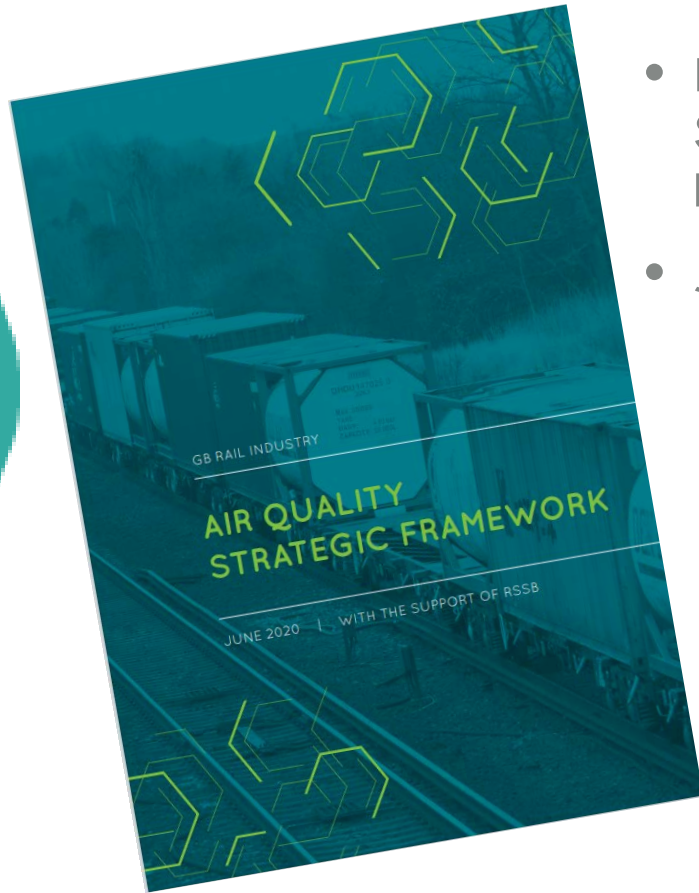


WMRE Rail Emissions Strategy

Peter Sargant, Head of Rail Development

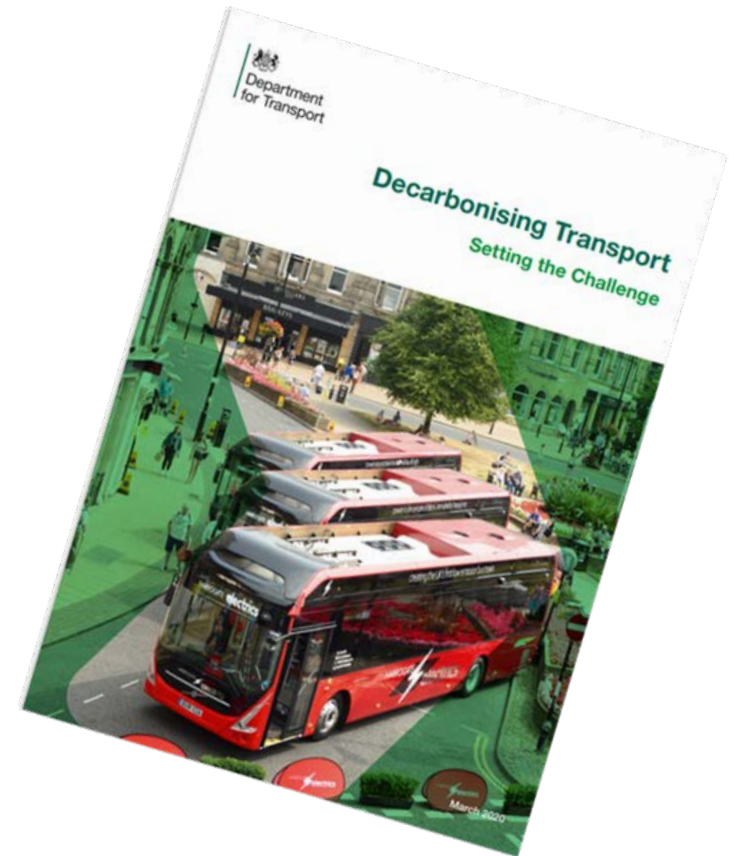
January 2021

National Strategic Context

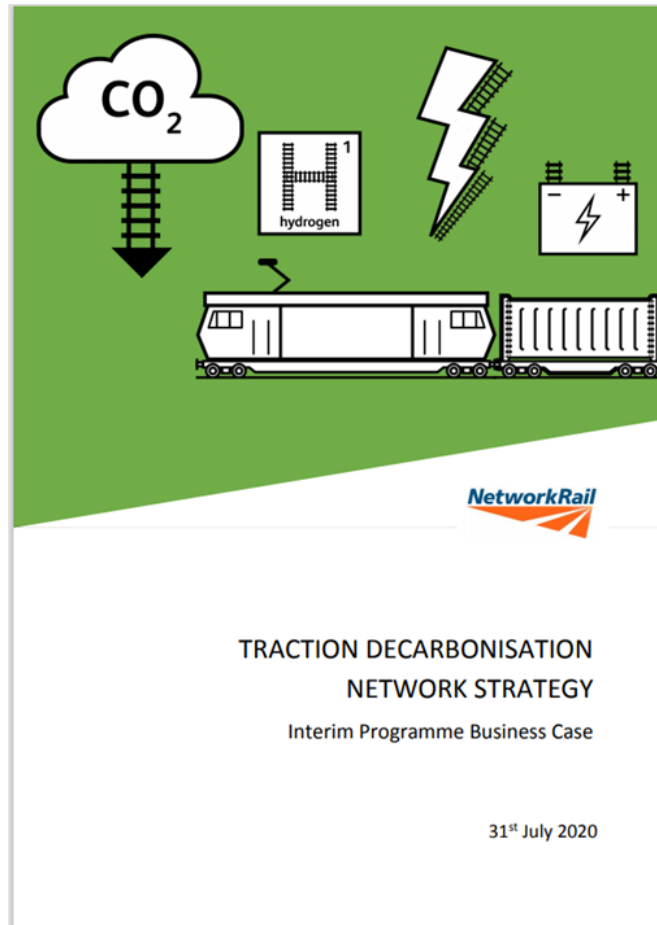


- RSSB Air Quality Strategic Framework
- June 2020

- DfT Decarbonising Transport - March 2020
- Net zero Transport Emissions by 2050
- Transport Decarbonisation Plan to be published Spring 2021



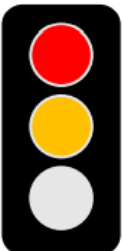
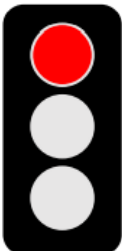

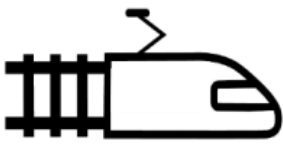
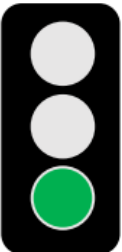
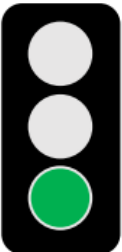


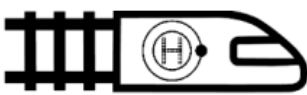
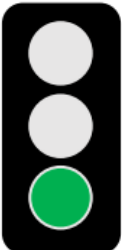
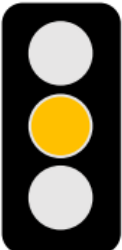
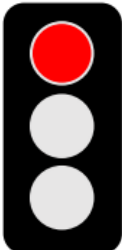
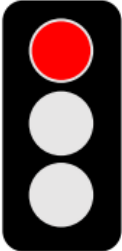


Traction Decarbonisation Network Strategy (TDNS)



- Published by Network Rail Autumn 2020
- Outlines long-term proposed outcome for Traction Power on network to eliminate diesel trains
- Proposes significant expansion of electrification supplemented by battery and hydrogen
- Provides a high-level business case for meeting the 2050 net-zero target
- A more detailed Programme Business Case will be published soon – this will show proposed phasing of electrification

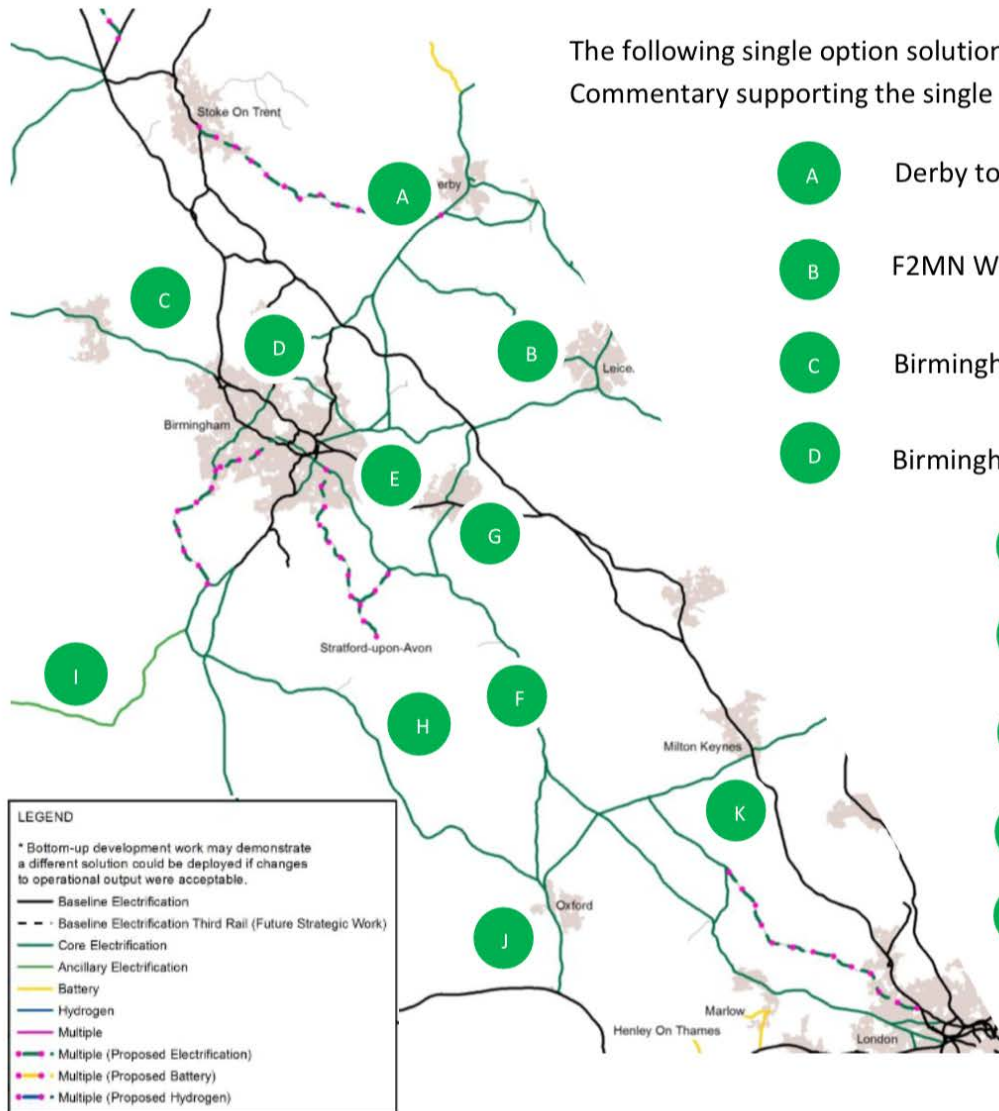
Traction Power Options

	Passenger (75 mph)	Passenger (100 mph)	Passenger (125 mph)	Freight
<p>Battery</p> 				
<p>Electric</p> 				
<p>Hydrogen</p> 				

- Battery
 - Limited range
 - Good solution for extending services short distances “beyond the wires”
 - Test trains under development
- Electric
 - Optimal solution for traction power
 - Mature technology
 - Infrastructure is very expensive
- Hydrogen
 - Reasonable range potential
 - Practical challenges over hydrogen production, storage and use
 - Low efficiency, poor energy density
 - Test trains under development

Most WM Routes Proposed for Electrification

WEST MIDLANDS (WM)



The following single option solution recommendations are made for the West Midlands.
Commentary supporting the single option recommendations is provided in the table overleaf.

- | | | | |
|----------|-----------------------------------|----------|-------------------------------|
| A | Derby to Birmingham | J | Banbury to Didcot |
| B | F2MN Western Section | K | Oxford to Bletchly (E/W Rail) |
| C | Birmingham to Shrewsbury | | |
| D | Birmingham North Freight Corridor | | |
| | | E | Nuneaton to Birmingham |
| | | F | Chiltern Main Line |
| | | G | Nuneaton to Leamington Spa |
| | | H | Worcester to Oxford |
| | | I | Worcester to Herford |

Diesel/Electric Train Operation in Birmingham

Based on December 2019 Timetable	Total Trains per off- peak hour	Diesel		Electric	
Birmingham New St	48	18	38%	30	63%
Birmingham Moor St	15.5	15.5	100%	0	0%
Total	63.5	33.5	53%	30	47%

- Chase Line electrified in 2019 – Birmingham to Rugeley services converted to electric
- Shrewsbury and Hereford are remaining diesel local routes at New Street
- Cross Country main operator of diesel services at New St
- Snow Hill Lines Electrification study due to be undertaken by Network Rail this year (funding approval awaited from DfT)

New diesels are much cleaner

	Standard	Hydrocarbon	NOx	Particulate Matter
		g/KWh	g/KWh	g/KWh
Class 170 (introduced 1999)	UIC Stage 2	1	6	0.2
Class 196 (introduced 2021)	EU Stage 3b	0.19	2	0.025

- Class 196s replacing Class 170s on Shrewsbury and Hereford Line services
- New Camp Hill Line services will be operated by Class 196 4-car diesel units

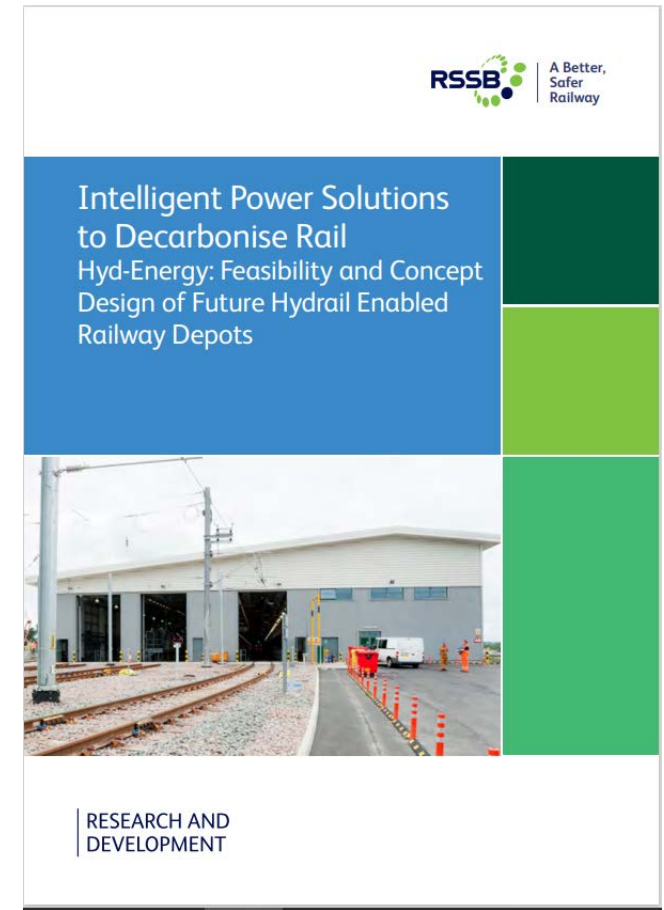
WMRE Investigating Bi-Mode Rolling Stock

- Project to investigate potential for introducing Battery/Electric Multiple Units (BEMU) on the WM rail network
- Benefits would be:
 - Facilitates Aldridge station project
 - Allows replacement of unsuitable LNR Class 350s on WM local services with a dedicated fleet of urban configuration trains
 - Could allow removal of diesel services at New Street, including on Camp Hill line
- Significant challenges
 - Commercial/contractual
 - Funding
 - Technical
- Study underway – due to report Spring.



Overarching Strategy

- WMRE is updating its Rail Investment Strategy – much greater focus on emissions and decarbonisation
- WMRE will support and promote electrification of the network – needs to be coordinated around Midlands Rail Hub and other upgrades
- WMRE will consider supporting hydrogen train trials – working with University of Birmingham and other partners
- WMRE will take forwards the BEMU study
- WMRE will support Network Rail and Operator partners with their proposals to introduce cleaner trains onto the network and reduce emissions





Final Page