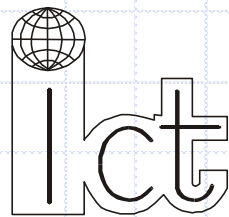


**Road Safety Week 2023 (11<sup>th</sup> – 17<sup>th</sup> January 2023)**

**Conference on  
Fast Tracking Road Safety Through 5Es**

**Capacity Building for Road Safety  
Audit in All Stages of Road  
Development & Operation**



**Prof. P. K. Sikdar  
Advisor, IRF (India Chapter)  
President, ICT Pvt. Ltd.**



**First About  
What is..**

**Road Safety Audit**

**Road Safety Audit (RSA) is the standard method to ensure safety of all road users on a road/highway**

**ROAD SAFETY AUDIT is  
“Safety Insurance”  
of the roads**

**Road Safety Audit (RSA) is a formal examination of an existing or a new road or a traffic project for the accident potential and safety performance**

IRC:SP:88-2019

MANUAL  
ON  
ROAD SAFETY AUDIT

*(First Revision)*



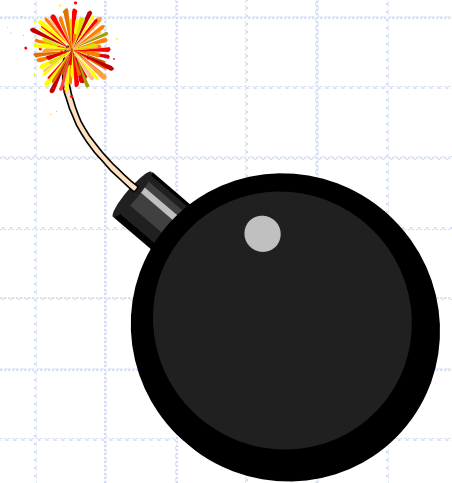
INDIAN ROADS CONGRESS  
2019

**Road Safety  
Audit  
Manual  
IRC:SP:88**

# Underlying Concepts

**Diffuse the  
Time Bomb**

- **Prevention is better than cure**
  - **Less trauma**
  - **Less money for treatments**
- **Drive, Ride, Walk in Safety**
  - **Less accident costs over whole economic life of project**

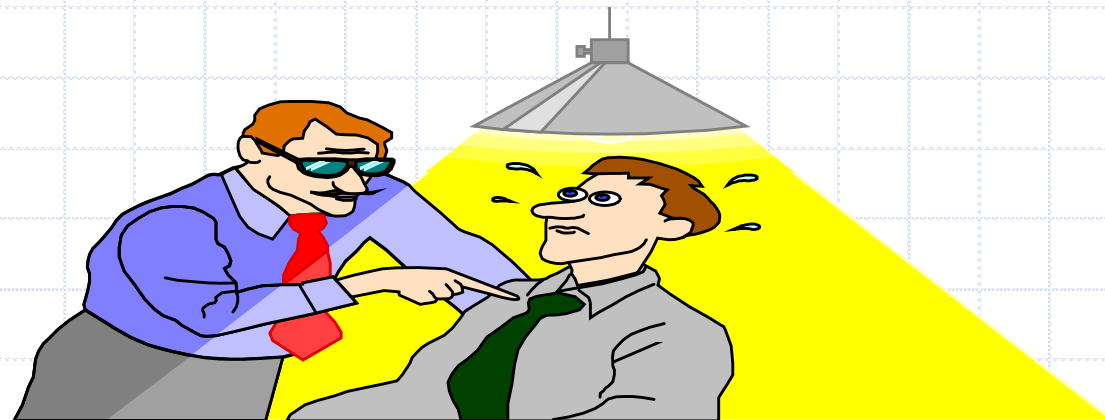


# Why Audit ??

SCCoRS directed that every road 5km or more must be audited at every stage of its development/upgradation

# Other reasons for Why Audit ?

- Inappropriate or outdated standards may be used;
- Standards are the minimum requirements; Safety often needs more than that;
- Combination of diverse elements in the design may yield a result that not the best in safety
- There is pressure to increase capacity of the road versus safety, and in each case safety is sacrificed
- Changes are made during construction that do not consider operational safety factors



# 2<sup>nd</sup> Decade of Action for Road Safety

UN General Assembly Resolution 74/299 declared a **Decade of Action for Road Safety 2021-2030**, with the target to reduce road traffic deaths & injuries

**BY AT  
LEAST**

**50%**

during that  
period

**2021-2030**

**India is signatory to this  
resolution..**



# **RSA identifies the deficiencies of road with respect to safety**

- ❑ Mistakes in design and detailing**
- ❑ Lack of attention to detail**
- ❑ Lack of understanding of safety issues**
- ❑ Interaction of design elements**
- ❑ Poor provision for vulnerable road users**
- ❑ Poor or misleading design**

**BUT, this is not anybody's job... needs special skill**

# Who Should Carry Out Road Safety Audit ?

- Must be independent of the design team
- **Team of at least two people**
- At least one safety engineering “expert”
- Others
  - Highway engineers
  - Road safety education specialist
  - Traffic police
  - Maintenance specialist

## **How an auditor is to be prepared/created/developed ...**

**Stage 1: Preferably a Civil Engineer (Others also can be trained, if interested and committed for the job)**

**Stage 2: Traffic & Transportation Engineering -Expertise to be developed)**

**Stage 3: Trained in Road Safety Engineering**

**Stage 4: Trained in Road Safety Audit**

# IRC Codes/Manuals Related to Road Safety

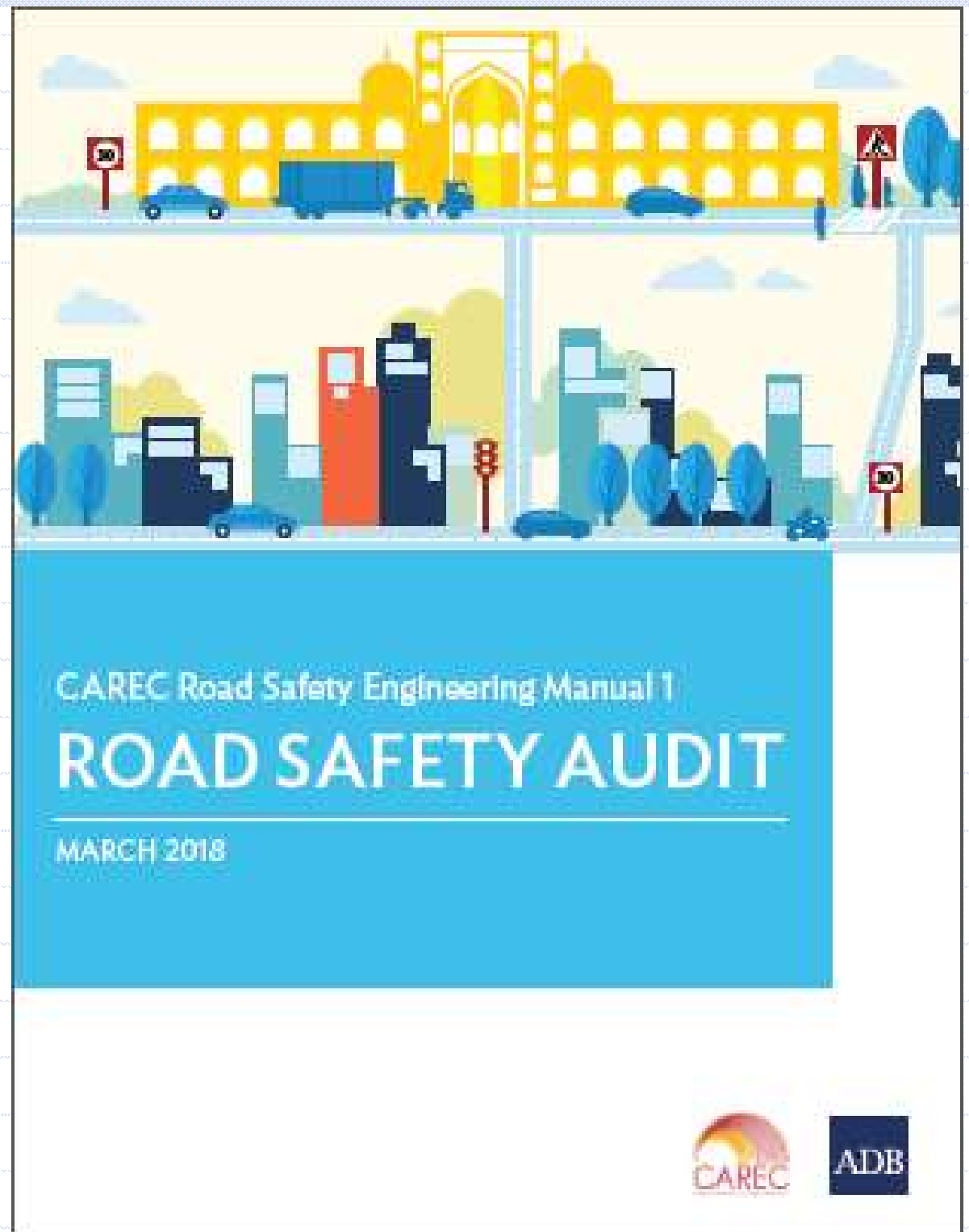
## A. Road Safety Audit Manual

- **IRC:SP:88-2019**-Manual on Road Safety Audit  
(First Revision of the Code is Published September 2019).

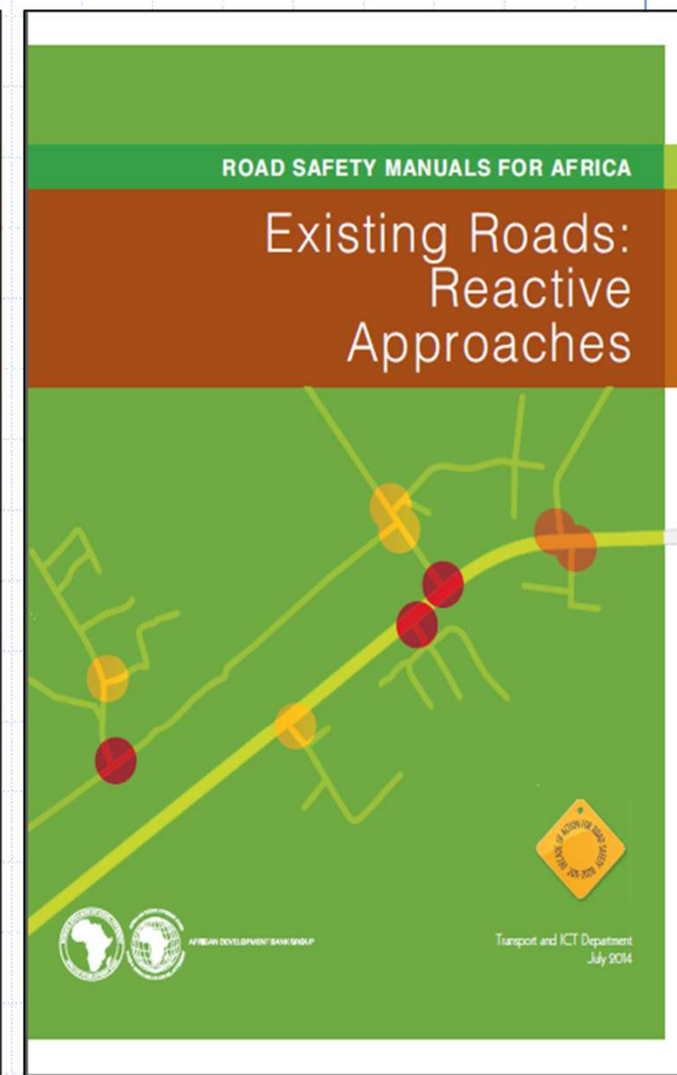
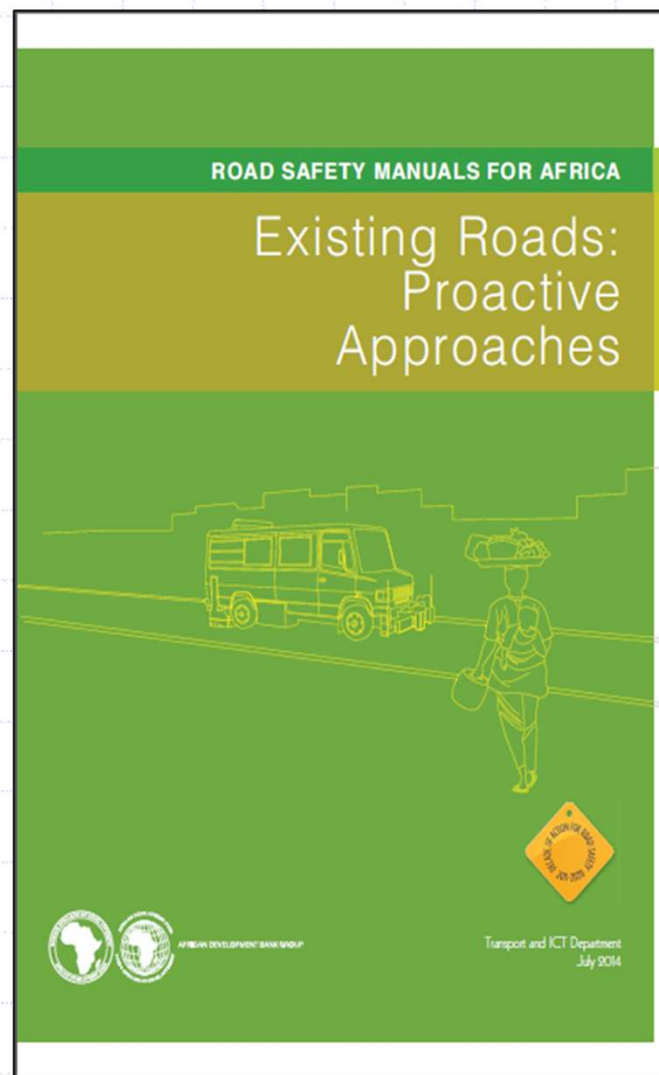
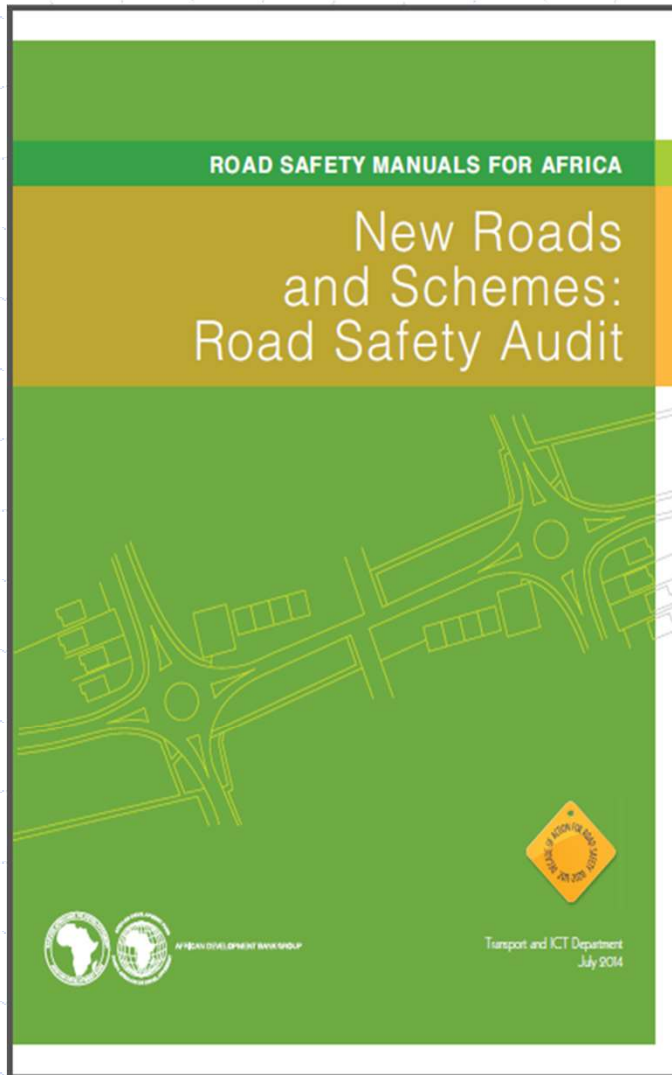
## B. Other Safety Related Codes/Manuals

- **IRC: SP:55-2014**-Guidelines on Traffic Management in Work Zones (First Revision)
- **IRC:67-2012**-Code of Practice for Road Signs (Third Revision)
- **IRC:35-2015**-Code of Practice for Road Markings (Second Revision)
- **IRC:99-2018**-Guidelines for Traffic Calming Measures in Urban and Rural Areas
- **IRC:103-2012**-Guidelines for Pedestrian Facilities (First Revision)
- **IRC:SP:41-1994**-Guidelines on Design of At-Grade Intersections in Rural & Urban Areas (**Better DO NOT USE this guidelines**)
- MoRTH-Type Designs for Intersections on National Highways, 1995
- **IRC:SP:44-1996**-Highway Safety Code
- **IRC:SP:73-2018**-Manual of Specifications & Standards for Two Laning of Highways with paved shoulder (First Revision)
- **IRC:SP:84-2019**-Manual of Specifications & Standards for Four Laning of Highways Through Public Private Partnership (First Revision)
- **IRC:SP:87-2019**-Manual of Specifications & Standards for Six Laning of Highways Through Public Private Partnership (First Revision)

# CAREC Road Safety Audit Manual



# AfDB Manuals for Road Safety (2015)



[http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ROAD\\_SAFETY\\_MANUALS\\_FOR\\_AFRICA\\_-\\_New\\_Roads\\_and\\_Schemes\\_Road\\_Safety\\_Audit.pdf](http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ROAD_SAFETY_MANUALS_FOR_AFRICA_-_New_Roads_and_Schemes_Road_Safety_Audit.pdf)

[http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ROAD\\_SAFETY\\_MANUALS\\_FOR\\_AFRICA\\_-\\_Existing\\_Roads\\_Proactive\\_Approaches.pdf](http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ROAD_SAFETY_MANUALS_FOR_AFRICA_-_Existing_Roads_Proactive_Approaches.pdf)

[https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ROAD\\_SAFETY\\_MANUALS\\_FOR\\_AFRICA\\_%E2%80%93\\_Existing\\_Roads\\_Reactive\\_Approaches.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ROAD_SAFETY_MANUALS_FOR_AFRICA_%E2%80%93_Existing_Roads_Reactive_Approaches.pdf)



<http://roadsafety.piarc.org/en>

n

**ROAD SAFETY MANUAL**  
A MANUAL FOR PRACTITIONERS AND DECISION MAKERS  
ON IMPLEMENTING SAFE SYSTEM INFRASTRUCTURE

INTRODUCTION

STRATEGIC GLOBAL  
PERSPECTIVE

ROAD SAFETY  
MANAGEMENT

PLANNING, DESIGN &  
OPERATION

TOOLS



## WELCOME TO THIS WORLD ROAD ASSOCIATION GUIDE

**THE NEW ROAD SAFETY MANUAL (RSM) IS DESIGNED TO HELP COUNTRIES AT EVERY STAGE OF INFRASTRUCTURE DEVELOPMENT TO FULFILL ROAD SAFETY OBJECTIVES.**

It is aligned with key pillars for the [United Nations Decade of Action for Road Safety 2011-2020](#):

- **Pillar 1:** Road Safety Management;
- **Pillar 2:** Safer Roads and Mobility;
- **Pillar 4:** Safer Road Users.

This comprehensive resource builds on the broad range of knowledge and experience provided by PIARC in the [first edition](#). It includes new thinking on road safety and offers a clear argument on why adopting a Safe System approach is crucial for your country.

The Safe System approach aims for a more forgiving road system that takes human fallibility and vulnerability into account. Under the Safe System approach, everyone (public agencies, automobile manufacturers, road users, enforcement officials, and others) must share the responsibility for road safety outcomes.

**The manual is split into three parts and can be downloaded in chapters.**

Key principles for each of the topics are included and discussed in the sections, with case studies and links to detailed technical material and other references.

**ARE YOU A RESEARCHER,  
A STUDENT OR A  
PROFESSIONAL?**

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# NCHRP

SYNTHESIS 336

NATIONAL  
COOPERATIVE  
HIGHWAY  
RESEARCH  
PROGRAM

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## Road Safety Audits

*A Synthesis of Highway Practice*

TRANSPORTATION RESEARCH BOARD  
OF THE NATIONAL ACADEMIES

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**Huge Road Development Programme  
in the country since last two decades**

**But, there were many  
Miscarriages of Road Safety  
Audit or No Audit in our  
Network**

**Road network has become second largest  
with > 6 million kilometres of roads in India.  
But, road deaths continue to rise year after  
year : more than 150,000 every year**



# Intersection of village road not designed for proper geometry



# Geometry deficiency for a high speed road



# Unsafe Geometry & Entry from Service Road



# Unsafe Approach of Grade Separation



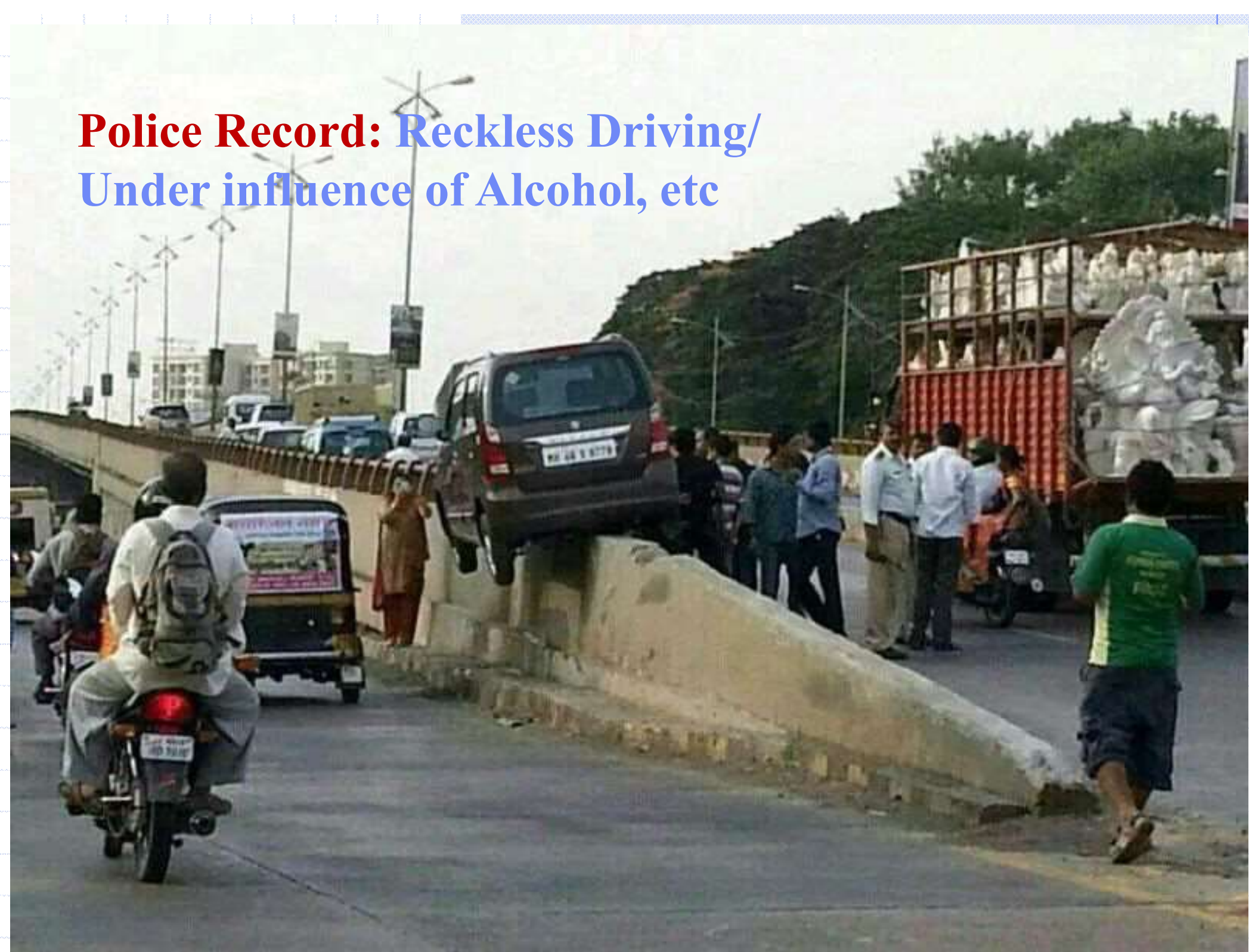
# Unprotected higher carriageway



# Unsafe Junction



**Police Record: Reckless Driving/  
Under influence of Alcohol, etc**



**Beautiful, but with serious safety issues**





# Beautiful, but with serious safety issues





Bad Alignment of high-speed 4-lane highway

# **Incorrect channelization....**



Figure 6.1



**Surya River Bridge**

Figure 6.2



**Surya River Bridge**

# Stages of Road Safety Audit

- **Feasibility/Preliminary Design Stage**
  - Concept, Route/alignment options, standards, impact on network, no. of intersections
- **Draft Design Stage**
  - Layout, geometrics (hor. & vert.), land implications, concept of sign and markings
- **Detailed Design Stage**
  - Geometrics, intersections, signs, markings, lighting, signals, intersection details, impact protection
- **Pre-opening Stage**
  - Drive/cycle/walk/ride, in day/night, effectiveness of sign/markings, landscaping, crash protection, readability of the road as user
- **Existing Roads**
  - Safety hazards identification to prevent accidents

# Programming of Audit Stages

Stage	F (Feasibility)	Draft Design	F/ Draft Design	Detail Design	Draft Design / Detail Design	Const.	Pre-opening
Scheme							
Major Highway Schemes	*	*		*		*	*
Minor Highway Schemes		*		*			*
Traffic Management / Traffic calming			*	*			*
Accident Remedial Schemes					*		*
Major Maintenance Schemes			*	*			*
Major Development Schemes	*	*		*			*
Expressways	*	*		*		*	*
Temporary Traffic Management of Major Schemes					*	*	

# **Why...?**

## **Capacity Development for Road Safety Audit**

**Most Road Authorities do not have capacity & skill for this task. Also, to be really useful, it has to be done by independent auditor(s).**



# Shortage of Trained/Experienced Road Safety Auditors in India

- LAHE could produce about 80 certified Road Safety Auditors by imparting 6-week Road Safety Engg. & Audit Training.
- IRF (India Chapter) & Australian Road Research Board (ARRB) with CRRI could train about 300 Road Safety Auditors through 5-days Road Safety Audit Training.
- CRRI/IIT-Delhi also imparted training and could produce large number of qualified Road Safety Auditors.
- Unfortunately, about 50% of above trained Road Safety Auditors have not pursued their career in Road Safety. Further, only a limited number is found to do this job passionately.
- Now, a 2-Weeks Course (**with common content**), imparted by CRRI, IITs, NITs, etc for Certified Road Safety Auditors.
- There is no Accreditation System yet, and this pool of certified Auditors are used for all audits.

# Accreditation System- Worldwide

- To effectively coordinate road safety auditing in Western Australia, the Institute of Public Works Engineering Australasia – Western Australia (IPWEA WA) and Main Roads WA (MRWA) signed an agreement on 22nd December 2016.
- Two levels of Accreditation:
  - Primary Stage of Accreditation- Road Safety Auditor
  - Advanced Stage of Accreditation- Senior Road Safety Auditor
- **Road Safety Auditor Requirements- for the highly professional work.**
- Senior Road Safety Auditors must lead the team at least TWO road safety audits over TWO years to maintain accreditation as a Senior Road Safety Auditor.
- All Senior Road Safety Auditors must also ensure they register their audits to remain accredited.
- Similarly Road Safety Auditors are required to be team members on at least TWO audits over two years to maintain their accreditation.
- Audit team members must also ensure their audits are registered to remain accredited. Auditors who do not maintain their accreditation will be removed from the list.
- Source: [www.road-safety-audit-wa.org](http://www.road-safety-audit-wa.org)

# Accreditation System- Worldwide- Contd.

- **The European Union has an accreditation system,** which is required for auditors working on the Trans-Europe highway network, including safety inspections (i.e. What they are now calling audits of existing roads)
- **New Zealand has training but no accreditation,** just a register and that is pretty informal and incomplete.
- **India...ARRB & IRF (IC) have provided many courses in association with CRRI, but there are other providers of training and the Indian Roads Congress was asked to prepare a national training curriculum, which you are undergoing...but there is much to do yet.**
- **Thus, Some Training is happening in India, but there is nothing that provides formal accreditation till date.**

# Accreditation System- Worldwide- Contd.

- South Africa (SoRSA) has no greater official government recognition as a RSA training and accreditation 'body' as anyone else, but SoRSA probably has the most organised process and system in place. (Society of Road Safety Auditors)
- ARRB is a training provider and is not an accreditation authority, ARRB does administer the VicRoads RSA registration database. Western Australia, Queensland and NSW all have registration databases, which provide a de-facto accreditation.
- UAE has a RSA Manual, but they neither have any registration and nor accreditation.
- The USA has training, but it falls a long-way short compared to Australia and UK.

# South Africa - Minimum requirement for Road Safety Auditor

- The Audit Team Leader must:
  - **Be a Registered Professional Engineer** or Professional Engineering Technologist with the Engineering Council of South Africa (ECSA), and
  - **Have at least 10 years of experience** in Road Safety Design and/or Traffic and Transportation Engineering and/or Geometric Design; and
  - **Have successfully completed a recognized Road Safety Audit course** to the equivalent of at least 5 **CPD** points/credits.
- The **curriculum must contain** the following 4 Modules
  - Road Safety Legal Issues, Legislation and Policy
  - Collision Investigation
  - Road Safety Audit
  - Road Safety Engineering/Road Design
- Must have undertaken **at least 2 formal road safety audits** within a period of two years as the Audit Team Leader or Audit Team member.

**CPD=Continuing Professional Development**

**Above all...**

# **Road Safety Audit**

## **Needs:**

- management commitment
- an agreed process/procedure
- an independent, experienced audit team

**Conscious demand for Audit and respect for the audit recommendations required in Road Authorities uniformly.**

With reasons of **insufficient funds**, nothing gets done..

**Everyone must be safe on road...**



**Thank You**

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