Road Safety Inspections

Phil Allan

- Government of South Australia
- Executive Director Road Safety
- Phil.Allan@saugov.sa.gov.au

Definition

A Road Safety Inspection (RSI) is:

- An on-site systematic review conducted by a Road Safety Expert
- Conducted on an existing road or section of road
- Aimed at identifying hazardous conditions, faults and deficiencies that may lead to serious accidents

Important Points

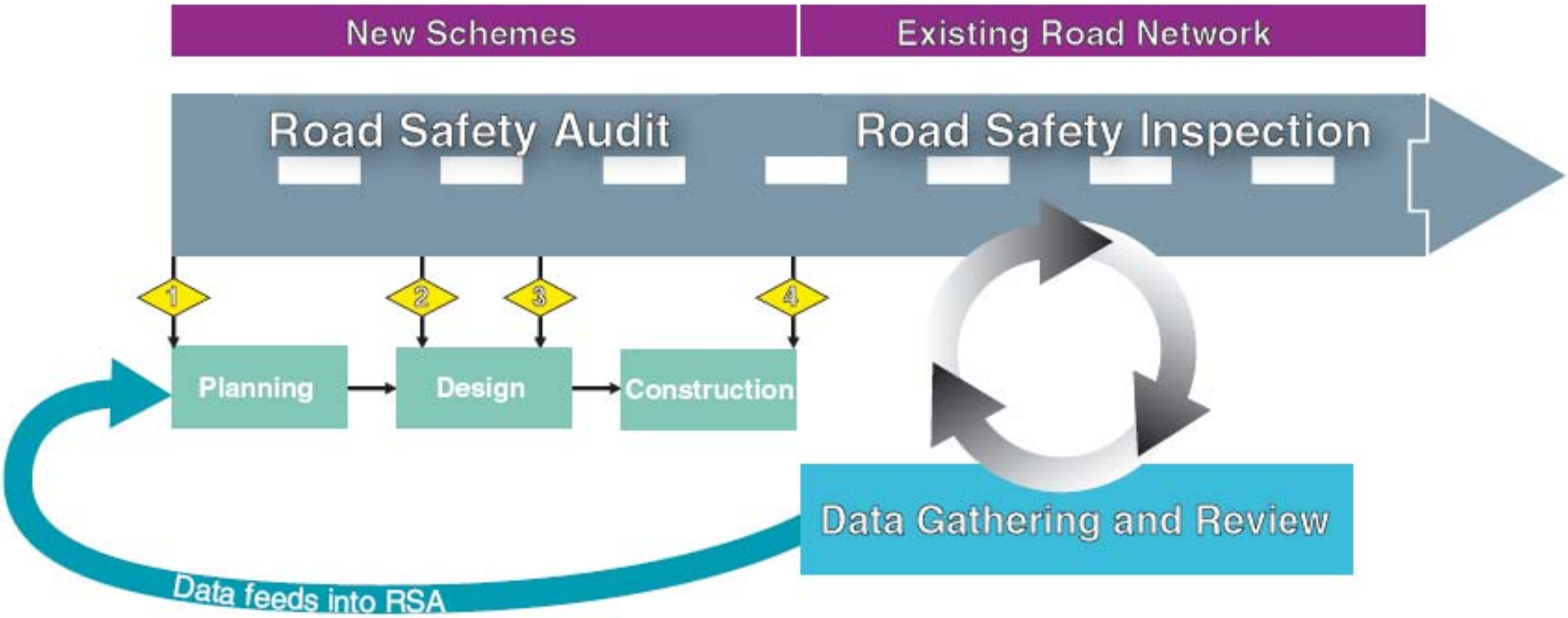
- RSIs focus on existing roads and roadsides and what influence or impact they might have in relation to an accident
- RSIs are systematic – need to be comprehensive, detailed and methodical (check lists)
- RSIs need to be carried out by an independent person or team with experience in areas such as road safety, traffic engineering, road user behaviour or road design
- RSIs do NOT require accident data
- RSIs are not directly related to routine maintenance
- RSIs aim to identify any features that may lead to future accidents, so that remedial treatment may be implemented before accidents happen

Important Points

➔RSIs have the following benefits:

- Identification of types of features that exist across the network for ‘mass-action’
- To specifically address safety, rather than relying on routine maintenance
- To provide a comprehensive overview of safety issues along a certain road

Process


New Schemes
Existing Road Network
Road Safety Audit
Road Safety Inspection
1
2
3
4
Planning
Design
Construction
Data Gathering and Review
Data feeds into RSA

What should be looked at?

Function

- Role
- Traffic Mix
- Traffic Volume
- Speed Zones

What should be looked at?

- Cross section - surface conditions, drainage, shoulder, median
- Alignment – curves, consistent design, hills, speed limit
- Intersections – junctions, traffic signals, accesses, interchanges, railway crossings
- Service and rest areas – petrol stations, shopping facilities and parking places, loading/delivery areas, public transport

What should be looked at?

- Needs of vulnerable road users – motorcyclists, pedestrians and cyclists
- Traffic signing, markings, lighting – speed limit and other signage, visibility, edge lining
- Roadside features and passive safety installations – slopes, trees, civil engineering structures, drainage ditches and other obstacles, clear zones, guardrail

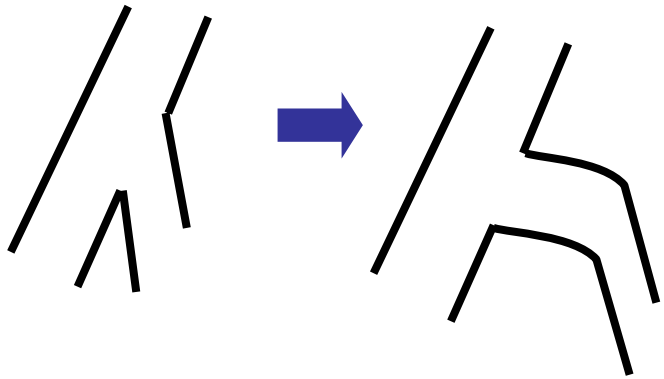
A variety of issues should be checked:

- Inspections should be regular (timing not fixed)
- Inspections are not related to routine maintenance
- Inspections should be conducted at night as well as during the day, possibly at various times of day (e.g. re sun glare) and possibly in winter and summer

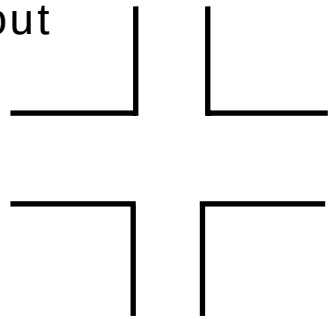
Why do inspections?

It can reduce the potential or the actual number of accidents at intersections, for example:

- changing an intersection from a Y junction to a T junction



- Changing a cross road to a roundabout



Why do inspections?

It can reduce the potential or actual number of head on collisions, for example:

- Wire rope barriers
- Audio tactile markings
- Coloured central medians

Why do inspections?

It can reduce the potential or actual number of accidents for vulnerable road users, for example:

- Pedestrians
- Cyclists
- Mopeds

Why do inspections?

It can reduce the potential or actual number of accidents involving roadside Hazards, for example:

- ➔ Removal
- ➔ Protection

The procedure for a Road Safety Inspection

1. Preparation of the field study in the office
2. The field study itself focusing on completing the check list
3. The RSI report
4. Remedial measures and follow up

1. Office Work

Preparation for the Field Study

General project data

- Road function
- Traffic situation
- Road standard
- Surroundings
- Video or pictures of the road is an option

Preparation

- The field study – necessary equipment
- Check lists/Investigation form

1. Preparatory work in Office

Road Function

- Describe the function of the road
  - Is it a national, regional or local road?
- What kind of vehicle traffic uses this road?
  - Is it long or short distance traffic
  - Is there a mixture of traffic e.g is it a school bus route?
  - Is the road part of a major traffic route?
- What about heavy vehicle traffic?
  - Is the proportion more or less than average?
  - Is it a freight route?
- Do vulnerable road users such as pedestrians or cyclists use the road?
- Describe the surroundings in general.
  - Is the road situated in a rural, sub-urban or urban area?
- If the road passes through agricultural areas, there are probably many slow moving vehicles that use the road.

1. Preparatory work in Office

Traffic Situation

- Determine the traffic volume
- Detemine the traffic growth during the last 5 years
- Determine the composition of the traffic
  - The proportion of private cars, buses and trucks
- Is the traffic volume expected to change in the future?

1. Preparatory work in Office

Road Standard

➔ Describe the road standard and include comments on:

- Road function
- Traffic volume
- Types of junctions
- Types of intersections
- Speed limits etc.
- Alignment/geometry

➔ Analyse the speed limits

- Are they suitable for built up areas?
- Are there vulnerable road users?
- Are children, elderly and disabled frequent users?
- Does it match the alignment of the road?

1. Preparatory work in Office

Surroundings

- Describe the surroundings
  - Is it rural, urban or sububan?
- What kind of surroundings are there?
  - Forest
  - Agricultural
  - Built up
  - Combination of the above
- In built up areas, describe in detail if it is industrial, shopping or residential
- Are there facilities that generate heavy traffic?
- Has there been any change of land use?
- Does the road pass through any towns or villages?

2. Field Study

What to take on the field study:

- Equipment
  - Safety Vest (reflecting)
  - Spirit Level, tape measure, stopwatch
  - Digital or video camera
  - Road map
  - Passenger car (flashing light/warning triangle)
  - Check lists
  - Office work outcomes

- The inspection should be led by a trained person with a background in traffic engineering and road design, who can bring in experts with a knowledge of guidelines and regulations about traffic, signs etc as necessary. Must have strong communication skills

3. Checklists

There will be different checklists for different types of roads – urban, inter-urban and motorways

Characteristic	No.	Question	Yes (√) No (X)	Comments
1. Function, operating elements and surrounding	0	Have eventual audit results from previous audit phase been taken into consideration?		
	1	Are there findings on the accident situation?		
	2	Are there specific traffic composition characteristics to be taken into consideration?		
	3	Are special measures required for particular groups e.g. for young people, older people, sick people, physically handicapped, hearing-impaired or blind people?		

3. Checklists

73 Lighting	1	Is the road sufficiently illuminated?		
	2	Is the stationary lighting appropriate?		
	3	Is the lighting of special situations (transition zones, changes in cross section) suitably designed?		
	4	Do remaining unlit areas present potential problems?		
	7	Does the existing road lighting lead to conflicts in recognizing the yellow indication (sodium discharge lamps)?		
	9	Does lighting need to be changed so that crossing pedestrians are clearly visible?		
	9	Is contrast lighting required at the intersection?		
	10	Does the ambient lighting present any special requirements?		
	11	Can the stationary lighting cause problems in recognizing the traffic signs or the alignment of the road?		
	12	Are the lighting masts situated outside of the safety zone or properly protected?		
	13	Is stationary lighting at intersections/service and rest areas properly situated?		
	14	In the areas where is no stationary lighting, are there any potential dangers?		

Main topics of the checklist

- Function
- Cross section
- Alignment
- Intersections, Junctions, Traffic Signals, Railway Crossings
- Service and rest areas (petrol stations, restaurants, shopping facilities, parking places etc.)
- Needs of pedestrian and cyclists (extra footpaths and crossings)
- Traffic signing, Markings, Lighting
- Road side features and Passive safety installations (including slopes, plantings, civil engineering structures, drainage ditches and other obstacles)

4. RSI - Report

- The Road Safety Inspection report is the official document in which the result of the inspection is collected

- Usually there are three parts in the report:

  - PART A – general information about the road section

  - PART B – Investigation form with the deficiencies

  - PART C – Suggestions for countermeasures

- Appendix with maps, photos and illustrations

4. RSI - Report

➔PART A

- Outline the activities that have been undertaken
- A general description of the road or road section including the traffic situation (for example traffic volumes, composition of the traffic volumes)

4. RSI - Report

➔PART B

- Will describe the deficiencies which were found and an assessment of the safety deficiencies
- It will contain the completed investigation form and the documentation with pictures
- Accurate location of deficiencies is critical

RESULT OF ROAD SAFETY INSPECTION ON 4th July 2006 ON THE NATIONAL ROAD 20B FROM KM 229 TO KM 234	
Length	11 km
Speed limit	-40km/h: in the urban area, village and town. -60km/h outside the village and town
1 Function and surrounding	-National road -Long traffic transportation, mixed functions -About 20% of the inspected area is surrounded by linear settlements; the -rest of 80% is the mountainous area with pine-tree and fruit-tree forests. -There are many private accesses outside the build up areas. -- At the transitions from the interurban area to the urban area there is no speed limit by signings, etc.
2 Cross section	-The cross section is suitable to the traffic volumes on the whole road section. -The width of the two main carriageway is 2 x 3m = 6m with bituminous concrete pavement, the shoulders of 2 x 1m of asphalt and 2 x 0.5m graded aggregate -There is no separation lane between the motorized and non–motorized traffic. -There are markings of edge lanes but they are insufficient and at some places they are heavily damaged. -At several dangerous positions, there are crash barriers and guardrails. -There are guardrails and curb stones for the protection of landslide on the slope. -The drainage system is not sufficient at some places. -There are some crossing culverts. -The road surface is not sufficient at some locations especially the edge of the is not constructed stable enough so at some places they are heavily damaged,
3. Alignment	-The visibility on the whole route seems to be clear enough but at some places it is obstructed by the architecture and some greenery so sight distance is not sufficient at some sections. -The possibilities for overtaking are suitable with the cross section of 6m wide

4. RSI - Report

➔ PART C – will contain proposals for:

- **Short term measures**
  - for immediate improvement of the situation
- **Medium term measures**
  - for smaller investments or maintenance measures
- **Long term measures**
  - for larger investments

➔ Catalogue of potential countermeasure will help

Note: Cost may be an issue but remedial works should be prioritised according to risk

Example from Greece

- Most intersections in the **western part** are not designed properly with left turn lanes and some are not perpendicular. We couldn't investigate all intersections. The intersection with the local road to Prodromo – end of the **eastern part** – is used as an example:

- The intersection is very wide with extra lanes for different directions guided by traffic islands above the level of the carriage way. The radii of turning lanes allow high speeds. There are some dangerous conflict points and the visibility of the traffic on the main road is partly obstructed by course of the turning lane (eg the driver on the right turn has to look backwards when entering the main road). There is lighting but no traffic light and no speed limit ahead of the intersection. There are no crossing facilities for pedestrians and cyclists.

Examples from Vietnam

In Summary

- RSI is an on-site detailed review of an existing road looking for potential problems
- RSIs should be regular and follow a standard process and look at a range of issues
- RSIs should be carried out by an expert and/or expert team
- RSIs should result in a report with possible (high and low cost) countermeasures

Thank you for your attention

Name: Phil Allan
Email: Phil.Allan@saugov.sa.gov.au
Telephone: +618 8204 8843