Background
Road Safety – A New Decade of Action

GLOBAL PLAN
DECADE OF ACTION FOR ROAD SAFETY
2021-2030

The Global Plan describes what is needed to achieve the target, and calls on governments & partners to implement an integrated SAFE SYSTEM APPROACH

WHAT TO DO?

HOW TO DO IT?

WHO TO DO IT?

By at least 50% during that period

Your Learning Journey

Road Safety

Design Stage Audit

Urban Audit

Hill Road Audit

Work Zone Audit

Approach to Safety Audit

Construction & Implementation

Tunnels

Ground Levels

Casual Effects

Trestles

Case Studies

Roads

Landscapes

Accidents

Data Analysis

Incidents

Investigations

Backups

Remedial Measure

Crash Modeling

Integrating Intelligent Transportation Systems (ITS)

Safety & ITS

Vehicle Restraint Systems

Technology

Engineering

Road Safety Strategies

Road Safety Plans

Empowerment & Outreach

Law Enforcement & Road Safety

VR and Other Alcohol-Reducing Safety

Pre-Hospital & Trauma Care

International Scenarios

Impact Scenarios

Safety Companion

Safety Actors

Roads & Markets

Ways & Traffic Carrying

Work Zone Safety

Enforcement & Road Safety

Safety in Traffic Design

Safety in Infrastructure Design

Roadside Hazard Management

Traffic & Road Safety

Introduction to Intelligent Transportation Systems (ITS)
Road Safety Engineering

- Road safety engineering encompasses various aspects of road design, traffic management, and safety measures aimed at preventing crashes, minimizing injuries, and saving lives.
- Key components include:
  - **Road Design**: Designing roads and highways with considerations for safety features such as lane markings, signage, visibility, alignment, and geometric design to reduce the likelihood of accidents.
  - **Intersection and Interchange Design**: Designing intersections and interchanges to facilitate safe and efficient traffic flow, including the use of traffic signals, roundabouts, and advanced intersection designs to minimize conflicts and improve safety.
  - **Traffic Control Devices**: Installing and maintaining traffic control devices such as signs, signals, pavement markings, and traffic calming measures to provide clear guidance to drivers and pedestrians and improve overall safety.
  - **Roadside Safety Features**: Implementing roadside safety features such as guardrails, crash cushions, and clear zones to mitigate the severity of crashes and protect motorists from roadside hazards.
  - **Vulnerable Road User Safety**: Designing roads with considerations for the safety of pedestrians, cyclists, and other vulnerable road users by providing dedicated facilities such as sidewalks, crosswalks, bike lanes, and pedestrian crossings.
  - **Speed Management**: Implementing measures to manage vehicle speeds, including speed limits, speed humps, speed enforcement, and roadway design features that encourage compliance with speed limits.
  - **Road Safety Audits**: Conducting comprehensive road safety audits to identify potential hazards and recommend safety improvements in existing road infrastructure.
  - **Blackspot Analysis**: Identifying high-risk locations on roads using crash data to prioritize safety interventions and reduce accidents effectively.

Blackspot Definitions

- Road Accident Black spot is a stretch of National Highway of about **500 m** in length in which either **5 road accidents (involving fatalities/grievous injuries)** or **10 fatalities** took place during the last **3 calendar years**.
- Blackspot is defined as a road section of **500 m** length or junction that has the number of road crashes higher than the **Average Annual Total crashes (AATC)** computed for candidate road section / network considering in study. More precisely, blackspot is a road section of 300-500m length that has an abnormally high number of road crashes showing a pattern of crash types due to some underlying local risk factors.
  - IRC 131-2022: Guidelines for Identifying and Treating Blackspots Clause: 4.3
Questions

• Is Road Safety Audit only to address blackspot analysis?
RSA Because...

What is RSA?

- Independent Team of Auditors
- Qualified Systematic Detailed
- Formal Examination
- Report of potential safety concerns in project
RSA Benefits

1. Reduced “whole of life cycle costs”
2. Reduced risk of crash and its severity
3. Enhanced attention to the safety needs of VRUs
4. Lower costs for remedial work at black spots
5. Reduced overall costs of road trauma
6. Safer road networks developed
7. Important contributor to meeting crash reduction targets
8. 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
Standards Compliance and Road Safety

- 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?
Visuals
Road Safety Audit (RSA)

RSA Thinking-1
RSA Process

Road Safety Audit (RSA)

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
- 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
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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

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<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 (&quot;desktop&quot; audit)</td>
<td>Audit Team</td>
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### RSA Steps (Contd.)

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<th>RESPONSIBILITY</th>
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<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>
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<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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<td>9  Response on the Audit report</td>
<td>PM/Road Authority</td>
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<tr>
<td>10 Follow-up-implement all agreed recommendations</td>
<td>PM and Designer</td>
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Audit Report Links


Closing thoughts

At Least Seven Killed, 12 Injured As Bus Rolls Down Hill In Himachal Pradesh

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 Nitti panchayat on Solan-Ragah road, about 70 km from Shimla.

Meghalaya Truck Accident: At Least 16 Killed, 50 Injured

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 Jhalor village, 11 km from Nongstoin, the district headquarters of West Khasi Hills.
Thank you!

Road Safety Basics

- **Components**
  - Human
  - Vehicle
  - Road

- **Types**
  - Road Safety Audit (RSA) is proactive
  - Crash investigation/blackspot analysis is reactive