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Current Advances in Road Infrastructure Safety Equipment



Management of Road Infrastructure Safety

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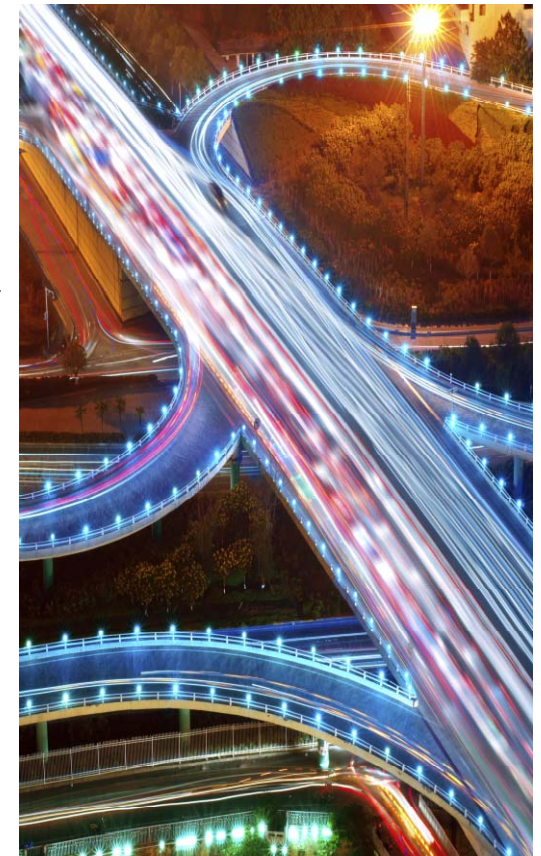


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Background

- Road infrastructure safety may be critical for road safety enhancement, especially in emerging economies.
- Traditional «reactive» approach to road safety (e.g. high risk site management) is becoming ineffective in more advanced countries.
- Moving towards a Safe System approach where the Road Administration has responsibility for the safety of the infrastructure.





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IRTAD WG - Management of Road Infrastructure Safety



Working Group **participants:**
Argentina, Austria, France, Germany,
Greece, Italy, Korea, South Africa

Aims:

1. To describe the most consolidated RISM procedures.
2. To analyse the use of RISM procedures worldwide and to identify possible barriers to their implementation.
3. To provide example of good practices.
4. To provide recommendations for the implementation of RISM procedures.



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The IRTAD Report on “Management of Road Infrastructure Safety”

1. Introduction
2. Road Infrastructure Safety Management:
An Overview
3. Road Infrastructure Safety Management
Worldwide
4. Good Practices of Road Infrastructure Safety
Management
5. Conclusion and Recommendations for Better
Road Infrastructure Safety Management





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Road Infrastructure Safety Management procedures

- Road Safety Impact Assessment (RIA)
- Road safety measures Efficiency Assessment Tools (EAT)
- Road Safety Audit (RSA)
- Network Operation (NO)
- Road Safety Performance Indicators (SPIs)
- Network Safety Ranking (NSR)
- Road Assessment Program (RAP)
- Road Safety Inspection (RSI)
- High Risk Sites (HRS)
- In-depth Investigation





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Description of RSIM procedures

- Introduction
- Tools and data needed
- Common practices
- A synthesis:



Purpose

Compare different implementation scenarios from road safety point of view

When

RIA is generally undertaken at planning stage (stage 1) and before a major upgrading of the infrastructure (stage 6).

Where

Part of the road network potentially influenced by a measure.

Data

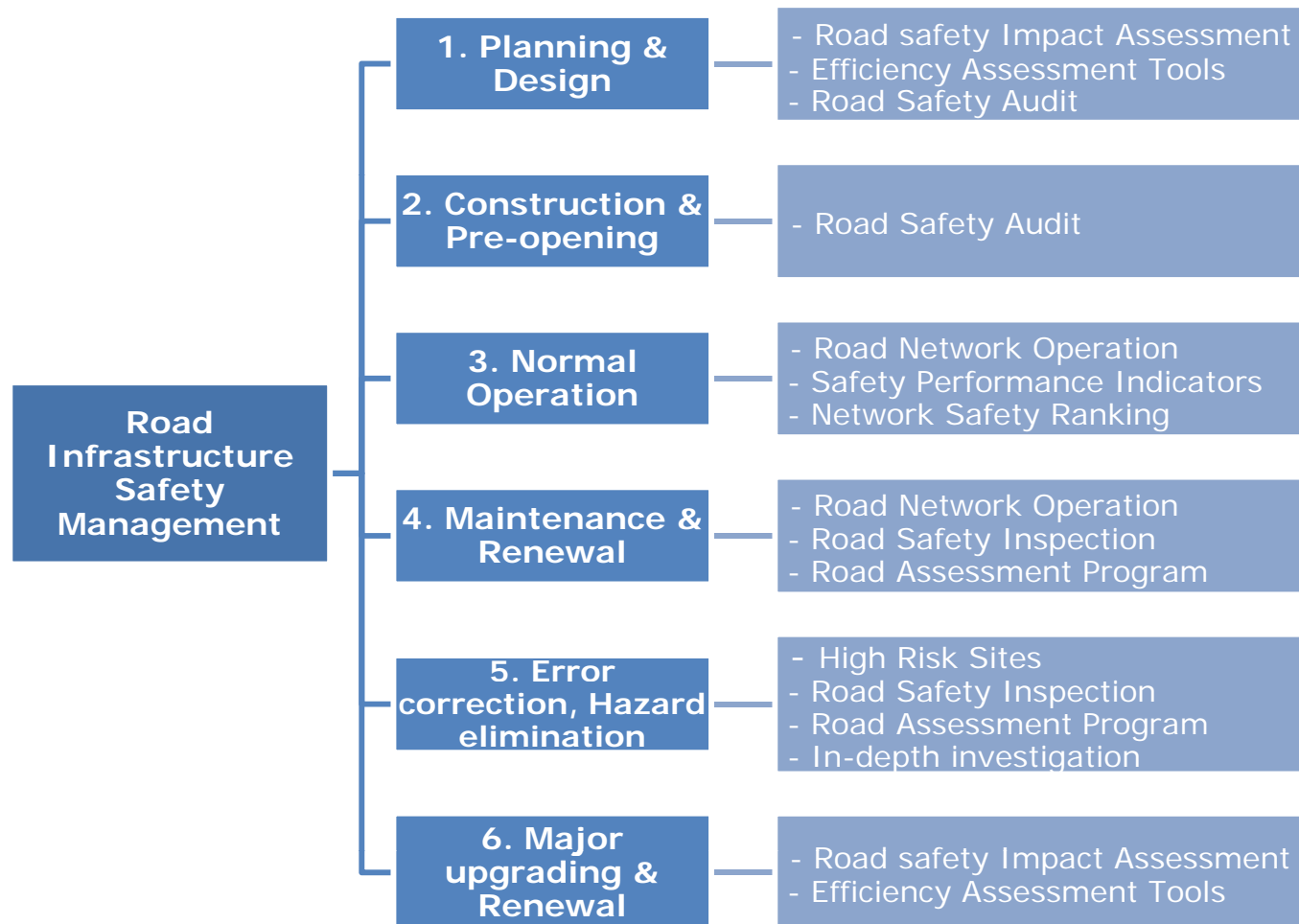
Roadway related, Traffic related, Measures related



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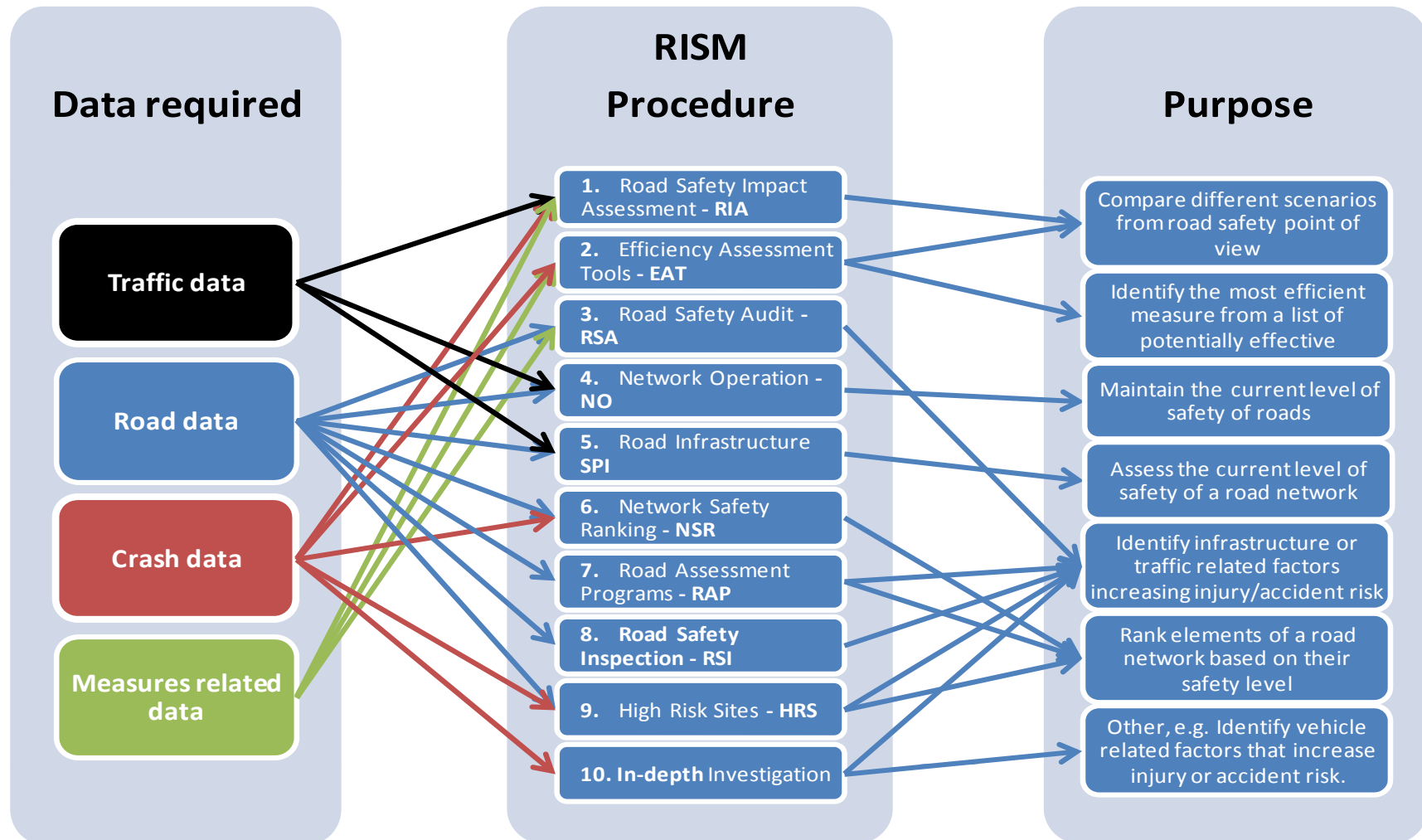
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Putting it all together (1)





Putting it all together (2)

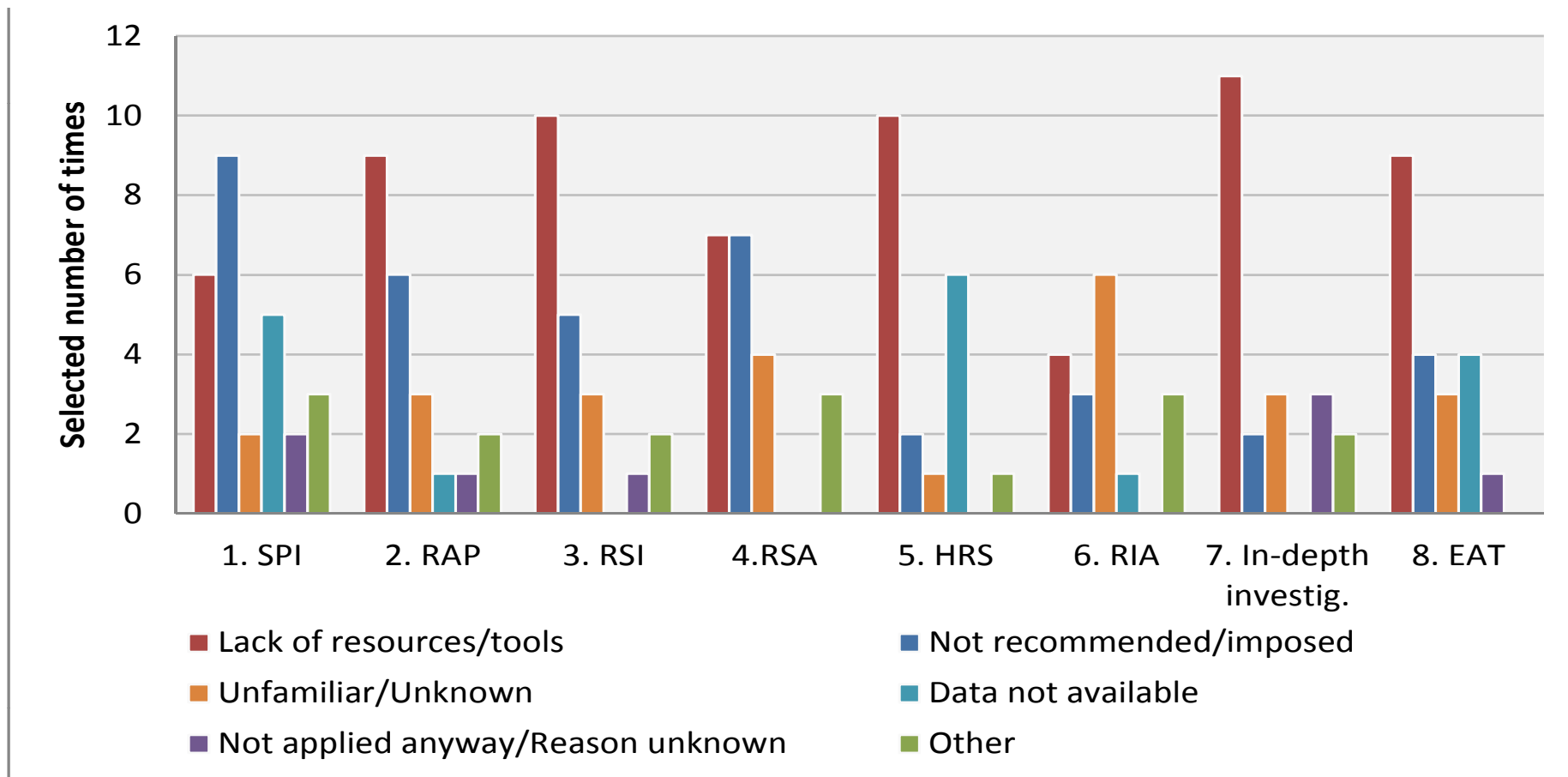




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What are the main barriers that may prevent the use of RISM procedures?

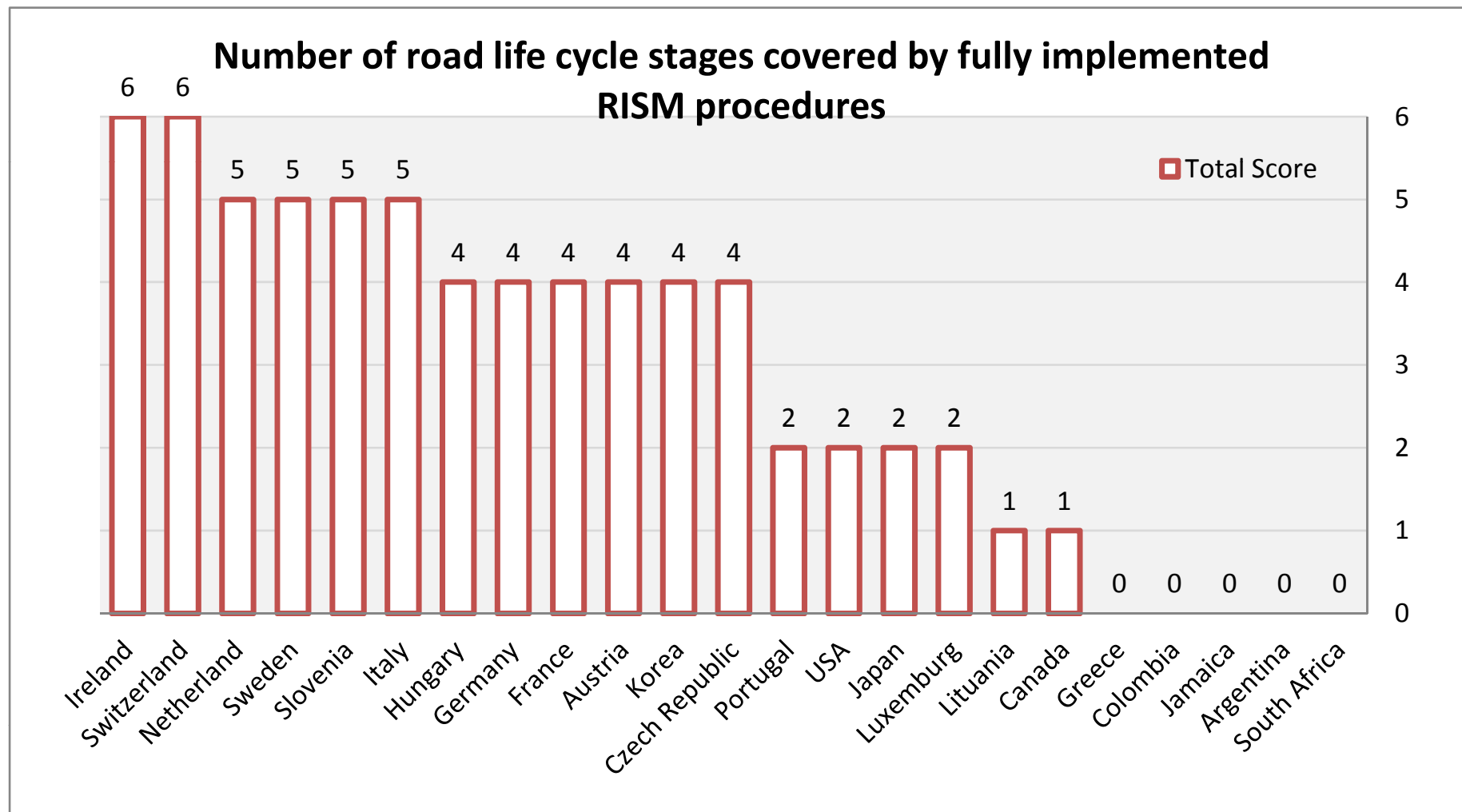




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Who is implementing a pro-active approach?





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Good practices

- To better understand possible issues related to barriers highlighted within the survey.
- To identify (affordable) solutions to these issues.
- To report good practices showing how these issues have been overcome in some countries.

Box 2 - Infrastructure Safety Management on Austrian Motorways

Legal basis:
EU DIRECTIVE 2008/96/EC on road infrastructure safety management was transposed into national law by adding two articles to the Austrian National Roads Code (Bundesstraßengesetz) in 2011. The Code now foresees all tools of the Directive to be applied of the Austrian sections of the Trans-European Road Network (TERN). The Austrian motorway agency ASF/NAG-3 – an executive agency under the Austrian Ministry of Transport, Innovation and Technology (bmvit) – is responsible for implementing the tools. Although not required by the Directive, ASF/NAG applies Infrastructure Safety Management on all sections of its 2175-km network of motorways and expressways (as of 2012), i.e. including those which do not belong to the TERN. The whole network is subject to a road-toll (toll stickers for cars and on-board units for mileage-dependent charging for HGV > 3,5t).



Figure 25: The ASF/NAG network. Source: ASF/NAG

The FSV¹³, the Austrian Association for Road-R guidelines in the field of infrastructure safety management:
• → RVS 02.02.21 Road Safety Analysis (last update: 2004)
• → 02.02.33 Road Safety Audit (last update: 2004)
• → 02.02.34 Road Safety Inspection (last update: 2012)
• → 02.02.35 Certification of Road Safety (last update: 2012)
The application of all above guidelines (except the network and recommended on all other roads. The FSV (in German).

Box 3 - New road safety programs and legal responsibilities of road authorities

Road safety programs are implemented for the sake of improving safety of road users in general. They are not intended for identifying defects of roads and asking legal responsibilities of road authorities, which is in charge of developing and managing roads. However, for road authorities, it is natural to worry about legal liability issues after introduction of some road safety programs such as Road Safety Audit. The RSA is intended to identify possible risk on the road design and to suggest remedial actions to prevent or to reduce those risks, but certain suggestions cannot be implemented owing to budgetary, technical, or institutional constraints. Then a certain individual can exploit those unimplemented suggestions as proofs that road authorities did not take their responsibility sufficiently.

In the United States, introduction of RSA has been an issue because of legal liability, but now it is well implemented in many States, resulting in good safety performance of road infrastructure. Owers and Wilson (2001) investigated legal liability issues and RSA in the US and concluded that it should be implemented by transportation entity. In the study, they tried to answer two fundamental questions related to implementation of RSA. The first is whether RSA adds value to road authorities and the second is whether the RSA is legally defensible. Their answers are positive to all questions. They also emphasize that, "From a utilitarian perspective, the public policy of improving road safety for all road users must reign supreme over the competing policy favouring the plaintiff's redress of his or her harm that fevers the individual over the many". They even recommend a legal statute that protects road authorities from legal litigation. Federal Highway Agency provides some information on legal issues on RSA in their internet homepage. Their survey on RSA in the US shows that there is no correlation in the application of RSA and whether or not the State had sovereign immunity. Another finding is that liability is one of the major factors in performing RSA. They can demonstrate proactive efforts of road authorities to identify and mitigate safety concerns. When findings from RSA cannot be implemented, an exception report is developed to address liability and mitigating measures.

Aforementioned legal liability issues can be raised in any countries trying to introduce new road safety programs such as Road Safety Audit, Road Assessment Programs, Road Inspections, and Road Safety Impact Assessment etc. However, it should be noted that all these proactive efforts for road safety can protect road authorities from possible legal liability issues as US studies on RSA suggest. Application of road infrastructure safety programs is particularly important since they can fill in the gaps that a typical design standard can bring about. Abiding by design standards is essential to protect road authorities from legal liability but perhaps some further efforts are necessary as design standard cannot always guarantee safer road infrastructure. Please refer to Box 9 for further information on the relation between safety and design standards.

Reference
Owers R.S., and Wilson, E.M., Safety analysis without the legal paralysis: The Road safety Audit program, 2001.
<http://safety.fhwa.dot.gov/rsa/legal.cfm>, Archived Aug. 13, 2013.



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Key Messages of the Report





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Key Message 1

- ***Road Authorities are key players for improving road safety***
 - In the USA, road conditions contribute in 53% of all road deaths and 38% of all injuries.
 - There are substantial opportunities, programs, and tools to improve safety of road infrastructure.
 - Road safety measures should be defined and implemented according to preference and circumstances of each country.





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Key Message 2

- ***Road Infrastructure Safety Management procedures are effective and efficient***
 - **RIAs** and **EATs** provide better information to policy makers in order to make better decisions.
 - **RSAs** and **RSIs** have shown positive cost-benefit-ratios, up to 99:1.
 - Regular use of **RAP** has shown improvements in Spain, UK and Sweden.
 - **HRS** (and potentially **NSR**) approach results in an 18% reduction in casualties.





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Key Message 3

- ***Success factors for the implementation of a RISM procedure are:***
 - *adequate level of investment*
 - *a supporting regulation*
 - *road safety data*



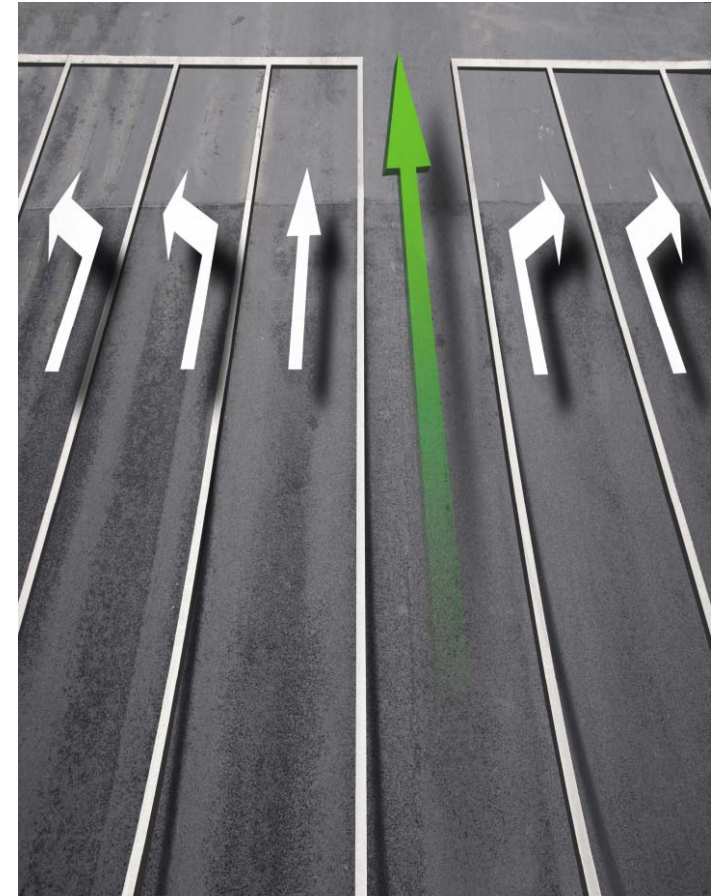


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Key Message 4

- ***A critical requisite is an adequate institutional management capacity to support the development and implementation of effective interventions.***
 - The risk exists that a formal procedure becomes a purely ritual act.
 - Critical factors include: political commitment to improving safety, the adoption of ambitious safety targets, vertical and horizontal co-ordination, stable funds.



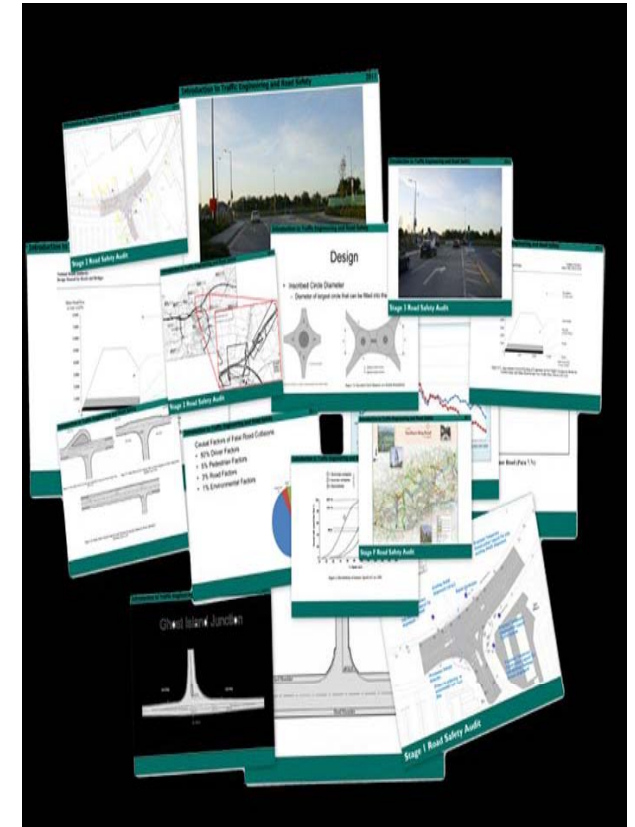


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Key Message 5

- ***Several tools supporting road infrastructure safety management are already available.***
 - International guidelines and manuals are nowadays available.
 - National guidelines and software are available in many countries (e.g. Australia, Austria, Canada, Finland, Germany, Greece, Ireland, Japan, the Netherlands, Norway, Spain, Sweden, UK, USA, etc.)





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Key Message 6

- ***Each country has specific needs and has to cope with specific barriers to the implementation of RISM as different conditions exist.***
 - There is no procedure better than other, and it is not the case that a more extensive use of these tools automatically ensures a superior road safety performance.
 - Procedures should be adapted to the specific conditions of each country.
 - Low and medium income countries can focus on low budget procedures.



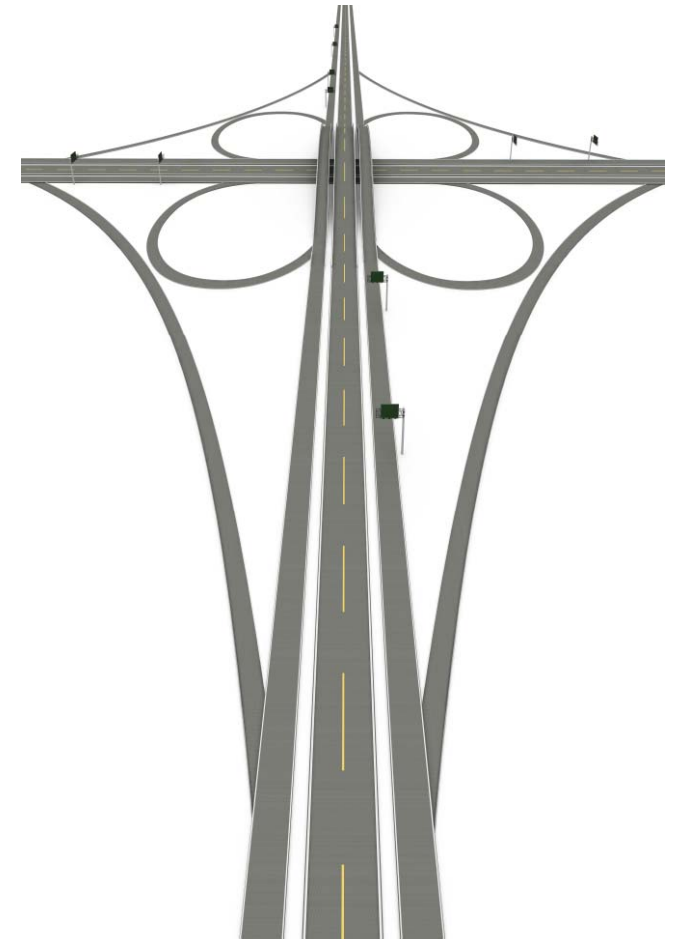


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Key Message 7

- ***Road design standards cannot guarantee road safety in all conditions.***
 - Designers may be encouraged to reduce construction cost and are not aware of future traffic conditions.
 - The relationship between design standards and road safety is unclear and the level of safety designed into roads is unpremeditated (Hauer, 1999).
 - Design standards are important to keep up with *nominal safety*. *Substantive safety* must be considered in design process to care for safety in principle.





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Key Message 8

- ***Road infrastructure should be improved with the development of self-explaining roads to guide drivers to adopt appropriate behaviours.***
 - Evidence of increased safety after the implementation of the self-explaining roads.
 - In general a more **pro-active approach** to road infrastructure design and management is desired (e.g. Vision Zero, Sustainable Safety, Safe System, Safety Conscious Planning).





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Key Message 9

- ***Road safety performance monitoring helps to achieve safety target of road authorities.***
 - A target should be defined and progress toward the safety target should be monitored.
 - Fundamental road safety performance indicators can be the number of road accidents or fatalities per unit distance or unit number of vehicles or vehicle travelled.
 - Monitoring can be effective if the exact location of accidents or x, y coordinates are available.





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