



**XXIVth World
Road Congress
Mexico 2011**
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BENCHMARKING OF ASSET MANAGEMENT METHODS

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TC D1 - WG1: Benchmarking of Asset Management Methods

- Not just a technical/engineering challenge
- Need to ensure assets are maintained at optimum level - many challenges
 - e.g. Funding, political, technical, road users needs
- Managing with sustainable approach
- Many aspects and different degrees of success
- What aspects to consider in establishing an asset management approach?



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Aim and Objective

Identify best practice in asset management systems with key aspects for road authorities at different stages of development to consider when choosing a system.

Review costs associated with asset systems and recommend where costs are focused.



WG1: Benchmarking of Asset Management Methods

Working Group Members

Ramesh Sinhal (Chairman)	UK	Sophia Tekie	Namibia
Alfred Wenninger-Vycudil	Austria	Bert de Wit	Netherlands
Gerhard Eberl	Austria	Jasper Schavemaker	Netherlands
Jose Ortiz-Garcia	Colombia	Chris Parkman	New Zealand
Viktor Bardoczky	Hungary	Donald Morrison	Scotland
Dominique Rafanomezana	Madagascar	Fernando Varela Soto	Spain
Ricardo Solorio Murillo	Mexico	Richard Abell	UK
Rachid Tabbouchy	Morocco	Stephen Gaj	USA



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Main stages of the work

- Case Studies
[preparation and peer review]
 - Mexico
 - Namibia
 - Netherlands
 - United Kingdom – England
 - United Kingdom – Scotland
 - United States of America - Utah
- Benchmark development
 - Good practice
- Reporting



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Benchmarking capabilities (1)

- Appropriate goals and objectives
- Performance focused organisation
- Organisation:
 - Support from top to bottom and bottom to top
 - 'Walk the talk' for change management
- People culture
 - Breaking barriers (competencies)
 - Training
 - Knowledge management
 - Investing in people
- Data and information
 - Have the right data and analyses
 - Effective and efficient use of data



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Benchmarking capabilities (2)

- Risk management
 - Process for risk management
- Delivery and resource allocation
- Planning for asset management (e.g. forward plan)
 - Performance based programme
- Systems - use the right terminology
- Balanced approach

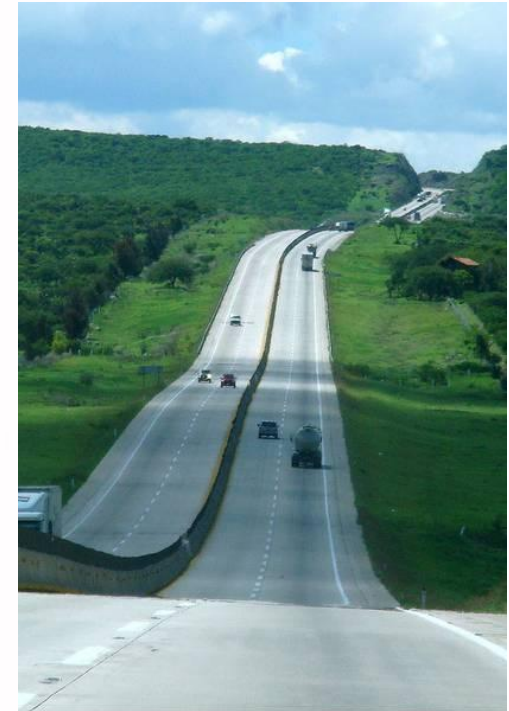


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Mexico Case Study – Ricardo Solorio Murillo

Federal toll-free network

- National systematic approach exists
 - Not yet set based on formal asset management framework
- Performance Indicators set to evaluate performance and for Annual Investment Maintenance Plans
- Budgets limited but managed by:
 - State-wide multi-year contracts (incentivised)
 - Improved efficiencies in the supply chain
- Plans to integrate management systems - under common framework



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Namibia Case Study - Sophie Tekie

National road network

- New Administration (established 2000)
- Annual and long-term plans
- Emphasis on training young engineers
- Access to asset data for organisation and stakeholders
- International data collection methods used to local needs
- HDM4 and local systems used to prioritise maintenance programme
- Risks managed at project level
- Organisation champions



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Strategic Road Network

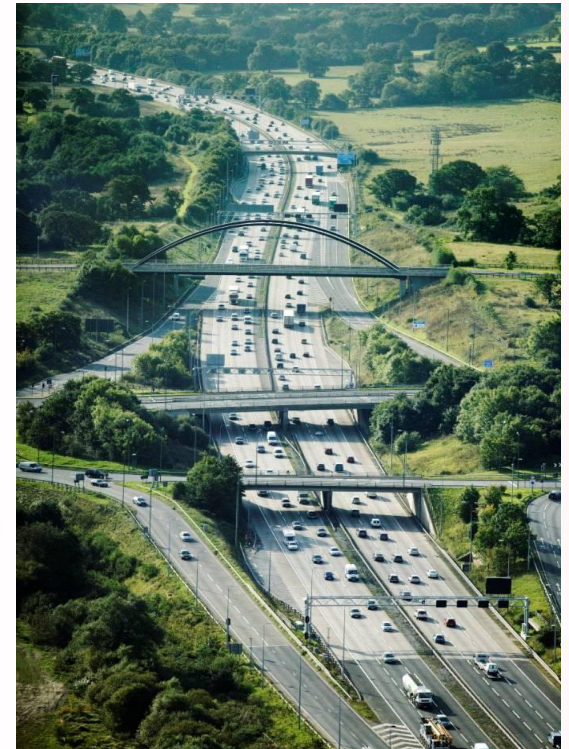
- Performance service levels between Government and Road Administration used to set budgets
- Gap analysis of organisation
 - Organisation matrix shows current position with job roles
- Data quality audit completed – data meets needs
- Consistent risk based across asset prioritisation
 - Reliability, availability, maintainability, safety
- Centralisation of asset planning



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Trunk, secondary and local roads

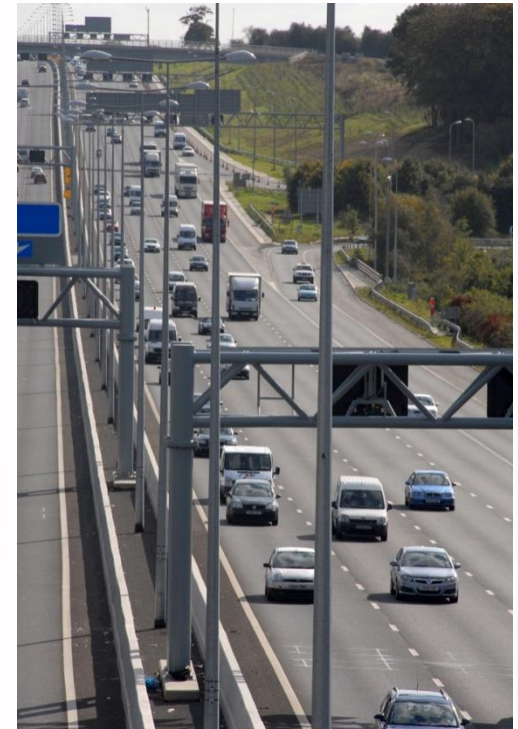
- Private contractors and maintenance centres for routine and periodic maintenance and operation
- Advanced technologies for updating inventory records
- Private contractors and managers use the same management system
- Planning to preserve road asset, keep public aware, maintain safety and sustainability
- Central system for pavements, structures, traffic and safety



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Strategic road network

- Strategic and Annual Business Plans
- Move to integrate the management of different asset types
 - More than system or data changes – people and processes
- Clear strategies for collection and management of asset data to meet the asset management business objectives
- Maintenance programme (4 years) aligned with Government spend allocation periods
- Outcome risk-based contracts



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UK (Scotland) Case Study – Donald Morrison

Strategic Road Network

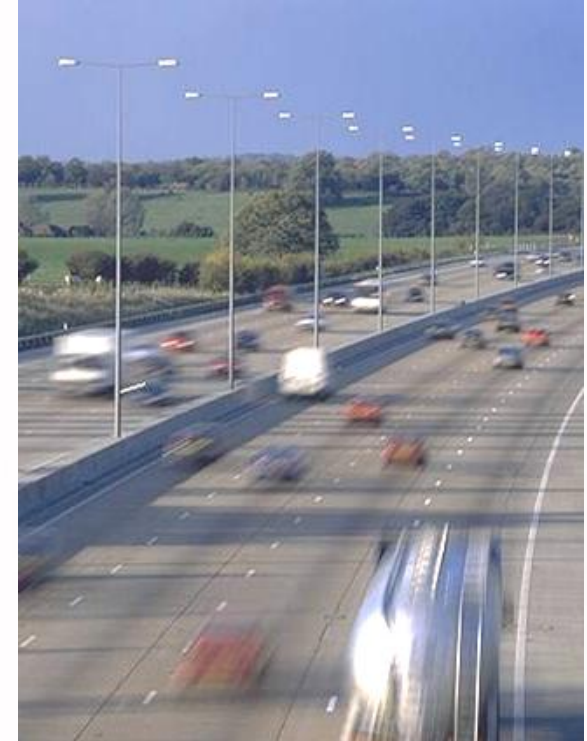
- Transparent and consistent objectives link Government policy to asset management objectives
- Audit of financial, technical and performance of maintenance contractors
- Gap analyses show differences between current and good management practice for the AM Improvement Plan
- Lifecycle long term planning
- Risk considered at strategic, tactical and operational levels



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State Road Network

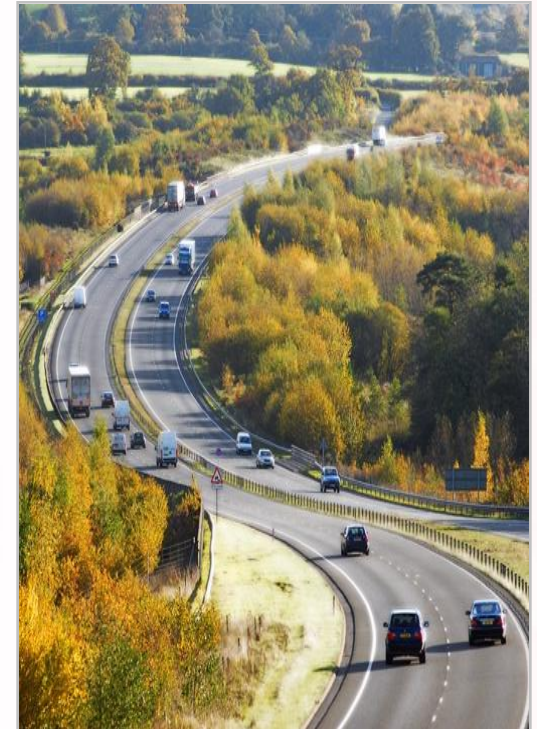
- Strategic, Implementation and Communication Plans ensure understanding through the organisation
- 10-year System Preservation Plan for project selection
- Risk analysed
 - Failure, Vulnerability, Safety, Environment, Economics, Society and Mobility
- Strong links between strategic decision support system and asset specific management systems



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Conclusions

- Decision makers
 - Long-term view
 - Commitment from asset owner and strong leadership
 - Strong procurement procedures
- Technical aspects
 - Data, standards and tools to meet required outcomes
 - Manage risk at legislative, strategic and tactical levels
 - Consistent across asset types
- International road organisations
 - Promote consistent and appropriate approach to asset management



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Thank you for listening

Now:

**Example of good practice -
Risk based maintenance**

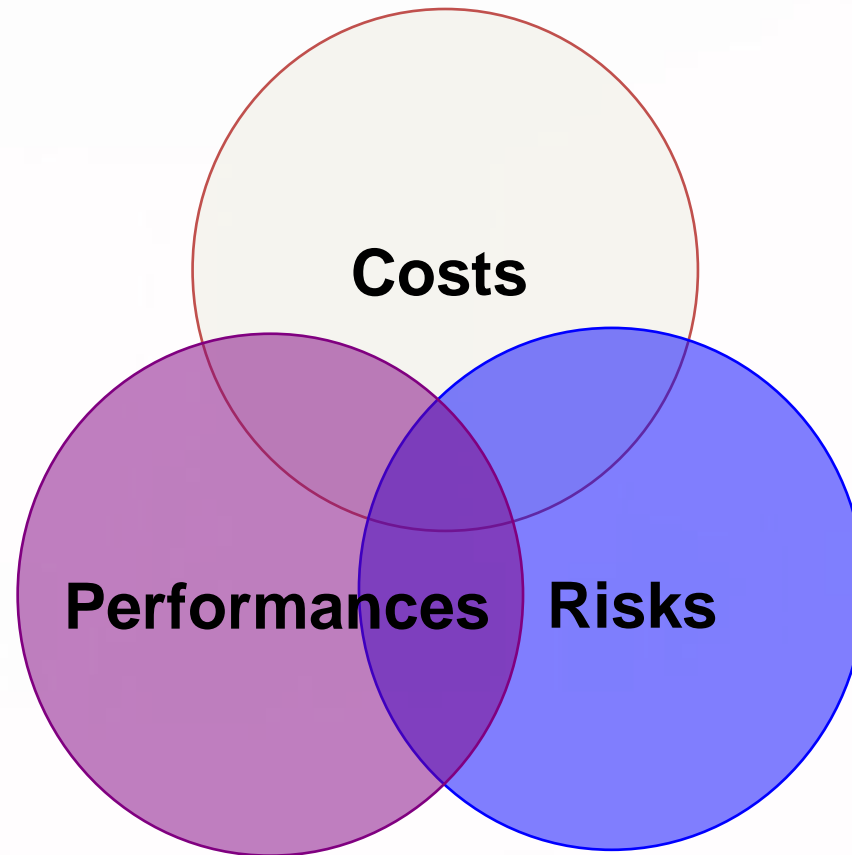
**Bert de Wit
Netherlands**



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Risk Based Maintenance – Bert de Wit

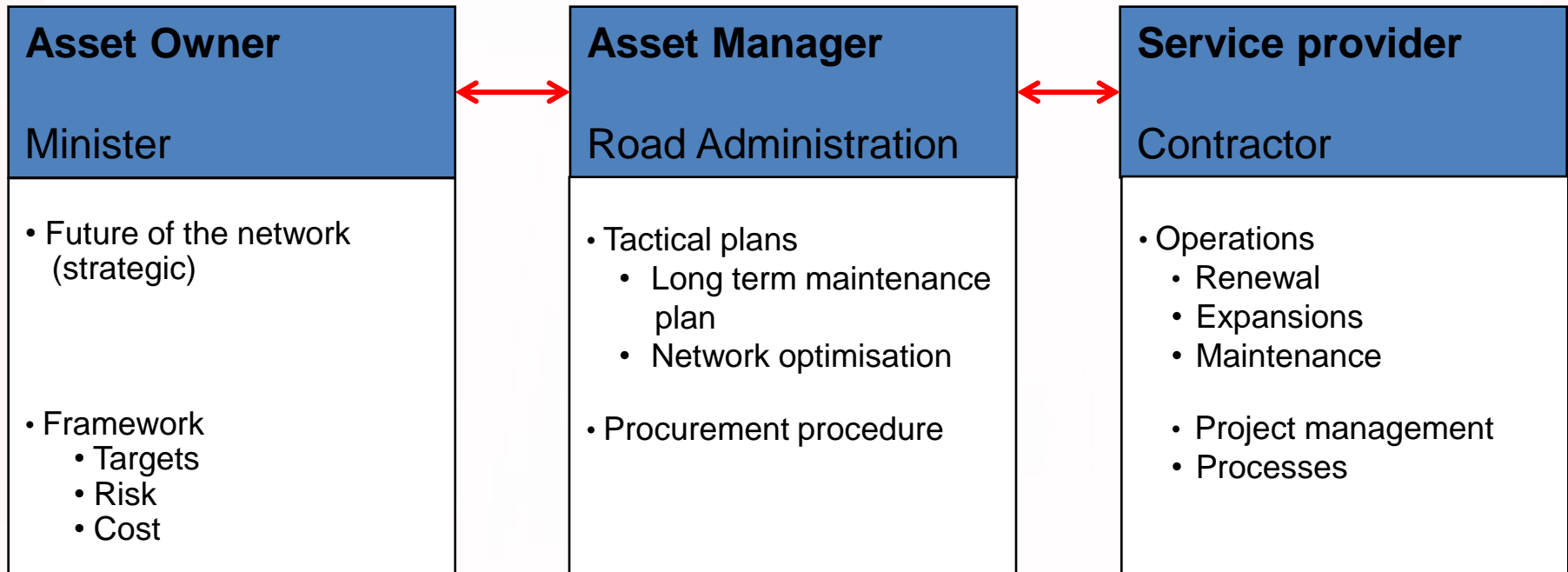
Netherlands



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Risk Based Maintenance

Roles in Asset Management cycle



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Risk Based Maintenance

Program Asset Management, Rijkswaterstaat

Improvement of

- Service Level Agreements
- **Risk based maintenance planning (RAMS methodology)**
- Infrastructure information (quality and availability)
- Planning tools & Programming tools
- Maintenance processes
- Getting most out of market cooperation (quality and innovation)
- Life cycle cost (LCC)



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Risk Based Maintenance

RAMS (SHEEP)

- R = Reliability
 - A = Availability
 - M = Maintainability
 - S = Safety
 - S = Security
 - H = Health
 - E = Environment
 - E = Economics
 - P = Politics
- One language for participants in SLA cycle
 - Cross asset prioritization
 - Suitable for project and network planning



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Risk Based Maintenance

SLA KPI's for the future: 2013 - 2016

- KPI's based on RAMS (SHEEP)

Trends:

- Less money
 - Less employees
- More with less
- Risk Based
- Prediction of 'RAMS SHEEP'



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Risk Based Maintenance

Improvement KPI's (example)

Service level agreement for road network period 2013-2016			
Availability	Road category	Category a (5000 veh/hr)	95%
		Category b (3500 veh/hr)	90%
		Category c (1500 veh/hr)	80%
Reliability	Maximum number of failures	Category a (5000 veh/hr)	1
		Category b (3500 veh/hr)	2
		Category c (1500 veh/hr)	5



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Risk Based Maintenance

Criteria – risk based prioritization of road sections

Reliability (example)

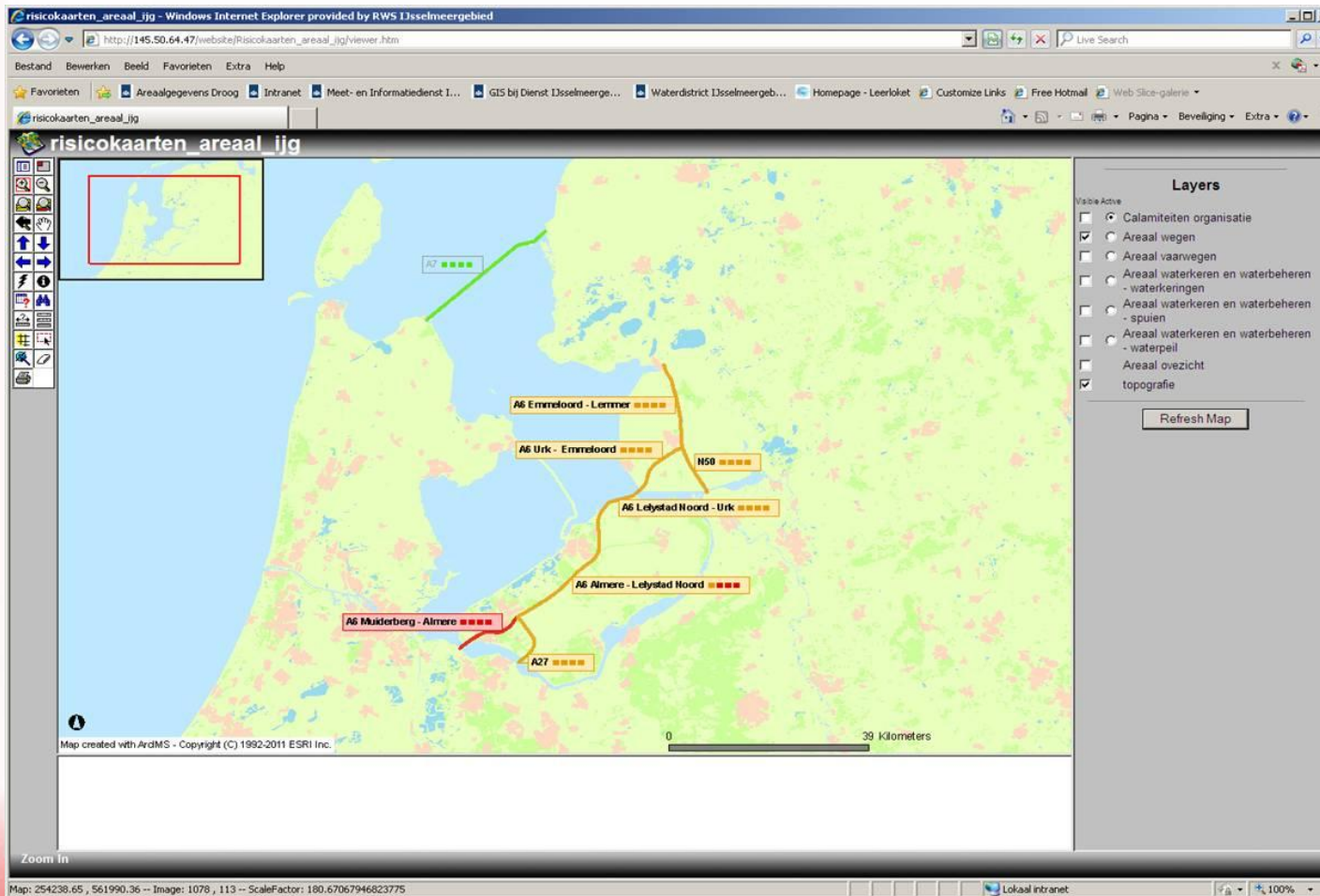
Frequency of event	Impact			
	Negligible	Minimal	Severe	Catastrophic
Daily	5	10	15	20
Monthly	4	8	12	16
Annual	3	6	9	12
10 year	2	4	6	8
100 years	1	2	3	4



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Risk Based Maintenance

Risk Map motorways



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**Thank you for
listening**

