Affordability in Rail Infrastructure Projects

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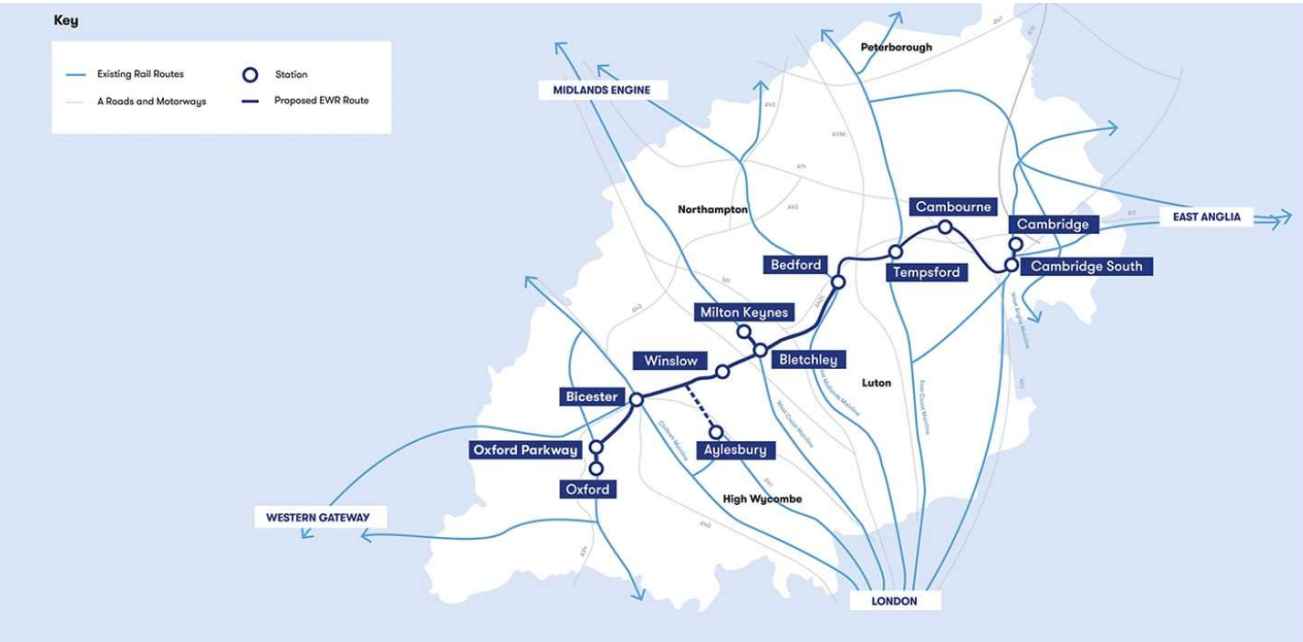
What is East West Rail?



East West Rail is a nationally significant railway project which aims to deliver much-needed transport connections for communities between Oxford and Cambridge

Delivered in **3** connection stages:

CS1: Upgrading an existing section of railway between Oxford and Bicester and bringing back a section of railway between Bicester and Bletchley

CS2: Refurbishing existing railway between Bletchley and Bedford

CS3: Building brand new railway infrastructure between Bedford and Cambridge

Headlines


'Monumental mistake' fears shatter consensus on HS2
Rail link will tear up rural Britain
Cost of HS2 will be at least £70bn, says Boris
Rebels at gates of Chequers
20%
Crossrail's budget overspend so far for this financial year, driven by difficulties on station projects
Manchester Evening News
NORTHERN RAIL CHAOS
TIME FOR CHANGE
TOWNS AND CITIES ACROSS THE NORTH JOIN FORCES TO CALL FOR ACTION ON TRAINS NIGHTMARE
SPECIAL REPORT: PAGES 2, 3, 4 & 5
Post
OFF THE RAILS
2000 trains cancelled
105 services screwed
- and even more subjected to long delays
Gazette
The Huddersfield
'TIME TO STOP THIS RAIL CHAOS'

UK Project Performance Map

	Wind power	Roads	IT-led change	Rail	Nuclear power*	Buildings	Nuclear waste storage
Cost overrun	18%	19%	23%	43%	45%	57%	238%
Frequency of cost overrun	7 of 10	8 of 10	5 of 10	5 of 10	10 of 10	7 of 10	9 of 10
Schedule overrun	44%	17%	72%	6%	58%	14%	70%
Benefits overrun	n/a	+5%	-4%	-7%	n/a%	-5%	-23%
Cost Black Swans	0%	2%	13%	12%	0%	13%	43%
Ø duration, years	1.7	4.2	3.3	6.3	7.9	5.0	6.8

* Attention: Small N with only 3

Source: Oxford Global Projects Database (Q4 2022)
Note: Measured from date of decision to build, in constant prices
Black Swans are defined as projects with statistical outliers with cost overrun > 85%

Understanding what drives the cost of infrastructure projects (for HS2 Euston)

To minimise the cost of major infrastructure projects we need to be clear about the key drivers of cost. Based on the work done here, for the HS2 Productivity Improvement Strategy and numerous other studies the following is a useful list of the key drivers of cost on these projects.

1. Requirements	The principal driver of costs. The more demanding the requirements the more expensive the project.
2. Constraints	The more challenging the constraints the more expensive the project.
3. Concept Design Response	The better the Concept Design response to the Requirements and Constraints the more cost effective the project.
4. Construction Strategy	The more optimal the overall construction plan, the more efficient the construction operations, more optimal the use of MMC etc the shorter the program, the fewer the resources used, the more affordable the project.
5. Commercial Management Strategy	Key areas are the approach to remuneration (including pain/gain share), risk and contract administration. Inappropriate models generate significant increases in out-turn costs.
6. Detailed Design Output	In terms of materials quantities, systems specifications, spatial arrangements, buildability, etc. the more effective the Detailed Design process the more affordable the project.
7. Construction Efficiency	The more efficient the construction operations and associated planning and assurance activities the shorter the program, the fewer resources required, the lower the cost.
8. Error	The fewer errors, the less direct and indirect costs of rework and the more affordable the project.
9. Disruption	The more disrupted the project process, the higher the cost of the project. Disruption is typically caused by funding failures, significant change in requirements, inefficient assurance and approval processes, ineffective behaviour of key stakeholders particularly regulators or statutory undertakers, unforeseen events on site, environmental protestors, etc.

Proposed solutions

Having completed an analysis of cost drivers at Euston we developed seven potential solution workstreams with the HS2 Euston Senior Leadership Team (SLT). These are based on work done for the HS2 Productivity Improvements Study, studies at Euston and experience across the infrastructure sector.

Workstream	Purpose
1. Concept Design Optimisation	Optimise requirements (including OSD/ASD), design constraints and conceptual design response through a series of focused challenge exercises to reduce cost, program and carbon.
2. Design Efficiency Initiative	Optimise system and materials specifications through a "lean design" program to reduce cost, program and carbon.
3. Construction Strategy Optimisation	Produce an optimal construction strategy, overall approach and methodology, plot plan, sequence etc.
4. Construction Efficiency Initiative	Optimise construction operation through a "lean construction" program targeted at the construction team within the IPT - focused on improved task planning and scheduling, supervision, use of construction technology, etc.
5. Commercial Strategy Optimisation	Develop a Commercial Strategy that optimally addresses remuneration, incentivisation and risk.
6. Error Elimination (GIRI) Initiative	Reduce error and rework through a "GIRI" program across the whole IPT to shift the culture in relation to error and to identify and root causes systemically.
7. Disruption Minimisation Initiative	Reduce disruption through a disruption management program focused on identifying and managing all of the key disruptors including external stakeholders.

Generic estimate of cost, carbon and programme savings

Solution Strategy	Out-turn Cost	Programme	Carbon
1. Concept Design Optimisation	-10% (+/-5%)	-10%	-10%
2. Design Efficiency Initiative	-5% (+/-2.5%)	-5%	-15%
3. Construction Strategy Optimisation	-10% (+/-5%)	-20%	-5%
4. Construction Efficiency Initiative	-5% (+/-2.5%)	-10%	-2%
5. Commercial Strategy Optimisation	-10% (+/-5%)	-5%	-5%
6. Error Elimination (GIRI) Inititative	-5% (+/-2.5%)	-5%	-3%
7. Disruption Minimisation Initiative	-5% (+/-2.5%)	TBC	TBC


What can we do as an industry to change the affordability of projects?