



2nd Stakeholder Consultation Workshop Project on Promoting Low Carbon Transport (LCT) in India

Dates: 18-20 October, 2011

Venue: India Habitat Centre, New Delhi, India

India is in transition towards peak mobility demand amid rapid economic growth, population growth and a rise in incomes. One of the greatest challenges faced by the transport sector is having in place the right infrastructure and services to fulfil the mobility needs, while reducing negative impacts locally and globally. India as an emerging economy is potentially a role model for future developing countries and has the capacity to design and implement a sustainable low carbon transport model. A low carbon transport strategy requires an integrated approach to identify measures that will achieve net benefits in enhancing mobility. This entails developing the foundation to creating such pathways.

Since a year ago, UNEP and key partners have been implementing the LCT project that will help articulate the requirements of a low carbon transport scenario for India. The project has a two-prong objective and approach: (i) to create an enabling environment for coordinating policies at national level to achieve a sustainable transport system and (ii) to enhance the capacity of cities to improve mobility with lower CO₂ emissions.

The project team is happy to share these preliminary results with key stakeholders and beneficiaries. A 3-day workshop is being organized to review project results that set the basis for achieving overall objectives. Topics that will be covered during the workshop will include sustainability indicators, integrated assessment to develop a transport action plan (roadmap), assessment of transport interventions in India and its impact on sustainability and, methodology for low carbon mobility plans. (Details of each topic are provided below).

The workshop is expected to generate discussions around the identified topics and provide concrete recommendations that will help the project team in finalizing the outputs. It will also help fast track the next phase of the project that involves testing of the methodologies and toolkits produced at both national and city level and integration of these outputs with existing transport policies in India.

Background note

The project on Promoting Low Carbon Transport in India was launched in November 2010. It is a joint collaboration between UNEP and the International Climate Initiative of Germany and is implemented jointly by the UNEP Risoe Centre and prominent partners in India namely the Indian Institute of Technology, Delhi (IITD), the Indian Institute of Management, Ahmedabad (IIMA) and the CEPT University. The project team is also working in close coordination with a number of ministries and institutions in India, in particular the Ministry of Environment and Forests (MoEF) at the national level and, the Ministry of Urban Development (MoUD) at the city level for low carbon mobility plans.

Workshop Topics

i. Sustainability Indicators

The development of sustainability indicators is a key activity and it will lay the ground for the development of a Transport Action Plan at the national level, and a methodology for low carbon mobility plans at the city level. Transport activity has steadily increased during the last few years and has resulted in serious impacts on the economy, society and the environment. These current trends have undoubtedly called for the need to incorporate the sustainability and liveability dimensions into transport planning. Thus, in order to monitor whether these sustainability and liveability concerns are being properly addressed, the development of a set of indicators through which performance towards these goals can be measured is crucial.

ii. Integrated Assessment at National Level

The Transport sector is the second largest contributor of CO₂ emissions in India. It is also the largest consumer of fossil fuel for which India is heavily dependent on imports. Moreover, the transport sector gives rise to negative impacts such as traffic congestion, local air and noise pollution, and road fatalities. An integrated assessment for the transport sector spanning from 2010 to 2050 using an integrated modelling framework is being undertaken for business as usual and low carbon set-ups. The assessment employs scenario methodology to carry out policy analysis and summarizes the scenarios on a number of indicators for sustainability.

iii. Methodology for Low Carbon Mobility Plans

There are 35 cities with a population of more than 1 million in India, and many more will join this group in the immediate future. Further, most of these cities do not have good infrastructure for low carbon mobility like walking and cycling. Public transport is not convenient and reliable, and is unaffordable for the poor. This has resulted in the fast growth of private modes such as the two wheelers, cars, etc. and reduced mobility for poor people. A program for urban renewal under the Jawaharlal Nehru National Urban Renewal Mission is being undertaken across different cities. The Ministry of Urban Development has mandated preparation of Comprehensive Mobility Plans (CMP) as a prerequisite for projects that seek funding under the JNNURM. A tool kit to prepare these CMPs is also available from MoUD. The methodology for low carbon mobility plans will complement the toolkit for CMP and provide an integrated approach to analyze future mobility scenarios in terms of CO₂ emissions, inclusiveness and adaptation to climate impacts.

iv. Case Studies

In depth case studies for information sharing on sustainability impacts of the following transport systems / infrastructures:

- Metro transport systems,
- Bus Rapid Transit (BRT) systems,
- Non-motorised transport (NMT) modes, and
- Dedicated rail freight corridors.

The **Transportation Research and Injury Prevention Programme (TRIPP)** at the Indian Institute of Technology Delhi, is an interdisciplinary programme focussing on the reduction of adverse health effects of road transport. TRIPP attempts to integrate all issues concerned with transportation in order to promote safety, cleaner air, and energy conservation. Faculty members are involved in planning safer urban and inter-city transportation systems, and developing designs for vehicles, safety equipment and infrastructure for the future. Activities include applied research projects, special courses and workshops, and supervision of student projects at postgraduate and undergraduate levels. Projects are done in collaboration with associated departments and centres at IIT Delhi, government departments, industry and international agencies.





Herman Knoflacher
Chairman of the Working Group (Transport Systems)
and Professor at the
Institute for Transport Planning and Traffic Engineering
University of Technology
Vienna
Austria

We need to understand, first of all, that there must be equity in space utilization if our cities are to become sustainable. Equality in transport use requires a knowledge of the mechanism of traffic systems. The technical traffic system enables access to high and effortless speeds. This applies to public transport and cars. With increasing motorisation, the share of public transport in passenger transportation decreased (Germany 1950: 65% public transport, today 17%). For equity to prevail between private and public vehicles, not only is the number of parking spaces important, but also their site plan in relation to the rest of the street furniture.

The effects of the car on human beings is so drastic that only a physical change of structure can bring about equal opportunities. Today's parking order is not a result of scientific or rational considerations; it was fixed arbitrarily in the garage law of the Third Reich on 17th February 1939 (it became effective on 1st April 1939). It became common practice in designating areas adjacent to building developments although building regulations do not advocate this. This essay should help transport planners to substitute parking rules that are based on scientific principles in place of this old usage.

- Equal treatment must be according to different modes of transport:
- Pedestrians
- Cyclists
- Public transport (PT)
- Individual motor car traffic
- Creation of a balance between modes
- Creation of scientifically established recommendations for political implementation,
- Consideration of participation and implementation in transport systems in urban and municipal areas.

Parking is fast becoming a major problem in urban areas. How do we go about addressing this issue?

Speed and land use patterns are key factors in any transportation system. So far, increasing traffic and structural problems are mostly met with measures in flowing traffic; above all, through the building of additional infrastructures. Especially with the introduction of transport planning and technology a focus on flowing traffic and its efficient handling can be noticed. Symptoms are treated with high expenditure. This is coherent because problems in flowing traffic are noticeable to laypersons too. This approach results in urban sprawl, in the disintegration of urban structures, in the weakness and destruction of the commercial economy and the retail trade; it results in deficits in public transport and in the manifold effects in the social, environmental and sanitary structure of the state.

Already in the 1970s the recommendations of the OECD ("Transport in Cities") refer to the essential control variable of the city traffic and urban development, in the "garage and parking management".

A problem of the conventional community and transport policies was that traffic was not organised as a complete system. Parts were optimised independently of each other, without considering the effects to the complete system. While parking space was optimised individually, public transport always had to be developed for the complete system. With this difference in

Parking, People and Equity

approaches, no optimum for the complete system could be found.

The development of high speeds through technical traffic systems is a new technical innovation for which humanity has no evolutionary equipment. The possibilities created through these new technical traffic systems offer a fascinating perspective on the 19th and 20th centuries, particularly for the individual car user. The outcome of this systemic effect was not realised for a long time. Not until the second half of the 20th century were the main causes of this behaviour explored and scientifically justified.

There is a political requirement to integrate the public transport system according to its function on a competitive basis ("Priority for public transport"). The dominance of public transport disappeared with increasing motorisation, without concrete comprehensible causes.

Structures have to be created in urban areas such that they can truly offer equal opportunities. Primarily, equal opportunity acts in accordance with journey time (speed), comfort or rather the body energy input. Additionally, there are other factors of comfort, accouterment, cleanliness etc., which are however secondary factors. Taking into account the primary factor of energy input there are quantitative minimum conditions, which have to be accomplished to leave open alternatives for the users. As the body energy input of the pedestrian per time unit amount – depending on speed – is 2 to 6 times the body energy input of driving a car.

The main starting point for the improvement of the legal realisation is the building bylaws. Most Austrian building bylaws give a relatively wide scope concerning the spatial assignment of parking spaces to the structures for professional planners.

How do factors like speed of vehicles, and land use patterns enter the picture?

The parking spaces should be correlated to the stops or stations of the public transport system. This is in no way expressed in the building rules. The organization of space cannot happen isolated from the higher-ranking objective.

To ensure equal opportunities, at least the footpath to the car park has to be as long as the footpath to the bus stop.

Therefore this equidistance between the parking space and the bus stop is essential in land use planning and in the organisation of space if one is to grant a fair choice to all people.

For the citizens:

- **Safe environment:** as 70 % of the street spaces becomes car-free, the living, working, leisure and contact spaces of human beings can be arranged qualitatively in a high-class way.
- **Good environmental quality:** living spaces will be spared car emissions and noise.
- **High social integration capability:** The street space becomes available once again as communication space.
- Variety of numerous (but small) local shopping facilities.
- Return of workplaces and therewith employment opportunities in the living area.



For the economy:

- Fortification of the local economy revenues through the creation of local economical cycles with employment effects.
- Positive effects of employment, little use of resources as very little effort is required for motorised mobility.
- Enlargement and opening of new business fields.

For the municipal administration:

- Release of high maintenance and operating costs for road networks.
- Medium-term reduction of costs of the remaining infrastructure, as the settlements become more compact.
- Release of social charges, as social networks become sustainable.
- Relief of communities through reduced payment of contribution for public transport, as it will be financially efficient with the higher number of passengers.
- Advantage for public transport: It needs fewer subsidies. Admittedly, there are more critical customers.

The current financing system in the parking area is counterproductive for a sustainable development of the structures. At present a countervailing charge is levied on those who do not provide their parking spaces on their own plot or in their own house. Thereby, traffic, environmental and economic problems are produced, which burden the community.

Therefore the countervailing charge has to be disposed for parking spaces, which were not built. Instead there should be a traffic exciter charge for those who park at home.

As you said earlier, we return to the question of equity.

The position of the car park in relation to the other street, street furniture is of the utmost importance. Presently the principles of the market economy in the traffic system are not effective. So the user of the system receives false signals, which induce him to a behaviour that is against the objectives of land use planning and transport policy; nor will it help him to adapt the structures into the complete system. Persons who misbehave, are recompensed, while those who behave courteously, are punished through the countervailing charge.

Persons, who park according to the structure, should pay fewer charges than others. The level of the charge acts in accordance with the particular local circumstances, with the current or planned supply of public transport and with the consequential costs, which emerge at present or in future in the system. For the calculation of the level of the charge the following function can be consulted:

The charges should be introduced according to the acceptance of the access widths – either floating or staged. The cost function has to follow the acceptance function. The cost function applies to the transition period until a balance condition is reached.

A person, who parks at least as far away as the bus stop of the public transport, could pay as parking charge for the annual ticket of the public transport plus the operating costs of the garage. The person also gets an annual ticket for the public transport. A person, who parks at home, pays the costs, which he causes to the municipality or community. This price could be a multiple of the costs of an annual ticket – depending on the distance to the stop of the public transport. This traffic exciter charge disappears, when the structure is stabilised again and all parking spaces are such that they give an equal opportunity between the various traffic modes.

The described differentiation is particularly necessary for the transition period until there is a balanced situation, then there would be new finance structures that become possible and meaningful.

As the system is organised and operated constructionally, financially and organisationally contrary to the necessity of an effective transport infrastructure, a transition period has to be arranged, which has to be as short as possible. For the transition period today's distortion of competition, which exists between the peripheral shopping centres and the central shops in the city centre, has to be abolished. This can be reached when one has to levy a general parking charge (developing charge) at the shopping centres according to the number of parking spaces and the opening times, which accord to the short parking charges of the shops in the inner-city areas. This charge needs to be adopted completely for the revitalisation of the system as a whole.

Please tell us something about the importance of the parking location

Parking planning is not an individual affair. Parking planning and organisation are an exercise for the community and the public. The provision and planning of all parking spaces has to happen through an organisation, which makes sure that the parking spaces are planned, built and managed as is common with public transport stops. This has to be in agreement with the objectives of the system and the real behaviour of humans. In this market economic system an equidistance of the parking spaces and public transport stops has to be demonstrated, in order to accord with the basic principles of the market. If one of these factors – proper building structure, proper financing structure and proper organisation structure – is going to be ignored, there can be no solution for a sustainable city structure.

At the moment, an individual organisation of the parking space is possible on one's own property. But the effect of the parking space in the system is equivalent to public transport in speed and in spatial impacts. Due to the same spatial impacts, the parking space cannot be organised individually, if the system is to be stabilised. So this essay is of the view that the establishment of an organisation, which is responsible for the allocation, organisation and financing of parking is a must. It also would be responsible for the financing of public transport. The parking spaces will be organised in the right places to ensure equity. When someone needs a parking space or buys a car, he/she contacts this organisation and gets possible parking spaces at the appropriate price profile. It is a necessary organisation of a technical system. Through this form of organisation, the human gets back the freedom of choice, which is taken away today through the individualisation of parking spaces.

How do we tackle this issue?

Car parks are an important factor in town planning involving a complexity of related issues. With the introduction of an area-wide parking management the essential gap in the urban administration of resources is closed. The community gets financial security for planning, and for public transport. The community gets the responsibility for the essential control to revitalise the city centre.

In industry and trade equal opportunities will be established, as the high potential of shopping centres with nearly unrestricted supply of parking spaces will be available. Well organised communities with efficient short-distance traffic, short ways and favourable parking garages are attractive for industry and trade and achieve a liveable environment for humans, where a fair opportunity of choice is possible between carriers.



News

Do car scrapping schemes help the environment and increase safety?

Excerpts from: A comparative study of three national car scrapping schemes carried out by the International Transport Forum indicates that:

- Car fleet renewal schemes can reduce CO₂ emissions and air pollution and can contribute to making roads safer
- But the gains are insufficient to make up for the value of the scrapped cars - in some cases the net losses were large
- Claims of reduced environmental impacts and improved safety should not serve as the main argument for scrapping programmes
- Schemes can be better designed to maximise their environmental and safety impacts

One of the earliest and most visible signs in late 2008 of the impending global economic recession was the sudden build up of unsold cars in many countries as households drastically curtailed spending. Alarmed by the spectre of large-scale failures in the automotive industry, many governments implemented incentivised fleet renewal - or scrapping - schemes where consumers received sometimes substantial cash payments or discounts for trading in their old car for a new one. Authorities hoped that these incentives would stimulate consumer spending and assist car manufacturers and dealers in times of economic duress. Proponents of fleet renewal schemes also claimed that substantial environmental and safety benefits make these schemes attractive. Following on previous International Transport Forum work undertaken in 1999 that highlighted the high cost of addressing environmental goals through such schemes, we sought to revisit these claims. The employment or stimulus-related benefits of selected car fleet renewal schemes were not examined. The study focused on the cost-effectiveness of schemes in delivering CO₂ and NO_x emission reductions, and improving safety.

Three representative schemes for which detailed transaction data were available were studied: the French Prime à la casse, the German Umweltprämie and the US CARS programme. Results are based on a detailed investigation of 2.8 million individual transactions simplified into three car classes which serve as the basis for the emissions and safety analysis. Declining yearly distance driven by cars as they get older as well as the introduction and penetration of selected environmental and safety-enhancing technologies were taken into account.

All comparisons are made in reference to a base-case in which old scrapped cars would have stayed in the fleet longer and new cars would have been introduced later. Pollutant and CO₂ emissions only from the operation of the vehicles in question were considered, and not of those associated with vehicle manufacturing and disposal. Finally, all lifetime pollutant and CO₂ reduction benefits were monetised, added to the monetised safety benefits, and then compared with the value of the scrapped car to see if the former outweighed the latter.

Our analysis suggests that the road safety impact of the US CARS programme over the period 2010-2030 could reach c. 2 800 serious injuries avoided, of which c. 40 would have been fatalities. In Germany, we estimate the cumulative road safety impacts of the Umweltprämie to be c. 6 000 serious injuries avoided, of which c. 60 would have been fatalities. In France, the Prime à la casse is estimated to have resulted more modestly in c. 330 serious injuries (of which 20 fatalities) avoided. In the USA, we found that ESC (Electronic Stability Control) and the general vehicle safety improvement effect (incremental improvement of vehicle and infrastructure safety technology over time) accounts for 70% of the expected 2010-2030 impact.

In Germany, a higher percentage reduction in injuries from the "business as usual" (BAU) base-case is expected from each safety feature. Since penetration of these features in the scrapped vehicles was lower than in the USA, their broad introduction through the scheme is estimated to bring a stronger reduction in relation to the BAU injury levels. However, lower overall road injury figures, as well as lower levels of vehicle travel, lead to only slightly higher improvements in avoided injuries compared to the USA.

In France, the estimated safety impacts are very limited for several reasons; because of the smaller scale of the scheme, low expected remaining vehicle kilometres of travel of the scrapped fleet (because of a high share of very old cars), and a lower penetration rate of the safety features in the new cars in comparison with the other countries.

(Source: www.internationaltransportforum.org/Policy-Briefs/PDFs/2011-10-01.pdf)

International Course

The Transportation Research and Injury Prevention Programme (TRIPP) at the Indian Institute of Technology, Delhi organized a seven day International Course on Transportation Planning and Safety from 5-12 December 2011 at the Indian Institute of Technology Delhi. The course was co-sponsored by the Volvo Research and Education Foundations, IFSTTAR, France, Ministry of Urban Development, World Health Organisation, Bajaj Auto Ltd. Mahindra & Mahindra Motors Ltd., Tata Motors Ltd. TVS Motors Ltd., and the World Health Organization, SEARO. The course (an annual feature for the last 21 years), was attended by 60 participants from 10 countries. The faculty members included Anoop Chawla (IIT Delhi), Christer Hyden (Lund University, Sweden), Dinesh Mohan (IIT Delhi), Farida Saad (IFSTTAR, France), Geetam Tiwari (IIT Delhi), Harald Zellmer (Autoliv, Germany), Hermann Knoflachner (Technical University of Vienna, Austria), Janusz Kajzer (Chalmers University, Sweden), K N Jha (IIT Delhi), Mathew Varghese (St. Stephen's Hospital, Delhi), Nicole Muhrad (IFSTTAR, France), Pierre Van Elslande (IFSTTAR, France), Puneet Mahajan (IIT Delhi), Richard Kent (University of Virginia, USA), R.R. Kalaga (IIT Delhi), Shrikant Bangdiwala (University of North Carolina, USA), Sudipto Mukherjee (IIT Delhi), Sylvain Lassarre (IFSTTAR, France).



Establishment funds have been received from

Ministry of Industry, Government of India
Asian Institute of Transport Development
Tata Motors, India
Volvo Research and Educational Foundations (VREF), Sweden

Endowments for perpetual Chairs

CONFER, India: TRIPP Chair for Transportation Planning
Ministry of Urban Development India: MoUD Chair for Urban Transport & Traffic Planning
VREF: Volvo Chair for Transportation Planning for Control of Accident and Pollution

Transportation Research and Injury Prevention Programme
Room MS 815 (Main Building)
Indian Institute of Technology Delhi
Hauz Khas,
New Delhi 110016, India
Phone: 91-11-26596361, 26596557
Fax : 91-11-26858703, 26851169
Email : ird8541@cbme.iitd.ernet.in
<http://tripp.iitd.ernet.in>



A TRIPP Bulletin Insert

Road Traffic and Work Zone Safety Manual (Excerpts)

According to official statistics (National Crime Records Bureau), 118 239 people were killed in road traffic crashes in India in 2008. The situation has worsened in recent years. Traffic fatalities increased by about 5% per year from 1980 to 2000, and since then have increased by about 8% per year in recent years. This is attributable partly to an increase in the number of vehicles on the road, and partly to the absence of a coordinated official policy to control the problem. The fatality rate has increased from 36 fatalities per million persons in 1980 to 103 fatalities per million persons in 2008. Many of these traffic injuries and deaths take place in construction zones on roads and highways. A significant number of workers associated with construction and maintenance of roads are injured and killed every year. This increasing trend in injuries and fatalities has been recognised as a public health problem of significance by the authorities and public at large.

There is an urgent need to train practitioners and policy-makers in the scientific approach to injury prevention. There needs to be a cadre of professionals working from a shared understanding of the magnitude of the problem of road traffic and work injuries, the risk factors involved and the value of implementing evidence-based strategies. This underscores the need for persons working at all levels in road construction and maintenance to be equipped with appropriate knowledge and the skills derived from empirical evidence and professional expertise. Intervention programmes seeking to prevent injuries need to address the problem of capacity in different sectors. This manual attempts to address the problem of capacity for injury prevention by providing guidance to professionals managing road construction activity

The NHAI (National Highway Authority of India) had engaged the Indian Institute of Technology Delhi (IITD) to undertake a safety audit of contract packages under the Lucknow Muzaffarpur National Highway Project (LMNHP), World Bank funded 4-laning of NH-28 between Lucknow and Muzaffarpur. The IITD team comprised of experts from the following disciplines:

- Contract specialist
- Traffic management and safety
- Construction safety,
- Structural safety,
- Mechanical, electrical, and fire safety
- Workers and work zone safety,
- Occupational Safety and Health Administration (OSHA) specialist

The team visited all construction zones, conducted safety audits, and had discussions with all stake holders. The technical, legal and social issues were discussed in detail with the NHAI and the World Bank authorities at workshops organised for this very purpose. All the relevant information was gathered and a draft of the manual was prepared, peer reviewed, and revised, to be ultimately published in its present form. It is envisaged that the manual will be further refined in the light of experience in its use.

This manual is designed for a broad inter-disciplinary audience consisting of people involved in preventing work and road traffic injuries at work zones on roads and highways. This group includes policy-makers, administrators, road engineers, medical doctors, law enforcers, contractors. Since effective implementation of safety policies requires an interdisciplinary approach, this manual provides guidance to workers in a wide range of disciplines, who are involved in different aspects of road construction activity in different settings.

This manual includes two introductory chapters:

- Legislation
- Safety, Health and Environment Management

These are followed by the following six units

1. Safety Management Issues
2. Traffic Management and Safety
3. Construction Safety
4. Temporary Structures Safety
5. Worker and Work Zone Safety
6. Electrical and Mechanical Safety

This structure gives managers and trainers flexibility to customize the content for different audiences. The units provide users with information enabling them to respond to key safety questions:

- What are the appropriate methods and approaches for preventing accidents and injuries in different settings?
- What policies and strategies have been shown to be successful?
- What strategies should be implemented for maximum benefits?
- What can road construction and maintenance professionals do to initiate and sustain viable programmes to improve safety?

This manual equips users with specific information on:

- Laws and Rules related to Safety, Health and Welfare of construction workers
- SHE Policy
- Roles & Responsibilities of Organizations
- Roles And Responsibilities of Staff
- Qualification Criteria for Safety Officers And Managers
- Investigation, reporting, analysis and record keeping of incidents
- Detailed guidelines for ensuring safety in traffic management, construction, temporary, worker safety and electrical and mechanical safety
- Formulating and implementing safety policy.

This manual provides principles and information to meet training needs in different settings. It can be used in facilitator-guided training, as well as for self-learning. Professionals managing safety have different levels of prior knowledge. Some may have had formal training, while others may not. Also, these professionals are likely to be working on different aspects of safety. Trainers are advised to consider the needs of different audiences, especially their pre-existing knowledge and the practical needs in their work. The modular structure of this manual allows for flexibility in customizing the content to meet different training needs

This manual provides key principles and discusses problems encountered in the Indian context, but these principles and problems need to be made relevant to the local context. While the importance of adapting the content to local situations cannot be underestimated, trainers who are overseeing the local adaptation of the training materials must ensure that the fundamental principles are not radically changed or misrepresented. It is also important to ensure that the material, when adapted to a specific local setting, remains accurate. There are a number of ways of adapting this manual to a local context. Trainers can do this by:

- Modifying the style and level of content in view of the pre-existing knowledge base of the training audience.
- Introducing local experiences into the training materials to make the course meaningful to the audience, for instance by considering the local implications of road traffic collisions, risk factors and policy development.
- Asking trainees to look for examples in advance and make presentations on them during the training sessions.





Continued from overleaf:

- Inviting local decision-makers, government officials, staff of transport companies and insurance companies, and victims and researchers to share their knowledge, experience and projects.

The Contractor shall develop a thorough understanding of the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996, the Factories Act, 1948, Central Rules 1998, Building and Other Construction Workers' Welfare Cess Act, 1996, to not only satisfy the Inspectors but also to develop a perspective on the use of these legislations as the main tool for safety of workers at construction worksites. The Contractor is strongly advised to practice the principle of voluntary self-regulation rather than merely adopt a compliance attitude.

In addition to this, the construction works shall be undertaken in accordance with all applicable Legislations and Indian statutory requirements listed below for better health and safety management at construction worksites:

1. Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
2. Hazardous Wastes (Management and Handling) Rules, 1989
3. Motor Vehicles Act, 1988
4. Workmen's Compensation Act, 1923
5. Employees State Insurance Act, 1948
6. Employer's Liability Act, 1938
7. Trade Unions Act, 1926
8. Industrial Disputes Act, 1947
9. Contract Labour (Regulation & Abolition) Act, 1970
10. Inter-state Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979
11. Bonded Labour System (Abolition) Act, 1976
12. Child Labour (Prohibition and Regulation) Act, 1986
13. Children (Pledging of Labour) Act, 1933
14. Minimum Wages Act, 1948
15. Payment of Wages Act, 1936
16. Equal Remuneration Act, 1976
17. Payment of Gratuity Act, 1972
18. Payment of Bonus Act, 1965
19. Employees Provident Funds and Misc. Provisions Act, 1952
20. Maternity Benefit Act, 1961
21. Public Liability and Insurance Act, 1991
22. Indian Electricity Act
23. Boiler Act
24. Explosives Act and Rules prescribed under the Act like SMPV Rules and Gas Cylinder Rules
25. Mines Act
26. Plantation Act
27. Shops & Establishments Act

Safety, Health and Environment (SHE) Policy

The contractor as per Section 39 of the BOCW Act shall formulate a SHE policy and get it approved by DG/CIIBC respectively and display it at conspicuous places at work sites in Hindi and a local language understood by the majority of construction workers.

Within 4 weeks of the notification of acceptance of the tender, the Contractor shall submit a detailed and comprehensive Contract specific SHE Plan. The SHE Plan shall include detailed policies, procedures and regulations which,

when implemented, will ensure compliance of the contract provisions. The SHE Plan shall include the following but not be restricted to:

- 1) A statement of the Contractor's policy, organisation and arrangements for SHE.
- 2) The name(s) and experience of person(s) within the Contractor's proposed management who shall be responsible for co-ordinating and monitoring the
- 3) Contractor's SHE performance;
- 4) The number of SHE staff who shall be employed on the Works, their responsibilities, authority and line of communication with the proposed
- 5) Contractor's agent;
- 6) A statement of the Contractor's policy and procedures for identifying and estimating hazards, and the measures for addressing the same;
- 7) A list of SHE hazards anticipated for this Contract and sufficient information to demonstrate the Contractor's proposals for achieving effective and efficient health and safety procedures;
- 8) A description of the SHE training courses and emergency drills which shall be provided by the Contractor, with an outline of the syllabus to be followed;
- 9) Details of the safety equipment which shall be provided by the Contractor, including personal protective equipment;
- 10) A statement of the Contractor's policy and procedures for ensuring that
- 11) Contractor's Equipment used on the Project Site are maintained in a safe
- 12) Condition and are operated in a safe manner;
- 13) A statement of the Contractor's policy and procedures for ensuring that subcontractors comply with the Contractor's safety plan;
- 14) A statement of the Contractor's disciplinary procedures with respect to SHE related matters, and
- 15) A statement of the Contractor's procedure for reporting and investigating accidents, dangerous occurrences or occupational illnesses

The Contractor shall, from time to time and as necessary as required by the Employer to produce supplements to the SHE Plan such that it is at all times a detailed, comprehensive and contemporaneous statement by the Contractor of his site safety, industrial health and environment obligations, responsibilities, policies and procedures relating to work on Site. Any and all submissions of supplements to the SHE Plan shall be made to the Employer in accordance with the agreed procedures.

If at any time the SHE plan is, in the Employer's opinion, insufficient or requires revision or modification to ensure the security of the Works and the safety of all workmen and visitors at the Site, the Employer may instruct the Contractor to revise the SHE plan and the Contractor shall within 7 days submit the revised plan to the Employer for review.

Any omissions, inconsistencies and errors in the SHE Plan or the Employer's acceptance or rejection of the SHE Plan and/or supplements thereto shall be without prejudice to the Contractor's obligations with respect to site safety, industrial health and environment and shall not excuse any failure by the contractor to adopt proper and recognised safety practices throughout the execution of the Work.

The Contractor shall adhere to the SHE Plan and shall ensure, as far as practically possible, that all sub-contractors of all tiers require that the contracting parties each have a copy of the Site SHE Plan and comply with its provisions.

