T1009 Further research into adapting to climate change - Tomorrow's Railway and Climate Change Adaptation (TRaCCA) – Presentation To UIC RailAdapt Workshop

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Background

What is T1009: Tomorrow's Railway and Climate Change Adaptation?

An RSSB / government funded research study known as TRaCCA, in two phases, sponsored by the Technical Strategy Leadership Group:

Phase 1: A comprehensive knowledge review and knowledge gap analysis off issues relating to climate change *adaptation* not *mitigation* relating to the rail industry

Phase 2: Improving knowledge of climate change hazards and vulnerabilities, and proposing decision support tools to increase resilience of the GB railway

Organisations involved

A consortium led by ARUP

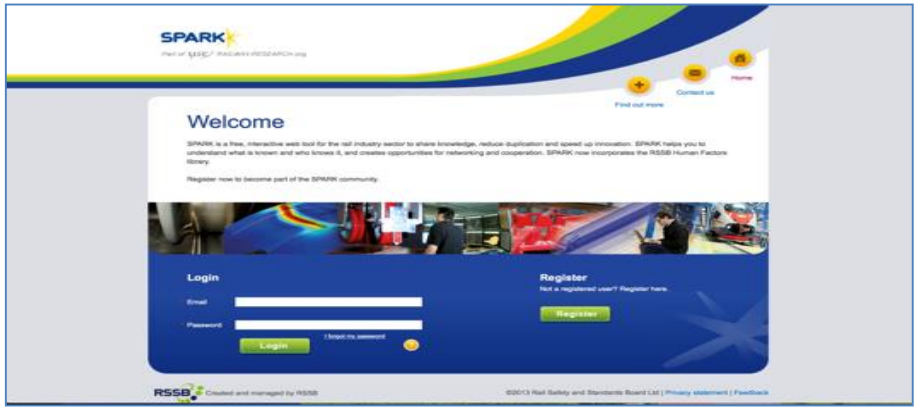
Phase 1 – Knowledge, gap analyses

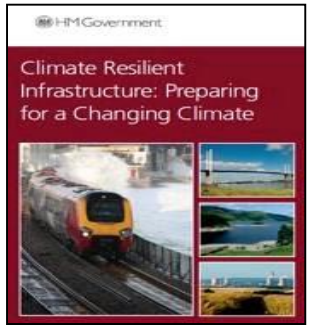
Tomorrow's Railway and Climate Change Adaptation

Phase 1 reviewed research on climate change impacts and information on weather resilience management in relation to the GB railway

Other infrastructure sectors, including Highways, were consulted

Over 500 related documents have been made available to the industry via the RSSB SPARK platform – see www.sparkrail.org





Phase 2 – nine ‘Tasks’

Five tasks led to a deep understanding of impacts and possible solutions:

Task 1 Climate change impacts on the GB railway and wider socio-economic consequences

Task 2 Good practice and lessons from other countries with similarities both in climate and railway systems

Task 3 The metrics we use and what might be better

Task 4 Risks affect the whole railway system – its assets, people, operations, maintenance and supply chain

Task 5 Mapping tools help to assess vulnerabilities

All outputs are available via www.sparkrail.org

Project outcomes

Key questions that T1009 has addressed

- How is the UK climate and weather going to change in the future?
- What are the impacts of climate change and extreme weather going to be on the GB railway?
- What is being done already or can be done about the impacts of climate change and extreme weather?
- How can we evaluate the cost and benefits of dealing with the impacts of climate change and extreme weather?

Principal recommendations and findings 2

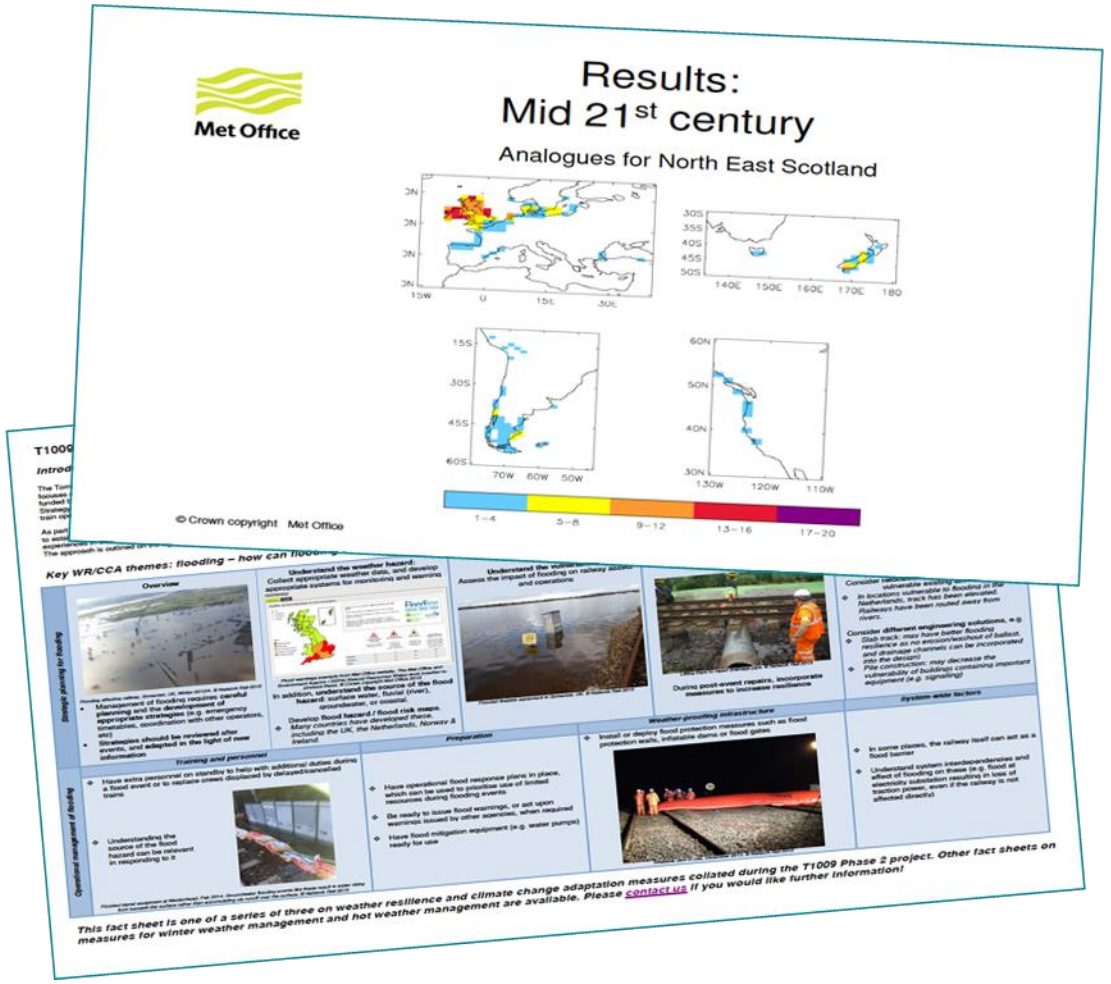
Britain's climate in 2080 will be similar to central France now

How is the UK climate and weather going to change in the future?

Looked at other climates and similar railways across the world

Compendium of climate and weather resilience measures logged in 'Spark'

Expect warmer drier summers, milder wetter winters, and more frequent extreme weather events
…BUT…
Extreme cold still possible



Principal recommendations and findings 3

At the front of the pack?

What is being done already or can be done about the impacts of climate change and extreme weather?

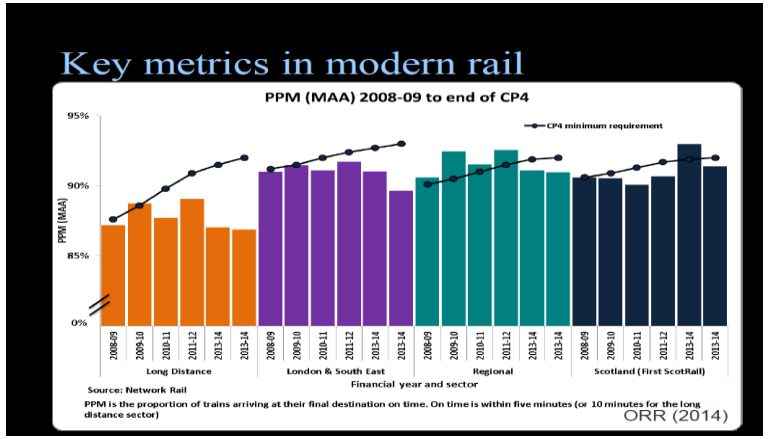
GB railway is up with other European/ global railways in terms of managing risks due to climate variability and understanding the vulnerability of our assets

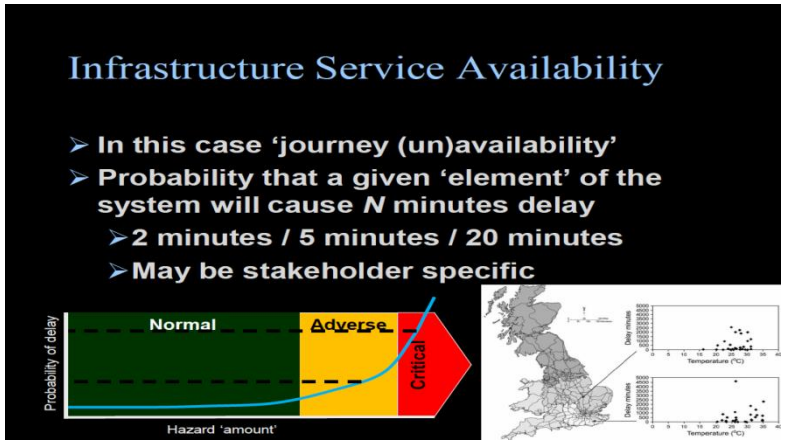
At the forefront of adaptation and resilience planning and implementation

Network Rail climate change adaptation plans
Climate change resilience steering group
Review of standards and specifications for critical assets

Principal recommendations and findings 4

Prototype metrics have been proposed





How can we evaluate the cost and benefits of dealing with impacts of climate change and extreme weather?

Need better metrics to assess the resilience of the railway as part of a wider transport system

New asset vulnerability tools have been demonstrated

'Delay minutes may not accurately reflect how regularly a route is not available for full service. We need a different mechanism.'
Mark Phillips, RSSB, quoted in 'Rail' 22 June 2016.

Principal recommendations and findings 5

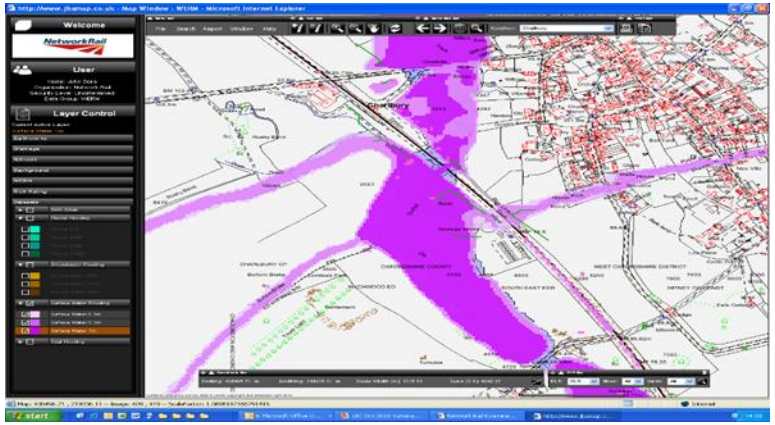
Climate change will impact asset life

What are the impacts of climate change and extreme weather going to be on the GB railway?

Changes will be required to railway standards and asset policies

Cannot rely on past weather for future design and maintenance
It is easier to adapt at asset renewal stage
Need to assess *current vulnerabilities – tools demonstrated based upon Systems thinking and Mapping*

Hundreds of GIS (Global Information System) Mapping based tools reviewed
Develop GIS-based alert systems and weather susceptibility maps



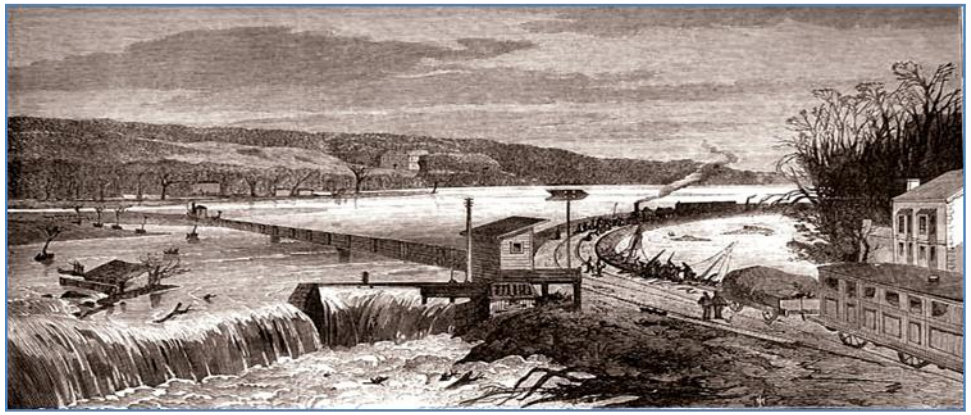
Principal recommendations and findings 1

Include socio-economic benefits when appraising rail schemes

How can we evaluate the cost and benefits of dealing with impacts of climate change and extreme weather?

Socio-economic benefits currently are not routinely assessed.

The Phase 2 case studies provide powerful illustrations.
Cowley Bridge Junction example:



Principal recommendations and findings 1

Include socio-economic benefits when appraising rail schemes

- Since publishing this research we have set up an Economics sub group of our implementation activity
- We have met with Network Rail, the Treasury (= Finance Ministry) and others to see what has been done already
- We are in discussion with the Department for Transport about developments
- We have a further meeting next month
- The conclusion so far is that investment appraisal systems in use (eg Webtag) allows exogenous and longer term factors to be taken into account but they are not mandatory
- We are exploring ways of making them more robust
- By improving investment appraisal mechanisms you don't automatically increase funding!

Conclusions

The climate is changing – we need to change the railway – TRaCCA helps and has over 200 recommendations

The GB railway needs to be more resilient; TRaCCA shows it is doing well…

- Taking climate change into account in investment planning
- Working with other owning and managing organisations whose infrastructure impacts the railway
- Modifying standards

…..and much more

RSSB setting up a monitoring and evaluation panel to track progress on the TRaCCA recommendations