can be achieved by the construction of raised footpaths in order to ensure that it is separated from the basic right of way for the vehicles, giving enough privacy for the pedestrians and ensuring that no exploitation of this space by the vehicles is possible.

One major hurdle that is commonly faced In the Indian cities is the inability to ensure the consistency in the standards in the provision of footpaths along the urban area. In addition, non – motorized transport modes such as cycling provide a cheap alternative for commute and are of special significance for the Indian cities where there is concentration of lower – middle income groups who need to commute more and more for their daily needs with sprawling of our cities.

Despite the income levels being low, the percentage of people using public transport rarely goes over 40%. This could actually mean two things: 1) the affordability levels of public transport for the average citizen could be low, thus showing such disparities; or 2) the service quality in these public transport systems could be abysmally low, which might be the reason why people favour other modes of personal transport. Thus, there is a need to intervene to ensure that modal shift happens and people come back to using public transport for their commute.

With this in view, we have attempted to identify the elements of a good public transport system for Indian Cities.

In order to classify a public transport system as a 'good public transport system', it must aim at achieving a set number of objectives which can be broadly divided into the following categories:

Ability to provide basic mobility for non – drivers –> Non – drivers have a significant desire to improve their mobility. Studies have shown that non – drivers, both elderly and aged between 18 and 64 (and also a proportion of passengers who are economically backward) engage in only half as many as trips in comparison with their driving counterparts. As a result of which, there have been instances where non – drivers have felt excluded from performing all their required activities A good public transport system shall aim to bridge this gap.

- Reduce travel times and costs for all trips, in comparison with private modes –> In addition to serving for fulfilling the basic mobility needs of non – drivers, public transport would be embraced even by those who currently commute in private modes, thus inducing a mode shift, if they are able to commute at lesser times and costs in comparison to the private car or taxis. This is especially true from the point of view of a developing world.

- Trip coverage –> a good public transport system would be available to and from the origins/ destinations of the traveller, thereby reducing the needs for transfer or use of alternative (private, para) modes. This would be an ideal situation.
- Spatial coverage –> a good public transport system would be accessible within reasonable physical proximity of the origin/ destination of the traveller. Reasonable distances of proximity would vary depending on conditions in situ, but an acceptable walking distance to board a public transport system is taken to be in the range of 500 – 600 m. This would further eliminate the need to depend on alternative (private, para) modes for transit or transfer.
- Temporal coverage –> a good public transport system would be accessible at all times of the day for undertaking the trip. Quite often, the situation is such that commuters face declining numbers of service (less frequent services) after a certain point of time in the night. It is often in relation to the demand, which dwindles beyond the morning and evening peak hours. A direct trade off between the frequency and patronage (demand) is required in order for a transport system to be effective or otherwise.
- Connected with the other systems of transportation in the city (multimodal integration) –> In cases where the same mode of transport is unable to provide the trip coverage, it may be in better interest of the commuters to ensure connectivity to other modes of transport, which will help the commuter in reducing the time he/ she takes for transfer.
- Heightened level of service, attractive enough for inducing mode shift –> Providing transit at an increased level of service from the present stage is one of the main reasons why customers who are currently using alternative modes, will be induced to undergo mode shift. This can be achieved in many ways like working on the aesthetics in the transport system, providing separate corridors for public transport by prioritizing public transport
- Contribute to increasing air quality and reduction in emissions –> Most public transport systems from the developing world are facing issues with age old fleet which do not comply to emission norms like Euro V or Euro VI. It has also been found that air pollution is the 5th major cause of death in India. Therefore, a good public transport system should focus in working towards increasing air quality and reducing the emissions from its fleet. This can be brought about by converting to less polluting fuels like Compressed Natural Gas (CNG) or Bio-diesel. Improving the fleet is also seen as a way forward.
- Heightened safety, leading to reduced accidents and subsequent injuries/ deaths –> Most public transport systems in the developing world are fighting issues of safety on board their fleet, primarily due to the use of age old vehicles, which constantly deny the security features, their newer counterparts might possess. Sense of security and safety on public transport is a major source of impediment for a large section of commuters who take to alternate modes. A good public transport system must be able to allay such fears of security and safety, thereby enabling higher patronage to their services.
- Contribute to transit oriented development and heightened opportunities for economic interaction –> The land use – transport connection is something which has been widely debated. After due deliberation, it is clear that both land use and transport have been seen to benefit each other and this cycle of development has a significant impact on both the phenomena. When public transport systems are able to provide trip coverage, it is possible that in due process, it would lead to heightened economic interaction and subsequent development of the newly connected area.

➢ Technology Vision 2035

By: Mr. Lokesh Hebbani Transportation Program Manager at CiSTUP

Technology Information, Forecasting and Assessment Council (TIFAC) is an autonomous organization set up in 1988 under the Department of Science & Technology, Government of India to look ahead in technologies, assess the technology trajectories, and support technology innovation by network actions in select technology areas of national importance.

In 1993, TIFAC embarked upon the major task of formulating a Technology Vision for the country in various emerging technology areas. The outcome of the Technology Vision 2020 exercise led to the set of 17 documents, including sixteen technology areas and one on services. The effort was a unique and pioneering exercise that involved more than 5,000 experts including scientists, technologists and corporate managers from academia, industry and the government.

The role of technology in the economic progress of a nation is well recognized and appreciated, efforts are being made globally to develop technology strengths and make the industries competitive, for well-rounded development of the society. The developing countries specially have shown a marked rise in the pace of economic growth in recent years with focus on Science, Technology & Innovations. If the trends available are to be believed, there is likely to be a shift in economic power towards the third world countries in the 21st century.

Changes in the global economic scenario, growing aspirations of Indian population for better living and the fact that India would be a developed nation by 2035, have challenged Technology Information Forecasting and Assessment Council (TIFAC) to delineate a Vision for the country. Having commended Technology Vision 2020 in the 1990s to catapult India into the league of developed countries, TIFAC has now geared-up itself to deliver Technology Vision 2035 for India.

To be prepared on a consultative framework, the Technology Vision 2035 would take into account our capabilities and competitiveness, accommodate regional aspirations, priorities & disparities and placed as a referential document.

The vision, it is hoped, will inspire and prompt the stake-holders across the spectrum to chart technological trajectories through subjective interpretations.

Towards evolving this document, a mammoth visioning exercise has been taken up to envision the technologies that would be required to take on the scenario in 2035. To be rooted in the people's aspirations/ perception about India in 2035 and the technologies that will enable their realization, exercise is being done through interaction with stake-holders, brainstorming meetings at regional level, group meetings with experts, thematic questionnaires and theme-based interactive sessions with young students, faculty & technocrats etc.

In order to get comprehensive insights into deep future, Advisory Committees comprising of expert groups have been formed to cover

The 12 thematic areas. They are

1. Educational Technologies
2. Energy Technologies
3. Environment
4. Food and Agriculture
5. Global challenge issues
6. Habitat
7. Information & Communication Technologies
8. Infrastructure
9. Materials & Manufacturing Technologies
10. Medical science & Health Care
11. Transportation
12. Water Technologies

These Committees are mandated to oversee generation of Scenario Reports for respective sectors. An apex body comprising of the social scientists, economists, S&T leaders and Chairpersons of Advisory Committees will guide in synthesis of Technology Vision 2035 from scenarios in the Reports from all the sectors put together. The draft document is proposed to be put in public domain for inviting suggestions before it is formally released.

The list of advisors serving in the Infrastructure Committee are:

Advisory Committee - Infrastructure

Sl. No.	Name & Designation	
1	Sh. D.P. Gupta, Former Director General (Road Dev.) & Additional Secretary, Ministry of Road Transport & Highways, GoI, New Delhi	Chairman
2	Sh. Pritosh Gupta Chief Executive Officer, IL&FS Infrastructure Development, Corporation Ltd., 2nd floor, Ambience Corporate Tower, Ambience Mall, NH-8, Gurgaon-122 001.	Member

3	Prof. S.K. Bhattacharya. Director,Central Building Research Institute (CBRI), Roorkee - 247 667	Member
4	Sh. B.V. Mallikarjuna Rao, General Manager (Urban Transportation), RITES India Ltd., RITES Bhavan,1, Sector 29, urgaon, Haryana - 122002	Member
5	Prof. M.S. Raghavendra, Professor & Area Chairperson Centre for Energy, Environment, Urban Governance & Infrastructure Development Administrative Staff College of India (ASCI), Bella Vista, Khairatabad, Hyderabad 500 082	Member
6	Prof. Chetan Vaidya ,Director, National Institute of Urban Affairs Core 4B, India Habitat Centre, Lodhi Road, New Delhi 110003	Member
7	**Prof. T.G.Sitharam, Chairman, Centre for Infrastructure, Sustainable Transport and Urban Planning (CiSTUP), Indian Institute of Science (IISc), Bangalore.** **Mr.Lokesh Hebbani, Transportation Program Manager, CiSTUP, IISc.**	Member
8	Dr. (Mrs). Pushplata Head of Department, Department of Architecture and Planning, IIT – Roorkee, Roorkee - 247 667	Member
9	Dr. Gautam Goswami/ Dr. T. Chakradhar, Scientist, TIFAC	Member Secretary

hnology plays an important role in the development of infrastructure. However, given the rapid evolution of technology in this sector, it is important to consider that any attempt accurately to anticipate change over a 20-30-years period is obviously a mammoth task. Hence, we request your views /insights and suggestions on the futuristic focus in the area of Infrastructure with Science and Technology perspective through this Ideapoke platform. Your feedback highly appreciated.

Please click on the link below or copy & paste this link on your browser.

http://www.indiatechvision2035.in/infrastructure.html

➢ Bicycling and walking in Indian Cities–perception and few suggestions.

By : M.L.V. Subramanyam

The word 'pedestrian' includes all non-vehicular mobility (including the use of, for example, wheelchairs, guide dogs or other mobility aids). Pedestrians form the largest single road-user group. Nearly all short trips could be undertaken on foot and even longer trips, whether the main mode of transport is by private car, public transport or cycling - require the road user to be a pedestrian at some stage of the journey. Walking is a key element in his or her trip or mobility of a person.

Planning and designing good pedestrian infrastructure with well-connected and amenable facilities will benefit the whole community. Our city corporations should adopt a footpath budget and do the needful in a planned manner. Creating communities that encourage people to choose walking as a mode of transport is a way to foster more sustainable, healthier and safer communities. Independent travel will be possible for more people including the elderly, children, families and people with disability.

Pedestrian Accessibility --Pedestrian networks should be planned in combination with land uses to provide residential access to mixed use centres and bus routes within a 400m walk, and access to train stations within 800m of strategic and secondary activity centres. Pedestrian networks should be designed with passive surveillance and good lighting to provide an attractive and safe walking environment. There should be minimum path width for different pedestrians. The footpath width should be designed keeping in view the necessities of the neighbourhood requirements. The Surfaces must be slip resistant, flat and even. All crossing points must provide adequate sight distance for pedestrians and approaching vehicles. Parking restrictions and lighting must be provided to meet visibility requirements. Pedestrian crossing facilities should be provided at all signalised intersections Parallel pedestrian phases with partial protection or with full Protection. Exclusive pedestrian phases (allows for diagonal crossings) Zebra crossings at slip lanes should be provided. To encourage pedestrian patronage across grade separated facilities guidelines have to be made for Overpasses& Underpasses. The audio-tactile push button assembly should be mounted on the wide roads at the traffic signal pole to give priority for the pedestrians or cyclist waiting to cross.

By 2030, to make Bangalore a vibrant, safe, accessible place with a supportive walking & cycling environment, everyone starting from city corporation, traffic police, etc to citizens should work towards creation of a network of footpaths, with necessary street furniture's, pedestrian friendly facilities in the city. Citizens should develop an healthier practice of keeping our footpaths clean without spitting on the footpaths, throwing dust/dirt/ garbage on our walk ways. We should all strive hard to keep our footpaths clean so that all Bangaloreans enjoy walking or cycling for transport, health and recreation. Walking & cycling is to be promoted as a healthy and sustainable transport mode at all levels of government. Improving existing or constructing new pedestrian facilities will play an important role in achieving these objectives and targets.

The International Charter for Walking. (Source-http://www.walk21.com/charter/): The International Charter for Walking was developed through the WALK21 international conference series in Melbourne, 2006. The Charter provides a common framework to help communities across the world refocus their existing policies, activities and relationships to create a culture where people. Local, State and National Government organisations are encouraged to commit to the Charter for walking, alongside individual community members.

The Charter focuses on the following strategic principles:

- Increased inclusive mobility
- Well designed and managed spaces and places fo people
- Improved integration of networks
- Supportive land-use and spatial planning
- Reduced road danger
- Less crime and fear of crime
- More supportive authorities
- A culture of walking

The Charter includes a practical list of actions that can be made in most communities, with authorities encouraged to add actions in response to specific local needs. A copy of the Charter can be found on the Walk 21 website http://www.walk21.com/charter.

The conference series Walk21 was initiated in 2000. Its objective is to promote the development towards healthy, sustainable and efficient communities in which people choose walking as a basic means of transport. Walk21 connects important professionals and fosters active exchange in order to increase the acceptance of walking requirements and establish them as an important aspect of public planning.

The first Walk21 conference took place in London in 2000. Among the hosts have since also been Barcelona, Copenhagen, Zurich, Melbourne, New York, Vancouver and Mexico City. Munich is the first German city to host a Walk21 conference.

For further information, please visit www.walk21.com.

BMTC – KSRTC FARE RAISE: NEED, ANALYSES AND RECOMMENDATIONS

by **Prof. T.G. Sitharam* and Mr. S.N. Raghavendra****
*Chairman, CiSTUP and **M.Tech Student

Public transport should be cheaper and attractive mode and the same shall be encouraged to better the environment, and as a long-term solution for meeting the transportation demands of the future. Government should subsidize the public transport, for social, environmental or economic reasons. Common motivations include the desire to provide transport to people who are unable to use or afford private mode, to reduce congestion, land use and automobile emissions. Other motives may include promoting business and economic growth, or urban renewal in formerly deprived areas of the state and the city.

In India, Public Transport Play a vital role in Socio-Economic growth. KSRTC and BMTC are STU's of Karnataka which are plying their vehicles to cater the need of southern Karnataka people. But due to increase in the cost of high-speed diesel and salary hikes (higher payment of dearness allowance) to their employees, these Corporations are undergoing losses. To come out of these losses BMTC and KSRTC have revised ticket fare, effective from the midnight of 15th June 2013. BMTC has hiked the fares by 16 per cent; KSRTC has increased the fares by 10.5 per cent. The other two STU's of Karnataka, North-West Karnataka Road Transport Corporation and North-East Karnataka Road Transport Corporations have also revised passenger fares in the same proportion.

Centre for infrastructure, Sustainable Transportation and Urban Planning (CiSTUP), Indian Institute of Science, Bangalore-560012 has studied the fare hike reason and the necessity for improving the Public Transportation. As the STU's major cost goes for High Speed Diesel (HSD), for STU's the HSD price is higher than the normal price. Even though KSRTC and BMTC purchasing the HSD from the retail bunk, there may be higher cost than previously supplied bulk quantity price. Also it causes the congestion in retail bunks along with public; reducing the Staff utilization by deputing the Diesel clerks in retail bunk, insufficient time for proper maintenance of vehicle at depot level etc., may also cause inefficiency in operation of STU's. Hence CiSTUP has studied the present situation of above said STU's in detail and came out with recommendations to improve the financial state of STU's, which in turn improve the socio-economic status of public. Recommendations have been listed under the following headings:

1. Support Required from Government Of Karnataka (GOK):

- Grants through Special Development Program(SDP)
- Grants through SUTP for Urban Transportation for Small and Medium cities
- There may be loss due to rural operation in remote areas by KSRTC, NEKRTC and NWKRTC which needs to be subsidized by the Govt.
- Providing funds for ITS implementation and other IT initiative programs such as procuring Electronic Ticketing Machine, Computers, etc.
- Rebate from Income tax
- Reducing Motor Vehicle Tax from 5% to 2% for KSRTC and BMTC
- There should be zero taxation on procurements related to public transport: Exempting bus transport systems from high transport taxes, lower interest rates for bus procurement and assuring fiscal incentives to make the infrastructure sustainable. Reduction of Excise duty on passenger transport vehicles, exemption of payment of Service tax for casual contract services operated by SRTUs, and exemption of toll tax are the areas that need immediate attention.
- For Student Pass 25% borne by KSRTC (Present GOK contribution is 50%); For Freedom Fighter Pass 50% borne by KSRTC (Present GOK contribution is 50%) ; For Blind Pass 50% borne by KSRTC (Present GOK contribution is 50%) ; For Physically Handicapped Pass 25% borne by KSRTC (Present GOK contribution is 50%) – GoK should do more.
- Setting up of a regulatory institutional mechanism to periodically revise fares of all public and intermediate public transport systems.
- Set up a Traffic Information and Management Center: Setting up of a Traffic Information

Management Control Centre for effective monitoring and enforcement of traffic as well as data generation and data collection for future planning in BMTC and KSRTC for aid in helping movement of their vehicles.

- Bus prioritization at intersections, dedicated/ demarcated lanes for buses in major cities. Encouraging BRT corridors after feasibility studies in many cities in Karnataka
- Public road transportation requires new Information and Communication Technology (ICT) enabled services which provides effective, efficient, accountable and transparent system to the commuters as well as officials because computerization of government services have capability to minimize corruption, provide transparent system and quality service to their users.
- Install high-security registration number plates to curb illegal vehicles on the roads.

2. Support Required from Government Of India (GOI):

- Fostering partnerships at the national level for strengthening transport infrastructure and developing innovative mass transport schemes.
- Exemption of toll tax on National Highways for SRTU's.
- Waive/reimburse state and local taxes on public transport
- Formulate a policy on advertising and its implementation plan: An advertisement policy which taps advertisement revenue on public transport
- Formulate a policy on parking and its implementation plan: Parking policy wherein parking fee represents the true value of land which is used to make public transport more attractive banning of parking on arterial/ ring roads, Funding for creation of multilevel parking centers in the city centre with park and ride facility etc.
- Support for capacity building at the state level to design parking facilities in a manner that encourages greater use of public transport and non motorized modes as also financial support for construction of parking complexes;
- Congestion Charging: The stated aim of the scheme is to encourage travellers to use public transport, cleaner vehicles, bicycles, motorcycles or their own two feet instead of motor cars, thus reducing congestion and allowing for faster, less polluting and more predictable journeys. The funds raised in this scheme is expected to be invested in public transport
- Increase Funding for Purchase of Buses for Urban Transport Systems under JnNURM; Support for investments in mass transit systems
- Government should focus on improving public transportation.
- To have a more coordinated approach to urban transport management through Unified Metropolitan Transport Authorities
- Setting up of a Dedicated Urban Transport Fund at the State level (some states might have already implemented)
- Promoting and financial assistance for key feature that they integrate multiple technologies, such as metro rail, light rail, Bus Rapid Transit and basic bus services. A common ticketing system or common fare card services for all the different modes implemented through PPP model, making it easy for passengers to transfer from one mode to the other.
- To provide concessions for the adoption of cleaner fuel and vehicle technologies so that the pollution caused by motor vehicles gets reduced
- Providing grant/subsidy/Viability Gap Funding (VGF) in support of losses incurred in rural operation, promoting PPP projects for operation of buses in rural and hilly area under Gross cost/Net cost model, one time funding to purchase buses by the Central Government/State Governments for rural connectivity, providing land infrastructure grants and promoting PPP projects for development of public transport infrastructure, and third party insurance facility for SRTUs too will be a strong support.

- Promoting and providing financial assistance for Passenger information systems and Intelligent Transport System, enable users to know when the next service is due and to understand the routes easily, and high frequency of service reduces the hassle of a long wait for the next bus or train. Central assistance for implementation of ITS in SRTUs; improving the quality of buses; and adequacy of public transport buses too will have to form a major part of the strategies.
- Participation of groups or individuals other than government officials in the decision-making process. It points to the need to incorporate public opinion into transport policy development.
- Special prominence is given to the role of the private sector in the decision-making, planning, management, and operation of transportation systems. Private sector involvement is considered necessary to augment public resources for infrastructure investment and for improving operational and managerial efficiency.
- Promoting to develop guidelines for environmentally-friendly transport and action for reducing vehicle emissions.
- Support for investments in NMT i.e., cycle tracks and pedestrian paths
- Use of battery operated vehicles/electric vehicles for buses

3. Action to be taken by KSRCT & BMTC:

- Rationalization of Schedules
- Flexi-fares for rural sector
- Effective Operation- maintaining punctuality & regularity
- Soft skill training to Drivers
- Proper maintenance of Vehicles at depot level
- Incorporating the Modern technologies into the day to day operations
- ITS application for optimization of demands
- Introduction of mini low floor buses for densely populated areas
- Optimization of resources including manpower
- Introduction of common mobility card which will be useful for integrating different modes and increase the convenience for public transport commuters
- Curbing the Pilferage
- Proper utilization and maintenance of Spare Parts, Tyres & tubes, Lubricants and other items

* * * * *

➢ OPEN DAY @ CiSTUP, IISc

➢ Sustainable Transportation Materials and Innovation

Dr. Krishna Prapoorna . B

As part of the CiSTUP's core research theme "Pavement Materials and Pavement Design", two research projects were conceived and developed at the Center, which helped provide advisory to nine postgraduate and undergraduate students for the completion of their respective theses and industrial training projects. The following provides the details of the ongoing research projects:

- **Development of Pavement Management System (PMS) for Bangalore City:** The major objective of this study is to develop a PMStool thatprovides a comprehensive solution to maintaining the roadway network of pavements in the City of Bangalore, which will bring about an efficient, convenient, safe and smooth quality of pavements. Till date, pavement (road) condition survey of two zones of Bangalore city (Rajarajeshwariand Byatarayanapura zones) is complete encompassing around 230 km of arterial and sub-arterial roads. It is envisioned that the pavement performance conditions will be incorporated into a software programcapable of predicting the pavement condition parametric indices, which will aid in providing maintenance strategies and cost recommendations to maintain those roadway sections in future. A screenshot of the proposed cover page of the program inclusive of the components is shown in Figure 1.
- **Understanding Tyre / Road Noise Elements in Bangalore:** The main objective of this taskis to develop a methodology to evaluate tyre / pavement noise of the various road types and sectionsin Bangalore. Till date, field noise measurements have been performed covering over 25 roadway sections and three different road types in Bangalore city, including: conventional asphalt concrete (AC), Polyethylene modified AC (PMAC), and Portland cement concrete (PCC). Field noise measurements were performed using noise meter mounted underneath a noise trailer manufactured in-house and attached to the parent vehicle (Figure 2). On average, noise measurements at three different vehicle speeds revealed that conventional AC surface was quieter than PCC followed by the PMAC surface as indicated in Figure 3.Noise indices will be developed for the different pavement types and correlations with pavement condition, age, and traffic volume will be established.
- It is noteworthy that although many traffic noise studies have been conducted in India, the contribution of tyre / pavement interface noise to the overall noise has not been established. The approach taken in this study is first of its kind within the framework of tyre / road noise research and development in India.
- IISc's Advanced Pavement Engineering Laboratory (APEL): was setup in the CiSTUP'spremises along with the equipment and instruments pertinent to transportation pavement materials engineering research. The laboratory was inaugurated by theIISc's Dean of Engineering Prof. Raghunandan on 27 March 2013. It is anticipated that laboratory research activities in the areas of pavement materials characterization will be undertaken in future. Figure 4 provides a pictorial view of the IISc'sAPEL.

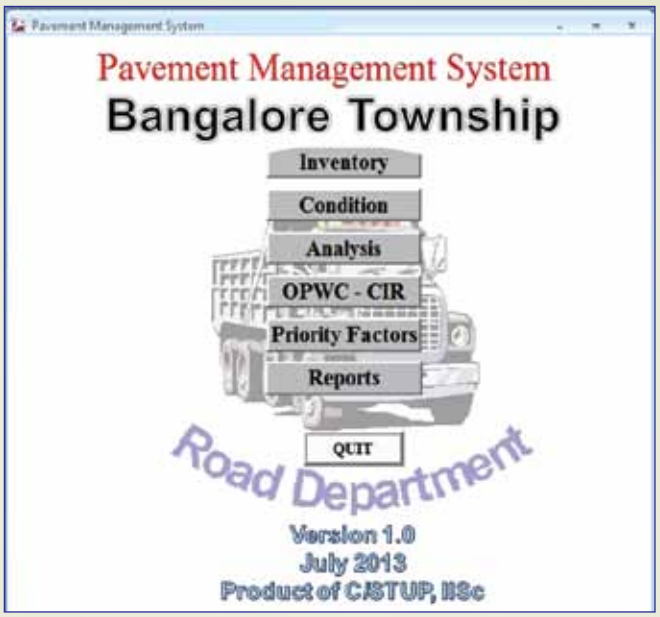


Figure 1. Screenshot of Proposed Pavement Management System Cover Page

Figure 2. Field Tyre / Pavement Noise Measurement Equipment Setup

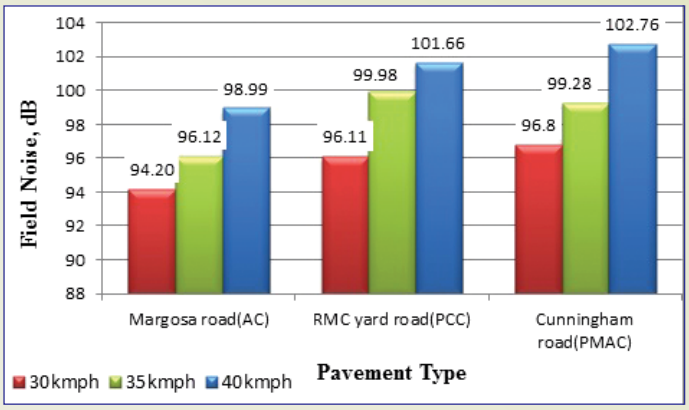


Figure 3. Field Noise Measurements of Typical Conventional Asphalt Concrete (AC), Portland Cement Concrete (PCC) and Polyethylene Modified Asphalt Concrete (PMAC) in Bangalore City at Three Different Vehicle Speeds

Figure 4. CiSTUP's Advanced Pavement Engineering

➢ Project – Decentralization of Solid Waste Management in Bangalore

Jaya Dhindaw, Radha Chanchani, Dr. H.N. Chanakya, Prof. T.G. Sitharam, Monika Yadav, Sonali Patro

Objective: This study seeks to develop a decentralized model for the sustainable management of solid waste which is ward/neighborhood centric so as to be replicable and efficient. The study includes designing a prototypical neighborhood/ward level waste management center to demonstrate feasibility of the concept. The model should be such that it may be incorporated as part of a park or any other public open space/facility.

Methodology: Background information gathering, literature review, case studies and site visits were conducted to understand and ascertain the physical, spatial and technological requirements of a decentralized facility.

Literature review was carried out to identify the processes involved in the management of waste at the city and ward levels. Quantity and quality (components) of waste at the ward level was ascertained and different waste streams were identified.

The processes involved in waste segregation and primary processing were studied. Spatial requirements for each activity/waste stream were calculated. Thereafter, a market assessment was conducted to determine the quantities at which the individual waste streams would be marketable for recycling. Finally a flowchart for a 'neighborhood waste processing center' was developed. Two design prototypes were developed. Interactions/Interviews with various stakeholders in the waste management process were conducted to gain insights and feedback on the design prototypes.

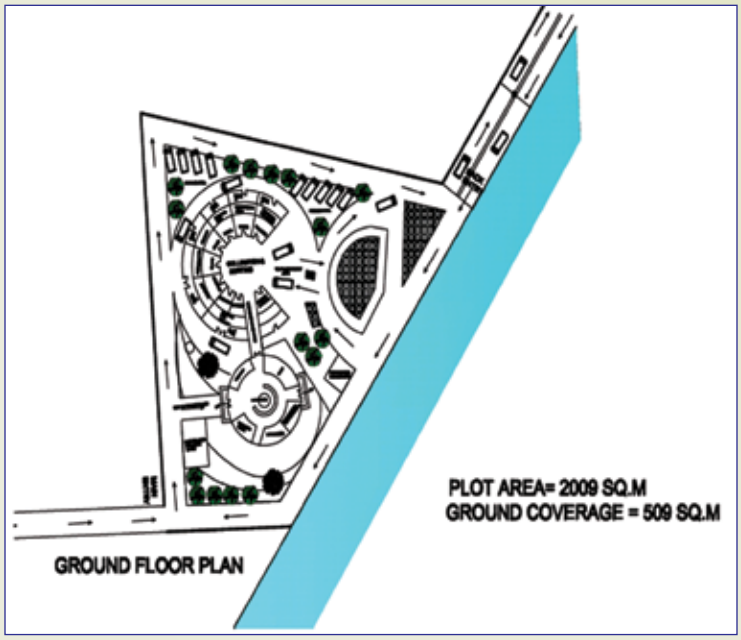
Recommendations: The study revealed that the provision of an aesthetically and well-designed neighborhood waste management center would be well received by the community and would be a significant step towards addressing waste at the local level. The facilities could be located as part of community green areas/parks and other public recreational spaces. The design of individual facilities could be enhanced to make it more neighborhood/community specific.

Prototypes: To this end two prototypical pilot site schematics were developed. These could then be replicated in each ward/neighborhood with slight modifications. Salient features of the schematics were:

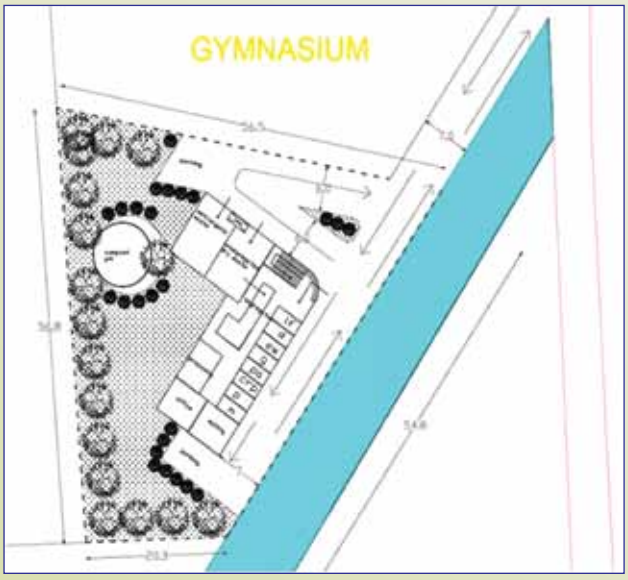
1. Designs used indigenous materials and construction techniques
2. Designs placed emphasis on the need to preserve open space and have an interactive human interface

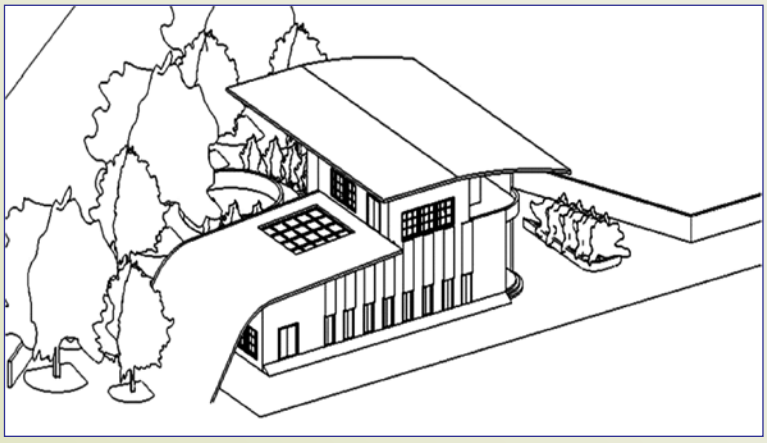
3. Designs were compact and optimized the process flows within the spaces
4. Prototype 1 (P1) incorporated the use of solar panels on the roof for meeting its energy requirements.
5. Prototype 2 (P2) used the green roof concept as a means to integrate nature into its design

Prototype 1



Prototype 2





➢ Urban Sustainability: Bangalore – A Case Study

By Anindita Singh & Arpita Poddar, Supervisor : Dr. Keya Chakraborty

Motivation of the research: Sustainable development is one that satisfies three basic conditions i) rates of use of renewable resources do not exceed their rates of regeneration, ii) rates of use of non-renewable resources do not exceed the rate at which sustainable renewable substitutes are developed, and iii) rates of pollution do not exceed the assimilative capacity of the environment.

Urban sustainability takes all aspect of human society as environmental, material, ecological, social, legal, cultural, political, and physiological dimension. Urban life requires good environmental quality, adequate water and food supplies, housing infrastructure as well as green and open spaces. on this ground UNCHS and World Bank have derived a number of indicators like socio-economic development, infrastructure, transport, environmental management, local government, affordable and adequate housing and housing provision as a measure of urban sustainability.

Therefore, sustainability assessment can be simply defined as any process that directs decision-making towards sustainability.

Gap areas: Based on a through literature review two gap areas are identified as main concern of the present research:

Lack of substantial research work on the topic of sustainability of Bangalore as a case study and

Though macro level sustainability assessment is available but there is a need to explore micro or local level assessment of the existing concept.

Objectives: Based on the same the objectives are –

To understand the concept of urban sustainability

To indentify the indicators of urban sustainability in context of Bangalore.

Comparison of indicators across different time period and different levels that is Global, Indian and then Bangalore as an urban entity.

Research framework: Figure 1 depicts the framework of the proposed research. It deals with four steps starting with pre-survey phase, survey, analyses, and conclusions. Each step deals with detailed phases in accordance.

Based on the aforesaid three objectives the research will focus on deduction of the indicators from macro level to micro level, viz. world level scenario to Indian level and finally at local level. Malleswaram area of Bangalore city has been taken as a micro level survey for the present research.

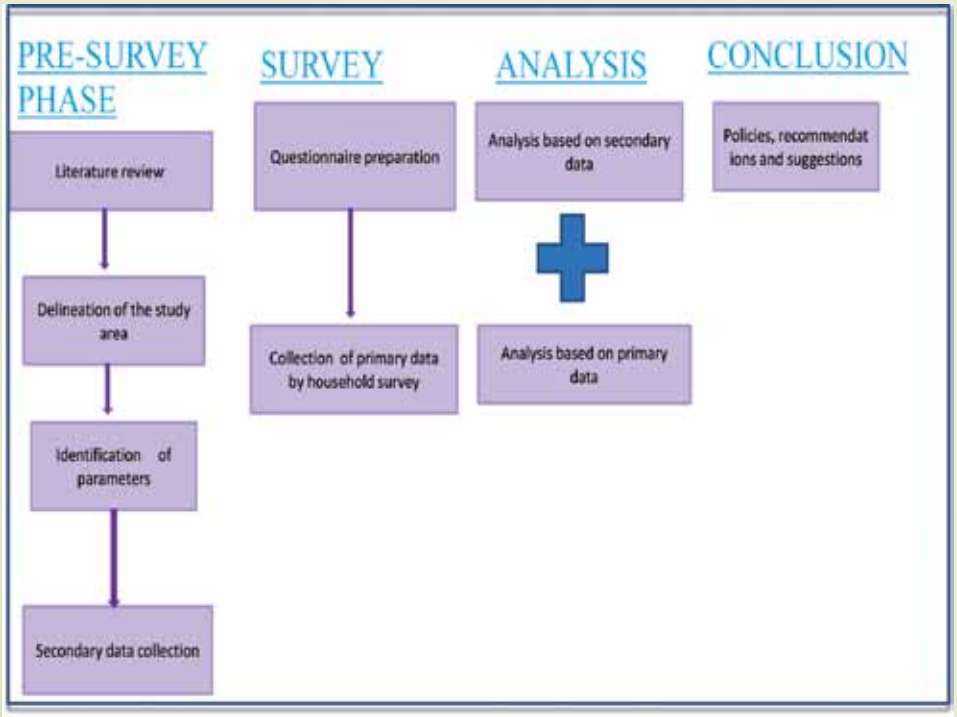


Figure 1: Research framework

Report on Participation of CiSTUP Planners in Various External Meetings/Lectures/Conferences/Seminar

1. Prof. John Polak, Imperial College of London Visited CiSTUP on 05.02.2013. Chairman Prof. T. G. Sitharam, Mr. J. Satya Sai Kumar, Planner met him and held discussions about various issues. He expressed interest for establishing a joint Research centre on cities as major theme.

2. As a part of the AusAID project Curtin University of Sustainable policy (CUSP) conducted a workshop on 'Stemming car dependency and improving transport options in Indian cities' at Indian Institute of Human settlements. Prof. Peter Newman ,Director CUSP invited CiSTUP's participation in this workshop. Prof. Sitharam, Jyothi chava and Mr.Sai Kumar attended the event from 15th to 16th March 2013. Delegation from CUSP, Curtin University, Australia. CUSP sought CiSTUP's collaboration and active participation in their activities on various urban issues. During the course of this meeting the Director of CUSP, Mr.Peter Newman invited two planners from CiSTUP to visit their campus for a short course and to define project and research collaboration roadmap for CiSTUP and CUSP.

CiSTUP transport Planners Jyothi Chava and Mr. Sai Kumar went to CUSP, Perth, Australia from 1st April to 15th April 2013 to attend a course on "sustainability through Deliberative Democracy process" and to discuss on research collaboration between CiSTUP and CUSP. The course is about how to engage public in planning and implementation along with stakeholders to achieve sustainability. In this course, Prof. Janette explained various techniques currently using all around the world for deliberative process along with their methodologies and their applicability. It is a valuable technique, CiSTUP can include some of these techniques in future projects wherever applicable

After several discussions with CUSP, CiSTUP team finalized the project proposal and prepared draft MOU between CUSP, CiSTUP and DULT for the development of research collaboration in the field of "value capture framework through integrated land use change and transit based financing for Perth and Bangalore urban rail transit and sustainable transport planning around urban rail stations through deliberative democratic process in Bangalore'.

3. Chairman Prof. T. G. Sitharam was invited for an interactive discussion on "GOVERNANCE OF CITY-SYSTEMS & THE CHALLENGES OF MOBILITY" with Chief of Staff, Deputy Mayor, Policy & Palnning, Mayor of Londons Office, Sir Edward Lister on Friday the 12th April 2013 at Mysore Hall, ITC Gardenia,Bangalore. Keynote address was by Sir Edward Lister which was followed by Panel Discussions. The panel included Mr. N. Sivasailam,MD Bangalore Metro Rail Corporation Ltd. & Ms.Kiran Mazumdar Shaw,Chairman & MD BIOCON.Mr.Ian Felton,British Deputy High Commissioner, Bangalore, Ms. Swati Ramanathan, Chair Person, India Urban Space Foundation & Cofounder Janagraha also participated in the event.

4. British High commission Delegation headed by their Cliamte Change Minister had a meeting with CiSTUP on 15.032013 and held discussions on future interest for collaboration.

5. Ms. Radha Chanchani, Urban Planner CiSTUP participated and represented CiSTUP at Embarq India's CONNECTKaro event on 15-16th April 2013

in Mumbai. The workshop included sessions on bus transport, feeder services, autorickshaws/ taxis, non-motorised transport, transit-oriented development, urban planning/design and market opportunities for sustainable transport. There was sharing of knowledge, experiences, case studies and demonstration projects. Discussions surrounded on finding practical ways to scale up sustainable transport integrated with land development. The event was attended by over 150 participants including govt. officials, policy makers, practitioners and experts in the areas of urban transport and urban planning. Shared with interested people about some of the work/ projects undertaken by CiSTUP, particularly study of the autorickshaw sector in Bangalore city.

6. Ms.Radha Chanachani also attended and contributed at DULT's NMT Task Force Meeting on 7th March 2013. The projects reviewed included 1) Malleshwaram Accessibility Plan 2) DPR for NMT Infrastructure at HSR Layout 3) Problems with Jayanagar Cycle Tracks 4) Progress on Madivala Cycle Track Project. The meeting was attended by relevant stakeholders and discussions revolved around practical solutions to challenges and way forward in implementing these projects.
7. IISc's Advanced Pavement Engineering Laboratory: was setup in the CiSTUP's premises along with the equipment and instruments pertinent to transportation pavement materials research. The laboratory was inaugurated by the Dean of Engineering Prof. Raghunandan on 27 March 2013. It is anticipated that laboratory research activities in the areas of pavement engineering will be undertaken shortly.
8. Dr.Krishna Prapoorna Biligiri,Senior Research Fellow at CiSTUP participated and presented a paper at the Global Summit on Road Infrastructure, The Hotel Lalit Ashok, Bangalore, 7-8 February 2013; Topic: Innovative Infrastructure Materials for Roadway Safety Implementation .
9. Dr. K. V. Gururaja Urban Planner CiSTUP participated in an Invited talk an spoke on "Influence of Urban-Rural Gradient on Wetlands of Bangalore: A case study using amphibians." at First multi-stakeholder workshop conducted for Strategic Action Planning for Revival of Bangalore Lakes on 4th April 2013. Taj West End, Bangalore.
10. Dr.K.V.Gururaj,Urban Planner also Presented a paper on "It's all in Behaviour: Using behaviour in taxonomy" in a workshop on Traditional and Modern Approaches in Animal Taxonomy on 26th April 2013. GKVK Campus, Bangalore.

Inaugural of Pavement Laboratory

SL.No.	Name of the Intern	Project Title
1	Abhishek Chethan	Understanding Tyre/Pavement Noise Characteristics of Bangalore City Roads
2	Mohammed Ali Boodihal	
3	Rakesh Sahu	
4	Rudraradhya Swamy. H. M	
5	Mahdev	Development of pavement Management System for Bangalore City-Rajarajeshwari Zone.
6	Vishwanath. S.D	
7	Sumit Jain	Development of Pavement Management System for Bangalore City-Byatrayanapura Zone.
8	Suraj.M.S	
9	Patil.K.S	
10	Akhil Bhaskar	A Study of Pedestrian Underpass in Bangalore City.
11	Amal Joy Nariyelil	
12	Amal Raj. S	
13	Anirudh Madhusudhanan.K	
14	Sonali Patro	Exploration Study of Form Based Codes (FBC) in the Context of Bangalore City
15	Shailna Wadhwa	
16	Arpita Podder	"Urban Sustainable Development in Indian Cities: Case Study Bangalore"
17	Anindita Kumari	
18	Sonali Patro	Exploration Study of Form Based Codes (FBC) in the Context of Bangalore City
19	Shailna Wadhwa	
20	Debadutta Parinda	
21	Safoora Beevi.K.A	Review the Best Practices of Congestion Pricing in Bangalore City context.
22	Monika Yadav	Designing a prototype for decentralised waste management center for Bangalore City
23	Nishant Dwivedi	Developing the Conceptual Photo Simulation for Revitalising the nala network in Bangalore City
24	Sukrita Mahon	Integrated Public Transport System –Case Study of Bangalore Metro
25	Monika Yadav	K.R.Market Studies
26	Nishant Dwivedi	
27	Rakesh Jinka	Study the influence of Namma Metro on Land Values along the Metro Corridor

Click of interns with cistup chairman and planners

➢ Report on Workshop on "Urban Freight Transport: A Global Perspective"-

by : Mr. Lokesh Hebbani, Transport Planner CiSTUP participated in this event.

A two day International Workshop on "Urban Freight Transport: A Global Perspective" was held at Indian Institute of Technology Madras on June 24th and June 25th, 2013. This workshop was jointly organized by VREF's Center of Excellence for Sustainable Urban Freight Systems (Troy, New York, U.S.A) and Center of Excellence in Urban Transport, IIT Madras. This workshop was attended by about 100 International, National and local experts, planners, engineers and students.

The impacts produced by freight activities are profound and complex; while the freight system is a crucial contributor to a vibrant economy and a key determinant to quality of life, it is also a major source of environmental pollution, unwanted noise and potential safety hazards. Simply put, freight activity produces both positive and negative impacts on modern urban living. On the positive side, an efficient freight system is a necessary condition for economic competitiveness and for realizing the full potential of economic globalization. On the negative side, freight activities produce significant amounts of negative externalities which, in turn, generate community opposition.

The speakers at this workshop were world renowned experts in the above areas. The workshop addressed the practical applications, government policies, decision making, methodologies and technology for freight modeling and optimization, innovative solutions and experiential results. CiSTUP was represented at this workshop by Mr. Lokesh Hebbani, Transportation Program Manager who also made a presentation on International case studies in urban freight transportation and provided a comparative analysis of international experiences and their relevance to India - What would work and what would not.

➢ Monday, 15th April, 2013 workshop on Urban Mass Transportation organized by Robert Bosch Engineering & Innovation

Chairman CiSTUP,Prof.Sitharam was invited to a workshop on Urban Mass Transportation organized by Robert Bosch Engineering & Innovation at their campus in Koramangala.This workshop was held on Monday, 15thApril, 2013, 8:30 to 17:00 hrs. He made a presentation on Mass Transportation Systems:Market and Technology Forward Mapping which was well received and appreciated. He suggested the following measures among other things

- Mobility of 'People' rather than 'Automobiles'
- Increase the modal share of public transport system
- Meet all the transportation requirements for those unable to use Automobiles
- Reduce the negative impacts of automobile congestion
- Decisions about what services to provide, and how to provide and pay for them, should be based on an understanding of the mission of mass transportation in a particular community

The Workshop activities included Context setting, Introduction of participants Presentation by academia and industry experts which was followed by Q & A.

➢ Report on: The 21st Century Indian City: Towns, Metros, and the Indian Economy.

Dr. Keya Chakraborty, Research Associate at CiSTUP Participated in a conference titled

"The 21st Century Indian City: Towns, Metros, and the Indian Economy" - a 2-day conference on urbanization in India organized by The Center for South Asia Studies, University of California, Berkeley, and the Indian Institute for Human Settlements, Bangalore on 26-27 March, 2013 at the IIHS Bangalore City Campus, India.

Prof. Liza Weinstein (Northeastern University), Prof. Hrushikesh Mallick (Centre for Development Studies), and Prof. Venky Panchapagesan (Indian Institute of Management,Bangalore) discussed on Location, Regulation, Speculation:Urban Housing and Real Estate. Ashok Bardhan (University of California,

Berkeley) was the Chair of the session and deliberated valuable comment on the issue of affordable housing.

Prof. K. V. Ramaswamy (Indira Gandhi Institute of Development Research), Prof. Carol Upadhya (National Institute of Advanced Studies), and Prof. Smita Srinivas (Columbia University) highlighted the issue of job creation and livelihood in accordance. Dr Gautam Bhan (Indian Institute for Human Settlements) was the Chair of this session titled: In Search of Livelihood: Job Creation in Urban India.

In the session of Urban Welfare Regimes: Inclusive Growth, Cash Transfers, Job Programs, Prof. Ananya Roy (University of California, Berkeley) was the session chair and talked about better future from the point of view of any dweller residing in a city. Prof. Om Mathur (National Institute of Urban Affairs), Ms. Shrayana Bhattacharya (World Bank), and Dr. Gautam Bhan (Indian Institute for Human Settlements) had a focused discussion regarding need of inclusive growth and its remedial policies.

Finally, in the Panel discussion: Living in the City: Debating Bangalore's Urban Future, Prof. Raka Roy (University of California, Berkeley) was the moderator and wind up the whole conference with the speeches of columnist Ms. Kalpana Sharma (Journalist), Mr. Prakash Belwadi (Journalist & Theatre Personality), Prof. Narendar Pani (National Institute of Advanced Studies), and A. Ravindra (CM's Office, Urban Affairs, Karnataka).

In brief it can be concluded that the 3rd Berkeley conference on Indian cities is worthy to academicians and policy makers, who attended the same, as it focused on distinct urban issues as well as sets policy guidelines for those issues. As a participant it is also beneficial to hear from eminent speakers about various social and political issues that need to be considered as we seek to make Indian towns, cities and metros vibrant, both in the economic, as well as social spheres.

FICCI International Sustainable Development Conference, Bangalore, India

Federation of Indian Chambers of Commerce & Industry (FICCI) had organized an International Sustainable Development Conference 2013 at Hotel Lalit Ashok in Bangalore, India on June 25th & 26th. CiSTUP was represented at this conference by Mr. Lokesh Hebbani, Transportation Program Manager.

The theme of the FICCI International Sustainability Development Conference 2013 was Business Responsibility and the Conference focused on three principle business responsibility topics: Sustainable Supply Chain, Sustainability Innovation and Responsible Investment. The conference endeavored to further enhance awareness about these topics and also to highlight the current initiatives in the corporate world.

Some of the noted speakers at this conference were:

1. Mrs. Kiran Bedi, First Woman IPS Officer (1972-2007), Noted Social Worker & Activist
2. Bernhard O. Herzog, Transport, Supply Chain Specialist, GIZ from Germany
3. Jonathan Shopley, Managing Director and External Affairs, The CarbonNeutral Company, UK
4. Ram Kaundinya, MD, Advanta India.

This Conference was sponsored by Government of Karnataka, British Deputy High Commission, Consulate General of Federal Republic of Germany, Bangalore.

➢ Newspaper Article that appeared inTIMES CITY

EXPERTSPEAK Ban parking on arterial roads TIMES NEWS NETWORK

Traffic experts and planners say the parking policy is a much-needed intervention and will go a long way in smoother movement of vehicles. At the same time, they caution authorities to be realistic and unbiased in implementing it.

TG Sitharam, chairman, Centre for infrastructure and Sustainable Transportation & Urban Planning (CiSTUP),IISc,said as part of the policy, the state government should take bold decisions like banning parking on arterial roads. I suggest it for artierial & sub-arterial roads, including MG Road, so that it facilitates smooth movement of traffic. To facilitate parking space, vertical parking areas should be constructed under PPP model. With available technology, parking space for up to 40 cars can be provided within a 30x40 site, he added.

Sitharam said theres no point in building huge parking lots far away from business centres. Vehicle users won't feel it convenient if parking is at a distance.Also, parking should not be free. The government should come up with suitable pricing mechanism.Also, bylanes of residential localities should not be disturbed as its not practical to ask people to make parking spaces in built-up properties, he added.

Suhail Yusuf, secretary, Brigades Shops and Establishment Association, said automated parking, like on Brigade Road since 2004, should be encouraged. Local business associations should be allowed to operate parking. There's a danger in tendering the parking system as it would allow the mafia to take over. If there is no association on a road, local traders should be encouraged to form one. They would be happy to do it as a hassle-free system would get them more customers, he added.

Traffic expert CEG Justo said the policy should not ignore mechanized multi-level parking as its the answer to space constraints. As the vehicle population grows, parking woes will scale up.Its high time we speed up policy decision in this regard, he added.

➢ Newspaper Article that appeared in UDYAVANI kannada newspaper-14th Feb March


4 ಉದಯವಾಣಿ ಬೆಂಗಳೂರು
ಗುರುವಾರ | ಫೆಬ್ರವರಿ | 14 | 2013

ಬೆಂಗಳೂರು

ವರದಿ...

ಅಧಿಕಾರ...

➢ Open day at Cistup - News Coverage


and researchers at Centre for Nano Science and Engineering in IISc on Saturday.

They were surprised to hear that a hair as wide as 40,000 nano metre (0.004 mm) can fit approximately 2,000 transistors. The breadth of the hair was measured with a nano metre device and explained to students. When water molecules are made of hydrogen and oxygen, then why does it catch fire when combined in air? This was a question asked by an inquisitive student, after seeing a hydrogen balloon experiment.

How can we be a part of IISc? Another favourite question posed by many students. "I am keen in studying at IISc," said Sunanda Chhetri, III BSc student from Vijaya College, while interacting with researches at Centre for Infrastructure, Sustainable, Transportation and Urban planning (CiSTUP).

"We require students to be project assistants in various researches. Science students can approach us for internships and learn from IISc," explained Lokesh Hebbani, transportation programme manager, CiSTUP.

ICE, ICE, BABY: Students were amused to see balloons kept in dry ice, which kept changing its shape whenever brought kept at normal temperature

SOLUTION? An office helper's version of how the Nayandanahalli junction can have flyovers in two levels and an overarching metro line above the flyover — all this to ease the traffic

➢ Newspaper Clippings

Walk into IISc and start loving science

The Times of India, Bangalore - Friday, July 19th 2013

IISC STUDY SUGGESTS STREAMLINING TO MAKE AUTOS A LAST-MILE CONNECTIVITY BOON

Autocrats a bugbear for public

Rohith B R | TNN

They are looked upon as a necessary evil in Bangalore. Autorickshaws may be a pet hate, but are still a popular mode of transport. Auto drivers, known to be a rude community, are the subject of a study by the Centre for Infrastructure and Sustainable Transportation & Urban Planning (CISTUP), IISc, which endorses that they've become a problem for citizens.

'A Study of the Autorickshaw Sector in Bangalore City' said frustration among the public regarding auto services is growing. It found that common complaints against auto drivers include refusal to ply, overcharging, rude behaviour and harassment. Efforts to regulate the sector, like traffic police, pre-paid counters and complaint registration system have not helped.

TG Sitharam, chairman, CISTUP, who monitored the study, said there was an urgent need for regulation. The study also said auto drivers try to make an extra buck by overcharging after 7pm, though the official hour is after 10pm. They also do this during festivals, rain, outside high-end malls, office complexes and posh residential colonies.

TOP COPY

THE OTHER SIDE

Auto drivers say the main reason for refusing certain destinations is because they aren't profitable, if time, fuel and other expenses are factored in. M Manjunath, president of Adarsha Auto Union, said some government initiatives were unrealistic. "For example, the subsidy of Rs 1,000 to convert mechanical meters to electronic meters is of little use as the cost of installing digital meters is over Rs3,500," he added.

The study recommends that the government streamline the sector to make it a win-win situation for the public and drivers. "The sector has the potential to supplement public transport and go a long way in last-mile connectivity," it said.

Radha Chanchani and Pagan Rajkotia, are working as urban planners with CISTUP, IISc, said their team interacted with over 250 auto drivers and 100 people for the study.

TIMES VIEW

Citizens have for long put up with boorish auto drivers, but no one has come up with any solution. The expert study offers some hope with its recommendations. The authorities could grab the opportunity to work out a happy solution for commuters and drivers.

ENSURE CLARITY

Automation should be introduced at all levels, including licensing, registration, pre-paid and other services to ensure transparency. Steps like curbing the number of permits for auto rickshaws won't be of much use.

TG Sitharam | CHAIRMAN, CISTUP, IISc

IISC STUDY RECOMMENDS

1. Soft skills training for auto drivers
2. Conveniently located pre-paid auto counters, with proper signage
3. Advertisements on public complaint system
4. Awareness and involvement of public
5. Review auto meter fares on regular basis
6. Forum for auto drivers and public to speak
7. Address mafia issues at commercial hubs, pre-paid counters
8. Auto feeder service with fixed fares, demarcated stops within Metro station radius in future

DRIVERS SAY » IN A DAY

3 Hrs is the average time spent waiting for passengers

120 Km Average distance run

₹810 Average earnings

REFUSE TO PLY TO AVOID
- Trips with little gain
- Areas with bad roads and heavy traffic as more fuel is spent

- Face harassment, unnecessary penalties by traffic police
- Lack awareness and interest in Easy Auto, other services

PEOPLE TALK »

- 39% aware of on-call or dial-up Easy Auto services, 68% not aware
- 26% aware of public complaint system, transport dept and traffic police numbers
- Majority feel auto stands are useful and conveniently located
- 53% say they find autos within 10-15 minutes, 47% say willing auto driver is tough to find
- Mechanical and digital meters can be tampered with; 81% say high chances of mechanical meters being tampered
- Rude behaviour: 21% almost always, 33% sometimes, 36% rarely, 10% never
- 39% say autos are safe; 19% say they are unsafe
- 56% say traffic police rarely or never help tackle auto drivers

FACTS IN STATS »

Number of autos

1.13 lakh (official figure)

1.5 lakh (unofficial figure)

Auto-human ratio

1,770 AUTOS PER 1 LAKH PEOPLE

ILLEGAL AUTOS: 25,000 - 5

HELPLINES » For overcharging, refusing to ply: 25588444/ 25588555

LIST OF EVENTS SINCE LAST ISSUE OF NEWSLETTER

SL.NO	TITLE	DATE
1	Open House Presentation of Research Projects for support under Phase IV http://cistup.iisc.ernet.in/research-supportedprojects-4.php	5th March 2013
2	"Mobilicity 2013: FORUM FOR SUSTAINABLE BENGALURU" http://cistup.iisc.ernet.in/mobilicity.php	6th March 2013.
3	Talk on" Governance and design in infrastructure public private partnerships: the indian experience with the bangalore international airport limited". By Kalpana Gopalan IAS http://cistup.iisc.ernet.in/presentations/Kalpana15032013.pdf	15th March 2013
4	Workshop on "Air Quality Monitoring, Modeling and Assessment" http://cistup.iisc.ernet.in/airquality.php	22nd March 2013
5	Foundation Day 4th Annual Lecture –"Transport and Urban Design Issues in the Face of Global Warming" By Prof.Dinesh Mohan	26th March 2013
6	Seminar on CiSTUP Past, Present and Future	31st March 2013
7	Open Hose Presentations of Research Projects supported by CiSTUP-Review.	13th May 2013
8	Talk on Engineering growing networks: Some ideas by Dr. K.W. Axhausen Professor of Transport Planning at the Eidgenssische Technische Hochschule (ETH) Zurich (Swiss Federal Institute of Technology) http://cistup.iisc.ernet.in/presentations/Axhausen.pdf	16th May 2013
9	Talk on "Dynamic Incident Progression Curve for Classifying Secondary Crashes" -By Venkata Chilukuri, PhD,University of Missouri-Columbia, USA.	5th July 2013
10	Discussion & Brainstorming on "Restoration of Bangalore's lakes-Case study of Bellandur watershed"	11th July 2013

Contact Us:

Prof. T. G. Sitharam, Chairman

Centre for infrastructure Transportation and Urban Planning (CiSTUP)

Indian Institute of Science,

Bangalore-560012

Phone (chairman):+91-80-22932521

Phone (office):+91-80-22932521/2043

Fax:+91-80-23468207

Email-Chairman@cistup.iisc.ernet.in

Website URL: http://cistup.iisc.ernet.in

Collated & Organized by: Mr. M. L. V. Subramanyam

Designed by: Ms. Neetha. V. Ashtakar

This Newsletter is for Limited Circulation Only