



ASET/AIIT EVENT REPORTS FOR APRIL - 2018

1. Event Name: Seminar/Expert Talk

Aim of Event: Sustainability Issues in Urban Metro Systems

Participation: 70 participants from Department of Civil Engineering, Amity University

Date: 02 April 2018

Venue: Smart Class Room, C-214, ASET, AUH

Organized By: Department of Civil Engineering, ASET, AUH

Faculty Coordinators: The committee consisting of following members organized the programme:

- Maj. Gen.V. K. Narang (Retd.), Director, Amity School of Engineering & Technology, AUH.
- Prof. (Dr.) R.K. Malik, Prof. & Head, Dept. of Civil Engg., AUH.
- Dr. Naveen B.P., Associate Professor, Dept. of Civil Engg., AUH.
- Mr. Lalit Kumar, Assistant Professor, Dept. of Civil Engg., AUH.

Outcome related to Academia Connect

Urban transportation infrastructure in India needs big investment and a massive upgradation. It is estimated by various studies that 60% of Indians will be living in urban areas by 2050. Metro is emerging as key solution to fulfill demand for urban transportation in India.

India had been lagging behind other countries in terms of metro development. The country's first metro in Kolkata opened in 1984, the second New Delhi, launched in 2002. After the success of Delhi Metro, lots of Indian cities are exploring the option to implement metro rail project across the country. As per Ministry of Urban Development (MoUD), about 316 kms of Metro rail are under operation and more than 500 km of Metro rail are under construction across the country.

The urbanization has led to increase in the traffic density especially in the Metro Cities necessitating the installation and operation of Urban Metro Systems. The completion of metro projects in cities is a complex issue and various issues are involved at different stages of the projects especially from planning to construction stage. The metro runs at a grade, underground or elevated corridors depending upon the availability of land proximity to archaeological sites, technical feasibility and density of the buildings, etc. The major sustainability issues pollution, aesthetics of the city, safety and financial issues and loss of green cover as well as social implications such as resettlement and rehabilitation are usually encountered.

Rail-based 'Mass Rapid Transit System' has been widely accepted as a solution for most of the traffic and environmental pollution related problems which major cities throughout the world are facing now. Metro rail construction activities are being undertaken in a big way in India, existing metro rail network of the city of Kolkata and Delhi are being expanded, while it is under various stages of construction in cities like Bengaluru, Chennai, Mumbai and Hyderabad.

The main objective of this seminar, important environmental and other critical issues have been discussed in the Indian context which are equally relevant in other developing countries.

Outcome related to Industry Connect

Overall, it was an overwhelming experience where the experts shared their insights and gave new perspectives which can lead to further sustainable action and fruitful interactions.

Planning: The Planning process includes the Travel demand, Economic cost including impact on Environment and Financial feasibility.

Parameter to justify MRTS: The minimum ridership should be 25000 per hour per direction (PHPD). Although in Delhi it is around 60000 PHPD.

Design life: The structural components of Metro system are designed for 120 years whereas travel demand is forecasted for 10-15 years. The Delhi metro is designed for 90 seconds headway and 8 coaches but the present system is working at 270 seconds headway whereas number of coaches are variable ranging from 4-8.

Cost: The cost of underground metro system is around 500 crores per km whereas for elevated corridor it is 50 crores per km.

Type of Section: The selection depends on the density of building along the route. The congested urban corridors have underground metro system in spite of having 10 times the cost of above ground metro system.

Methods of construction: The underground metro construction is complex process in comparison to elevated corridor as the equipments used are delicate and possibility of disturbance to surrounding areas is more. The Bottom up and Top down method are used for construction depending upon the availability of land (in terms of time) and disturbance to traffic.

TBM: Tunnel boring machine is used for tunneling process in soft ground and hard rock in India. It is found to be suitable in terms of operation and suitability in different strata of soil.

To make the transportation system more efficient and successful, there is need to focus on integrated travel demand and infrastructure. As metro do not provide last mile connectivity, there is need to develop Intermediate Public Transport system in a better way.

Outcome related to Students Learning & Grooming

Tunnel boring machines are important tools in underground infrastructure projects. Although being well established equipment, these machines are based on designs of more than 60 years ago and are characterized by big dimensions, enormous weight and high power consumption. Commercial aspects should be noted too. The model adopted by the TBM industry requires constant replacement of cutter discs and specific labor skills, usually offered by the same manufacturing company. In some cases the cost of replacement parts and technical assistance can be higher than the acquisition cost of an entire machine. These aspects are no longer compatible with the concept of sustainability that is an important aspect of current society. While the technical characteristics require a large quantity of steel and several inputs, the adopted model is not competitive. One alternative is looking for new technologies that break the old paradigms and allow the development of high performance concepts with lower social and environmental impact.

Outcome related to Society outreach

- To gain state of the practices and technologies in the areas of Urban Metro Systems.
- Understanding the critical issues related to metro rail projects.
- To gain design and construction of metro foundation concepts.
- Understanding importance of NATM and Tunnel boring practices carried out in Urban Metro systems.

- Improve the network and operational efficiency of metro system
- Automated Metro and Signalling system
- Operation and Maintenance of metro network
- Ticketing integration with other modes of transport
- Innovative Funding and Financing Model

Glimpses of the Event (Photographs)



Facilitating the Guest of Honour



Welcome address by Head, Department of Civil Engineering
Dr.(Prof.) R.K. Malik



Seminar Address titled "Sustainability Issues in Urban Metro Systems" by Mr. Mohan Gupta, Director Operations, Geodata India Pvt.



Memento presented to Guest Speaker

Discussion Session



Discussion Session with students



Guest Speaker Mr Mohan Gupta with Faculty of Civil Engineering



Guest Speaker with Faculty and Participants



Vote of Thanks by Dr Naveen BP