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Building the Northern Powerhouse: The role of infrastructure owners and operators

Graham Winch and Rehema Msulwa

Report 3 of 4



Introduction

A persistent economic gap exists between the North and the national average, with the region's productivity lagging the UK average by 11%, and according to a recent prediction it is likely to get worse unless action is taken². As we have argued, infrastructure is seen as one of the cornerstones for transforming the Northern economy into a Powerhouse. Better connectivity will lead to faster, more frequent and reliable journeys, quality digital infrastructure can unlock economic growth and improve the delivery of infrastructure services, and new forms of energy can power the Northern economy. The first two papers in this series focused on the financing and funding of these vital investments, with particular attention placed on the challenges of addressing the distortions in national resource allocation generated by current best practice in cost-benefit analysis. In the next two papers, we turn our attention to the delivery of projects once financed.

In this paper we will focus on the crucial role of the infrastructure owner and operator in successful development projects, both during project shaping and during delivery. After reviewing the reasons why owners play a crucial role in infrastructure development and identifying the lessons of the delivery failures for the Elizabeth Line and the North West Electrification programmes, we will recommend:

- That the ownership model for Northern Powerhouse Rail be considered with due urgency.
- That the organisational capabilities of infrastructure owners in the Northern Powerhouse region be systematically developed.
- That the capability development programmes sponsored by the Infrastructure and Projects Authority be based in the North and opened up more widely to private sector infrastructure owners.

Acknowledgements

We are enormously grateful to Simon Murray of Acumen 7 and Natalya Sergeeva of University College London for reviewing earlier drafts, and to Laura Gilmore and David Haimes of Highways England for the case study.

² UK 2070 Commission (2019) Fairer and Stronger: Rebalancing the UK Economy. Sheffield, UK 2070 Commission.

Why Focus on Infrastructure Owners?

On an international front, the UK's construction sector is high performing in productivity terms, but significant challenges still remain. As in virtually all countries, growth in construction productivity has lagged behind that of the economy as a whole. The inevitable result is that infrastructure assets have become relatively more expensive over time which means that the cost side of the cost benefit calculus explored in Paper 2 is likely to be growing at a faster rate than the benefit side, thereby discouraging infrastructure investment. The UK also has a particular problem with the costs of infrastructure investment, which tend to be higher than in similar economies for a variety of reasons⁴. These reasons are to do with regulatory issues such as relatively high levels of environmental protection and commercial arrangements, generating high transactions costs rather than production costs in project execution.

While the fourth paper in this series looks at the important role that collaborative relationships with suppliers has, this paper develops an under-considered insight from the Infrastructure Cost Review that has not received widespread attention.

There is a high level of consensus from the interviews that

clients in the UK tend to have less in-house technical capability than in other countries and are consequently less able to lead, discuss, challenge or interrogate designs both in technical or aesthetic terms⁵.

We will argue that one of the principal challenges for UK infrastructure development – and hence for the Northern Powerhouse – is that the required capabilities of the owner in infrastructure development have not been fully understood and that this has held back both the planned performance of infrastructure programmes, and the performance of those programmes against plan. As will become clear, we prefer the term “owner” rather than “client” because the former captures the full range of owner capabilities required for infrastructure development while the latter focuses on the contractual relationship with the supply side.

³ McKinsey Global Institute (2017). Reinventing Construction through a Productivity Revolution. MGI.

⁴ HM Treasury (2010) Infrastructure Cost Review: Main Report. London, HM Treasury. This statement is not incompatible with the earlier statement on productivity because that is measuring value added per head in project execution on site, while the cost review is measuring total physical cost per unit of infrastructure asset.

⁵ HM Treasury (2010) Infrastructure Cost Review: Main Report S2.39



Owners in Infrastructure Development

Who are the owners in the UK infrastructure sector?

Following a wave of privatisations from the 1980s onwards, they are now roughly evenly split (by net asset value) between the public and private sectors⁶. While there have been debates recently regarding the wisdom of the balance across this split, this paper takes an agnostic view between the benefits and drawbacks of both public and private sector ownership as both need the same owner capabilities for infrastructure development. These owners are typically specialist infrastructure businesses whose purpose is to supply the infrastructure services defined in Paper 1 to their customers. They are typically regulated by sector-specific economic regulators whose aim is to mitigate the natural monopoly effects of infrastructure against a Regulated Asset Base (RAB). This arrangement has been successful in providing investment capital for infrastructure development in the privatised sectors⁷, and has now effectively been copied by the public sector for Highways England and Network Rail. Local authorities with their roads and light rail systems are the largest group of infrastructure owners outside the RAB arrangement.

Some Northern Powerhouse infrastructure owners are privately owned (such as Peel); some are publically quoted (such as United Utilities); others are owned by private equity (such as Kelda Group, owners of Yorkshire Water). Some are fully within in the public sector (such as Transport for Greater Manchester – see paper 1), while public-private partnerships (such as Manchester Airport Group) and concessions (such as Mersey Gateway) are also important. Some are regionally focused (such as Electricity North West and Cadent) while others are British bodies (such as National Grid and Highways England); very few, except OpenReach, are UK-wide. The infrastructure sector in the Northern Powerhouse is very much a mixed economy with a rich set of interactions between the public and private sectors. However, the core business of all these organisations is to deliver the infrastructure services identified in Paper 1, and they cannot maintain and expand their ability to do so without investing in developing new infrastructure assets.

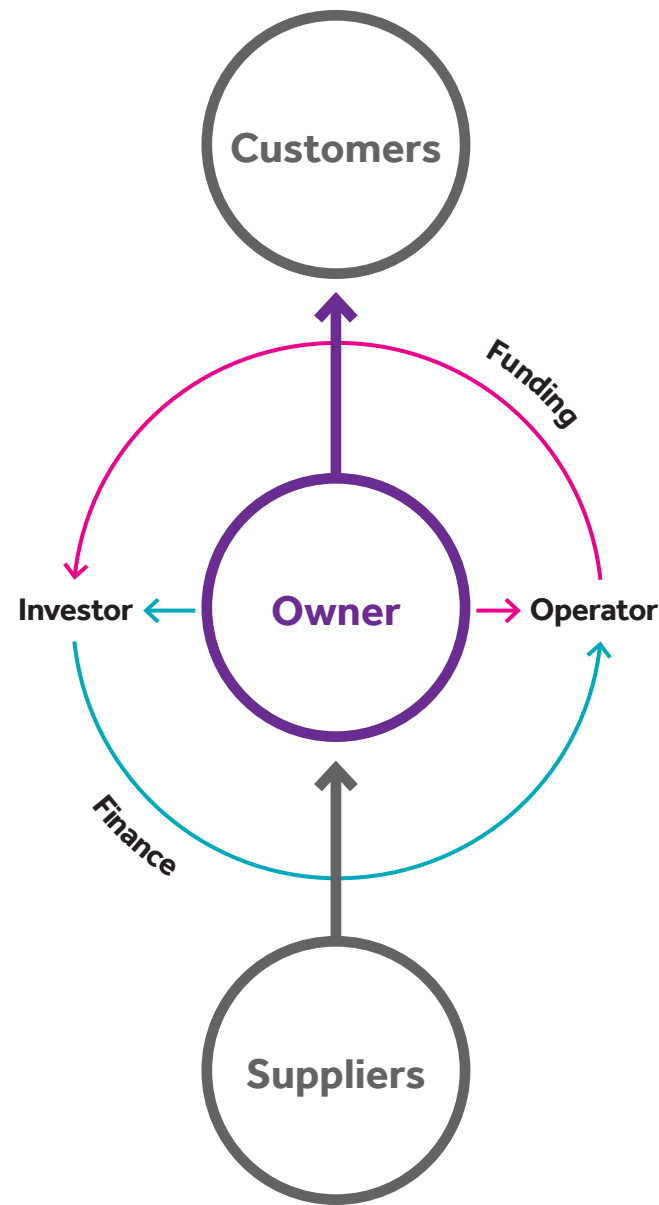


Figure 1: The Generic Infrastructure Owner Business Model

The generic Infrastructure Owner Business Model shown in Figure 1 shows how the owner is accountable for raising the finance required for investment in the infrastructure asset and then providing the funding to repay that investment through operating the asset and delivering services to customers. This can be done directly as in the case of water and roads, or indirectly to an intermediary such as in rail where the direct customers of Network Rail are the Train Operating Companies (TOC) and the Freight Operating Companies (FOC), which then on-sell infrastructure services for travelling, transporting, and commuting to the final consumer. In sectors such as electricity, gas and broadband, this value system of intermediaries before the final consumer receives those services is quite complex.

In some privately-owned sectors, the business model is highly integrated – for instance, water companies raise their

own capital, operate their own assets, and bill their customers directly. In other sectors, the business is too fragmented. This is a criticism of the rail sector where finance comes from HM Treasury, and funding from a mix of revenue support (again from HM Treasury) and access fees from the TOCS and FOCS. Network Rail – the rail systems owner and operator, has little direct contact with its services' end users – the passengers⁸. Some owners may choose to engage an operator for their network such as KeolisAmey, which currently operates Metrolink on behalf of Transport for Greater Manchester. However, the vast majority also operate their network while sometimes outsourcing maintenance. What is almost universally outsourced by owners and operators is asset delivery in the form of upgrades to existing assets and the provision of new assets, so we now turn to the organisation of infrastructure asset development programmes.



Figure 2: The Three Domains of Infrastructure Development

⁶ Grice, J. (2016) National Accounting for Infrastructure. Oxford Review of Economic Policy. 32 (3) 431-445.

⁷ Helm, D. and Mayer, C. (2016) Infrastructure: Why it is under provided and badly managed. Oxford Review of Economic Policy. 32 (3) 343-359.

⁸ This fragmentation is presently the subject of the Williams Review which will publish in autumn 2019. See also Rail Delivery Group (2019) Changing Track: Proposals for a More Customer-focussed, Joined-up, and Accountable Railway. RDG.

Infrastructure Asset Development Programmes

Infrastructure asset development programmes inherently involve collaboration between three types of organisation, or domains, with differing interests, incentives and cultures. As is shown in figure 2, infrastructure asset development programmes are shaped and delivered by a coalition of the owner and suppliers that form a temporary project organisation to develop particular assets. Our focus in this paper will be on the owner organisation and its governance interface with the temporary project organisation. We will analyse the commercial interface between the owner and the supplier domain in Paper 4.

There is a growing body of empirical evidence⁹ that a capable owner is a crucial success factor in infrastructure asset development. This development programme can be divided into two phases - project shaping¹⁰ and project delivery. Project shaping is the process by which the business case for the asset investment is aligned with the strategy of the owner organisation it is best practice to use the Five-case Model presented in Paper 2 as the basis for project shaping. In cases where the owner organisation is established specifically to deliver the asset – HS2 is a good example of this – early shaping is done by varying coalitions of project promoters prior to the establishment of the owner organisation. This is often the case for transformative infrastructure investments, but rarely the case for enabling ones which are typically shaped through the negotiations between the owner and the regulator under the RAB five-year cycle. Project shaping involves a number of interactive activities:

- Rigorous development of the business case using the tools discussed in Papers 1 and 2, while bearing in mind their limitations. (cf. case study of Transport for the North as project promotor in Paper 2).
- Extensive stakeholder management informally building political coalitions in support of the investment, and formally through the requirements of legislation with respect to infrastructure development.
- Articulation of a future-orientated narrative of why the investment should be made around which high profile advocates can mobilise support. It is notable that the Elizabeth Line failed to be financed even though the cost-benefit analysis of the easing of congestion on the London transport network was favourable. It was only when the Mayor of London advocated its centrality for London’s global competitiveness and the line was connected with Heathrow airport that finance was agreed¹¹.
- High level asset delivery planning including technology options; budgets, schedules, and stakeholder mitigations. The Project Initiation Routemap¹² provides an extensive toolkit for asset delivery planning during shaping, while benchmarking against comparable projects¹³. The quality and thoroughness of this aspect of project shaping – known as front end loading - is one of the best predictors of major project delivery performance¹⁴.

As the asset development programme moves from the shaping to the delivery phase, the capable owner pivots towards project delivery which again involves a number of interactive activities:

- Appointment of a project sponsor to provide leadership from the owner side. The sponsor is often called the Senior Responsible Owner (SRO) in UK central government and is accountable for:
 - ☑ knowing how a project creates value in service delivery;
 - ☑ being able to communicate the value proposition to the suppliers;
 - ☑ maintaining decisiveness, so that suppliers have the information they need to maintain progress and deliver value;
 - ☑ knowing how to design the commercial interface and the benchmark price for which suppliers should be obtainable;
 - ☑ sponsoring the project from inception to completion¹⁵.

The role of the sponsor, in short, is to provide oversight on behalf of the owner as the investment programme moves through the phases of delivery:

- Designing an effective assurance process for the programme¹⁶, including designing the Gateway Review process and putting in place the “three lines of defence”¹⁷ (project team processes, programme assurance, and internal audit).
- Implementing an effective controls system for reporting on past progress and forecasting future progress, including choosing appropriate external collaborators if required. Owners should never rely on delivery suppliers for controls data¹⁸.
- Establishing a Programme Management Office (PMO) that can design systems and set standards, audit the controls systems, and develop human resources.
- Creating/designing a plan for moving the asset into beneficial use; suppliers can deliver outputs but they cannot deliver project outcomes against the business case. This is an owner responsibility.

⁹ Particularly, Merrow, E. W. (2011) Industrial Megaprojects. Wiley.

¹⁰ Miller, R. & Olleros, X. (2000) Project Shaping as a Competitive Advantage. In: R. Miller & D.R. Lessard (eds.) The Strategic Management of Large Engineering Projects. MIT Press.

¹¹ Schabas, M. (2017) The railway metropolis: How planners, politicians and developers shaped modern London. Thomas Telford.

¹² Infrastructure and Projects Authority (2016) Improving Infrastructure Delivery: Project Initiation Routemap Handbook. Cabinet Office.

¹³ Infrastructure and Projects Authority (2017) Transforming Infrastructure Performance. IPA.

¹⁴ Independent Project Analysis (2009) Productivity in the UK Engineering Construction Industry. Department of Business, Innovation and Skills.

¹⁵ Cabinet Office (2011) Government Construction Strategy. Cabinet Office, S. 2.13.

¹⁶ National Audit Office (2010) Assurance for High Risk Projects. NAO.

¹⁷ Hone, D., Higgins, D., Galloway, I., & Kintrea, K. (2011). Delivering London 2012: Organisation and programme. Proceedings of the Institution of Civil Engineers, 164(5), 5-12.

¹⁸ Merrow op cit.

Lesson 1: The Elizabeth Line¹⁹

The announcement in August 2018 that the central section of the Elizabeth Line would not open as planned in December 2018 was unforeseen by many stakeholders. The programme had received a favourable review in the 2014 NAO report, and few suspected the challenges that it faced. These are so great that on year later in August 2019 there was no definitive date for its opening. We will argue that an important reason for this situation is one of governance as defined in Figure 2, and in particular a weakness in the relationship between the owner (Transport for London - TfL) and its delivery partner (Crossrail Ltd.) despite Crossrail being a wholly owned subsidiary of TfL.

Delivering the Elizabeth Line is an enormously complex programme with 118km of new or refurbished track, including 42km in tunnels, from Reading to Shenfield across central London. Eventually, the Elizabeth Line will inter-connect with HS2 in a new station at Old Oak Common. Finance comes from a mixed pot of public and private money negotiated by and between TfL and DfT; the latter also provides separately the finance for Network Rail's upgrade of existing track. Farebox revenues flow to TfL to fund its loans and to pay access fees to Network Rail. TfL contracted with MTR Crossrail to operate the train services of up to 24 per hour in 2014. The trains were procured directly by TfL outside the contract with Crossrail from Bombardier; their procurement was delayed while the option of PFI was considered and rejected. The interface between the trains and the track through the signalling systems is the responsibility of Siemens, which also held the contract for the Supervisory Control and Data Acquisition (SCADA) systems that enable remote control of tunnels and station systems.

Once the programme started to slip against the planned schedule, Crossrail attempted to accelerate the schedule in order to maintain the publically agreed end date. This drove complexity into the schedule with which Crossrail's reporting systems on progress by its suppliers could not cope. For instance, an attempt to accelerate dynamic testing of the trains meant reducing worksite access for construction (hence slowing that activity down), but because the signalling software was not fully developed the dynamic testing was not successful. This growing complexity escalated the number of compensation events payable to suppliers by Crossrail as the interfaces between works packages became more difficult to manage. Crossrail's three lines of defence were progressively demobilised during 2018 as the situation worsened.

Reporting from Crossrail to the Joint Sponsor Board (DfT and TfL) could have been better. Briefings typically reported status rather than trends which made it difficult for Board members to read the true state of progress. KPMG summarised the situation thus:

[Crossrail's] approach was to avoid reporting slippage to the Stage 3 opening date whilst putting plans into place to mitigate the delays. It seems that over time more and more stretch or optimism became incorporated into the programme through assumptions around shorter activity durations and in some cases parallel running activities to reduce elapsed time but with a consequence that efficiency became more difficult to sustain, float decreased, and time required to complete activities started to exceed the programme time allowed²⁰.

We can infer a number of lessons from Crossrail for future transformational projects in the Northern Powerhouse:

- Accelerating a late-running infrastructure project can make it later. This is because acceleration drives further complexity into an already complex organisational system and pushes it towards the system's tipping point²¹ and a loss of control. The fact that definitive completion dates were still not available in August 2019 suggests that Crossrail pushed the Elizabeth Line over this tipping point and the continuing difficulties in re-planning the project.
- TfL as the owner and operator of the Elizabeth Line appears to have relaxed its usual high standards across the governance interface. This may have been because it was "pulled" towards the investor role by its joint relationship with DfT or because it wholly owned Crossrail and therefore did not believe that it needed the usual commercial oversight over a supplier. Whatever is the case, there was apparently an ownership void on the Elizabeth Line, and most of KPMG's recommendations for completing Crossrail can be summarised as asking TfL to assert ownership of the programme and its outcomes.
- In our judgement, the challenges on the project were compounded by a culture of heroic civil engineering in the team²² which marginalised the central importance of systems engineering in both the state-of-the-art SCADA installations and the signalling despite the latter being of unprecedented technical complexity. We need to raise the question of whether the current generation of civil engineers is being equipped with the appropriate systems integration skill-set to lead the new generation of transformational infrastructure projects as they incorporate information systems of increasing sophistication.

¹⁹ Sources: National Audit Office (2014) Crossrail; NAO (2019) A Memorandum on Crossrail; NAO (2019) Completing Crossrail; KPMG (2019) Independent Review of Crossrail – Governance. TfL; KPMG (2019) Independent Review of Crossrail – Financial and Commercial. TfL.

²⁰ KPMG op cit p 81.

²¹ Taylor, T., & Ford, D. N. (2006). Tipping point failure and robustness in single development projects. System Dynamics Review. 22(1), 51-71.

²² Witness the Crossrail You-tube channel and The Fifteen Billion Pound Railway (Windfall Films, 2014).



Resourcing and Developing Owner Project Capabilities

Owner organisations need the capabilities to ensure that they can effectively shape and deliver their infrastructure investment programmes, and take the asset outputs from those programmes into beneficial use by delivering infrastructure services. Research sponsored by Heathrow Ltd under the auspices of Project 13²³ and carried out by AMBS investigated the capabilities that infrastructure owner organisations need for their development projects summarized in table 1. These are in addition to those required for the operational delivery of infrastructure services, and need to be fully aligned with those operational capabilities.

Role	Description
Articulating the voice of the customer	Ability of the owner to understand who the customer for their infrastructure services specified in Paper 1 is, engage with those customers, obtain and analyse their feedback, and then translate and articulate it into an outcome. Then to flow the voice of the customer up and down the owner organisation and sustain the engagement. Ability of the owner organisation to balance and align customers’ views and expectations with the organisation’s values and strategic goals.
Value-driven mind-set	Ability to focus on value delivery rather than asset delivery. Value is defined in terms of outcomes for customers and hence value to the business rather than net present value of the investment. Ability to provide and present a broader view of the value in the business case. Ability to manage both the funding and financing sides of the Infrastructure Business Model shown in Figure 1.
Articulating the voice of operations	Ensuring programme managers, asset operators, and asset maintainers have clarity of the business objectives and the infrastructure service offer to the customer and are able to plan for the operations and maintenance upfront.
Relating to the supplier domain	Ability of the owner organisation to design new delivery models across the commercial interface that facilitates early engagement and alignment between customers’ needs and the supplier domain. This will be discussed further in Paper 4.
Creating complex systems	This is the classic set of skills associated with owner-side programme management. It requires bringing together the appropriate technology, structures and processes and infuse a common understanding of what is to be achieved and the ability to manage change and integrate systems.
Recruiting, building and maintaining talent	Ability to attract, build and retain the right ‘talent’ - individuals who are professionally qualified, knowledgeable, experienced, competent, innovative thinkers, who can challenge by “speaking truth to power”, and who can deal with uncertainty. The talent is more akin to a business manager profile rather than a project manager, and requires people who can be advocates of the business case and defend project value through project shaping and delivery. This will be addressed further in Paper 4.

Table 1: Infrastructure Owner Development Capabilities

Much progress has been made in the development of these project capabilities in recent years leading to what is widely known as the intelligent client²⁴. For instance, the Highways Agency (as was) made considerable progress in developing these capabilities which laid the foundation for the launch of the Government Owned Company (GovCo) Highways England in 2016, and the case study goes on from there to show how Highways England is using Project 13 principles to become a capable owner. However, as the case of the Elizabeth Line shows, more progress is required, and Project 13 advocated moving beyond intelligent client capabilities towards the capable owner²⁵. The differences between the intelligent client and the capable owner with respect to the owner capabilities identified in Table 1 are summarised in Table 2.

Role	Intelligent Client	Capable Owner
Articulating the voice of the customer	Has a comprehensive knowledge of present customer needs; attempts to meet them but does not always do so.	Has comprehensive knowledge and understanding of present and future customer needs; meets and exceeds their expectations.
Value-driven mindset	Has a rhetoric of outcomes, but is culturally focused on outputs through asset construction and heroic engineering.	Has a deep understanding of value; value drives it as a supplier of infrastructure services. It takes full responsibility for achieving the value embedded in outcomes; outputs are merely a means to this end.
Articulating the voice of operations	Has an ongoing engagement of operations embedded in the project team throughout the lifecycle starting with front end definition. There is a responsive and continuous engagement from operations.	Has an integrated asset development and asset operations capability with both functions perceived as equals in the owner organisation.
Relating to the supplier domain	Builds a truly collaborative environment at programme level; has relationship-based contracts with aligned objectives. Has a deep enough understanding of project execution to challenge suppliers when their performance is below expectations. Encourages innovation.	Creates an aligned business eco-system extending beyond individual programmes for the delivery of infrastructure services through asset life. Drives and facilitates innovation through the supply chain and understands how this contributes to the value and capability of the owner organisation.
Creating complex systems	Has a Project Sponsor who works closely with the owner project team to support the team through delivery. Project team moves beyond managing risk to managing uncertainty and complexity. The performance management function is fully established by the owner, but still focused on reporting and is therefore reactive. Full stage/gate process established, supported by a nascent PMO.	Has a fully capable owner team including systems integration capability which enables flexibility and innovation culture supported by a PMO and strong portfolio management. Fully embedded owner performance management systems are focused on forecasting and therefore proactive; singularity and clarity of shared purpose; ability to understand and embrace new technologies and innovations.
Recruiting, building and maintaining talent	Has full career development paths, but still reliant on traditional professional groupings rather than creating the new roles that the owner requires. Good understanding of the importance of building and maintaining talent, but with gaps in attracting and maintaining talent.	Has well-structured and applied recruitment processes; actively enhances diversity; has well understood career progression; colleagues actively live company values; events are organised to attract new talent. Culture fully embraces diversity; it is the employer of choice. Strong leadership and training of new generation of leaders.

Table 2. The Capability Differences between the Intelligent Client and the Capable Owner

²³ Project 13 is an initiative of the Infrastructure Clients Group which works under the auspices of the Infrastructure and Projects Authority. It is coordinated by the Institution of Civil Engineers.

²⁴ Infrastructure and Projects Authority (2016) Project Initiation Routemap. IPA.

²⁵ Project 13 (2018) P13 Blueprint. Institution of Civil Engineers.

Lesson 2: The Northwest Electrification Programme²⁶

In May 2018, a planned timetable change across the Northern Railway franchise to take advantage of new, faster and more reliable electric trains led to severe disruption across the franchise for passengers. Although the wrath of passengers and media attention focused on the TOC, the root cause of the disruption was the challenges failure of Network Rail had in delivering its North West Electrification Programme (NWEF). In particular phase 4, of that programme (Preston to Manchester) acquired cumulative schedule delays as a result of a series of decisions with unintended consequences which were then compounded by a three week overrun on the blockade for Phase 3 (Blackpool to Preston).

At the time, Network Rail was organised into three main divisions: System Operator (SO) responsible for operational planning (essentially timetabling); Infrastructure Projects (IP) responsible for upgrade programmes; and the Route Businesses – in this case London North Western – which act as the programme sponsor and “agent” of DfT as investor, as well delivering regional maintenance and operations. The underlying problem appears to be that Infrastructure Projects and System Operator had little interaction with each other, particularly around risks to the completion of the programme. IP focused on the delivery of the NWEF but made an early error by conducting a “risk-based” ground survey of only 60 out of 1700 locations for catenary pylons in an area that had been continuously mined for two centuries. As 65% of foundation piles failed, extensive re-design was required and schedule delays inevitably accumulated. An attempt to catch up over the Christmas and New Year holiday of 2017 using a line blockade only completed 75% of its planned work. By January 2018, Network Rail faced the May 2018 deadline for the completion of Phase 4 electrification with mounting challenges to achieving it.

The uncertainty regarding the completion of the electrification works meant that operational planning by the SO was schedule compressed – the timetable is the core operational plan on a railway yet both the both the Network Rail and Northern Railway operational planners were left with far too little time to plan and re-plan their operations both

singly and jointly. We suggest on the basis of the evidence provided by the regulator that much of the challenge lay within Network Rail itself. It was both responsible for infrastructure upgrades and leading on operational planning through its System Operator function, while the Route Business provided relatively weak sponsorship. Despite pressure from the Northern Railway, Network Rail refused to defer the milestone for Phase 4 while there remained a chance of success, despite the rapidly increasing risks. When the delay to Phase 3 undermined Northern’s driver training programme, the inevitable happened. What are the lessons of this case for Northern Powerhouse enabling projects?

- The “voice of the customer” within Network Rail from London North Western was not strong enough to engage with the System Operator and Infrastructure Projects to bring them together to look at the system as a whole²⁷.
- The “voice of operations” from the SO was not heard clearly enough by IP, and operations did not recognise its responsibility to manage risks resulting from late delivery of the asset.
- IP as a creator of complex systems made some decisions with unintended consequences. First, it did not invest enough reducing uncertainty through “front end loading”²⁸ – the risk-based ground survey was a false economy. Second, it tried to accelerate programme delivery once it had fallen behind which increased risk by compressing the schedule and hence increasing the complexity of the programme. Acceleration of programme delivery rarely pays dividends – it is much better (usually cheaper and often faster overall) to face this issue early and extend the project deadline.

Although broader reforms to the structure of the rail industry are undoubtedly required, in our view the proposed reforms would not have greatly improved Network Rail’s programme delivery in this case. Network Rail’s challenges in acting as a capable owner for NWEF were the root cause of the disruption experienced by passengers in May 2018.

Recommendations

Drawing on our review of the importance of a capable owner in infrastructure development for the Northern Powerhouse we make the following recommendations:

- The Northern Powerhouse stakeholders should identify the potential ownership model for Northern Powerhouse Rail. This could be Transport for the North, but that choice would likely distort its strategic purpose and it lacks expertise in service delivery. Network Rail is focusing more on service delivery and has a number of challenges in delivering the Control Period 6 portfolio²⁹. This suggests an HS2 plus type of organisation which then may or may not contract with a train operating company (TOC) to run the trains. However, if the trains are to be run by a TOC, then that operator needs to be appointed early enough to ensure the voice of the customer comes through in service level design. An integrated rail and train service provider may be preferable.
- Whatever the legal ownership structure of NPR is, it will need to develop the capabilities to govern the programme itself, and not become over-reliant on a delivery partner. In our analysis, Transport for London, while very much an intelligent client, relied too heavily on its delivery partner, Crossrail Ltd., and governance of the relationship between TfL and Crossrail could have been better.
- The systematic capability development programmes promoted by the Infrastructure and Projects Authority are presently focused on the needs of UK central government³⁰. There is nothing wrong with this, but we recommend consideration be given to delivering these programmes in the North and extending them to other non-governmental bodies including utilities in the private sector in order to strengthen the Northern infrastructure sector more generally.

Conclusion

The UK has world class infrastructure development capabilities, but there is much room for further improvement. If the North is to realise its full potential, infrastructure asset development and service delivery need to move towards a more effective model. However, it is for infrastructure owners – both public or private sector – to drive this change within the overall strategy of the National Infrastructure Commission. Northern infrastructure owners will need to take the strategic initiative during project shaping and emphasise delivery into beneficial use by focusing on outcomes rather than outputs.

²⁶ Sources: Office of Rail and Road (2018) Independent Inquiry into the Timetable Disruption in May 2018. ORR; Nichols (2012) North West Electrification – Programme Management Review. Network Rail.

²⁷ A reorganisation of Network Rail in early 2019 addressed this issue as part of the “putting passengers first” initiative.

²⁸ Merrow (2011)

²⁹ Nichols (2013) Project and Programme Management Capability Improvement Study. Network Rail.

³⁰ See, for instance, Infrastructure and Projects Authority (2017) Transforming Infrastructure Performance. IPA.

Case Study:

Highways England's Journey to a Capable Owner³¹

This case study shows how Highways England's (HE) Regional Investment Programme within its Major Projects Directorate is focused on improving its maturity, capability, capacity and focus over a series of four investment cycles. This is defined as moving "from transactional to a high performing enterprise. Driving efficient and predictable delivery, with benefit focused teams and a value driven culture".

HE is a GovCo accountable for improving, operating and maintaining England's Strategic Road Network which saw the need to think about the direction of travel required for successful delivery for their major projects. The Regional Investment Programme (RIP) delivers all major capital investments between £10m and £500m to support both regional and national growth. HE is now halfway into Roads Period 1 (RP1) in which the RIP represents a significant proportion the capital investment portfolio with a value of ~£7billion. This represents approximately 17% of UK investment in highways outside London with over 80 schemes nationwide.

To define the strategic road map, the RIP Senior Leadership Team (SLT) carried out a visioning process to determine the operating model over a series of time horizons. They recognised the influence on delivery of changes in the market and operating environments as well as the other areas within HE. They began to align these to identify the further changes needed to deliver a successful RIP which was "holistic, targeted and owned" and aligned with wider HE aspirations.

The SLT developed a high-level 20-year roadmap which sets out the roadmap for moving away from being a transactional organisation to becoming a high-performing enterprise in line with Project 13 principles as shown in Figure 3. The pace of this journey is set by the 5-year regulatory periods in which HE works. Each road period over the twenty years is framed by a Road Investment Strategy (so RIS1 to RIS4). Each period focuses on a series of strategic themes which run throughout the activity as golden threads and together they provide the building blocks for owner capability maturity development.

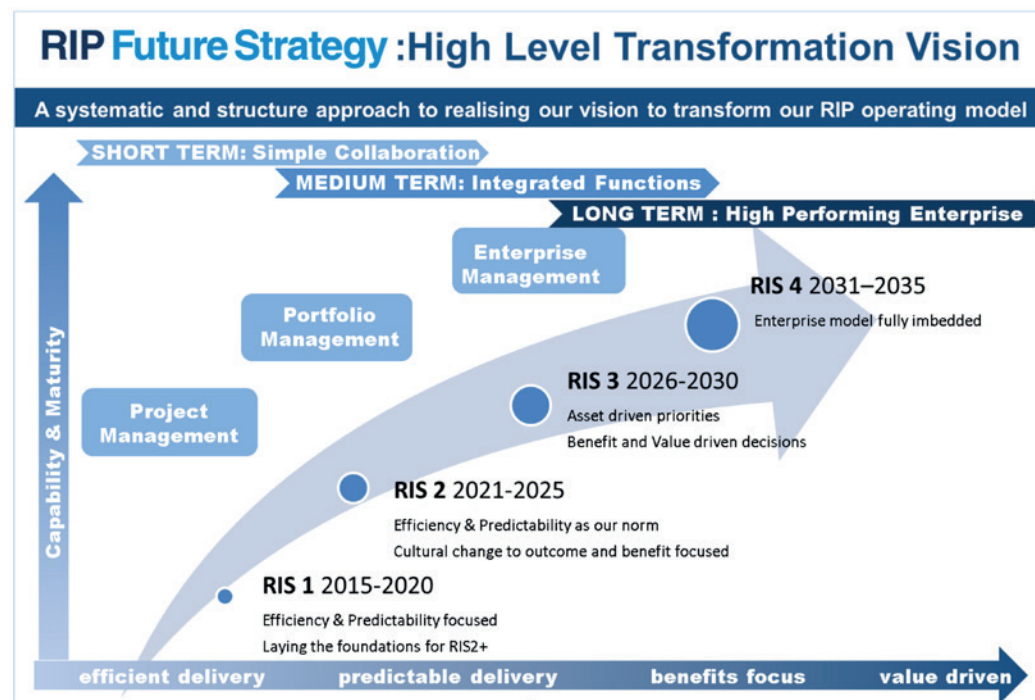


Figure 3: Regional Investment Programme High-level Vision³²

³¹ The original version of this case study was prepared by in collaboration with Eunice Maytorena and Natalya Sergeeva.

³² Source: Highways England



Through a visioning process, the SLT began to think in terms of the targets and outcomes they wanted within their delivery model. Four strategic delivery themes were identified: Efficient delivery; predictable delivery; benefits focus; and value-driven. The focus on delivering value for money provides the foundation for the first two themes of efficiency and predictability. They are about driving costs down, but in a smart way, and being a trusted deliverer to underpin HE’s proposed delivery model. This delivery model based on Project 13 principles is focused on improving relationships across the commercial interface. By engaging suppliers, they can begin to understand the portfolio better, and can, for example, see more long-term work. HE recognises that efficient and predictable delivery cannot be solved by changing commercial relationships alone. HE wants to make sure that wider thinking is taking place in terms of how and why activities are done and that whether it has the organisational maturity to transform delivery from the inside out. One interviewee said “we need to stop thinking about projects, projects, projects and start thinking about portfolios”.

The benefit and value theme is centred around the need for project delivery teams to think about value for money and the outcomes proposition driving decisions rather than the traditional time-cost-quality output criteria alone. A shift in thinking is required, and that is going to be enabled by how the benefits are identified and valued, how they are be embedded in contracts and how HE plans to realise these benefits and outcomes for customers. It is also about shifting thinking from value engineering to value management.

The RIP future strategy is aligned to the five Project 13 areas with 12 focused work streams defined to deliver the strategy. All initiatives within these work streams are linked to one of the four themes of efficiency, predictability, benefit focused and value driven. To bring this strategy to life, the strategy team have been engaging their internal and external stakeholders. The SLT wants to ensure the alignment of any identified strategic initiatives has a direct thread to the future aspirations of the programme and HE more widely.

As part of its Project 13 Capable Owner work, the RIP is developing its leadership culture and behaviour. One approach has been to provide creative forums across regions to connect teams and share learning. These engage HE’s communities of practice, making them feel they have a supporting network. HE is trying to do this across the whole organisation, by focusing on creating the right environment for people to thrive.

Across all its major programmes, Highways England is encouraging people to think about the business problem rather than the asset solution. It looks to empower the project teams to help develop solutions with outcomes for customers at the heart of those decisions. The aspiration is that HE will challenge and empower their teams to move from output-focused to outcome-driven behaviour. This is a cultural challenge, but by doing this, “you change the behaviour whereby during options selection you don’t simply pick the option that is closest to the solution that you were given initially; and you start the behaviour that challenges how well each of these options resolve the business problem”.

HE has been investing in people. Since 2015, it has seen its strategy and planning teams mature hugely, and their economics function grow. It has been recruiting into the central risk, PMO, benefits and value management teams, and sponsorship teams. It has committed to a number of training programmes and apprenticeships to grow its internal capability and to draw on the expertise that is out in the market more to help, but with the intention of improving in-house skills as much as it can.

This transformation will not happen overnight. It will happen “when we have the long-term vision and direction we all believe in, coupled with the targeted, measurable initiatives and building blocks to make that vision a reality. To make this a success we must focus efforts not only on the people, processes and the technology we need, but the culture we want to create within a programme where teams can thrive”.

Appendix - Glossary

Commercial Interface: The interface between the infrastructure owner organisation and the various specialist suppliers and advisors which provide it with the services required to develop and operate infrastructure assets.

Financing: The process of raising the capital to invest in the infrastructure asset. See Paper 1.

Freight Operating Company (FOC): Direct customer of Network Rail and provider of rail transporting services to businesses.

Funding: The income stream generated by the infrastructure services provided by the infrastructure asset which provides the ability to repay the financing capital. This may be directly from consumers of the infrastructure services (farebox; tolls; utility charges); from revenue support; or mixed forms. See Paper 1.

Governance Interface: The interface between the Infrastructure Owner and the temporary project or programme organisation that it has created jointly with its suppliers to deliver the infrastructure asset.

Infrastructure Owner: The organisation in the public or privates sector at the centre of the infrastructure development process which raises finance and ensures the funding stream that repays that investment from the delivery of infrastructure services to its customers. It does this by working with suppliers to develop and operate the infrastructure asset. See Figure 1.

Regulated Asset Base: The value of the infrastructure assets held by an infrastructure owner which provides the basis for judgements on owner performance by the infrastructure sector regulators. In effect, it provides a guarantee that the owners will receive a return on the assets they own which thereby aids raising finance.

Owner Domain: The domain of the owner organisation (possibly a joint venture or concessionaire) and its investors. Their core business is supplying infrastructure services to customers and they develop this business by intermittently investing in asset renewals and upgrades.

Project Assurance: The process of ensuring on behalf of the owner and its investors that a project is progressing according to plan.

Project Delivery: The process of delivering on the results of the Project Shaping process to deliver the output of an infrastructure asset which can then be moved into beneficial use by the owner.

Project and Programme Domain: The domain of the temporary project organisation which is typically associated with traditional project management.

Project Promotor: One or more parties which initiate the project shaping process. This is usually an infrastructure owner, but may be other interested parties such as local or national government. This is more often the case for transformational infrastructure investments.

Project Shaping: The process by which investors, owners, and other key stakeholders, supported by specialist advisors, address and resolve the five business cases in the Five-case Model and create a narrative which mobilises support for the investment. See Paper 2, Table 1.

Project Sponsor: The individual (usually a senior executive) with overall accountability for the investment project on behalf of the owner. This person is called the Senior Responsible Owner in UK central government.

Resourcing Interface: The interface between the suppliers and the project and programme organisations to which they provide human and material resources on behalf of the owner.

Strategic Capabilities: The set of capabilities that the owner itself needs in order to successfully implement its investment projects.

Supplier Domain: The domain of the specialist advisors and suppliers who provide the services required for the development and operation of infrastructure assets. Projects are their core business, so they are usually project-based firms that generate profits by delivering on projects for owners.

Supply Chain: The contractual hierarchy of organisations within the supplier domain related through a web of contract and sub-contract from the first tier down.

Train Operating Company (TOC): Direct customer of Network Rail and provider of travelling and commuting services to train passengers.



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