High-Speed Rail: Prospect and Promise

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Overview

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- Recent developments with High-Speed Rail (HSR) in Britain
- Why Britain needs HSR
- Energy and Greenhouse Gases
- The South Wales corridor
- National HSR network and its Business Case
- Mid and North Wales
- Next steps, including participation by Welsh agencies.

Network Rail, Greengauge 21 and HS2

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- August: Network Rail published ‘New Lines’ work
- September 16th 2009 – Greengauge 21 *Fast Forward* report
- December 2009 – HS2 report to Ministers.

Objectives of the Greengauge 21 HSR Development Programme

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- Strategies for HSR in each of five corridors and an overall national network
- Economic impacts at regional and city region level
- Identification of any critical sites
- Funding requirements & role of private sector in project delivery and operation.

  Together with supplementary work on: complementary measures; customer research; the GWML case; consultation findings.

Greengauge 21 Guiding Principles for HSR
approved by the Public Interest Group, January 2009

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1. **Capacity**
   - where there is unmet demand, for the national transport system
   - relief to the existing rail network
2. **Economic Regeneration**
   - growth, regeneration and wider productivity benefits
   - sustainable pattern of development
3. **Alternative to Car Use**
   - address the whole journey; an attractive, lower carbon, alternative to car use
4. **Modal Switch from Aviation**
   - attract demand from short-haul aviation to free-up runway capacity and/or reduce carbon emissions
5. **Nationwide Benefits**
   - phased national network providing benefits to all, reducing carbon emissions from the transport sector.

Why do we need High-Speed Rail?

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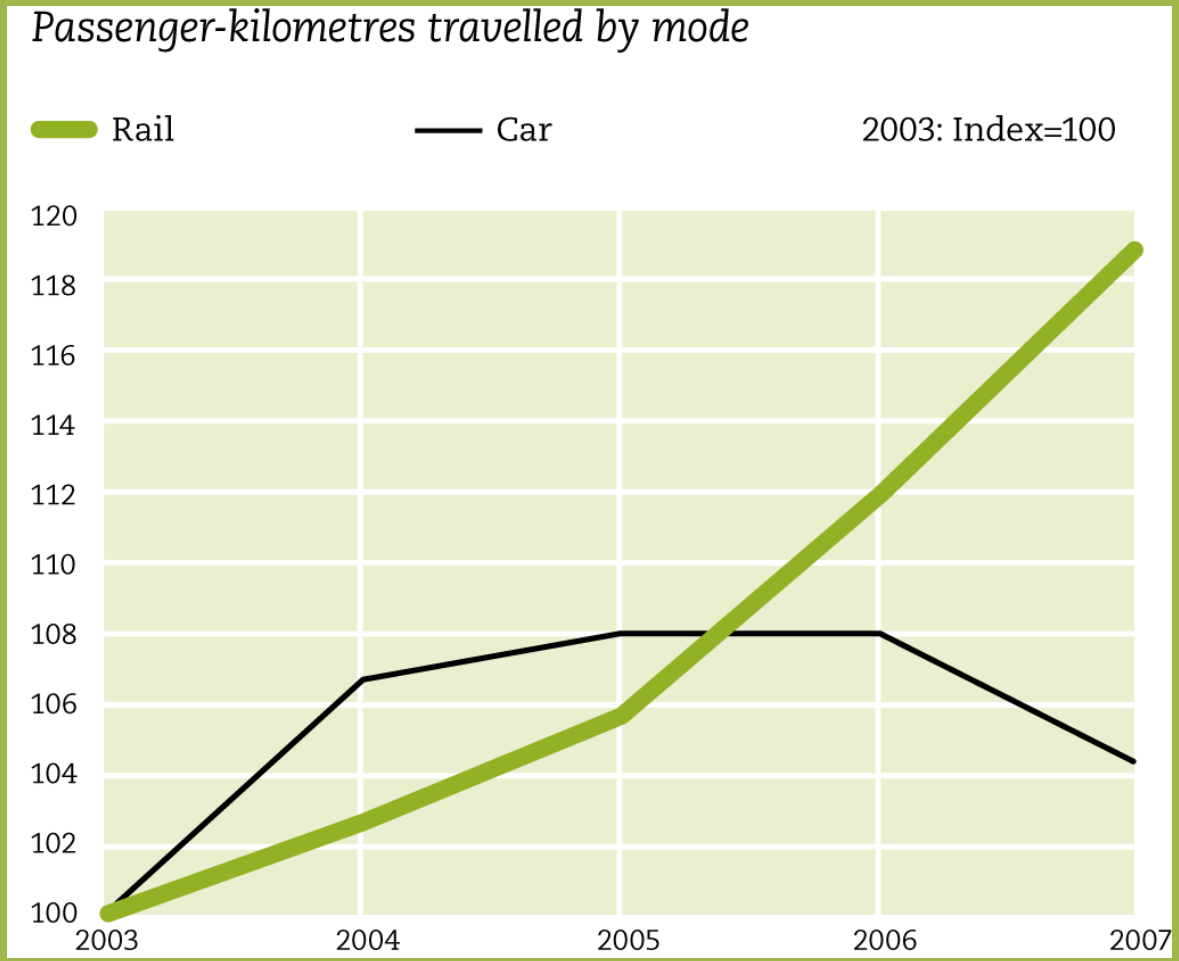

Public Opinion

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- Key messages from research: important for the consumer:
  - Ease of travel for whole journey
  - Optimising use of (travel) time
  - Importance of fares policy in securing popular appeal
  - Spontaneity matters
- High awareness of HSR among certain groups but lack of clarity for others – and some concerns
- **78% of people believe that HSR is essential for Britain's future and 95% believe it is an appealing concept.**

Why we need HSR (absolutely crucial to decide what high speed rail is for)

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- Our conclusion: about building national economic competitiveness with sustainable, high quality infrastructure and reduced carbon emissions
- So it's not *just* about transport and certainly not just about rail – or overcoming capacity shortfalls on rail

HSR changes mode share…

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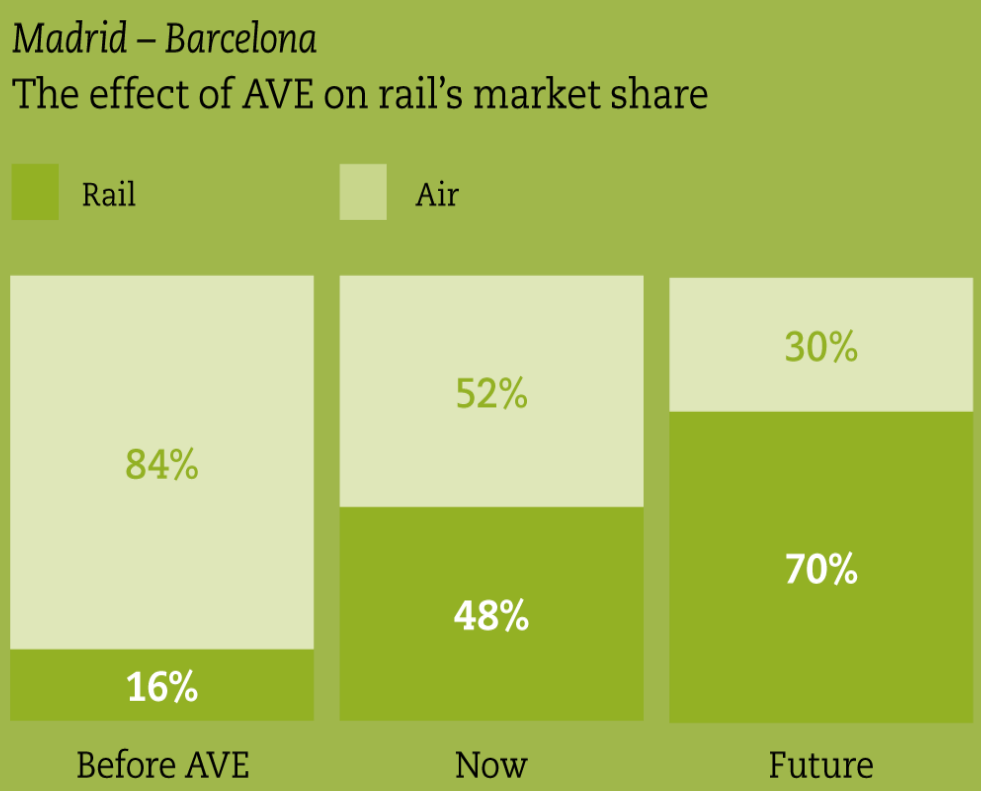

The Carbon Credentials of HSR

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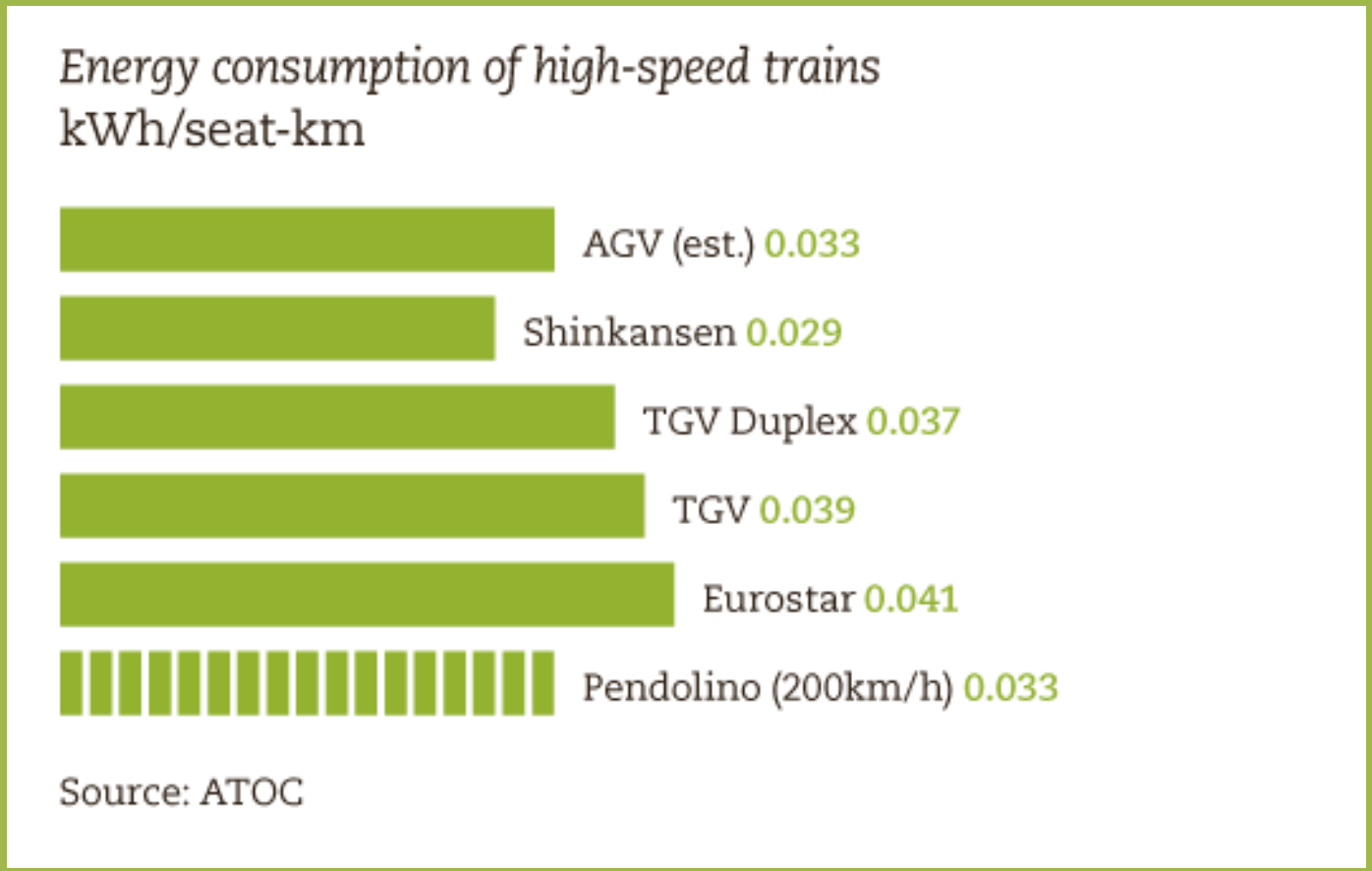

HSR as a Sustainable Mode Choice

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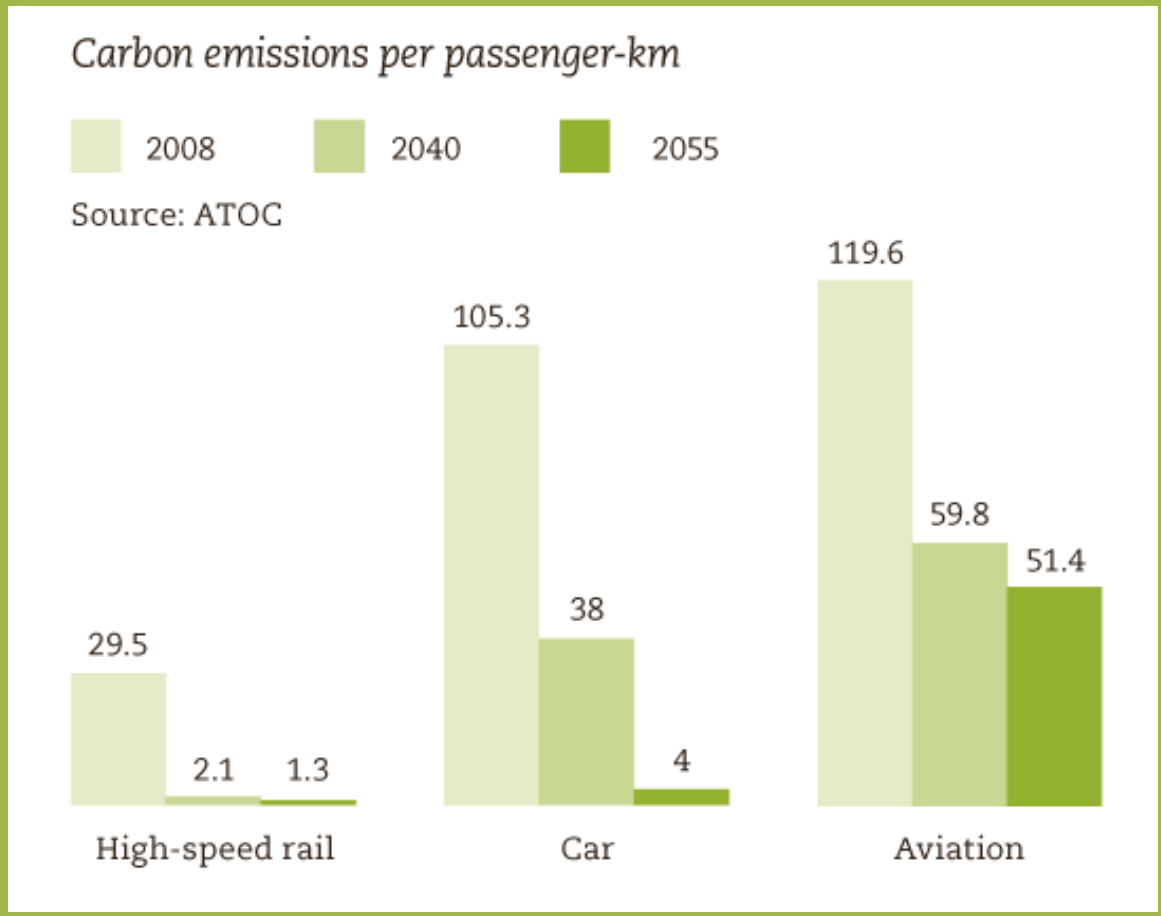

Five Key Issues to Consider in London – Bristol/South Wales Corridor

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- Capacity
  - is there a problem to solve?
- Journey time
  - enough improvement to deliver modal switch?
- Direct connectivity to Heathrow?
- Connectivity to Continental Europe?
- Taken together, will these gains support economic regeneration in South Wales?
- *Which features matter most will determine the 'Vision'.*

Current Journey Times (and 20 years ago)

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- As the network has become busier, journey times have lengthened
- May 2009 saw some minor journey time reductions from these December 2008 timetable schedules.

Journey time from London to	1989 Standard / Fastest	Current
Swindon	51m / 47m	55m
Bristol Parkway	1h15 / 1h11	1h24
Newport	1h 37 / 1h33	1h46
Cardiff	1h53 / 1h49	2h03
Swansea	2h46 / 2h44	2h58
Bath	1h23 / 1h02	1h25
Bristol TM	1h38 / 1h17	1h42
Exeter	2h13 / 1h55	2h03

Existing Network Constraints

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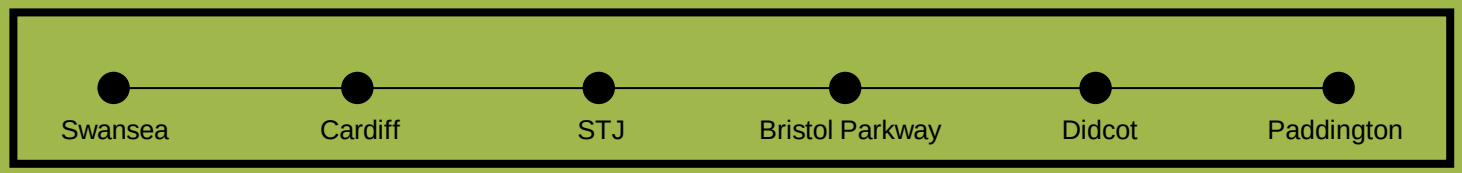

Swansea – Cardiff (exc)	Cardiff (inc) – Severn Tunnel Jn (exc)	Severn Tunnel Jn – Bristol Parkway (exc)	Bristol Parkway (inc) – Didcot East	Didcot East (exc) to Paddington (exc)	Paddington
Close to capacity	4-track theoretically spare capacity, but restricted because relief lines low speed (45 mile/h)	Constrained by 7 minute headway through Severn Tunnel, operating rules for freight trains	Close to capacity with current mix of freight and fast passenger	Didcot East & Reading's junctions Airport Jn into Paddington congested	Platforms at capacity in peaks, near capacity off-peak

Baselining – Current Plans for GWML

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1. **Crossrail (now – 2017):**
   - Better accessibility to City, Canary Wharf
   - Releases platform capacity at Paddington
2. **Reading station redevelopment and re-modelling** (to 2015)
   - removes bottleneck at Reading
3. **Resignalling provides opportunity to reduce headways**
   - between Reading and Didcot from 4min to 3min
4. **Bristol Parkway** 4th platform
5. **Speed increases**
   - between Severn Tunnel Junction and Cardiff
6. **Newport & Cardiff area resignalling**
7. **Electrification, ERTMS, IEP.**

Improved Services over existing Infrastructure

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	Service 1	Service 2
Omitting station calls	9 min	
Introduction of IEP	5 min	5 min
Raising line speed	2 min	2 min
Total reduction	**16 min**	**7 min**

Journey time from London to	Current	Estimated time, service 1 at 125 mph	Estimated time, service 2 at 125 mph
Newport	1h46	1h30	1h39
Cardiff	2h03	1h47	1h56
Swansea	2h58	2h42	2h51

New High Speed Line for South Wales

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A new high speed line between London and the Severn Tunnel:

- 186 mile/h (300 km/h)
- Newport by-pass would allow further 6 min reduction
- Further journey time reductions from a replacement Severn crossing
- If a Heathrow station is included, it would add 10 mins to journey times
- Freight benefits from fewer passenger services on conventional lines.

Journey time from London to	Current	Estimated time, with BPW call	Estimated time, non-stop CDF
Newport	1h46	1h09	1h09
Cardiff	2h03	1h26	1h19
Swansea	2h58	2h21	2h14

With Newport by-pass

London – Cardiff 1h 13min

London – Swansea 2h 8min

Option Summary

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Progressive journey time and capacity gains….

	Journey time (Cardiff)	Ball-park capital cost (£bn)
Existing plans (IEP, Crossrail, Reading, ECTS) and electrification	1h 56min	In base
And 4-tracking Didcot – Bristol Parkway with HSL	1h 35min	7.5
New HSL London – Bristol Parkway	1h 19min	13.4+
New HSL throughout London – South Wales	1h 10min	15.6+

New Severn Crossing

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1. **A number of options**
2. **New rail bridge**
   - parallel to the new M4 road bridge
   - not linked to a barrage or **incorporated into a Shoots barrage**
3. **200km/h assumed to be maximum speed** over such a structure;
4. **Journey time saving of 2 – 3 mins** compared with route via Severn Tunnel;
5. **Principal benefits would be**:
   - Infrastructure resilience through not having to rely on tunnel: we get Sundays back!
   - Increased capacity through the tunnel, and
   - May avoid need for freight train diversions and allow additional freight capacity through the tunnel.

A Vision for South Wales: achieve early progress and a flexible step-by-step upgrade (April 2009)

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1. Ensure that the GWML is connected into HS1 as HS2 is developed and that GWML is electrified
2. (related to this) get a new direct western access to Heathrow Airport
3. Expand the capacity of the central part of the GWML, allowing for faster speeds in the 225km/h – 300km/h range
4. Creating new high-speed route capacity between Bristol Parkway and South Wales
5. Add high-speed capacity at the eastern end of the route as needed

This provides the earliest possible introduction of high-speed trains to South Wales on upgraded route infrastructure offering valuable new connectivity as well as speed and quality gains.

Progress!

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- Advice to Welsh Assembly Government in April 2009
- In July 2009, Secretary of State for transport announced GWML electrification.

HSR Direct Connections to National Airport (CDG)

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Characteristics of a National HSR Network

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- Single N-S HSL, full by 2040/5
- Two routes are needed and offer better value for money than a single four track alignment
- Three E-W routes (Scotland; trans-Pennine; Bristol/Cardiff)
- City centres must be served to deliver the business case
- Peripheral airport/parkway stations can be added if they form sustainable transport hubs and help address modal shift
- Heathrow: a national HSR network opportunity.

What should a National HSR Network look like?

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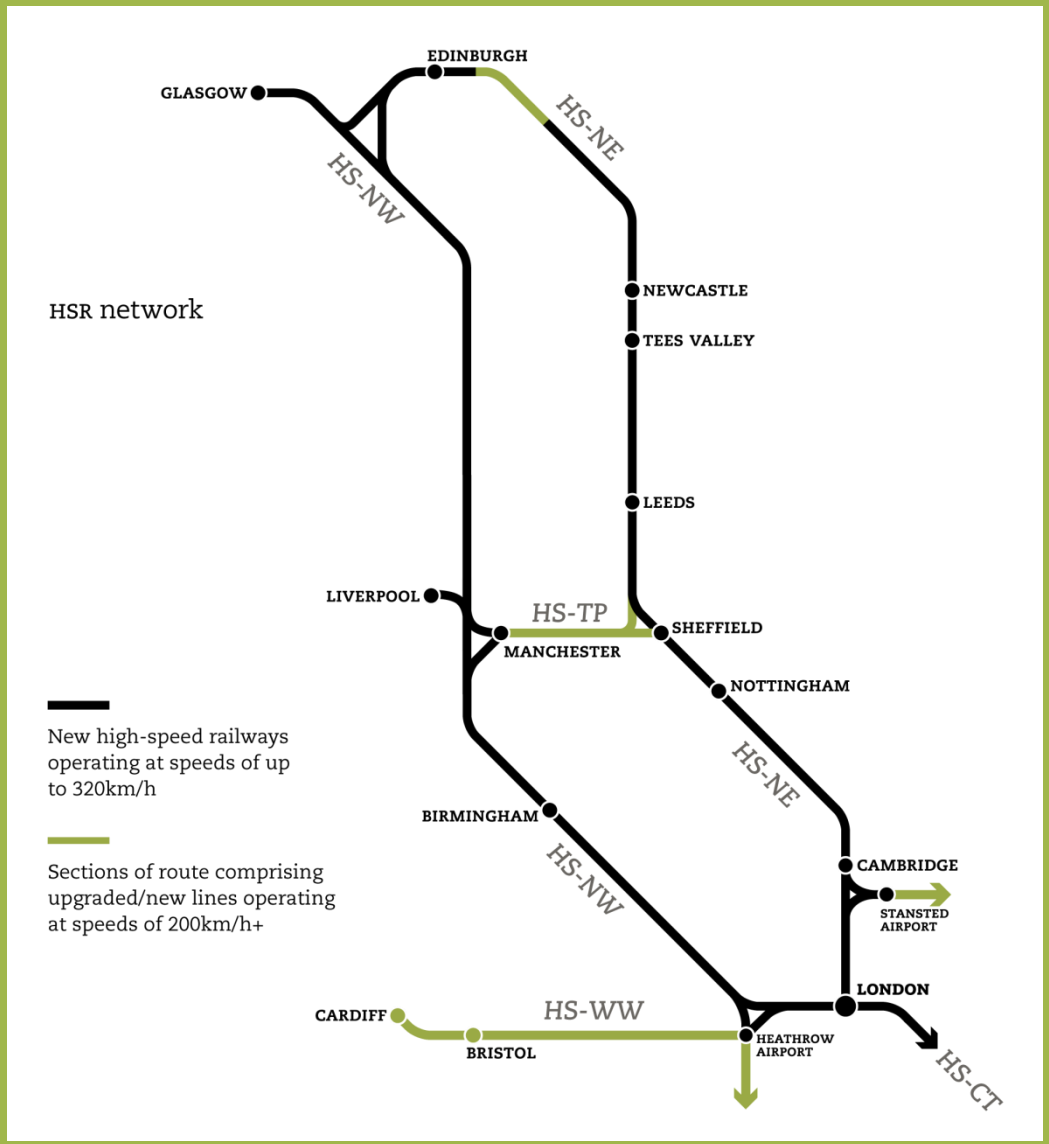

A Step-change in Journey Times

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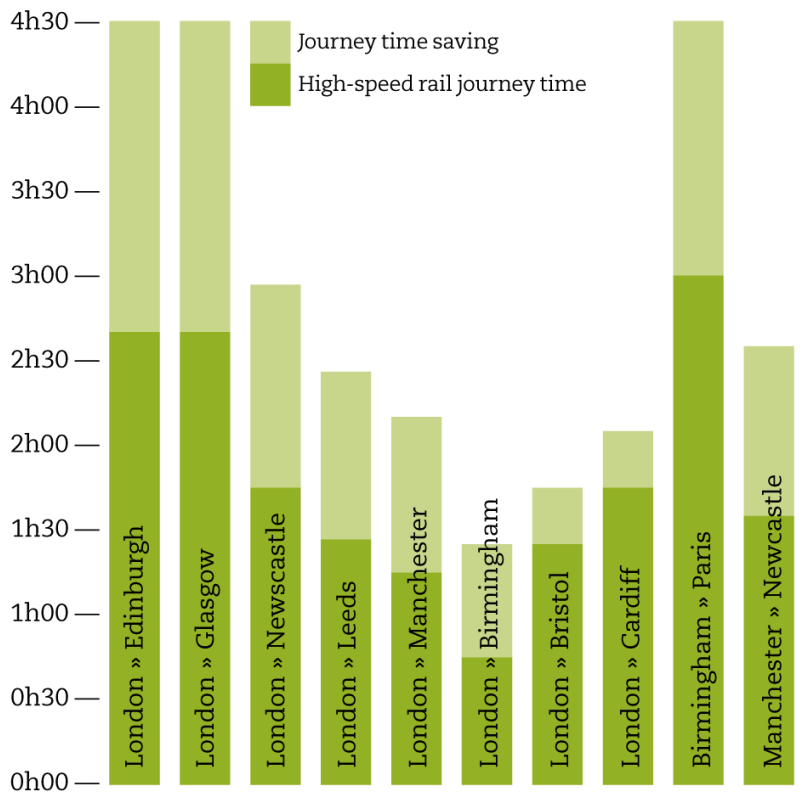
HSR services will typically offer journey time savings of 30–45% over today's rail journey



HS-WW as part of a National Strategy

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- Electrification of GWML allows through operation of HSR services at 200 km/h (or higher?)
- Connection to LHR airport allows direct access from South Wales and to HS1, HS-NE
- Shorter distances and high-performance of GWML means full HSR is likely to be of lower priority, but…
- Phased construction of new sections of 320 km/h route brings capacity & staged journey time improvements.

Heathrow Adds Value

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- Very positive incremental BCR
- LHR station serves air market and acts as a hub for wider south-east (broadly 50:50)
- Overall usage up to 20mppa
- Ideal outcome connections from a station on the airport site (not a remote ‘hub’, nor *en route* to the north) to:
  - HS2, HS1
  - GWML
  - SWML
  - Airtrack, Piccadilly line, Hex etc.

Economic Appraisal Results (BCRs)

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- Benefit cost ratio for the HSR network 3.5
  - HS-NW to Manchester 2.9
  - Extending HS-NW to Glasgow/Edinburgh 7.6
  - HS-NE to Newcastle 2.0
  - HS-WW (upgrade) 2.8
  - HS-TP (200 km/h) 1.3
- Also a very good case to link in Heathrow and a good case to connect to HS1
- Marginal case: extending HS-NE to Edinburgh.

Services that could be offered on a first phase of HS-NW

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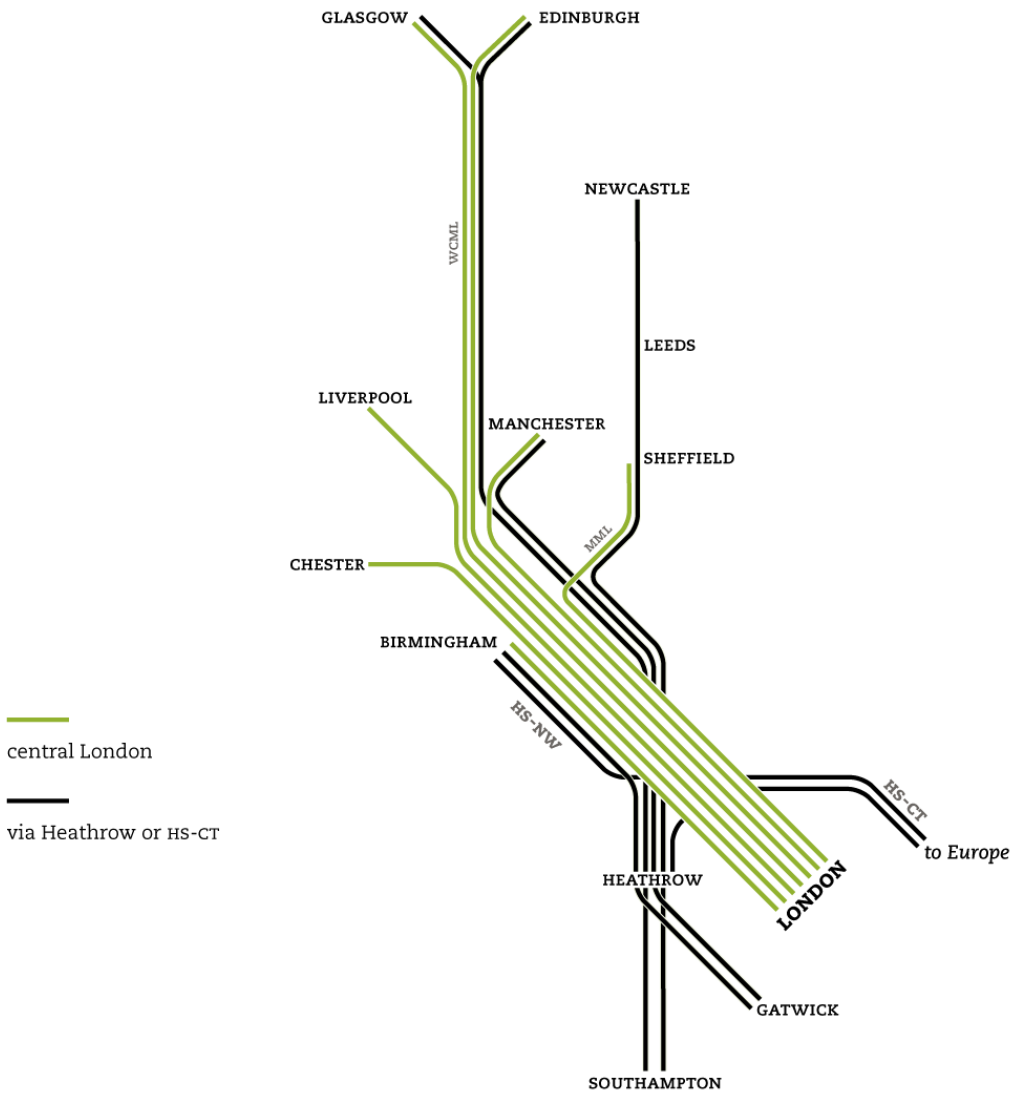

Mid and North Wales

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- Both can benefit from High-Speed North West:
  - Mid Wales – if a connection is made in Birmingham to the classic network
  - North Wales – if the Crewe – Holyhead line is electrified.

Next Steps

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- Alliance of city authorities
- ‘HS2’ will report; Ministers in Westminster will respond promptly
- *In our view,* overall network and strategy important as well as the project (HS2)
- Greengauge 21 is continuing; adding research and acting as custodian of the wider interest beyond the next project
- Welcome having Bristol and Cardiff City Councils join the Public Interest Group
- Wales Assembly Government will be invited to act as an observer.

Thank you.