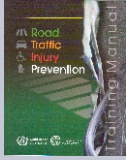




## Publications



### Road Traffic Injury Prevention Training Manual

Dinesh Mohan, Geetam Tiwari, Melekidzedek Khayesi and Fredrick Muyia Nafukho  
World Health Organization, Geneva

[Http://www.who.int/violence\\_injury\\_prevention/road\\_traffic/activities/training\\_manuals/en/index.html](http://www.who.int/violence_injury_prevention/road_traffic/activities/training_manuals/en/index.html)

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Badami, M.G., Tiwari, G., and Mohan, D. (2007) **Access and mobility for the urban poor in India.** In *The Inclusive City: Infrastructure and Public Services for the Urban Poor in Asia* (Edited by Laquian, A.A., Tewari, V., and Hanley, L.M.) Woodrow Wilson Press, Washington D.C.

Chawla, A., Mukherjee, S., Nayak, A., and Mohan, D. (2007) **Investigating the rollover propensity of a 15 seater mini bus.** *International Journal of Vehicle Safety* 2:1/2, 1-9.

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Mukherjee, S., Chawla, A., Mohan, D., Chandrawat S. and Agarwal, V. (2006) **Predicting throw distance variations in bicycle crashes.** *International Journal of Vehicle Safety* 1:4, 304-315.

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Mukherjee, S., Chawla, A., Nayak, A., and Mohan, D. (2006) **Rollover crashworthiness of a rural transport vehicle using MADYMO.** *International Journal of Crashworthiness* 11, 495-503.

Pinnoji, P.K. and Mahajan, P. (2006) **Impact analysis of helmets for improved ventilation with deformable head model.** In *Proceedings 2006 International IRCOBI Conference on the Biomechanics of Impact IRCOBI, Madrid, Spain.*

Sasser, S.M., Varghese, M., Kellerman, A., and Lormand, J.D. (2006) **A global vision of prehospital care.** *Prehospital Emergency Care* 10, 278-279.

Tiwari, G., Bangdiwala, S., Saraswat, A., and Gaurav, S. (2007) **Survival analysis: pedestrian risk exposure at signalized intersections.** *Transportation Research Part F: Traffic Psychology and Behaviour* 10, 77-89.

Vaishali M Patankar, Rakesh Kumar and Geetam Tiwari (2007) **Impacts of bus rapid transit lanes on traffic and commuter mobility.** *Journal of Urban Planning and Development*, 133(2), 99-106.

## Research & Consultancy Projects

### Sustainable Urban Transport in Less Motorised Countries Research and Training

**Sponsor** Volvo Research & Educational Foundations

**Team** D. Mohan, G. Tiwari, A. Chawla, S. Mukherjee, S.R. Kale, P. Mahajan, S. Sanghi, R. Ravi, Dunu Roy and M. Varghese.

### Planning and Implementation of BRTs Project in Indore.

**Sponsor** Indore City Transport Services Limited.

**Team** G. Tiwari and D. Mohan

### Designing the BRT System on Hadapsar Road(Pune),

**Sponsor** The Municipal Corporation of the City of Pune.

**Team** G. Tiwari and D. Mohan.

### Safer Bus Design

**Sponsor** Ashok Leyland Ltd.

**Team** D. Mohan, S. Mukherjee and A. Chawla

### Planning & Re-development of Spaces Around the Various Terminals at Delhi Airport.

**Sponsor** Pradeep Sachdeva Design Associates & GMR Infrastructure Ltd.

**Team** G. Tiwari and D. Mohan.

### Master Plan for Bus Rapid Transit System Integrated with Bicycle Network in Pune.

**Sponsor** Pune Municipal Corporation.

**Team** G. Tiwari and D. Mohan

### Operating Plan for the Implementation of HCBS on 15kms Stretch of Ambedkar Nagar to ISBT Corridor

**Sponsor** RITES Ltd.

**Team** G. Tiwari and D. Mohan.

## Course Announcement

The Transportation Research and Injury Prevention Programme (TRIPP) at the Indian Institute of Technology, Delhi, Volvo Education and Research Foundations and the French National Institute for Transport and Safety Research (INRETS) France, are organizing a seven day **"International Course on Transportation Planning and Safety"**. The course will be held in New Delhi, India, from 10-16 December 2007, and TRIPP will be the host institution. The course will have a common component for the first three days, followed by two parallel modules on Traffic Safety and Biomechanics and Crashworthiness.

Details of the course and registration form can be accessed from - [www.iitd.ac.in/tripp](http://www.iitd.ac.in/tripp)





## INTERNATIONAL WORKSHOP ON URBAN TRANSPORT: TODAY AND TOMORROW 21-24 March 2007, Agra, India

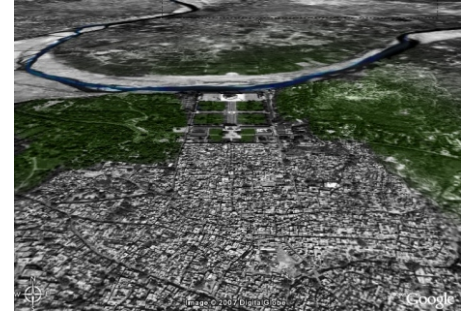
### Sponsors

Volvo Research & Educational Foundations, Sweden  
Infrastructure Development & Finance Co, New Delhi  
Ministry of Urban Development, Government of India

### Host

TRIPP, Indian Institute of Technology, Delhi

The objective of this seminar/workshop was to contribute to the understanding of socio-economic and land use policy challenges facing us to address the mobility and access requirements of cities in the 21st century. The “mature” cities in high income countries are dominated by car trips but in the recent past a number of them are attempting to move to a more sustainable future by adopting policies favouring public transport and bicycling. On the other hand, cities in the emerging economies are at present dependent on walking, bicycling and public transport for a majority of the trips, but in the name of development and progress, they are promoting a car-based policy agenda.



But something is going wrong. We are gentrifying the city centre, pushing the poor to the periphery, and building gated communities for the rich. We need to understand the connections between peace in the city and built form; low density vs. high density; between different public transport systems and equity. The question we need to ask ourselves is what urban forms will encourage walking and bicycling by offering us shorter and fewer trips; we also need to understand the structures of the city that accommodate the informal sector with dignity.

Forms of governance and citizen participation in city policy making will decide how we move toward more sustainable cities. Where do master plans fit in? What form should these plans take? Cities must become more democratic in their functioning so that the needs and aspirations of the low income groups and the informal sector find a place in the system. How do we move toward this? For example, opinion polls can get high support for a few capital intensive metro lines or fast highways instead of more efficient bus based transport systems, pedestrian and bicycle facilities. Large subsidies for metro systems are accepted easily whereas bus transit or paratransit are expected to pay for themselves.

### Questions:

- Are there unresolved design and safety issues in increasing non-motorised modes of transport?
- How can a public transport and paratransit and NMT (non-motorised transport) be optimized for promoting sustainable policies?
- What needs to be strengthened in the interlinkages between mobility and environment to improve the safety of the non-motorised user on the road?
- Can the provision of two or more ring roads and three or more lanes in each direction with grade separated junctions solve our problems? How do these forms and structures affect access, exclusivity, use of personal and public transport, congestion, pollution, safety, etc?
- What kind of decision making system will help us choose between surface and grade separated transport systems?
- Are there evidence-based pointers to be leveraged? What are the new directions to be taken in order to arrive at the inclusive cities of the future?

### Quotes:

“There is a conflict of meanings of the word sustainability between the rich and the poor. For the rich sustainability can be achieved through technology fixes – cleaner engines, fuels and metro systems. For the poor, sustainability is a lifestyle and employment issue more addressed by city form, land use and accessibility issues. This conflict manifests itself politically, with no easy or fast solutions.” – **Geetam Tiwari**

“When the speeds are increased it is not necessary that people save time. They start travelling longer distances. The travel time budget remains constant. There is enough empirical evidence to back up this insight... One of the secrets for the success of good public urban transport is the visibility of public transport vehicles in the public space. The most important transport system is in the brain of people. If public transport is not visible and present in the public space it will not be present in the brain and mind of people. Therefore, cities with a visible public transport have a much higher share of public transport trips, compared to cities with a ‘hidden’ and expensive underground system.” – **Hermann Knoflacher**

“Politicians and government officials are very sympathetic to the needs of the environment and to the exclusion of low income communities from the city. However, planners have been trained to deliver a form of development that is anti-pedestrian, anti-street, anti-dissolved space and anti-mixed landuse. The fault lies in their basic education which does not give them a structure of thinking which makes innovation possible and also because existing building by laws and zoning regulations supports this form of planning.” – **Arif Hasan**

“The emerging pattern of a positive correlation between gross residential density and public transport use as well as a negative correlation between density and car use is very clear. Only density levels of more than 100 pers./ha ensure that the percentages of public transport trips to work remain above 40%. Above the same density level, driving a car as the most density adverse transport mode remains below 40%... extremely high percentages of bus trips (above 30%) in Greater London also occur only in areas of gross residential densities of 100 pers./ha or above.” – **Philipp Rode**



“Two areas for future research seem to be of particular significance: first, how can we integrate land use and transportation planning so that both are conducted as part of a single, seamless exercise; and secondly, can we compare different localities around the world for their physical characteristics, compare them also for their attractiveness as areas to live and work in, and thus arrive at a range of possible values for the physical parameters that are more likely than not to deliver an enhanced quality of urban life?” – **Shirish B. Patel**

“It is therefore not surprising that the profession and discipline of urban planning have not been able to understand the nature of Indian urbanism – both as a socio-cultural construct and as a technical entity. Instead it has always tried to “discipline and punish” its natural propensities and not mediate it, let alone facilitate the process. It is therefore possible to construe from this brief analysis that urban planning as it is practiced in India, cannot come to terms with the contemporary complexities of Indian urbanism, including the issues of transport planning.” – **AGK Menon**

“Transport planning and implementation require both aggregation and disaggregation. A metropolitan system of expressways and mass transit will not work if at the sub-metropolitan level connectors and feeders are not provided. The functioning of these facilities also depend on the neighbourhoods and shopping precincts, how they are planned or have grown and what is the extent of connectivity needed. Current national and state policies and market forces will inevitably result in vehicular penetration and intrusion in every neighbourhood. The issue is how can we accommodate the voices of the neighbourhood cities in a metropolitan area.” – **K.C. Sivaramakrishna**

“A three-wheeled scooter rickshaw (TSR) is preferable to a car as it carries the same number of people on an average, takes one-third the parking area and one half the space while moving as a car. Since it weighs one-third of a car it wears out the road much less, has less tyre/rubber use, and uses one third of national resources to produce it. All this reduces indirect pollution. Since TSRs have a small engine they pollute much less per passenger than a car if the TSR engine uses clean technologies. Because of the small size of the engine, they can't go faster than 50 km/h, thus keeping to urban speed limits, controlling others speeds, and reducing the number of fatal accidents among pedestrians and bicyclists as compared to cars.” – **Dunu Roy**

“This conventional wisdom is easy to state. But, as far as I know, it is not implemented anywhere in the world. Virtually everywhere, transportation decisions are fragmented into bits – both functionally and as a matter of geography. Transportation decision making is rarely connected to other aspects of urban planning...The crisis facing the organization of transportation is not deciding what would be better – we know what would be better. The crisis is figuring out how to get from here to there. We don't seem to know how to design the broad-based system we think desirable. Moreover, we don't seem to know how to relate such a system, even if we had one, to the equally important narrower focus. We need, in other words, to figure out how to relate parts and wholes. Even more urgently, we need to figure out how to begin to head in the right direction.” – **Gerald Frug**

“The ways in which urban transportation is subsidized are as important in determining its impact on urban life as the physical characteristics of a system. The need for perennial subsidy derives from the fact that transportation's fixed infrastructure costs for construction and maintenance of rights-of-way, i.e., roads and rail beds as well as the more variable costs of purchase and maintenance of rolling stock, can never be fully covered by charges to the base of users. Travelers simply stop traveling when the costs get too high.” – **Elliot Sclar and Julie Toubert**

“Setting markets against institutions and denigrating ideas of governmental intervention (as a means of correcting faulty markets) in favour of the acclaimed merits of the free market, have in the last part of the twentieth century and the first part of the twenty-first, fragmented communities, cities, city-regions even nations. It has done this by, among other things, promoting infrastructure and services that make places, communities and economies increasingly compete rather than integrate, setting the 'have-nots' and creating new 'winners' and new 'losers' in a more uncertain and unsustainable future.” – **Harry T. Dimitriou**

“Highly compacted and mixed land use generates shorter distance travel. In many cities in China bicycle travel accounted for a high proportion of mechanized travel, as high as 50% - 80%. There is no waiting time; very flexible and reliable, bicycle clearly has the advantage over bus within the travel distance of 4-6 km range...The ring road strategy has been implemented with 5 ring roads in Beijing. Each traffic lane in Beijing's ring road will take as many as 1600-2100 pcu/h, almost to its saturation capacity. However, the effects to improve the city's operating efficiency are not obvious. Currently about 40% of people in Beijing spent more than an hour to work each day” – **Pan Haixiao**

“Since the smoothing effect (traffic flow) is more accentuated with buses, one may be able to deploy bus lanes even in congested ring roads, or for that matter, congested city centres...A nice feature of city street networks is that they are dense. Therefore, there is no harm in devoting an entire street to buses (as opposed to an entire freeway to high occupancy vehicles) if nearby parallel streets can be devoted to the low occupancy mode. One should still strive for laying the bus lines so as not to waste space in a damaging way.” – **Carlos Daganzo**

“General information campaigns and road safety awareness actions have shown no direct safety effects, but may be indirectly needed for the public acceptance and political priority of road safety measures. Also road safety education has minor effects, because the risk reduction of new users of each road mode to the three- to fourfold lower risks of experienced road-mode users requires several years of daily practice in traffic (driving 100.000 km for newly licensed drivers).” – **Matthijs. J. Koornstra**

“Cycling and walking for daily activities can bring major health benefits – half an hour a day can half the risk of developing heart disease, equivalent to the effect of not smoking. Transport policies in cities worldwide are designed with the private car in mind. Yet the vast majority of the world population will not have a car for the foreseeable future; they will suffer from traffic congestion, and the health risks from pollution traffic accidents and barriers to cycling and walking, but not benefit from private mobility.” – **Carlos Dora**



"In many areas, informal services are the only bonafide means of mobility available to the poor. They allow car-less, disadvantaged individuals to reach jobs, buy and sell produce, and access medical care. They also enlarge laborsheds, expanding the supply of workers across many skill levels from which firms and factories can draw upon. Pedicabs, tri-wheelers, and micro-vans are also an integral part of the distribution networks of many third-world cities, ferrying raw materials, furniture, equipment, and other goods in and out of neighborhoods." – **Robert Carvero**

"With regards to non-motorised transport, a shift in mindset is required which acknowledges these forms of transportation, particularly walking, as travel modes in their own right. With regard to for-hire transport, a clearer distinction from larger capacity paratransit carriers is required in the formulation of policies concerning market entry regulation, and an acknowledgement that these carriers serve particular market niches, and form important components of fragile survival strategies in 'developing world' contexts. With regard to paratransit, achieving an appropriate balance between quantity and quality regulation (including the regulation of inter modal competition when it occurs), and the effective integration of paratransit into rationalized public transport systems, are perhaps the most intractable and complex issues " – **Roger Behrens**

"Our research agenda is sophisticated control but over unsophisticated infrastructure... Since the cost of Wi-Fi and GPS tumbles daily, cost will not stop the penetration of CASS into rural America, the BRIC countries, or even perhaps the rest of the developing nations... If CASS has benefits in the United States, with its relatively well regulated traffic and its thousands of traffic-light controlled intersections, the benefits will be many times greater in India with it many unsignalized intersections and disorderly traffic." – **Raja Sengupta**

"Travel behaviour and decision making on infrastructure are influenced by car culture. There is no show girl/boy for public transport! Why?...An analysis for Taipei indicates that Bus Rapid Transit gives better benefits in terms of fuel consumption and carbon dioxide emissions compared with elevated expressways or metro systems." – **S.K. Jason Chang**

"The vehicle manufacturers in India, consider ITS as a boon for the transportation industry. However the transporters and the end-user consider ITS just as an industry hype...ITS can help in the increased usage of public transport modes by redefining the travel experience of the passengers on roads. This can be accomplished by offering value added services which can improve safety, mobility, productivity and comfort of the passengers." – **Aravind S. Bharadwaj**

"Traffic counting systems which are based on loops installed on the roads systems have major problems in Indian road conditions. Loop based vehicle counting systems assume lane discipline. By and large the traffic movement is strictly not lane based. This is made even more difficult by the heterogeneity of vehicles on the Indian roads which makes strict lane based movement almost infeasible. A camera based traffic counting system can handle these situations transparently." – **M. Balakrishnan**

"Wherever the lower income groups are able to get themselves heard we are more likely to have more sustainable cities as they will need facilities for walking, bicycling and public transport closer to place of work and shopping and leisure activities around their homes... If public transport has to made more appealing, it has to come closer to home, reduce walking distances and be very predictable. These conditions would favour high density surface networks (not metros) to reduce walking distances... Cities must have narrower avenues with smaller blocks (say 800-1,000 m) to allow for short walking distances to public transport... Safety from crime and road traffic crashes is a pre-requisite for sustainable urban transport options. This needs businesses and/or street vendors along all avenues." – **Dinesh Mohan**

## List of Participants

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