ROAD SAFETY AUDIT FOR NATIONAL HIGHWAYS

Workshop cum Training Programme on Road Safety
(17-21 September 2018, IIT Delhi)

TRIPP, IIT Delhi, MORTH & AITD

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India- Now Making World Class Infrastructure
ROAD ACCIDENTS
MAJOR MAN MADE DISASTER IN INDIA
• Safety Consultant for the Four laning of Kiratpur Sahib – Nerchowk section of NH-21 from km 73.200 to km 186.500 in the state of Himachal Pradesh for development, Construction and Post COD operation and Maintenance phase.

• Safety Consultant for the Four laning of Jammu-Udhampur Section of NH-1A from km 15.000 to km 67.000 in the state of Jammu and Kashmir for development, Construction and Post COD operation and Maintenance phase.
KIRATPUR SAHIB- NERCHOWK ALIGNMENT
JAMMU-UDHAMPUR NH-1A ALIGNMENT
Other Projects

• Construction of high level major bridge on river Hatania-Doania at km 113.297 of **NH-117** in the district of South 24 Parganas, West Bengal.

• Construction of **bridge over river Kushabhadra** on Balakati-Balianta road (old Jagannath Sadak) along with both side approaches in the district of Khurda.

• Construction of four lanes with paved side shoulder of Harike bypass of **NH-15** from existing km 158.350 to 166.925 of NH-15 in the state of Punjab under NHDP-IV.

• Construction of **bridge over Fulahar river** at Nakatti Point connecting Malda District with Katihar District.

• Construction of **bridge over river Chetei Nallah** at 26th Km of Jaleswar-Batgram-Chandeneswar Road (SH) along with both side approaches in the district of Balasore.
Road Safety Consultancy Services for the audit of Development, Construction & Post COD 2 years O&M period for the four laning of Kiratpur-Nerchowk Section of NH-21 from km 73.200 to km. 186.500 in the state of Himachal Pradesh to be executed as BOT (Toll) on DBFOT pattern under NHDP Phase-III
Road Safety Consultancy Services for the audit of Development, Construction & Post COD 2 years O&M period for the four laning of Jammu-Udhampur Section of NH-1A from km 15.00 to km 67.00 (length 64.58 km) in the state of Jammu & Kashmir to be executed under DBFO pattern.
Project in Punjab

4 Lane Bypass from Km 158.530 to 166.925 of NH-15 at Harike in Punjab State
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PROJECT TEAM
Department of Civil Engineering, TIET

Dr. Naveen Kwatra
Road Safety Auditor & Team Leader.
Professor, Structural Engineering

Dr. Prem Pal Bansal
Work Zone safety Auditor & Associate Professor,
Structural Engineering & Head, CED

Dr. Tanuj Chopra
Deputy Road Safety Auditor & Assistant Professor, Transportation Engineering

Prof. Rajesh Pathak
Traffic Planner & Tunnelling Expert, Associate Professor, Geotechnical Engineering
Safer Roads by Safety Audit

• It is a Formal Check
• Systematic and Evidence Based
• Auditors are Independent of Designers
• Safety Recommendations are set out in an Audit Reports
• Final decision regarding implementation of safety report rests with Project Director
Why Safety Audit?

- To minimize the risk and severity of accidents on the roads.
- To meet the needs and perceptions of all types of road users during the design stage itself.
- To ensure the workers' safety during the construction stage.
Why Safety Audit?

• To ensure the traffic management and safe working conditions.
• To ensure environmental safety of work zones and issues related to health of workers.
• To minimize the risk of accidents occurring on Project Highway and adjacent roads as a result of Construction, Operation and Maintenance.
• To ensure safe operations of plants, machinery, and equipment.
Road Safety Audit (RSA) basically comprises of three (3) Stages:

- **Stage 1** - Audit during design and planning. (Development Phase)
- **Stage 2** - Audit during Construction. (Construction Phase)
- **Stage 3** - Audit after the completion of the project. (Post COD, O&M Phase)
Safety Audit Procedure

1. Reconnaissance survey of Project Highway, Inception Report, Methodology, Training & Workshop
2. Project Data Collection
3. Pavement & Bridge Condition assessment
4. Assessing the documents
5. Inspecting the site
6. Preparation of safety audit report
7. Submission of safety audit report
8. Responding to the audit report
9. Implementing the agreed recommendations
10. Review of Previous Audit Report

Flowchart:
- Reconnaissance survey
- Project Data Collection
- Pavement & Bridge Condition assessment
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During Development Period:

• **Collection of data for all the accidents** in the project highway for preceding two years from Police Stations (Primary Source) or other secondary sources.

• **To perform the analysis of fatal and grievously injured accidents “to identify the black spots”** and relate to Accidents records with Traffic Volume to show trend as per Traffic Volume Count.

• **Carrying out a design stage Road Safety audit** as per the applicable manual, guidelines, standards and good industry practices; and prepare a draft Safety Report.

To review the comments from Concessionaire, Independent Engineer and NHAI on the draft Safety Report and furnish the Final Safety Report which inter-alia shall include costing of all the safety recommendations.
During Construction Period:

- To study the Safety Report of the development period and **provide a gap report** vis-à-vis what was given in Final Safety Report and Safety Report which was finally implemented.

- To **inspect the Project Highway Keeping into consideration the construction planning** for the project as prepared by the Concessionaire and then identified the safety implications of the construction planning.

- Carry out the **Safety Audit once in a Calendar Quarter**, till COD, to assess the adequacy of safety measures adopted and provided in construction zone(s).

- **Collect accident data (monthly)** from the Concessionaire/PD office/other secondary source and examine causes of fatal accidents including suggesting countermeasures.

- **Conduct Work Zone Safety Audit** for civil works, casting yards and stores as per Contract Agreement and submit quarterly safety report.
Documents used in the audit


ii) IRC:SP:55 “Guidelines on Safety in Road construction zones”

iii) IRC:SP:88-2010 “Manual on Road safety Audit”

iv) IRC:35 “Code of practice for Road Markings”

v) IS-4756 “Safety Code for tunnelling works”.

vi) BS-6164 “Code of Practice for Health and Safety in tunnelling in the construction industries”.

vii) Safety Manual NHAI

viii) Concession Agreement

ix) Inception report submitted to PIU, Concessionaire & IE by Thapar University, Patiala.

x) Other relevant IRC, IS & BS Codes as applicable
Implementation of 5 E’s of Road Safety

• Education
• Enforcement
• Engineering
• Environmental and Emergency Care
• Evaluation
Road Infrastructure

- *Road infrastructure development* is one of the major sectors contributing to the National economy. Maintaining these roads is one of the most important component of the entire road system and should not be neglected, particularly in developing countries like India.

- The magnitude of work involved in maintenance is very large but the funds available are not enough to meet the requirements. *The shortfall for maintenance funds is around 40%*. As per Vision 2021-IRC report, *the total replacement cost of the existing network is assessed to be about Rs 500,000 crore*. So these are huge national assets and maintenance of these roads is an economic necessity.

- *This creates the need to develop a comprehensive pavement maintenance decision support system which can suggest the optimum maintenance actions required and will also create safer road network as lack of maintenance is a major concern in road safety.*
GOOD ROADS ARE AN ASSET

AND

BAD ROADS A DEBT FOR THE NATION