



Drogi zaufania

Zwiększanie Potencjału Na Rzecz Bezpieczeństwa Ruchu Drogowego

Building Road Safety Capacity



**INFRASTRUKTURA
I ŚRODOWISKO**
NARODOWA STRATEGIA SPÓJNOŚCI



Generalna Dyrekcja
Dróg Krajowych i Autostrad

UNIA EUROPEJSKA
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ROZWOJU REGIONALNEGO



The proactive approaches of Road Safety Audit

Building Road Safety Capacity
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- Introduction
- Definition of road safety audit
- What should be audited
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- Checklist
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Traditional road engineering approach to safety

- « Wait and see policy »
- Safety countermeasures were not considered until the accident situation becomes unacceptable
- Accidents situation is analysed, countermeasure designed and implemented

PIARC Outputs

- **PIARC Technical Committee on Road Safety has focused on proactive approaches: Road Safety Audit (RSA) and Road Safety Inspection (RSI)**
- **Informations on current practice and experiences in different countries have been collected, analysed and discussed**

Definition of RSA and RSI

- PIARC took the initiative to clarify the definition of these procedures
- RSA: at the project design stage, before any construction has started
- RSI: a systematic study along existing roads
- Two coordinated approaches for accident prevention on road

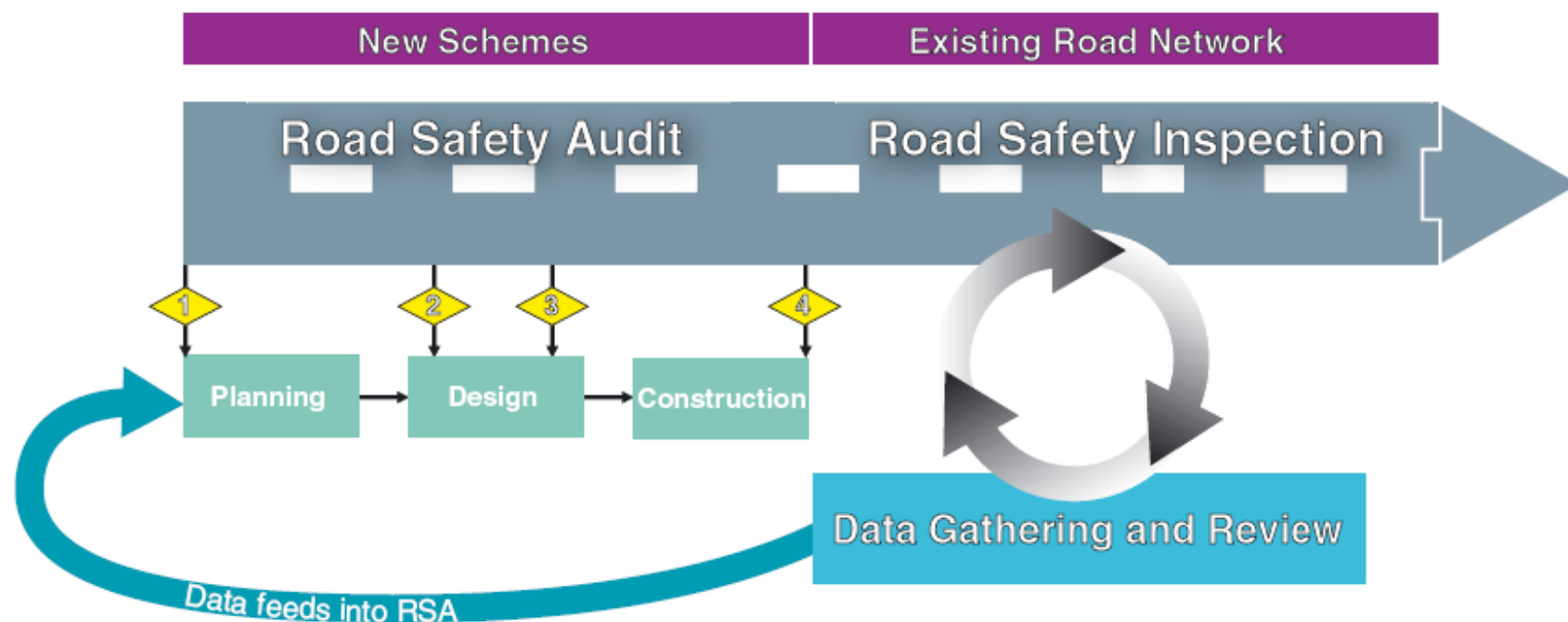
Link between RSA and RSI

Feasibility

Preliminary design

Detailed design

Pre-opening and Post-opening



What is Road Safety Audit?

- **« A formal road safety examination of the road or traffic project, or any other type of project which affects road users, carried out by an independent, qualified auditor or team of auditors who reports on the project accident potential and safety performance for all kinds of road users»**

What is Road Safety Audit?

- **Safety Audit report is a formal document, describing a problem...**
 - *“who can be hurt and in what way?”*
- **...and a recommendation**
 - *How the risk can be removed or reduced*
- **Report is produced for the scheme client**
- **Client decides how to respond to the recommendations**

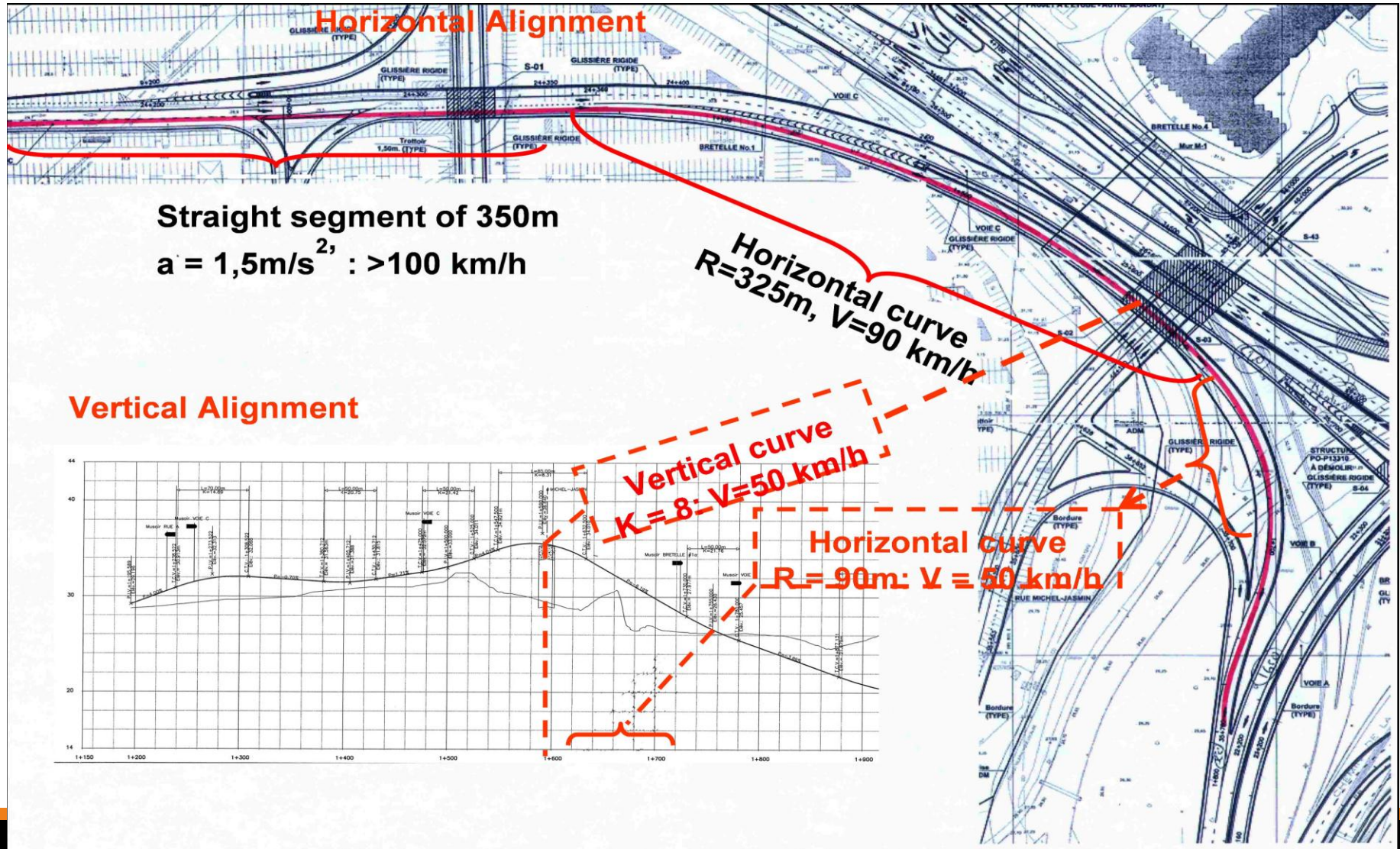
Costs and benefits of Safety Audit

- **Main benefits of RSA are to prevent road users from being injured or killed due to poor road design and avoid the expenditure of money for redesign and reconstruction to improve the situation.**
- **Some evidence of improvement in design due to a reduction in Safety Audit comments made in reports over time**

What should be audited or investigated?

- Function (Role, Traffic mix , Traffic volume)
- Cross section
- Alignment
- Intersection
- Public and private services, Service and rest areas, public transport
- Vulnerable road user needs
- Traffic signing, marking and lighting
- Roadside features and passive safety installations

Audit at design stage



Safety Audit Process

Commissioning

Ordering the audit



Selecting the team

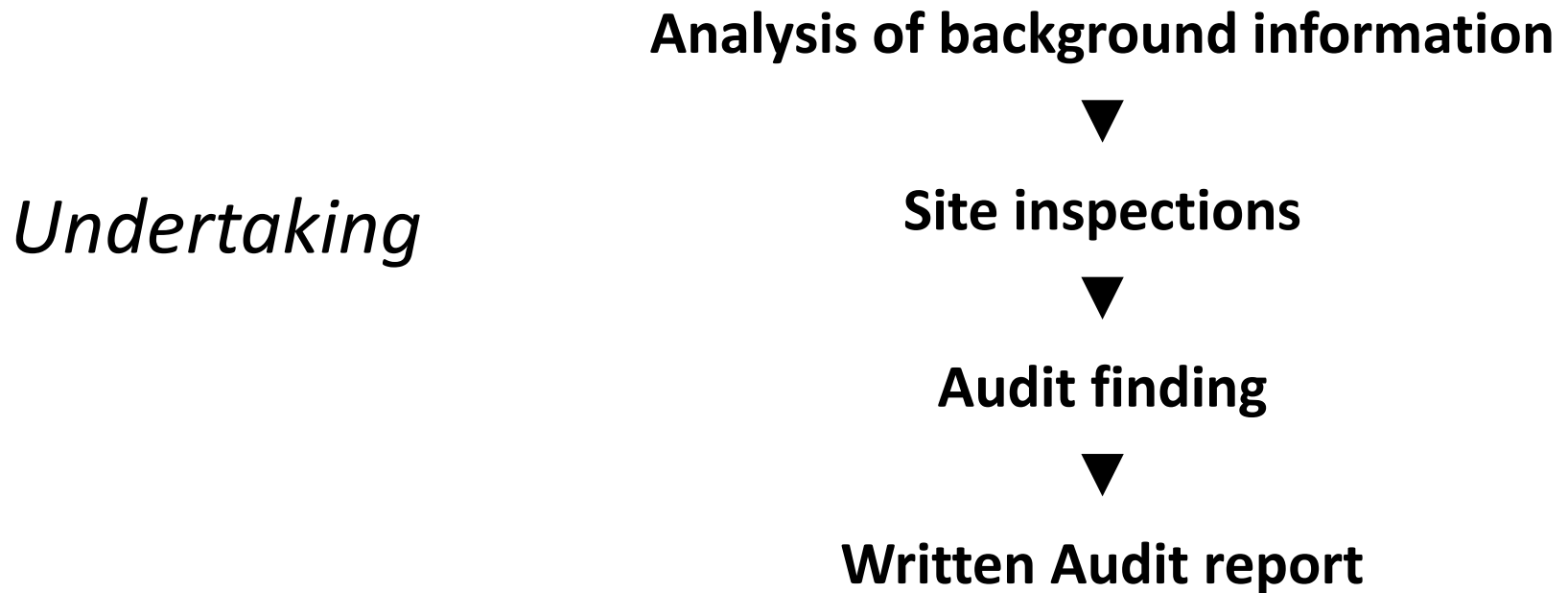


**Collection of background information and
Audit Brief**



Commencement meeting

Safety Audit Process



Safety Audit Process

Completion meeting



**Written Respond to the audit report
(Decision to make changes or not)**



Follow up

Completion

Checklists

- **Different checklists for different stages of a project's development**
- **To ensure that safety aspects have not been overlooked during the procedure**
- **Contain detailed questions regarding the safety of all users and they are an aid to make sure that all factors are considered**

Checklists structure

- **Eight sections corresponding to the sections detailed in the RSA and RSI Guide, and the Catalogue:**
 - Function
 - Cross Section
 - Alignment
 - Intersections
 - Public and Private Services
 - Vulnerable road users
 - Traffics Signing and Marking
 - Roadside Features

Check-lists

- **Inter urban main roads crossing build up areas,**
Preliminary design **Function of the road**

No.	Question	Yes (✓) No (X)	Comments
0	Have the section been audited at a previous stage, and have the findings been considered?		
1	Have the effects of the project on the surrounding road network been considered?		
2	Do the function of the road and the desired use of the road correspond?		
3	Have previous findings/documents on the accident situation been taken into consideration during the planning phase?		
4	Have specific traffic composition characteristics been taken into consideration?		

Remarks

- Safety Audit is a low cost, high benefit process that assists in producing safer new roads
- RSA is **pro-active**, trying to prevent accidents through the identification of safety deficiencies for remedial action rather than responding to recorded crashes.
- The development of procedures, training and compliance with procedures should ensure safety benefits

Catalogue of Design safety problem and countermeasures

- Gives informations of well known design errors and presents remedials measures
- Gives indication of the comparative countermeasure costs to facilitate prioritisation of the work
- Can be used as proactive or reactive safety tool

About the Catalogue....

- How to use as part of RSA process?
- Consider the subject area (ex: Intersection)
- Use examples of what can go wrong as a guide during the design process
- Use indicative costs to decide on most cost-effective solution

Structure of the Catalogue

- **Eight sections corresponding to the sections detailed in the RSA Guidelines:**
 - Function
 - Cross Section
 - Alignment
 - Intersections
 - Public and Private Services
 - Vulnerable road users
 - Traffics Signing and Marking
 - Roadside Features

Chapter 6 *Vulnerable road users*

6. Vulnerable road users

6.02 PROTECTION OF PEDESTRIANS AT INTERSECTIONS



Problem: Pedestrian conflicts with motorised traffic at intersections often result in fatalities. Provision for pedestrians at intersections should be given sufficient attention to ensure their safety without significantly affecting the journey time of the motorised traffic.



Treatment Types & Costs

- T1: The installation of pedestrian guard rails, central refugees and crossings to guide pedestrians. \$
- T2: A minor road central refuge at an unmarked crossing place. \$
- T3: Zebra crossing, with or without a central refuge. \$
- T4: Traffic signals to control the movements at the intersection. \$\$

Crash Types

- Pedestrian-motor vehicle collisions
- Pedestrian-cyclist collisions

Affected Users

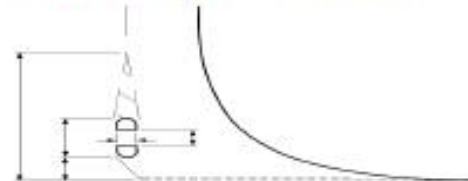
- All road users

Treatments & Their Benefits

T1: Pedestrian guard rails, central refugees and crossings to guide pedestrians and encourage them to cross the street in 2 steps.



T2: Minor road central refuge at an unmarked crossing place



T3: Zebra crossing



T4: Traffic signals that cater for pedestrians



Chapter 6 *Vulnerable road users*

Description
of problem

Potential solution

6. Vulnerable road users

6.01 CLOSE CONTACT WITH VULNERABLE ROAD USERS



Problem: Vulnerable road users – pedestrians, cyclists, draught animals and motorcyclists often come into close contact with faster moving, heavier motorised vehicles. This places the vulnerable road users in danger.

Treatment types & costs

T1 Edge markings	£
T6 Proper crossing facilities	£
T3 Relocated bus stop	£
T2 Kerbs and barriers	££
T4 Traffic calming	££
T8 Wider shoulder	££
T7 Wider traffic lane	££
T8 Segregated footpath	££
T8 Segregated cycle lane	££

Crash types

- Motorized vehicle with vulnerable road user

Affected users

- All road users

Design/Treatments & Their Benefits

All solutions entail protecting the vulnerable road users from the motorised traffic.

T1: Edge markings

Pedestrians on a busy footpath often spill onto the road while traffic often uses a shoulder if the road is congested. Marking the edge with a line or a low kerb reduces this misuse.

T2: Proper crossing facilities

Pedestrians often come into contact with motorised traffic when crossing a road. High standard crossings should be constructed and properly maintained.

T3: Relocated bus stop

Passengers boarding a bus parked at the road side and those serving food to those inside often queue onto the live traffic lane. Relocating bus stops away from the road and constructing a permanent barrier will help prevent people from being hit by passing vehicles.

T4: Kerbs and barriers

A high kerb or barrier will mark the edge of the road and will physically prevent a vehicle leaving the carriageway. If large vehicles use the road, barriers should be used because large vehicles may ride over high kerbs. Kerbs should have gaps to allow water to enter the drain.

T6: Traffic calming, (see also section Function - Traffic Calming section 1.04)

The drivers of slower moving traffic have more time to see vulnerable road users and take evasive action and the effect of an impact will be less severe. A variety of traffic calming measures in areas where vulnerable road users are present can be installed.

T8: Wider shoulder

A wider shoulder allows pedestrians to walk further away from traffic. In most cases, a 1.5 metre shoulder provides sufficient protection. If it is much greater than this, vehicles may use the space for travelling and thereby endanger themselves and pedestrians.



T7: Wider traffic lane

A wider lane allows faster moving traffic to more safely overtake slow moving non-motorised vehicles such as draught animals and bicycles.

T8: Segregated footpath

A segregated footpath is a very effective way of protecting pedestrians from motorised traffic, although it must be wide enough for the likely demand.

Footpaths can be located on the side of an embankment, in wide side drains during the dry season or along diversion roads opened up during road construction.



T8: Segregated cycle lane

A segregated cycle lane is similarly effective at protecting cyclists from motorised traffic.



Subject 6: Vulnerable road users

July 2007

Comparative
cost



Documents are available on PIARC website
<http://www.piarc.org>

Thank you for your attention!