

# House of Commons Transport Select Committee Inquiry - Major Transport Infrastructure Projects: Appraisal and delivery

**ACE Written Evidence**

**January 2020**

The Association for Consultancy and Engineering (ACE) champions the built environment, representing the views of around 450 members. Our members employ over 60,000 in the UK and 250,000 worldwide, contributing more than £15 billion to the UK economy, and provide design and engineering skills for the full range of built environment projects, including both national and local transport projects.

Despite the impact of the pandemic on short term demand transport networks will remain central to the UK's future economic prosperity. Patterns of commuting will no doubt be affected by the experience of the pandemic but transport will remain vital for the movement of goods and freight; for connecting employment markets to housing and for sectors such as tourism. In addition transport networks to adapt to changes in industrial geography of the UK driven by the move to 'net zero': for example the development of CCS clusters and hydrogen networks and the associated freight and mobility needs that stem from these.

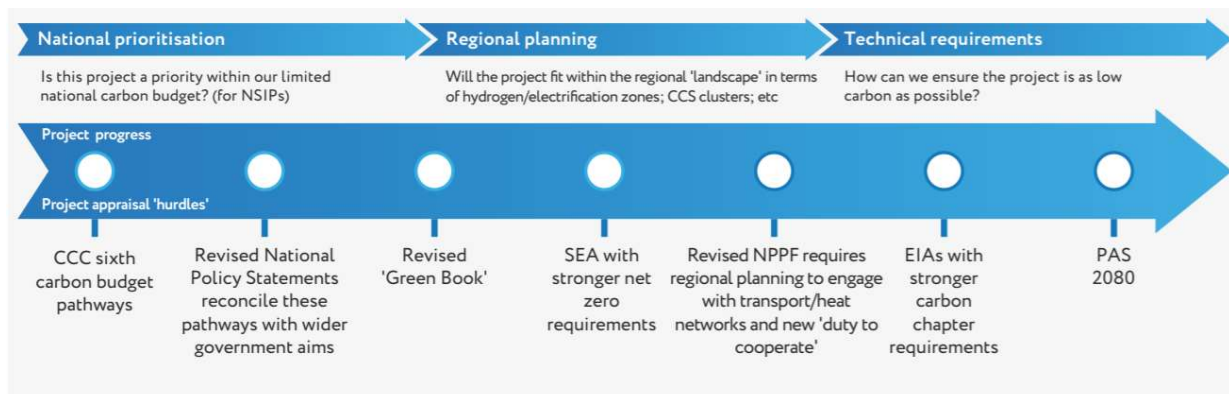
We do however believe that the the appraisal and delivery of major transport infrastructure can be improved. This written evidence focuses on two areas in particular: ensuring net zero compatibility and choosing the right design delivery model.

### Net zero compatibility

The current policy framework for infrastructure is not well adapted to the Net Zero challenge. It is based on an approach whereby choices between major built environment investments are made on the assumption that a range of desirable policy goals must be balanced against each other and against project costs. This does not automatically deliver a solution compatible with the absolute nature of Net Zero. There is also a frequent assumption that where a project with environmental impacts is approved, then those impacts can be mitigated and dealt with at a local level. A further problem is where an attempt has been made to retrofit carbon control into a policy tool that was never designed for this. A good example is the introduction of carbon chapters within Environmental Impact Assessments.

	Current approach	Net Zero challenge
<b>Strategic benefits/ impacts of project</b>	Cost-weighted against mix of relative benefits – connectivity, regional economic impacts, trade flows, ROI, etc..) each analysed through multiple indicators.	Need in addition to judge projects against an absolute single metric and target date, but with complexity of control/influence.
<b>Project appraisal</b>	Whether in public or private sector, project appraisal methodologies often include some calculation of the carbon involved.	Methodologies rarely enable a judgment to be made about whether wider portfolios of projects are consistent with the 2050 target.
<b>Local environmental impacts</b>	Planning system and EIAs used to regulate local impacts against legally set limits (air quality, noise, etc..)	Greenhouse gas emissions have a global, not local, impact so no way to judge the 'significance' of a project's carbon emissions as clear EIAs are supposed to.
<b>Project responses</b>	Typically involve commitments to cut but not eliminate carbon impact – acceptable in context of UK's previous 80% reduction target.	Shift from 80% target to Net Zero means that a 'lower carbon project' may still lock-in carbon for 2050 so could risk either stranding the asset or undermining the national efforts to reach Net Zero.
<b>National Policy Statements</b>	Intended to simplify and provide certainty in strategic planning by setting out Government policy framework for that sector.	All NPS's pre-date the Net Zero target and do not provide a framework for aligning infrastructure planning decisions with Net Zero.

The Net Zero 10 Point Plan gives a clearer sense of overall policy direction, and the CCC's Sixth Carbon Budget advice builds on this. However, we still need a policy framework that translates the high-level trajectory into a context for individual projects. The graphic below shows how this might work in practice.



## Project design delivery model

The way the delivery of major transport projects is structured is inevitably complex. The sequencing of the design stages of the project and how the different 'players' interact can make a large difference to the success and cost effectiveness. The experience of ACE member consultancies suggests a need to get two issues in particular right:

- Focusing consultancy design skills on the right issues at the start of projects
- Reinforcing the role of the design integrator and 'one team' approach

**Focusing consultancy design skills on the right issues at the start of projects:** Major infrastructure projects are by definition large and complex but the risk of cost overruns can be exacerbated by too much unfocused preliminary work. When this is done before the core outcomes of the project are agreed by all parties then the risk is poor scoping and design creep which will only add to cost later on.

The solution is not to cut out good optioneering and scoping work but to make sure this is based on a clear understanding of what the project is trying to achieve. For example on one rail project where the aim was to reduce passenger journey time an assumption was made that this could only be achieved through increasing line speed which would inevitably involve high cost engineering - other ways of reducing journey time were not looked at. The solution is greater use of value based decision making where a common, transparent understanding of how value is defined against different metrics is achieved at the outset. The Construction Innovation Hub value toolkit provides a good framework of how this can be incorporated into business case development

Once the outcomes of the project have been established digital design tools can be used to model and scope potential options at a much faster rate, effectively giving a digital model of the business case which can be interrogated rather than a static paper-based one.

**Role of the design integrator and a 'one team' approach:** Transport Rail engineering projects involve many different parties. For example a rail project can involve DfT; Network Rail, Train Operating Companies, consultants, contractors etc. Once the value outputs that a project is trying to achieve it is important to treat the project as a unified whole with a single team involved in delivering it. This has often been frustrated by unnecessary hiatuses and project segmentation alongside frequent changes of personnel between project stages. This can lead to inefficiency and delivery risks.

A better approach is to maintain a unified team throughout the project under the oversight of a design integrator. The design integrator will facilitate top down value-added design, where the overall design is optimised against programme objectives. In turn, this supports the individual delivery packages by providing contractors with a clearer reference design and suite of requirements with limited scope for change. This approach, which produces a more centralised design, rather than issuing standards and specifications to develop individual detailed ones, avoids over-specification and over-design.

Its important to note that the design integrator is more than a project manager, and must be able to bring together the disparate strands of the project, be able to challenge detailed designers, and be incentivised through KPIs related to the agreed values and outcomes rather than getting focused on the detailed technical challenges.

The design integrator will also ensure that's the full potential of digital design techniques are exploited, for example design material that can be accessed digitally by different partners in a collaborative way and through common data environments. Digital design also enables 'design rehearsals' to be carried out to prepare for construction, which in turn should ensure smoother implementation and less disruption to the day-to-day running of the network.

We have included below two case studies from the rail industry showing the potential for the approaches described above to be applied.

### Case study One: Northumberland Line 'One Team' Approach – AECOM

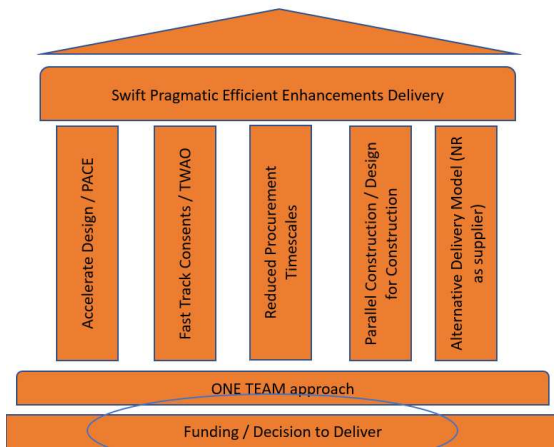
The Northumberland Line will bring passenger trains back into service between Ashington and Newcastle for the first time since the Beeching cuts. It is a great example of the sort of rail scheme central to 'levelling up' as it will improve access from towns such as Ashington and Blyth to employment hubs like Newcastle, as well as opening up new opportunities for education and travel. It will provide a real incentive for potential employers to relocate to and invest in the area; help to attract visitors and improve local tourism and enhance public transport connectivity within and beyond the region.

AECOM have been working with Northumberland County Council (NCC) on an alternative delivery model for the Line that would allow it to be delivered quicker and more cost effectively than traditional approaches. This approach includes:

- NCC being the project promoter, with Network Rail involved largely in terms of asset protection
- A strong focus on the cost vs benefits – making the project viable
- Work aligned to likely funding sources and spend timescales
- Rail Network Enhancements Pipeline (RNEP) provides governance stage gates and (potential) funding route
- A 'one team' approach where AECOM have brought together the key stakeholders to form a coherent group and oversaw programme integration

This approach is already leading to significant benefits. A robust business case and narrative that is 'owned' by all key stakeholders has been developed up front. The engineering is led by the business case and by operational requirements, with the governance designed to be agile to allow for decisions to be tested and made quickly. Network Rail are fully involved to ensure that the existing rail network will not be disrupted and a strong relationship with DfT has been established.

The project approach and the benefits in terms of faster delivery are shown in schematic form below:



Chronology of Programme Challenge and Review	
59 months	Original Baseline Programme (@March 2019)
51 months	Single Phase Programme (@April 2020)
44 months	Revised agreement with DfT on continuous design programme (@June 2020)
30 months	Project SPEED stretch plan (@July 2020)

Programme / Funding Model	Start	End
2 Phase delivery based on assumed TCF funding for Phase 1	March 2019	March 2020
Single Phase delivery based on Beeching or RNEP funding	April 2020	June 2020
Improved programme based on AECOM/NCC improvement + accelerated approvals with DfT	June 2020	July 2020
Project SPEED full opportunity programme	July 2020	July 2021

2021      2022      2023      2024      2025

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## Case Study Two: Applying the concept of a Design Delivery Partner (DDP) to HS2

The principle of a DDP reinforces the value engineers and consultants have on cost, schedule and quality. By giving consultants a key leadership position, it addresses a number of the challenges experienced on Phase 1 of HS2 and will nurture a decade-long partnership. This, in turn, will help attract the best talent, encourage innovation, and allow new tools to be introduced to the benefit of the programme.

The forthcoming Construction Playbook lists a number of delivery models, including *Hands on Delivery* which links to the DDP model. Effectively validated by the Cabinet Office, ACE analysis via the CIH Value Toolkit has also determined that it is the best option for HS2 phase 2 to balance client and industry capability.

While there will be a required change in the relationships between HS2, the market and the sponsoring Government Department for this model to be rolled out successfully, there is nothing structural which needs to be modified.

ACE's own Future of Consultancy research demonstrates the value that will be unlocked through a strategic engagement with the industry, allowing consultants and engineers to deploy their expertise and digital tools for HS2 in a much more effective and impactful way.

The DDP delivery model enhances outcomes in a range of ways:

- **'Controlling mind' to optimise design.** The establishment of the DDP will facilitate top down value-added design, where the overall route design is optimised against programme

objectives. In turn, this supports the individual delivery packages by providing contractors with a clearer reference design and suite of requirements with limited scope for change. This approach, which more fully develops a centralised design, rather than issuing standards and specifications to develop individual detailed ones, avoids over-specification and over-design.

- **Use of a digital model to underpin design and delivery.** A DDP model will ensure the use of a digital model and integrated data to support design optimisation. This will enable designers and contractors across the project to work together, develop deeper insights and rehearse delivery plans. This process not only optimises the delivery of the benefits, it also increases confidence, mitigates risks and improves the programme cost estimation.

- **Ensuring experts do what they are good at.** The DDP model helps align client and market capability in an optimal way and brings the best team together. The choice of the Hands on Leadership model is driven by the complexity of the stakeholder, funding and approvals environment. This tight focus complements the DDP spearheading the technical and delivery risks (design, programme, integration, technical complexity) and through a clear definition avoids duplication or overlapping influences.

- **Streamlined governance and approvals.** Through HS2's current *Evolve* programme, the development of a governance structure which organises internal team's interests in a more streamlined way will simplify the client/DDP points of engagement, improving productivity and effectiveness.

- **An output-based model with clear incentivisation.** The commercial and incentivisation model proposed clearly articulates the requirements to deliver HS2's objectives. This ensures clarity in the DDP's decision-making and a focus on value creation. Rather than incentives based on inputs, this output based model will allow consultants more flexibility to deliver productively and add value, while encouraging the innovative use of technology.

- **Optimised client size.** The complexity and scale of the project will require an agile approach to resourcing which develops and deploys the right capabilities at the right time, but only for as long as required. The DDP brings additional flexibility by opening up access and rewarding the deployment of expert resources at the right time to help manage peaks and troughs in demand, and to a broader range of capabilities without HS2 needing to have standby resources in-house.

### Further information

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