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A New Approach to Governance & Operational Safety Assessment for Complex Projects

June 2011 SORSA Conference

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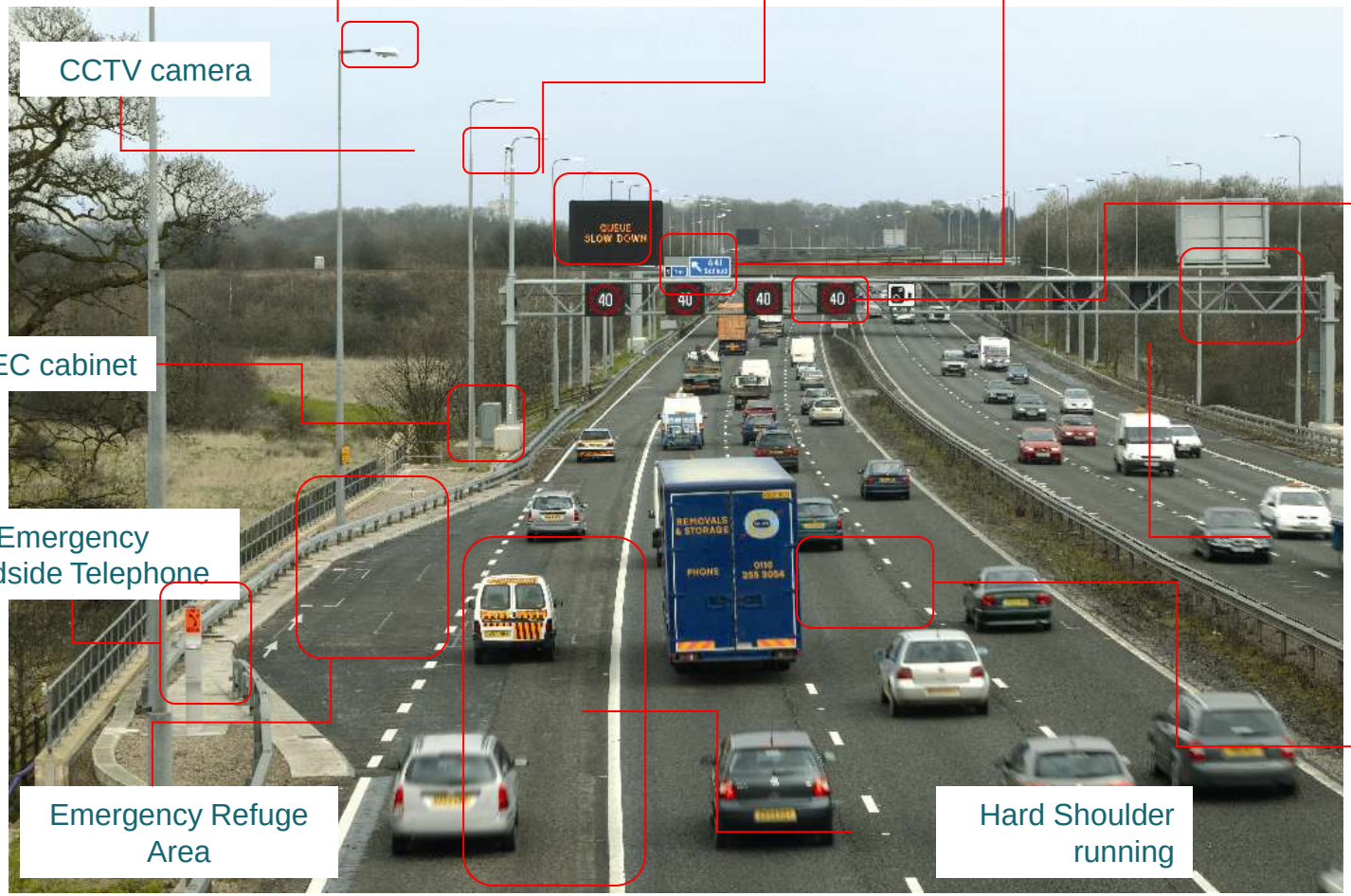
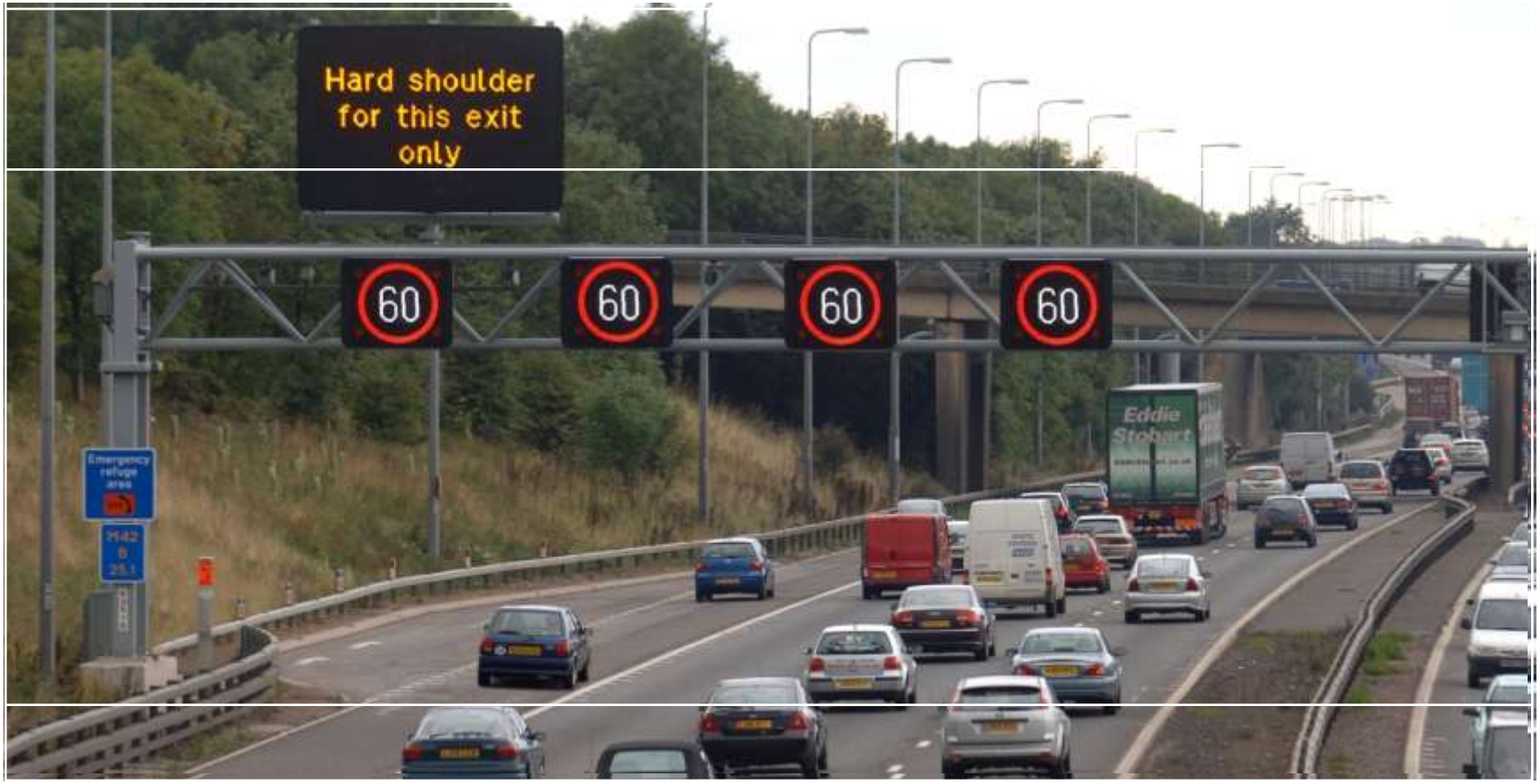
A New Approach to Governance of Operational Safety Assessment for Complex Projects

1. Why the new approach?
2. Description of approach
3. Potential applications
4. Implications for Road Safety Audit

Managed Motorway Overview



Operation


Hard shoulder
for this exit
only
60
60
60
60
Eddie
Stobart
Emergency
refuge
area

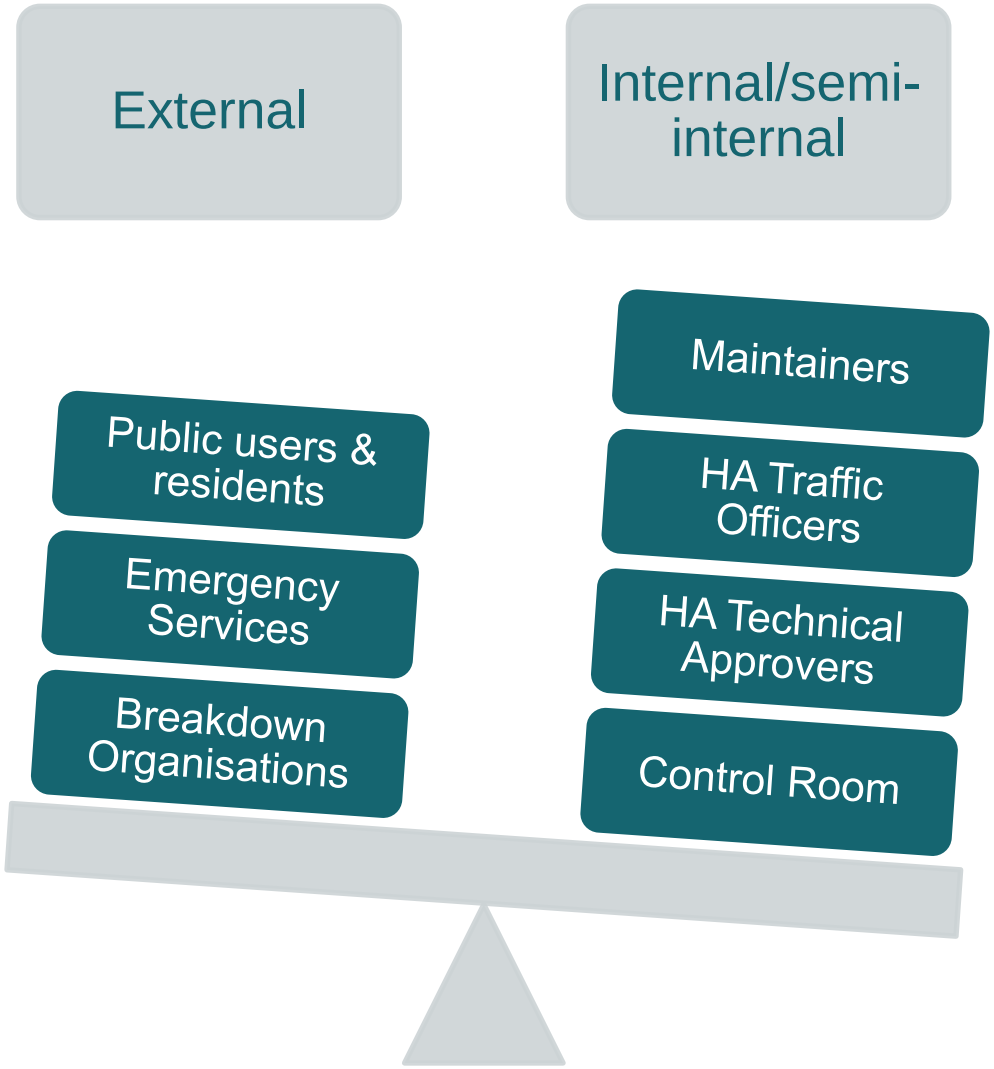
Reasons for new approach

• Design + RSA not considered sufficient to fully understand risks or demonstrate robust governance. There was a need to:

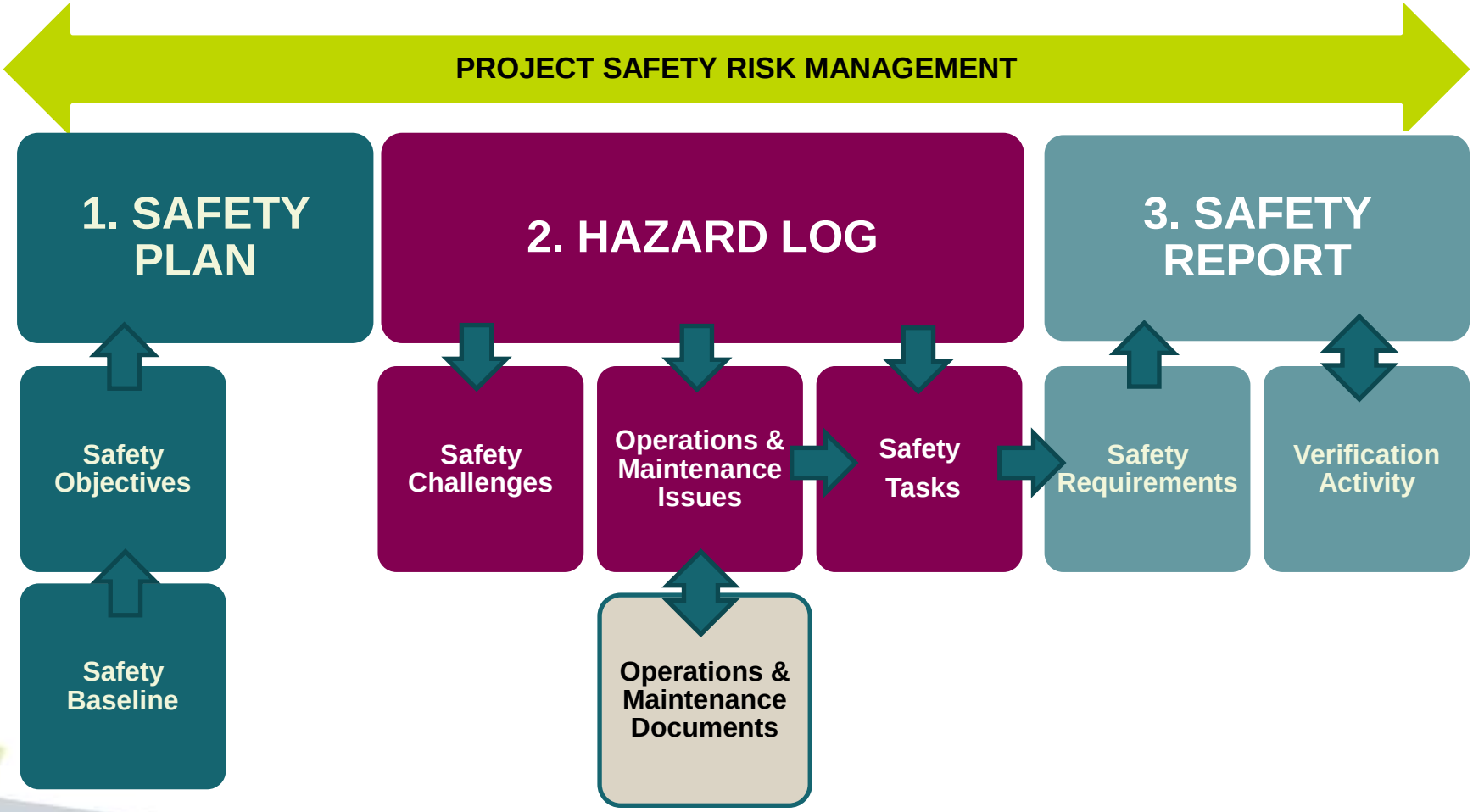
- Improve high level risk management of complex projects
- Understand interaction of design, operation, maintenance
- Identify challenging issues early
- Improve stakeholder input
- Reduce risk of accidents and reputational damage
- Drive road-worker considerations
- Increase confidence in potential value engineering options and related safety effects

Resonates with "operator" rather than "builder" function.

Stakeholders



The Safety Governance Process



1. Safety Plan

- **i. Sets Safety Baseline**
  - e.g. the number of personal injury accidents on the defined scheme length in the 5 years prior to implementation of the scheme

- **ii. Sets Safety Objective (targets)**
  - Road Users by groups or “all-in” – numerical objectives
  - Road Workers (normally “ALARP”)

- **iii. Sets Processes**
  - Defines low/medium/high risk assessment effort by reference to scheme features
  - Sets up safety committees and stakeholder groups
  - Defines component elements (e.g. road safety audit)

Safety Plan endorsed by safety committee to get buy-in from stakeholders

Safety Plan (a form of “SOFT” report)

S : **Success....what success will look like**

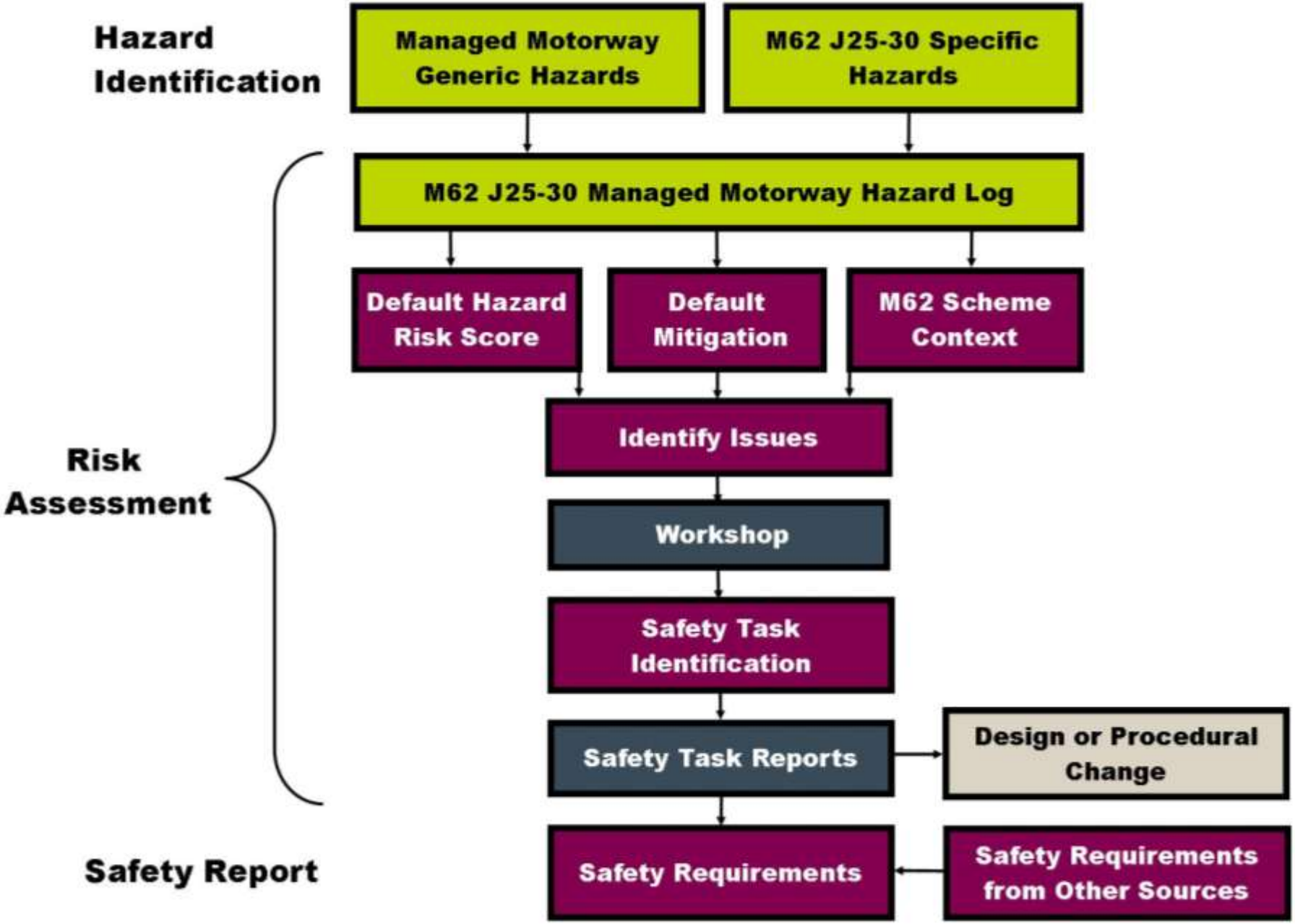
O : **Opportunities.....ensuring the project has the correct scope, including ancillary issues such as control rooms, enforcement etc**

F : **Failure....considers what may go wrong**

T : **Threats .....considers data availability, unknowns, innovation, equipment reliability**

2. Hazard Log

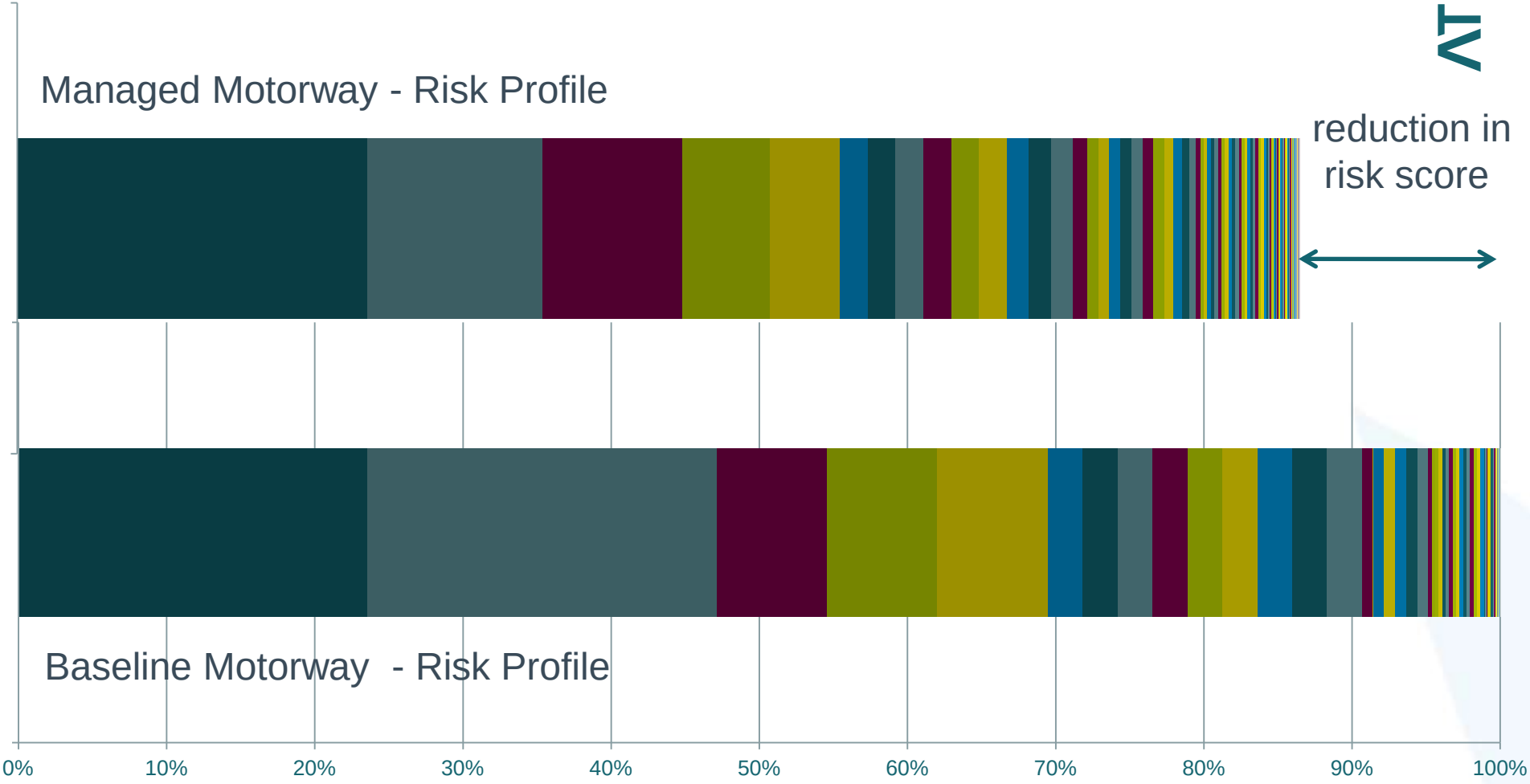
“Measure, Manage, Mitigate”


Hazard Identification
Managed Motorway Generic Hazards
M62 J25-30 Specific Hazards
M62 J25-30 Managed Motorway Hazard Log
Default Hazard Risk Score
Default Mitigation
M62 Scheme Context
Risk Assessment
Identify Issues
Workshop
Safety Task Identification
Safety Task Reports
Design or Procedural Change
Safety Report
Safety Requirements
Safety Requirements from Other Sources

Risk Quantification

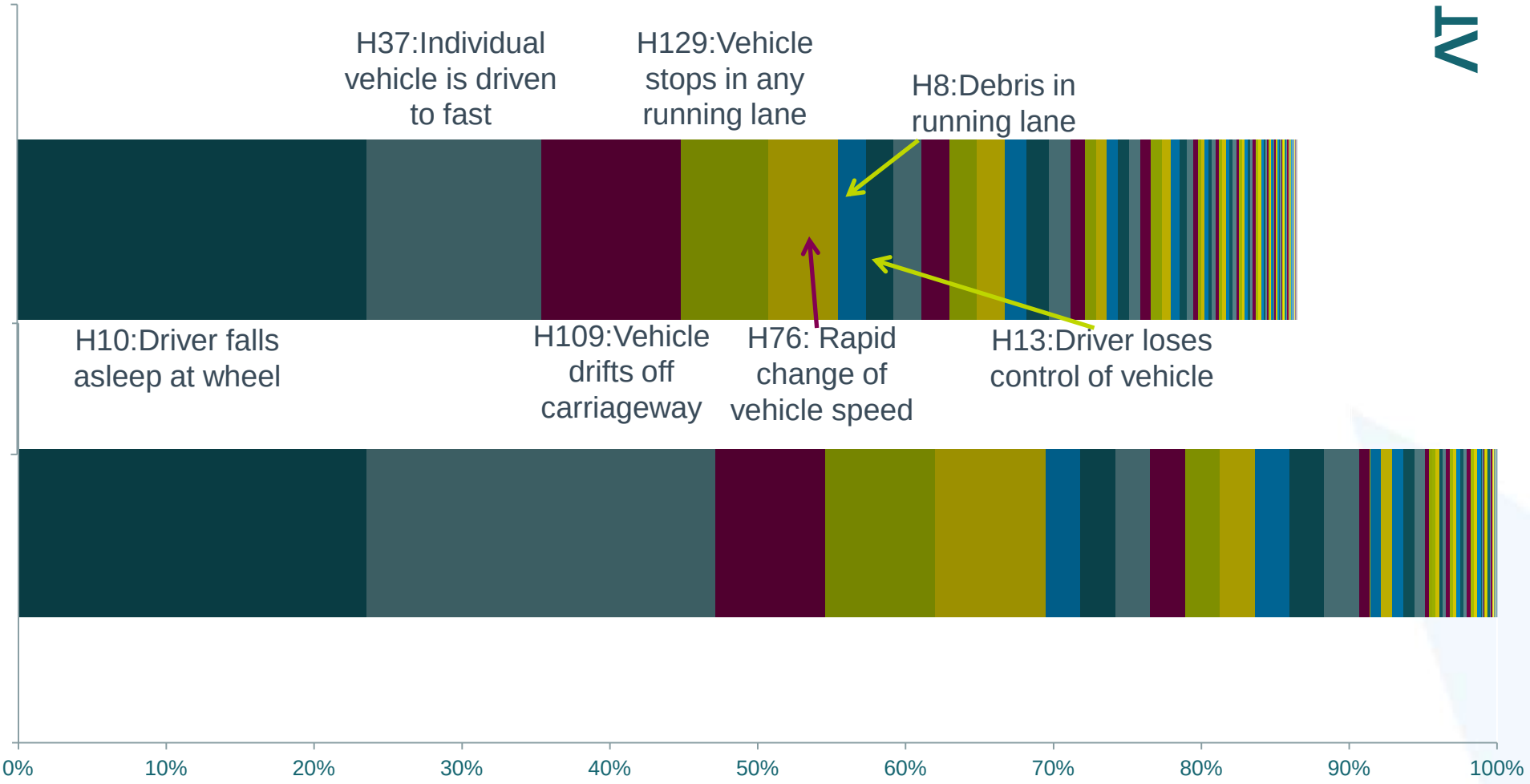
Frequency	0 to 6	[How often something happens]
Probability	0 to 4	[How often it may cause harm]
Severity	0 to 2	[What the outcome may be]
Total	0 to 12	[for each hazard – over 130 of them !]

Typical Hazard Log Results



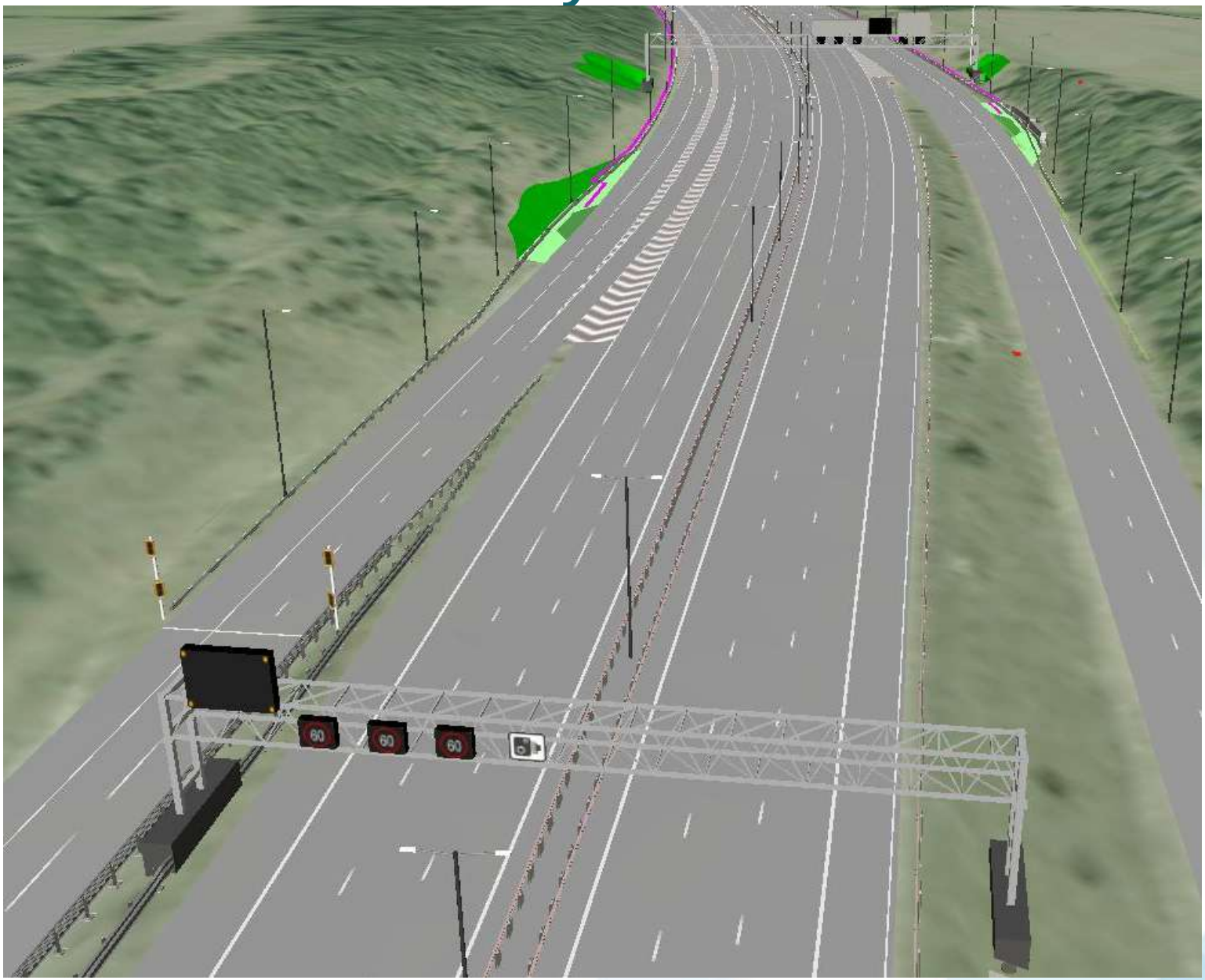
Individual Risk Scores as a proportion of total baseline motorway scheme risk

Typical Hazard Log Results



Individual Risk Scores as a proportion of total baseline motorway scheme risk

Use of Virtual Reality Models



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Use of Virtual Reality Models

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3. Safety Report

Pre-opening versions:

- Gives confidence that safety objectives will be met
- Identifies higher risk issues and mitigation needed
- Identifies and verifies **Safety Requirements** in place
- Defines future monitoring

Post-opening version:

- Reports outcomes and residual actions

Safety Requirements

- Process results in a list of mandatory safety requirements, defined as:

Those features, operational procedures, working methods or actions which are considered necessary for the safe functioning of the scheme.

- Also on occasion may include “do not/must not” type statements

Future Applications?

Current (*= Atkins)	Future??
Highways Agency Managed Motorways*	Transport Interchanges, toll plazas, bike hire schemes?
Second Forth bridge	Complex shared space areas?
M4 Newport Wales Variable Speed limits*	Light rail & trolley buses on-street?
	Event management/car parking/park and ride ?
	Strategic (10 year) safety planning?

- Process is highly adaptable and can be applied using variable degrees of rigour

- Highways Agency Interim Advice Note just published (IAN 139/11)

Governance

- Safety committee reviews key issues, including Departures from Standard
- Safety committee endorses Deliverables
- Highways Agency – multiple signatures (cross-Directorate)

Road Safety Audit Issues (1)

- Auditors ideally placed to be included in safety team
- Likely to be ‘disqualified’ from subsequent RSA
- RSA still required. No special arrangements to vary HD19.
- But, HA encourages cross-programme sharing of auditors to ensure appropriate knowledge of complex schemes
- I suggest including Safety Plan, Hazard Log summary and Safety Report as input documents in Audit Brief

Road Safety Audit Issues (2)

- Use of 3D model? – yes, but as an add-on/check not primary modus operandi.
- Need to understand signal settings, sequences, text messages and also CCTV coverage issues
- Include technology specialist in audit team
- Consider need for additional maintainability audit

“Maintainability”

- Wind-down rotating Message Signs (M4 Newport)
- HA Managed Motorways debating need for verge hard-standings to remove crews from hard shoulder

Concluding Remarks

Summary of benefits:

- Robust audit trail
- Safety specialist involvement from outset
- Reduces operational risks – 36 month results for M42:

➢ **2.25** accidents per month “after” (hard shoulder running)

➢ **3.17** in the 3 Lane Controlled Motorway mode

➢ **5.08** “before” (no control)

➢ Represents a 55.7% reduction overall

➢ No KSI during peak times

Thanks for listening !

Questions and Discussion

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Additional info slides

Disclaimer

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Safety Report Time-Line