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International Road Federation
6th IRF Regional Conference
Road Safety Strategy in India
Action Plan

SAFETY IN ROAD PROJECTS
UNDER
EPC AND PPP CONTRACTS

By

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SAFETY REQUIREMENTS

- Safety Requirement should aim at reduction in injuries, loss of life and damage to property resulting from accidents on the Project Highway, irrespective of the person (s) at fault.
- Users of the Project Highway include motorized and non-motorized vehicles as well as pedestrians and animals involved in, or associated with accidents.
- Vulnerable Road Users (VRU) include pedestrians as well as riders of motorized two-wheelers, bicycle and other vehicles which do not provide adequate occupant protection.
- Safety Requirement include measures associated with traffic management and regulation such as road signs, pavement marking, traffic control devices, roadside furniture, highway design elements, enforcement and emergency response.

Implementation of Road projects in India- History

➤ CASH CONTRACTS

- **Financed through budgetary resources or external borrowings**
- **Only mode of implementation till late nineties with few exceptions**
- **Even now more than 95% of number of road contracts adopt this mode**
- **Largely item rate or %age rate contracts, only a few EPC/Lumpsum(mainly bridges)**

Implementation of Road projects in India- History

➤ PPP/BOT CONTRACTS

- 1975 Highway sector opened for Private sector participation
 - BOT concept accepted
 - Cabinet approved comprehensive guidelines
 - Guidelines include BOT through MOU
- 2000 Model Concession Agreement by HPC
- 2001 Model Concession Agreement for small projects less than Rs 100 crores developed
- 2001 Concession Agreement Developed for Annuity Projects
- 2005-10 Model Concession Agreements for construction and O&M- Planning Commission

Status of NH projects

Sl. No.	Projects Categories	No. of Projects	Projects Cost (Rs. Crore)	Length (Km)
1	Completed PPP Projects under NHAI	55	20139	2998
2	PPP Projects under Implementation by NHAI	127	103451	11443
3	Completed Non-PPP Projects under NHAI	222	38395	8307
4	Non-PPP Projects under Implementation by NHAI	87	20333	3104
5	PPP Projects for award by NHAI in 2011-12	60	64488	7994
6	PPP Projects for Implementation by State Agencies	34	8649	4136
	Total	585	255455	37982

Safety in Road Design

Codes/Guidelines/Specifications

- IRC: 73 Geometric Design Standards for Rural (Non-urban) Highways
- IRC: 86 Geometric Design Standards for urban roads in plains
- IRC: SP: 73 Manual for Standards and Specification for two laning of State Highways on BOT Basis
- IRC: SP: 84 Manual for Standards and Specification for four laning of Highways through Public Private Partnership
- IRC: SP: 87 Manual for Standards and Specification for six laning of Highways through Public Private Partnership
- Ministry of RTH Circular No. RW/NH-35072/04/2004-S&R(R) Dated 27.04.2010
- MORTH Manual for Safety in Road Design

IRC:SP:84-2009

**MANUAL OF
SPECIFICATIONS & STANDARDS
FOR FOUR LANING
OF HIGHWAYS THROUGH
PUBLIC PRIVATE PARTNERSHIP**



**INDIAN ROADS CONGRESS
2009**

IRC:SP:87-2010

**MANUAL OF
SPECIFICATIONS & STANDARDS
FOR SIX LANING
OF HIGHWAYS THROUGH
PUBLIC PRIVATE PARTNERSHIP**



**INDIAN ROADS CONGRESS
2010**



**Public Private Partnership
in
Operation & Maintenance
of Highways**

MODEL CONCESSION AGREEMENT

Planning Commission
Government of India

IRC:SP:73-2007

**MANUAL
OF
STANDARDS & SPECIFICATIONS**



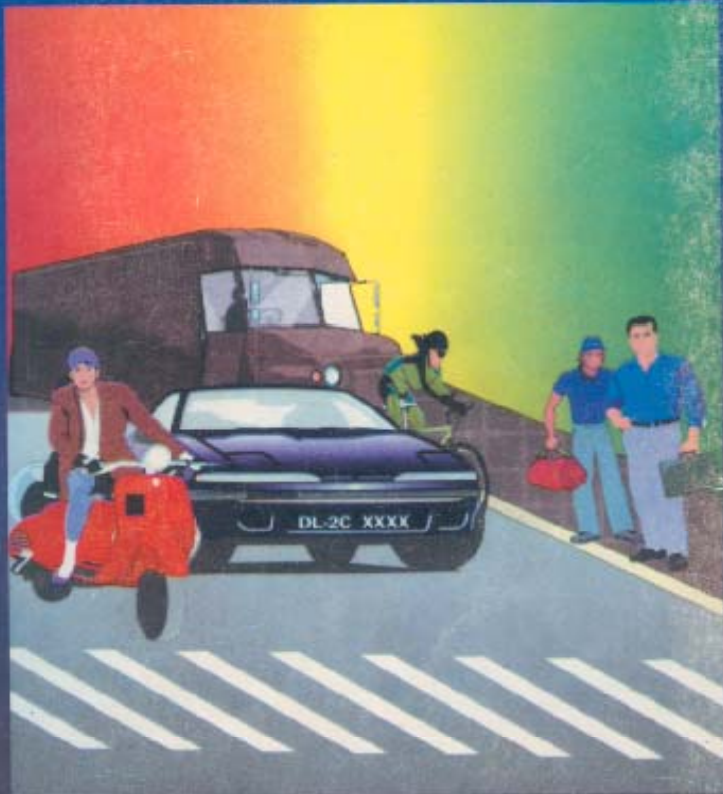
**FOR
TWO LANING
OF
STATE HIGHWAYS
ON
B.O.T. BASIS**

INDIAN ROADS CONGRESS
2007

Safety in Road Construction Codes/Guidelines/Specifications

- IRC: SP: 44-1996 Highway Safety Code
- IRC: SP: 55-2001 Guidelines for Safety in Construction Zones.
- IRC: SP: 88-2010 Road Safety Audit Manual

HIGHWAY SAFETY CODE



INDIAN ROADS CONGRESS
NEW DELHI

SPECIAL PUBLICATION NO. 44

IRC:SP:55:2001

GUIDELINES ON SAFETY IN ROAD CONSTRUCTION ZONES



Men at Work

Single file
traffic

Diverted
traffic ←

NO
WORKS
TRAFFIC



INDIAN ROADS CONGRESS
NEW DELHI 2001



**Public Private Partnership
in
State Highways**

MODEL CONCESSION AGREEMENT

Planning Commission
Government of India



**Public Private Partnership
in
National Highways**

MODEL CONCESSION AGREEMENT

Planning Commission
Government of India

Safety- Provisions in MCA

Article 12.2 Maintenance during Construction Period

- The Concessionaire shall maintain, as its cost, the existing lane(s) of the Project Highway so that its *traffic worthiness and safety are at no time materially inferior* as compared to its condition 7 (seven) days prior to the date of the Agreement,
- Concessionaire may, at its cost, *interrupt and divert the flow of traffic* if such interruption and diversion is necessary for the efficient progress of Construction Works and conforms to Good Industry Practice; -----the concessionaire shall at all times be responsible for *safe operation* of the project highway

Safety- Provisions in MCA

Contd.

Article 18 ‘Safety requirements’

- **Concessionaire shall develop, implement and administer a surveillance and safety programme for providing a safe environment on or about the Project Highway,**
- **The Authority shall appoint an experienced and qualified firm or organization (the “Safety Consultant”) for carrying out safety audit of the Project Highway in accordance with the Safety Requirements,**

Safety- Provisions in MCA

Contd.

Article 18 'Safety requirements' (Contd.)

- **All costs and expenses arising out of or relating to Safety Requirements shall be borne by the Concessionaire to the extent such costs and expenses form part of the works and services included in the Scope of the Project, and**
- **Works and services, if any, not forming part of the Scope of the Project shall be undertaken in accordance with the provisions of Article 16 (Change of Scope).**
- **Costs and expenses on works and services not covered hitherto before and arising out of Safety Requirements shall be borne from out of a dedicated safety fund (the "safety Fund") to be managed and operated by the Authority or a substitute thereof.**

Safety- Provisions in MCA

Contd.

Article 20 'Traffic Regulation'

- It is the obligation of the Concessionaire to **regulate traffic** on the project highway in accordance with the **applicable laws**.
- The Client shall assist the Concessionaire in procuring Police assistance for traffic regulation.
- There is a provision of **Traffic aid post** and round the clock patrolling by mobile police squad.
- Some facility like jeep and Chauffeurs are to be provided by the Concessionaire.

Safety- Provisions in MCA

Contd.

Schedule – L ‘Safety Requirements’

Safety measures during Construction Period

- **Client to appoint safety Consultant**
- **Safety Consultant to conduct safety audit and submit its Report**
- **The Concessionaire shall make adequate arrangement during the Construction Period for the safety of workers and road Users in accordance with the guidelines of IRC for safety in construction zones,**
- **Safety Fund for meeting Cost and expenses**

SAFETY-PROVISIONS IN MANUAL OF SPECIFICATIONS AND STANDARDS

- Highway patrol
- **Construction Planning**
 - Detailed plan for safe and efficient movement of existing traffic
- **Traffic Diversion**
- Access to private property
- **Cross road traffic**
- Guidelines for erection of Temporary works
- **Traffic management during construction**
 - Comprehensive traffic management plan
 - Declaration of construction Zone
 - Traffic management as per IRC:SP:55
- **Social disruption**

Provisions in Ministry's April 2010 Circular

- **Median:**
 - Depressed median of 12m or more width
 - Safety barrier on both sides of median
 - In case of median upto 2 m width- New Jersey type crash barrier at the center with antiglare screen
 - At least 1.5 m beyond edge of carriageway should be free of any obstacles
 - In case of raised medians already constructed- W-beam metal crash barrier along both carriageways

Provisions in Ministry's April 2010 Circular

Contd...

- W-beam metal crash barrier at the road edge where height is more than 3 m
- For green field projects – side slope of 1:4 or flatter. In case of slope steeper than 1:4 metal beam crash barrier
- Local traffic should be separated from main traffic
- Service road for pedestrian movement
- Where service road is not provided- ribbed pavement 250 mm wide additional paved shoulder with edge marking

Provisions in Ministry's April 2010 Circular

Contd...

- **Pedestrian facility in urbanised sections**
 - Service roads of width 7m , (minimum 5.5 m)
 - Footpaths with robust railing
 - Pedestrian underpasses/foot over bridges
 - Underpasses of minimum 7 m x 3.5 m
 - Parking facilities for local and commercial vehicles

Provisions in Ministry's April 2010 Circular

Contd...

- **Development of junctions**
 - Grade separator at major crossings
 - For lower category of roads- entry through service roads only
 - Properly designed acceleration and deceleration lanes
 - Rumble strips/speed breakers on cross roads
 - At grade junction below grade separation to be properly designed for chanelisation of traffic-to prevent wrong side movement

Current Scenario

- Very little attention is paid to safety in Cash Contracts
- Even where safety works are included as paid items the response has been far from satisfactory.
- Even in PPP projects Safety is considered as the last priority; especially during construction period.
- The Concessionaire often complain of theft/vandalism as excuse for not installing adequate safety devices
- There is often dispute about the safety requirements during construction period.
- There is no penalty for non-compliance of safety requirements
- Some provisions of Ministry's circular of April 2011 are not found acceptance by highway professionals/agencies as too much expensive and require to be deliberated.

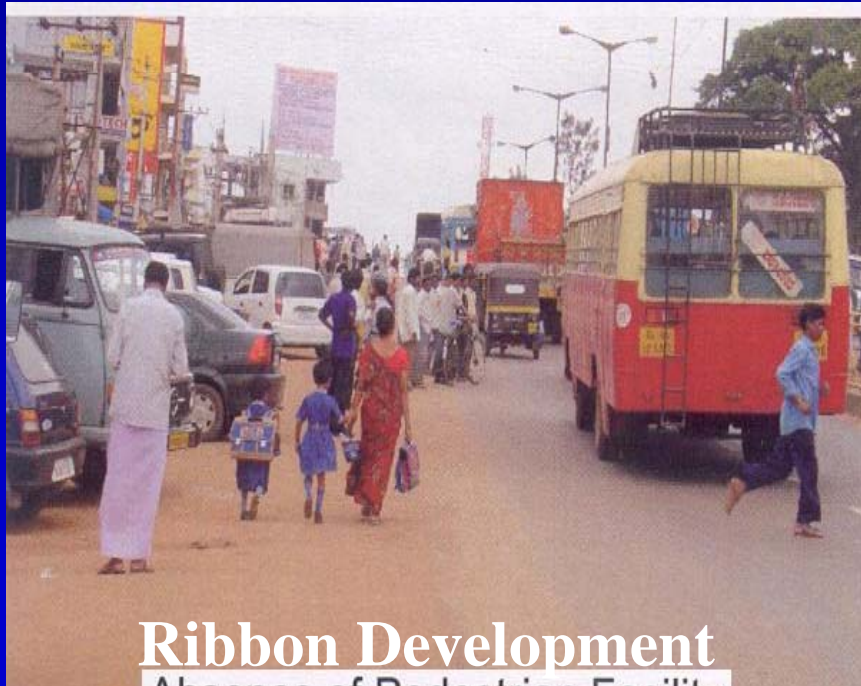
Typical signages at Construction site



Current Scenario

- The vehicles travel in reverse direction causing accidents
- The users create unauthorised median openings and cause accidents
- The vehicles are parked on the carriageway without proper indications/warnings; causing accidents, especially during night, when visibility is poor
- In the absence of regulations and enforcement, more and more ribbon development is taking place along the highways, which is adding to road accidents and fatalities
- All data of accidents, especially involving minor injuries and damage is not recorded.
- The accident data is not analysed scientifically to assess the cause of accident.

Wrong direction movement



Ribbon Development
Absence of Pedestrian Facilities



Unauthorised opening

TARGET

- Safety to be brought up from last to **FIRST** priority in Road projects
- Freeze number of fatalities at 2010 level for next 5 years (2010-2015)
- Reduce number of fatalities to 50% of 2010 figures by 2020 (2015-2020)
- Freeze number of road accidents at 2010 level for next 5 years (2010-2015)
- Reduce number of road accidents to 50% of 2010 figures by 2020 (2015-2020)

It means reduction in fatalities and number of accidents per 1000 vehicles by 10-15% per year during 2010-2015 and 20-30% per year during 2015-2020

ACTION PLAN

- Ministry's guidelines dated 27th April 2010 evolved as a sequel to 4th IRF Regional Conference should be discussed and deliberated in a larger forum like IRC to arrive at provisions which may be acceptable to the implementing agencies. Views of Planning Commission should also be invited and considered.
- Similar guidelines for road safety may be framed for 2-lane highways as more than 98% of road length in India are of 2 lane or lower standard.
- Based on deliberations, the IRC Manuals for 2/4/6 lane highways should be reviewed and modified.

Typical two lane highways, Vulnerable road users exposed to vehicular traffic



ACTION PLAN **Contd..**

- Suitable mechanism for analyzing the causes of accidents and effectiveness of safety measures should be set up. This will help in evolving cost effective engineering measures on scientific basis.
- Strict enforcement of Safety provisions at construction work sites
 - Mandatory use of safety Helmet, Safety Shoes and Jackets by all persons entering the construction site
 - No work should be allowed to proceed till adequate safety gadgets are procured and made available at work site
- Impose heavy penalty on violators of Safety norms
- Adopt Zero tolerance level on safety provisions

ACTION PLAN **Contd..**

- Introduce penalty clause in MCA for violation of safety norms
- The funds collected as penalty should go to Road Safety Fund
- The targets for reduction in number of road accidents and number of fatalities may be specified in MCA as performance indicators.
- To encourage road safety practice on our PPP projects, the project having best safety record may be awarded certificate.
- Develop comprehensive policy to encourage ribbon development along highways.

ACTION PLAN **Contd..**

- Appoint Safety Consultant before start of Construction
- Develop Comprehensive Safety Manual
- Develop some demonstration projects
 - The NH and state govt. companies managing the PPP projects as part of SPV should take the lead. – Charity begins at home
- The Ministry of Road Transport and Highways, State Government Road Departments, NHAI, the Concessionaires and Consultants, should adopt Safety Policy for themselves and display at all work sites.
- The Safety policy should be monitored at frequent intervals for its strict compliance

THANK



YOU