



Adapting to a changing climate

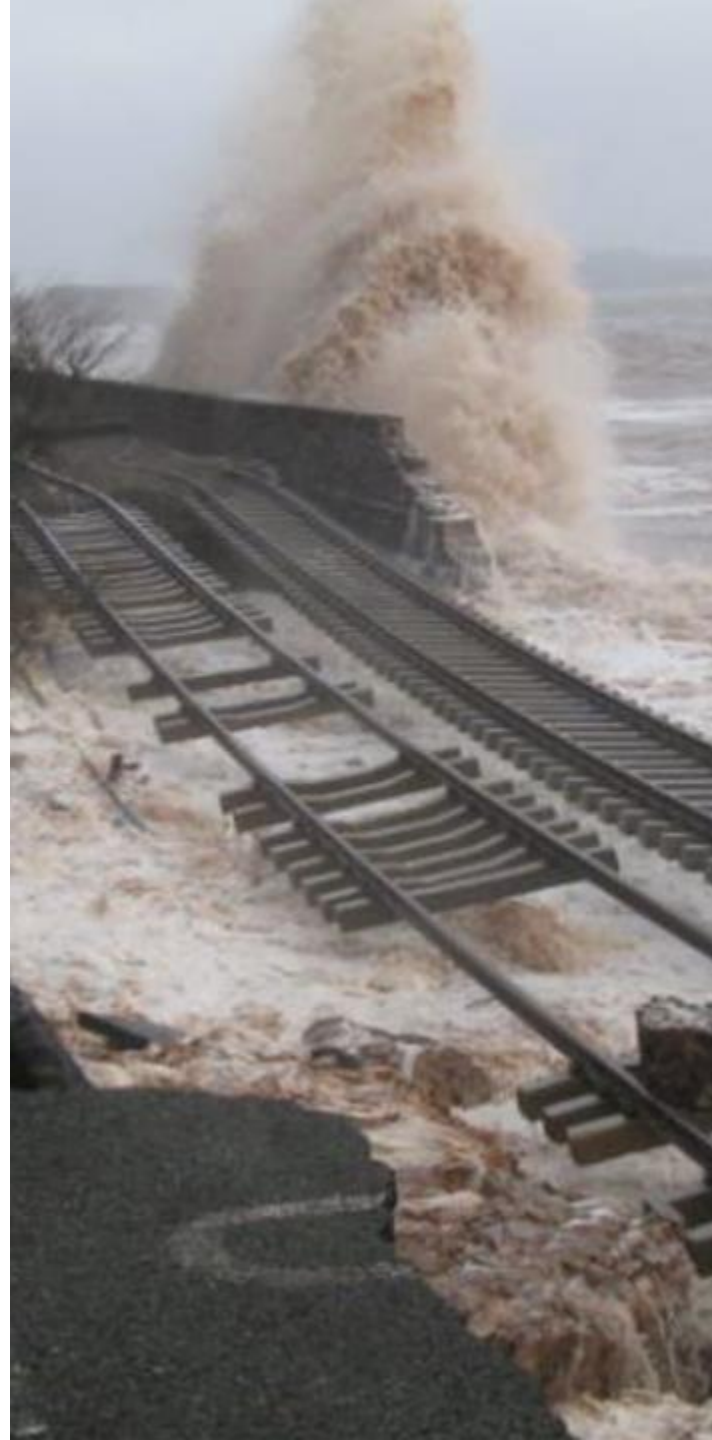
Network Rail's approach to managing the impacts of climate change

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**Simpler.
Better.
Greener.**

Our challenge

- Climate change is already impacting our services
- What service are we expected to run and what level of resilience do we need to build into the network to deliver it?
- When do we need to take action? What does that action look like?
- How much extra is climate change going to cost us and what impact does that have on our investment plans?

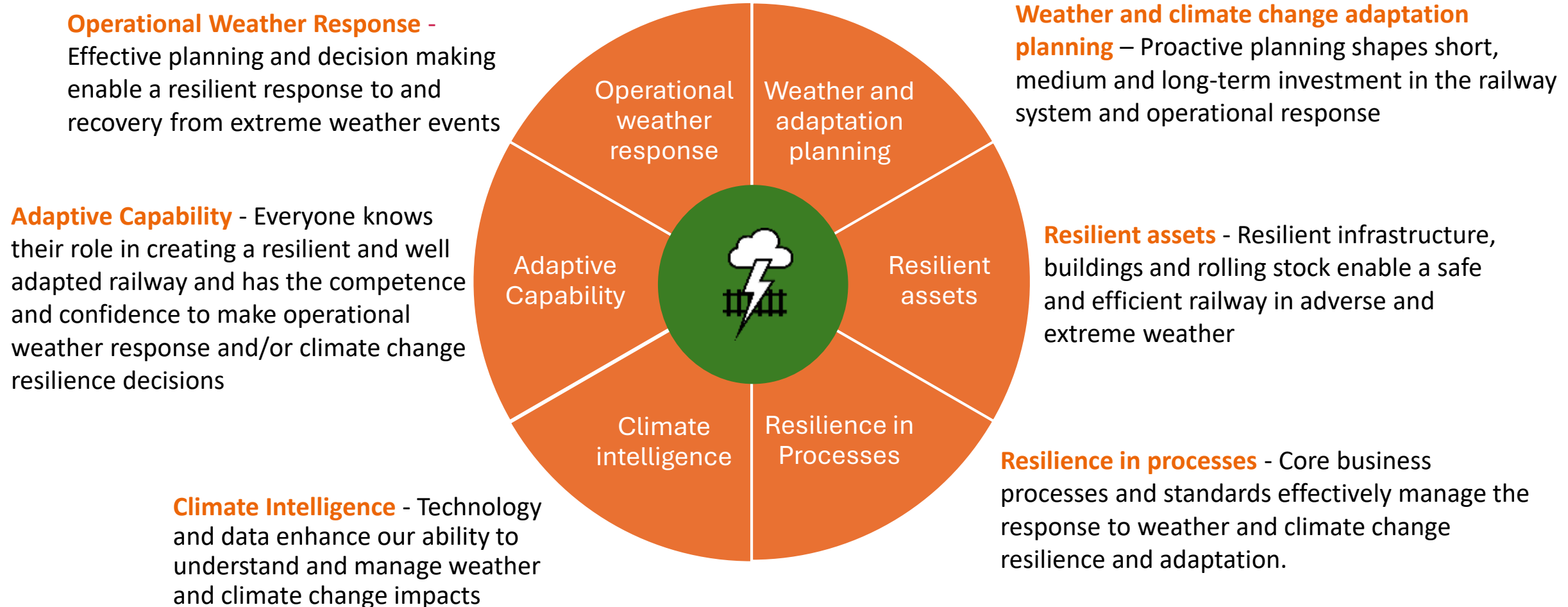


Our adaptation vision

To have a well-adapted railway system that is flexible, reliable, operates safely and is responsive to a changing climate



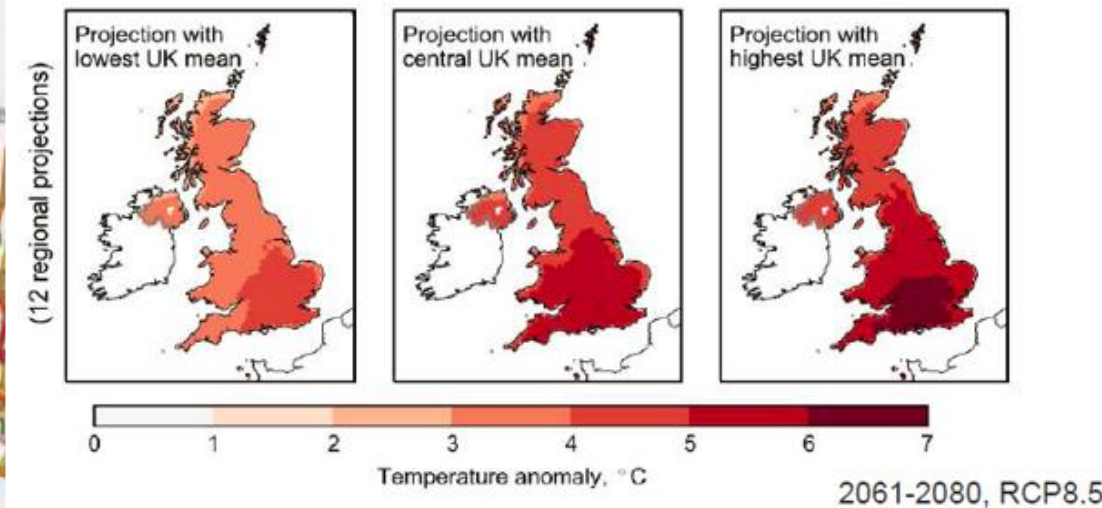
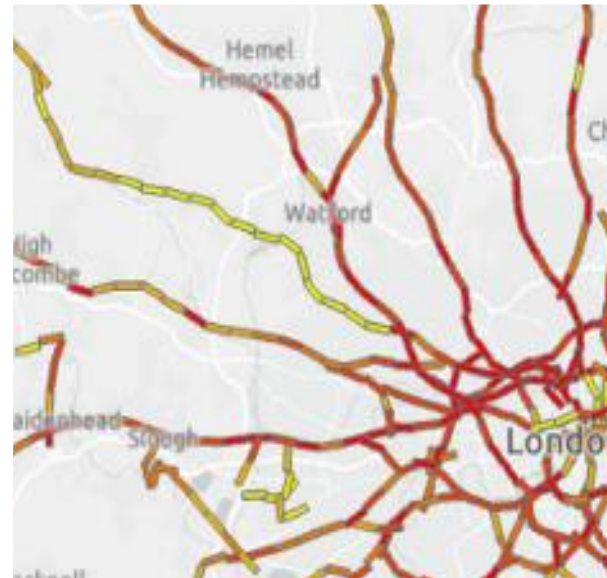
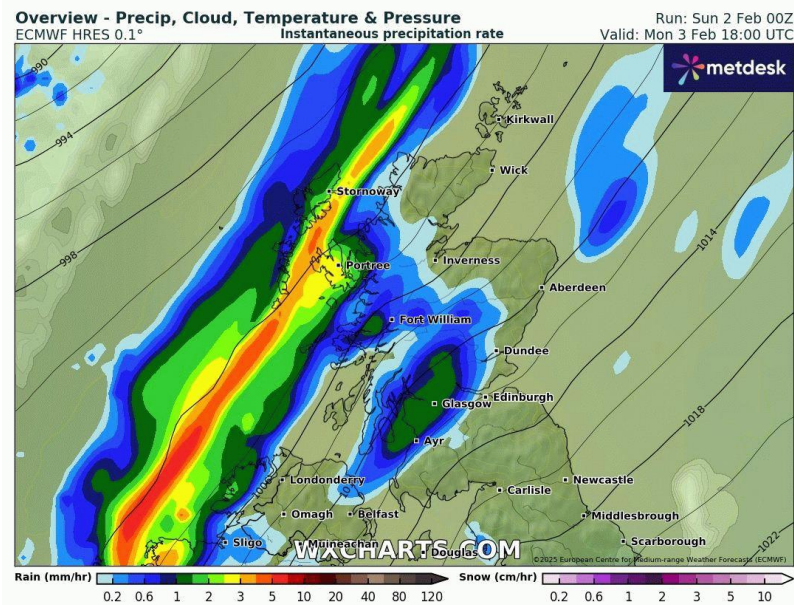
Our work falls into six key themes



Climate Intelligence

- Turning data into knowledge to understand risk and make better decisions
- Continuously improving our weather forecasting, monitoring and alerting capability
- Continuously improving our climate risk assessment
- Improving climate projection data and making it more accessible
- Trying to develop leading resilience metric
- Collaboration with rail and other sectors, UIC etc

Weather Hotspot	A weather hotspot is a line-side geographical area that is at a higher risk to one or more weather hazards.			
National Table				
Wind				
Category	Normal	Aware / Level 1	Adverse / Level 2	Extreme / Level 3
Sustained (mph)	29 or less	30 to 39.9	40 to 49.9	50 mph or more
Hourly Gusts (mph)	39 or less	40 to 49.9	50 to 59.9	60 mph or more
Rain				
Category	Normal	Aware / Level 1	Adverse / Level 2	Extreme / Level 3
Hourly (mm)				
3 Hourly (mm)	less than 3mm	3 to 4.9mm	5 to 9.9 mm	10mm or more
12-hour	less than 15mm	15 to 19.9mm	20 to 24.9 mm	25mm or more
12-hour on 100% Wet Soil (mm)	less than 5mm	5 to 7.9 mm	8 to 10 mm	10mm or more
Daily (mm)	less than 30mm	30 to 39.9	40 to 49.9	50 or more
Daily on 100% Wet Soil (mm)	less than 10mm	10 to 14.9 mm	15 to 19.9 mm	20mm or more
15 Daily (mm)	less than 70mm	70 to 99.9 mm	100 to 149.9 mm	150mm or more
Temperature				
Category	Normal	Aware / Level 1	Adverse / Level 2	Extreme / Level 3
Heat (°C)	less than 20 C	20 to 24.9	25 to 28.9	29 or more
Cold (°C)	warmer than -0	0 to -2.9	-3 to -7	-7 or colder
Frost (°C) (Minimum air temperature - wind >12 mph)	warmer than -0	-0 to -0.9	-1 to -2.9	-3 or colder
1 Day Diurnal Cycle (°C)	less than 13 C	13 to 15.9	16 to 17.9	18 or more
Snow				
Category	Normal	Aware / Level 1	Adverse / Level 2	Extreme / Level 3
Daily Snowfall (cm)	1.9 or less	2 to 4.9	5 to 14.9	15 or more
Accumulation	TBD	TBD	TBD	TBD
Drifting Risk	None	Low	Medium	High



A simpler, better, greener railway.

Resilient Assets

- Some of our network is resilient to weather impacts
- Will it remain resilient in the future as climate change progresses?
- All our work aims to help prioritise where and when we need to act



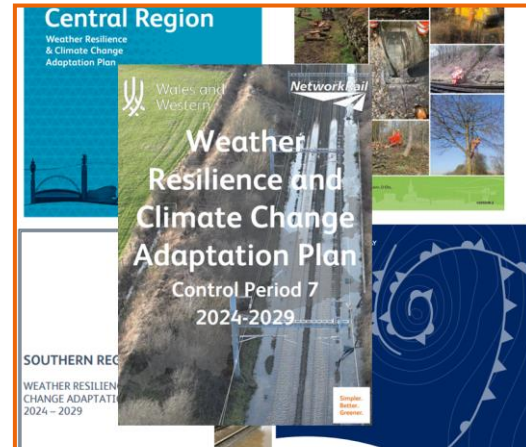
Adaptation planning

Adaptation Report



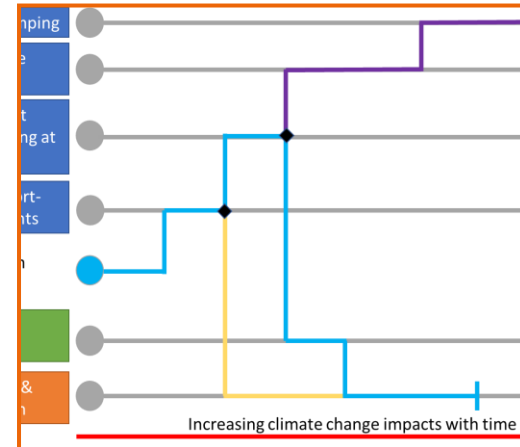
- Comprehensive assessment of UK climate risks
- Outlines adaptation actions for the next 5 years
- Reviews progress from the previous cycle
- Aligned with TCFD (no financial or transition risk analysis)

Regional WRCCA Plans



- Region-specific actions in Strategic Business Plans (e.g. asset renewals, monitoring, adaptation strategies)
- £2.8bn (~6%) of CP7 (2024-2029) railway investment supports resilience
- Delivery regulated by the Office of Rail and Road

Adaptation Pathways Strategies



- Whole-network assessment with focus on high-risk areas
- Maps short, medium, and long-term investment needs
- Identifies where resilience can be built via BAU renewals
- Some areas may need transformational change to maintain safe, reliable services

Strategic Business Planning



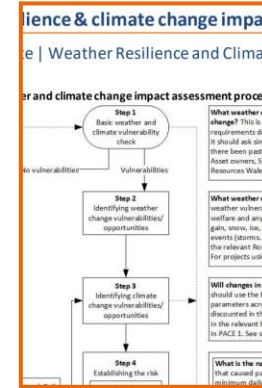
- Integrate climate change into long-term planning scenarios
- Model asset degradation and future maintenance needs
- Identify key resilience interventions for the next 5 years

Resilience in processes



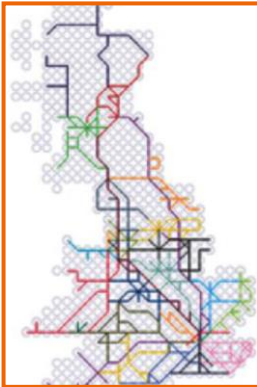
Asset standards

- Update asset design, maintenance, and operations standards
- Build resilience for future weather, not just current conditions
- Ongoing process — many standards still need updating



Project Delivery

- All renewals and enhancements should assess climate change impacts
- Projects should consider climate-resilient design options
- Guidance and climate projection tools are available to support this



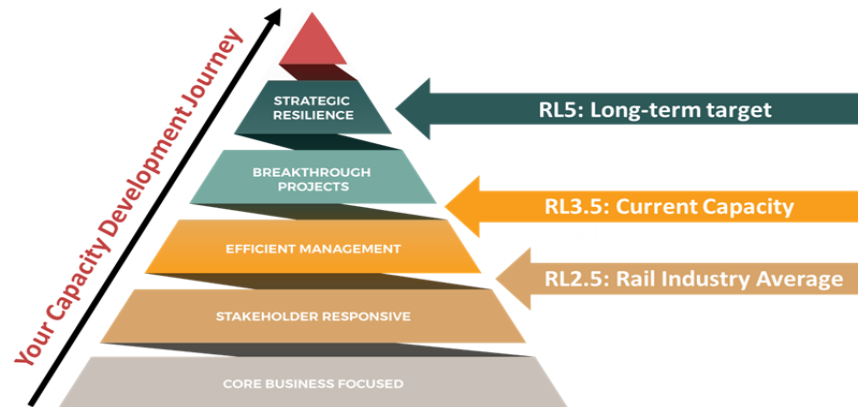
Strategic Planning

- Business planning now includes climate adaptation requirements
- Guidance available on economic analysis
- Adaptation pathways will inform future strategic planning

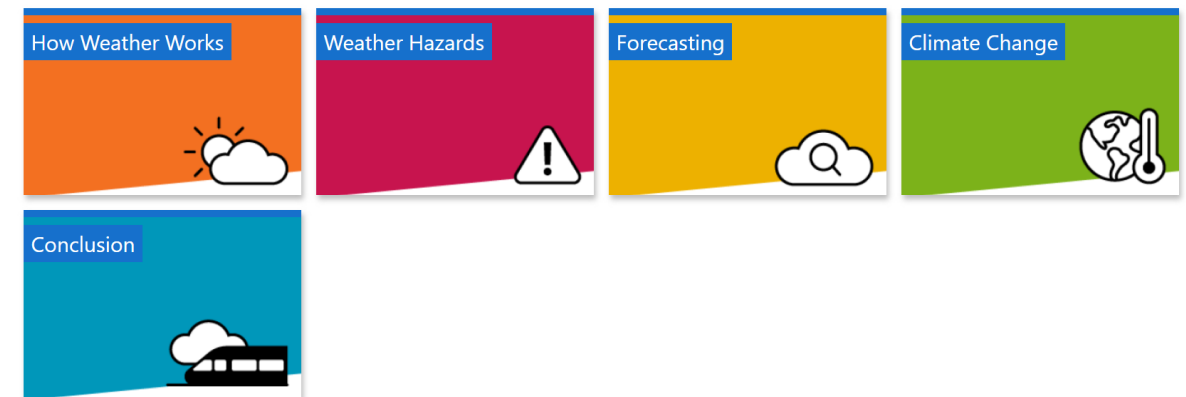
This is just the start...

Adaptive Capability

- Collaboration and knowledge sharing between practitioners in different parts of the business (site visits, co-developing research projects etc)
- UK Rail industry assesses the maturity of organisations in relation to climate change adaptation NR average score increased by ~1.5 points in past two years
- Weather Academy focusses on increasing competence of railway staff in relation to operational weather impacts
- Focus for next year on developing more climate change specific learning material



Select a module below to find out more about what it's about.



A photograph of a railway track stretching into the distance towards a bright sunset. The sun is low on the horizon, creating a strong lens flare and illuminating the tracks and surrounding vegetation. The sky is a mix of orange and blue.

Thank you

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