Border Roads Organization (BRO) Training

Road Safety Audit

Approach
IRC: SP 88 - 2019

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Road Safety Basics

• Components
  • Human
  • Vehicle
  • Road

• Types
  • Road Safety Audit (RSA) is proactive
  • Crash investigation/blackspot analysis is reactive
What is RSA?

Assesses safety of ALL road users
(car drivers / passengers / pedestrians / bicyclists / motorcyclists / trucks / bus passengers / 3-wheelers / users of animal drawn vehicles)
RSA Benefits

- Reduced “whole of life cycle costs”
- Reduced risk of crash and its severity
- Enhanced attention to the safety needs of VRUs
- Lower costs for remedial work at black spots
- Reduced overall costs of road trauma
- Safer road networks developed
- Important contributor to meeting crash reduction targets
- Social benefits
Road Characteristics to Examine

• On road sections
  • Alignment
  • Cross section (carriageway and shoulders) homogeneity/discrepancies
  • Surfacing (carriageway and shoulders)
  • Signing, marking, road lighting
  • Occupation of roadsides
  • Possibility of moving obstacles

• At junctions: junction layout
  • Junction design for vehicle and pedestrians
  • Signage, traffic lights, lighting
  • Surfacing
• Road users adapt their behavior to the road they see and expect

• What road users do depends on what the designer puts in front of them.

• Two kinds of safety:
  • Nominal safety – roads built to satisfy at least the minimum design criteria may be referred to as 'nominally safe.
  • Substantive safety – is defined as the actual long-term or expected safety performance of a roadway
Auditor’s Role

• Put yourselves into the shoes of the future users of the road
• How will they use the new road?
• What safety problems may some of them encounter?
• Is the road nominally safe?
• Is the road substantively safe?
RSA Thinking-4
An RSA is

- A formal process (not just an informal check).
- Conducted by persons who are independent of the design
- Conducted by persons with appropriate qualifications, training, and experience
- An Assessment of road safety issues in
  - road design
  - a Traffic Management Plan for road works
  - a newly completed road scheme
  - identification of safety concerns on existing road
RSA is Not

- Just a check of compliance with standards
- A substitute for regular design checks
- A crash investigation
- An opportunity to re-design a project
- More detailed site inspection
- Assessment or rating a project as good or bad
Why do RSA?

- Reduced "whole of life cycle costs"
- Reduced risk of crash and its severity
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Ingredients of Good RSA

• Focus on road safety issues only
• More than compliance check with standards
• Consider needs of all road users in all weather and lighting conditions
• Thorough and practical in findings
• Cost matters: road authority to decide justification of investment
• Produce audit report promptly – usually within four weeks of the audit inspection
Audit Stages

- Stage 1: Feasibility Stage/Preliminary Design Stage
- Stage 2: Detailed Design Stage
- Stage 3: Construction Stage
- Stage 4: Pre – Opening Stage
- Stage 5: Safety Audit of Existing Roads
RSA Objectives

• Primary
  • Minimize risk of crashes
  • Minimize severity of crashes

• Secondary Objectives
  • Minimize risk of crashes on adjacent roads (at intersections)
  • Importance of safety in road design
  • Needs and perceptions of all road users are met
  • Achieve a balance between needs where they may be in conflict
  • Reduce long term costs
  • Awareness of road safety engineering principles in process of planning, designing, constructing, operating, managing and maintaining roads and highways
  • Awareness of providing safe road schemes for non-motorized as well as motorized road users
RSA Principles

• Adaptation of road design and features to vehicle dynamics and to pedestrian movements
  • Horizontal alignment, superelevation
  • Roadsides, space sharing
  • Road surfacing
  • Junction design

• Error and conflict avoidance
  • Speed control
    • Avoidance of the need for abrupt changes of speeds
    • Modulation of desired speeds according to traffic mix
    • Adaptation of road design and features to desired speeds of vehicles

• Facilitation of emergency maneuvers and of recovery after loss of control
  • Road Surfacing
  • Roadside (clear zone, crash barrier)
## RSA Steps

<table>
<thead>
<tr>
<th>RSA STEPS</th>
<th>RESPONSIBILITY</th>
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<tbody>
<tr>
<td>1  Determine needs for RSA</td>
<td>Road Authority</td>
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<td>2  Select a Team Leader, who then selects the audit team</td>
<td>PM of Road Authority and RSA Team Leader</td>
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<td>3  Provide information to Team Leader</td>
<td>Designer (via Project Manager)</td>
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<td>4  Commencement meeting – outline project and discuss audit ahead</td>
<td>PM (plus Designer) and RSA Team Leader</td>
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<td>5  Assess drawings and design reports (“desktop” audit)</td>
<td>Audit Team</td>
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## RSA Steps (Contd.)

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<thead>
<tr>
<th>RSA STEPS</th>
<th>RESPONSIBILITY</th>
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<tbody>
<tr>
<td>6 Inspect site – day + night</td>
<td>Audit Team</td>
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<tr>
<td>7 Write audit report, submit to PM</td>
<td>Team Leader with audit team</td>
</tr>
<tr>
<td>8 Completion meeting – discuss key safety issues and clarify outstanding matters</td>
<td>PM (plus Designer) and RSA Team Leader</td>
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<tr>
<td>9 Response on the Audit report</td>
<td>PM/Road Authority</td>
</tr>
<tr>
<td>10 Follow-up-implement all agreed recommendations</td>
<td>PM and Designer</td>
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At Least Seven Killed, 12 Injured As Bus Rolls Down Hill in Himachal Pradesh

India News | Edited by Swati Bhushan | Sunday May 13, 2018

At least seven people were killed and 12 were injured today when a private bus they were travelling in fell into a gorge near Nai Neti panchayat on Solan-Raigarh road, about 70 km from Shimla.

www.ndtv.com

Meghalaya Truck Accident: At Least 16 Killed, 50 Injured

India News | Reported by Ratnadip Choudhury, Edited by Parmeshwar Bawa | Sunday February 26, 2017

At least 16 people were killed on Sunday when a truck they were in rammed into the concrete barricade of a road in Meghalaya’s West Khasi Hills district, police said. More than 50 people were critically injured in the accident in Jochkoh village, 11 km from Nongstoin, the district headquarters of West Khasi Hills.

www.ndtv.com
DAD, WHAT CAUSES WIND?

TREES SNEEZING.

REALLY?? NO, BUT THE TRUTH IS MORE COMPLICATED.

Thank you