Balfour Beatty

Journey towards a more climate resilient railway

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Embankment collapse near Hook in January 2023

Flooding across the North-West in October 2024

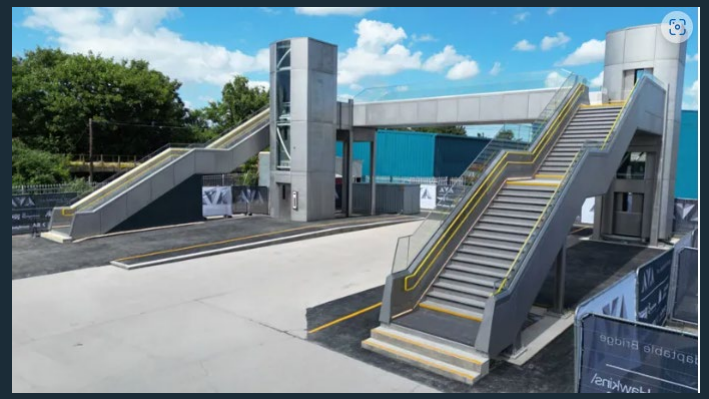
-Credit: (Image: Network Rail)

Making rail infrastructure projects more sustainable and climate resilient – 3 key areas of focus.

There is 650km of railway line at risk from coastal erosion according to the Climate Change Committee Credit: Paul Martin / Alamy Stock Photo

Decarbonisation and energy efficiency

- We need to reduce our carbon footprint and enhance energy efficiency, using sustainable materials wherever possible, and low carbon design:
  - Low carbon concrete
  - Green / Responsible steel
  - Blended ballast
  - Composite structures
  - Modern Methods of Construction



Flat pack footbridge & lift system developed by the AVA consortium. Manufactured off-site in factory conditions using state of the art techniques.

(Source: The Engineer – Prototype stainless steel AVA footbridge promises to transform UK rail stations)

Nature-based Solutions

- We need to leverage the power of nature to help mitigate against and adapt to climate change. Nature-based solutions can:
  - Provide flood management
  - Boost biodiversity
  - Improve air quality
  - Remove carbon from the atmosphere
  - Enhance well-being

Drainage channel and wetland adjacent to the rail corridor, Anglia Route, Eastern Region.

(Source: Peter Neal. From the Network Rail Sustainable Land Use Strategic Framework)

Infrastructure adaptation

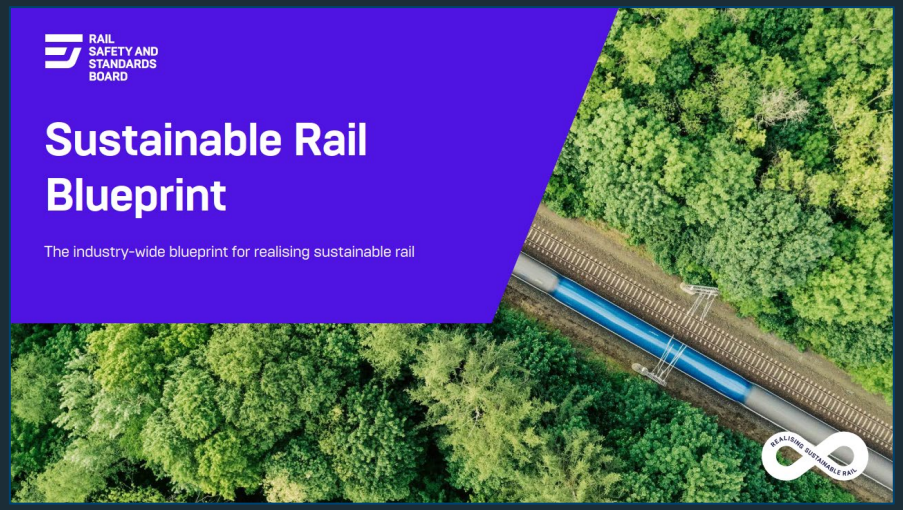
- We need to support the development of infrastructure that can withstand the impacts of climate change, such as:
  - Improved sustainable drainage systems (SuDS)
  - Permeable surfaces / Flood barriers
  - Elevated track beds
  - Reinforced embankments
  - Heat-resistant track materials
  - Cooling systems (e.g. for signalling)
  - Bridge tunnel reinforcement
  - Monitoring and early warning systems

Electrokinetic geosynthetic (EKG) technology has been used to stabilise a failing embankment in London resulting in a 26% cost reduction and a 47% reduction in carbon footprint over conventional methods.

(Source: www.electrokinetic.co.uk)

(Source: Network Rail Sustainable Land Use Strategic Framework)

Aligned Strategies & Coordinated Effort



Our future relies on all signals being green

- Building climate resilience in the UK's rail network requires a multi-faceted approach involving:
  - Infrastructure adaptation
  - Technological innovation
  - Sustainability Measures

- There needs to be a coordinated effort across the value chain:
  - Government
  - Industry
  - Communities

- There needs to be a culture of constructive challenge:
  - How do we help remove some of the time and cost barriers to encourage innovation?
  - Is Minimum Viable Product (MVP) the best long-term solution?
  - How do we move beyond upfront cost avoidance, to allowing for whole life costing?

Thank you

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