

Jacobs

Challenging today.
Reinventing tomorrow.

The Integrated Rail Plan

So the Integrated Rail Plan has now arrived.
But what needs to happen next?

What happens next?

1.0

Heavily anticipated and released in the weeks following COP26, the arrival of the Integrated Rail Plan (IRP) for the Midlands and the North of England has often been countenanced as the end point.

A final decision on the network and phasing plans for co-ordinated and integrated investment in rail across large parts of the U.K. — those same parts seemingly most in view from the perspective of the U.K. Government's "levelling up" agenda.

But like any great train journey, the arrival of the Integrated Rail Plan at the station is not the end point, but rather the beginning of a once-in-a-generation opportunity. One that we must make the most of.

It's worth reminding ourselves of the terms and conditions of our collective ticket.

Set by U.K. Government back in [February 2020](#), the Integrated Rail Plan "will set out how the Government plans to deliver Northern Powerhouse Rail, Midlands Rail Hub and HS2, as well as other proposed rail investments, including improvements to the existing transpennine line."

This will include "a recommended way forward on scoping, phasing and sequencing of delivery," as well as "opportunities to reduce cost, and reconsider HS2 Phase 2b scope and design standards," and "the recommended approach to sponsorship and delivery" alongside considering the best approach to deliver "onward connectivity to Scotland."

At £96 billion of overall investment, it is notable that the investment across the Midlands and North of England is broadly the same again as the anticipated expenditure on HS2 Phase 1 and Phase 2a already announced.

As a result, the plan sets the investment framework for decades, so needs to be right.



What is “right”?

2.0

Often this definition of “right” has been primarily considered — and perhaps too often conflated — with the definition of the actual network itself.

Yet, whilst consideration of the places to be “best” connected is clearly locally transformative, it is equally critical to recognise that the railway is never just about journey times and connectivity between sets of places, or even the number of freight paths.

Railways, if developed and designed right, are not just transport projects, they are critical **social infrastructure**. If you were in doubt, consider Stephenson, Brunel or Barlow.

So it is vital that this opportunity for transformative investment from the IRP must also be leveraged across the industry to transform how our future rail infrastructure is designed, constructed and operated; for both passenger and freight users.

And crucially, unlike previous episodes of transformation of our railways, this time it must be better integrated into its wider social, environmental and economic surroundings.

After all, it is only in the conversion of paper plans to the (now significantly decarbonised) steel and iconic gateways to our key towns and cities in the North and Midlands that genuine levelling up outcomes will actually be delivered.

Indeed, following COP26 and the needs of the Glasgow Climate Pact, it is also clear that the time for incremental change in how we deliver has also passed.

What therefore becomes “right” — and we need to see alongside the map of the IRP — is also the opportunity to **define, sponsor and deliver a different railway**. A railway that is passenger-centrally developed, and solely outcome-focused, at the heart of future delivery.

Making real the ability of such investments to genuinely transform economic productivity, deliver net environmental and sustainability gain, and drive greater access, inclusion and social mobility — literally and physically — through the way we design, develop and integrate the planned IRP investments beyond the immediate railway environment too.

What we at Jacobs, and others call delivering the *triple-bottom-line*.



A need to transform delivery, alongside transformative investment

3.0

Advancing economic productivity, environmental benefit and better social outcomes from the IRP and its planning are all laudable objectives, but it is in the “how” such a railway is **developed, designed and delivered** that the real work starts and value is created.

Paper plans need to be transformed in an outcome-focussed manner; efficiently, effectively and expertly building on the best of programmatic and trusted delivery, lessons learnt — underpinned by an enterprise culture.

This is to ensure aligned and collaborative delivery alongside acceleration demanded by both government and local leaders in the Midlands and the North; but without acceleration to the very detriment to the same benefits they seek and that these regions deserve.

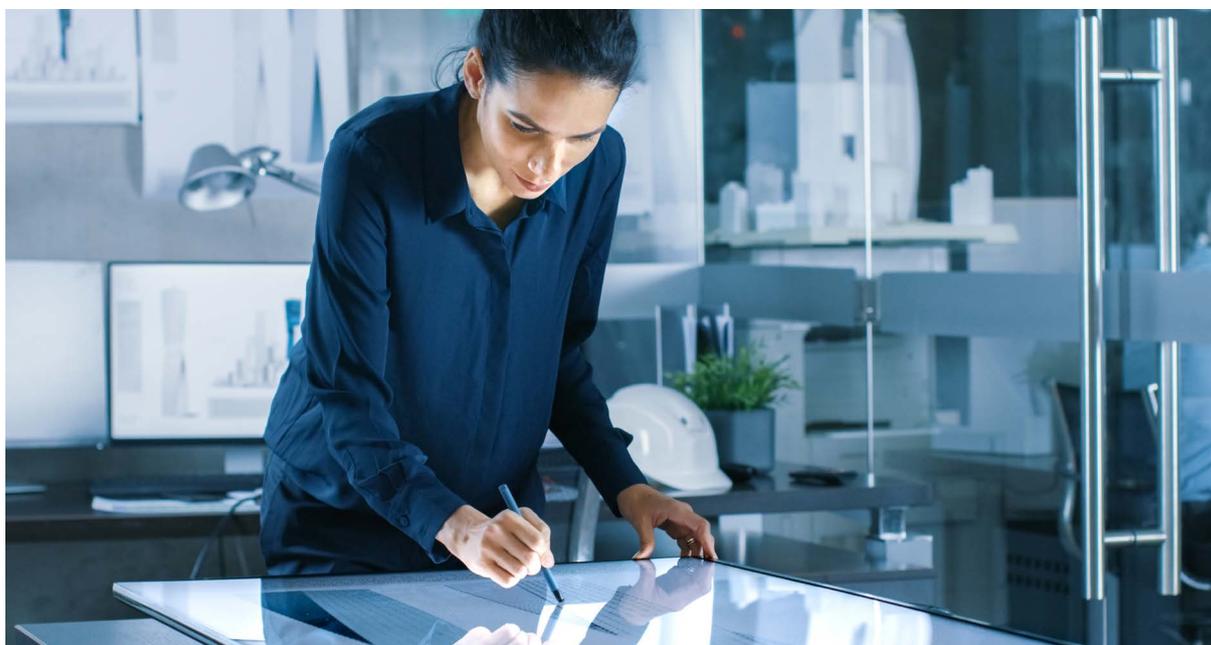
At Jacobs, this critical juxtaposition is where we have built our reputation for delivery.

Developing the integrated railway of tomorrow therefore means we must not deliver infrastructure solely for today’s needs. Instead we must visualise how society will operate in the future, its changing needs and how our day-to-day lives will evolve socially, digitally and in not only a post-pandemic future, but also as our regions proactively embrace a fourth industrial revolution.

Long asset lives make that even more critical, with future-made planning and in-built resilience; technologically, environmentally and behaviourally captured in the development process.

Given the scale of investment it is also critical that vital lessons of other major projects and programmes are not just acknowledged, but embedded in development partner roles, as well as future delivery.

So it’s important that everyone involved in the future delivery of the IRP sees it as a **“programme of programmes”** with important interactions not only in the short and medium term, but lasting 100+ years. Indeed, under new Treasury Green Book changes, they are likely to be able to be valued for longer too.



What needs to happen next?

4.0

As one of the largest set of investments likely to be made in infrastructure since the Victorian era, we suggest a laser focus needs to be on five salient opportunities to realise triple bottom line outcomes on the IRP journey:

1. **Cost, speed and a smarter way to deliver**
2. **Decarbonisation and environmental value creation**
3. **Translating an integrated plan into integrated outcomes**
4. **Fast forwarding and better integrating plan for hubs**
5. **Looking beyond traditional funding sources**

We have focussed on those that we feel cross-cut government, delivery agency, sub-national or local authority perspectives to maximise the overall investment potential:

1. Cost & Speed: A Smarter Way to Deliver

The IRP will contain proposals for both new and high speed lines, as well as transformation of existing railways and stations.

Despite the sizeable overall investment planned of over £96bn in the IRP, history teaches us that too often in the past it has not been enough.

The critical challenge of IRP is to respond to the previous National Infrastructure Commission's recommendation to deliver 50% quicker, 33% cheaper, as well as with 50% less greenhouse emissions, ensuring that the integrated outcomes and full network plan actually materialises.

Ensuring key parts are not lost or re-scoped due to cost increases elsewhere is a critical challenge, and one that needs to be brought to bear on the IRP scope and proposed delivery models.

As a trusted development partner for major infrastructure to U.K. Plc, we know that optimised planning of projects, wider adoption of best practice, and a long-term commitment to a rolling programme could reduce the cost of overhead line electrification across the U.K. and on many routes pertinent to the IRP, for example, by between 33% and 50%.

With over 180 km of new planned electrification in the IRP, this represents a particularly salient opportunity.

In our work "*A Better Way*", we highlight many of the opportunities to achieve this, and present six key recommendations to challenge the delivery models of today; and further promote quicker and more efficient delivery.

The unparalleled commitment to invest that we expect the IRP to define, must be matched by unprecedented changes in how such schemes are developed and delivered to actually succeed.

Work on *Project Speed* has started key changes to reform of environmental regulations, Development Consent Orders (DCO) and a range of client-side decision making and accountability. Yet whilst there are key lessons from individual projects, or the achievement of reduction in former Governance for Rail Investment Projects (GRIP) stage durations on several individual projects through the transition to PACE, few have brought this to bear yet on major programmes of rail investments which are highly interfaced and critically interdependent in systematic ways.

Yet this can be done. As High Speed Two's Phase 1 development partner, we helped produce the largest, most consulted and fastest Hybrid Bill ever achieved, made possible by proactive choices on oversight and governance, effective incorporation of Delivery 4.0, digital and lean processes, and the collaborative, enterprise culture enabled.

What is critical for promoters and future IRP delivery organisations to understand is that achieving speed is not, and should not need to be, about short-cutting design, breaking projects up into many sub-regional or indivisible parts, or the systems (read passenger-focussed) integration work required to achieve success.

Severely reducing this means that schemes will inevitably miss out on the very outcomes fought so hard for locally (and expected nationally), and required to be designed in. But from our experience such approaches also mean projects typically then spend longer at latter delivery stages and at greater cost of delivery.

Rather, achieving acceleration and greater programme and cost certainty is therefore actually about using digital and the culture of enterprise to effectively trim and accelerate governance, key decisions and those of funders, as well as through required planning and consents to maximise value from the scheme to the environment, economy and communities — whilst minimising timescales.

4.1

2. Decarbonisation & Environmental Value Creation

Both the North and Midlands have strong histories of technological and social innovation that must be harnessed through the next stages of IRP development and design to transform how our future railway is designed, constructed and operated.

The future development of the IRP network will be a critical green and digital enabler; provide demonstrators and catalysts for wider green investment along its spines; and underpin the evolution of fairer, greener and stronger regional economies across the U.K.

We have been co-creating, measuring and valuing the carbon impact on projects with our clients for many years and systematically understanding impacts and benefits of interventions.

Earlier this year we collated our insights on future net zero rail operations and delivery in our *Net Zero Rail: Network of the Future report*. This sets out our vision for the zero carbon railway of the future, and next steps and recommendations that the IRP and its delivery agencies must act upon to achieve this.

For carbon, much like the passenger or freight train, proposed solutions need to be analysed and embedded at the whole railway system level.

Aligned to the PAS 2080 Carbon in Infrastructure standard, our approach proposes solutions for the whole railway system and over the whole life of projects, much like the delivery of the IRP needs to.

The good news is that in these early stages of development, the opportunity and ability to influence the whole life cycle carbon of the IRP programme, and projects and programmes within it, is significant — as per each of the areas identified in Figure 1 below.

We fully recognise that many in the industry have only scratched the surface of decarbonising rail processes, so we are using Net Zero to catalyse the change programme internally, empowering an army of 'net zero engineers' prepared to take on the IRP through the roadmap identified in our Network of the Future Report — see Figure 2.

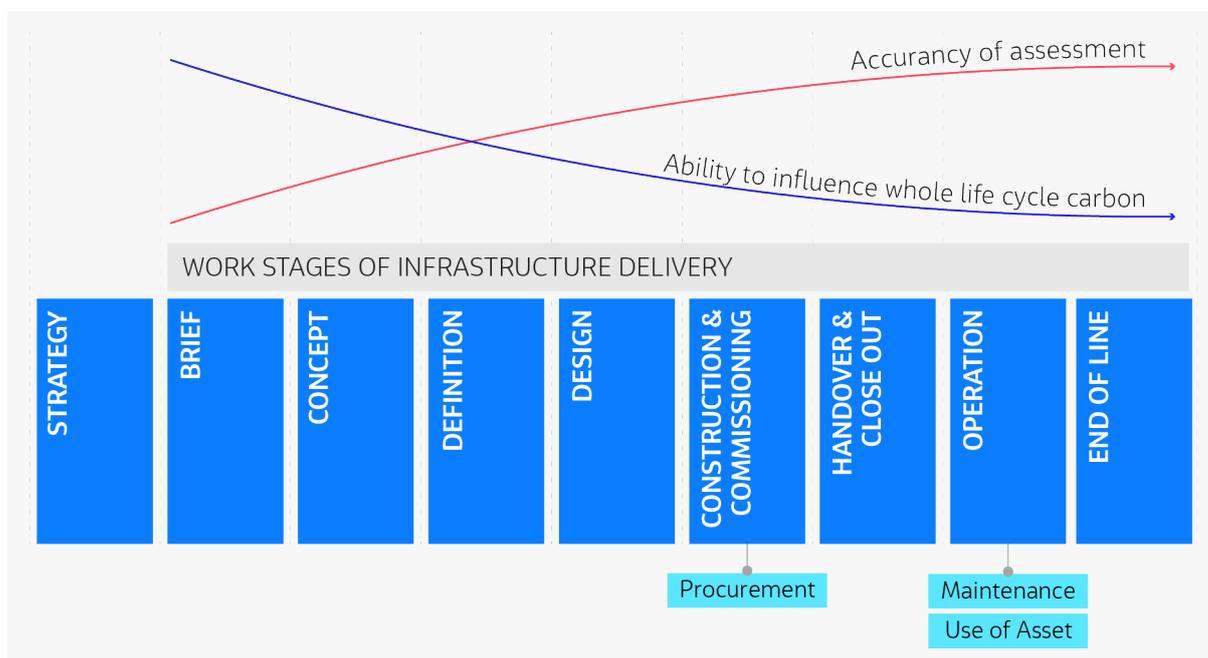
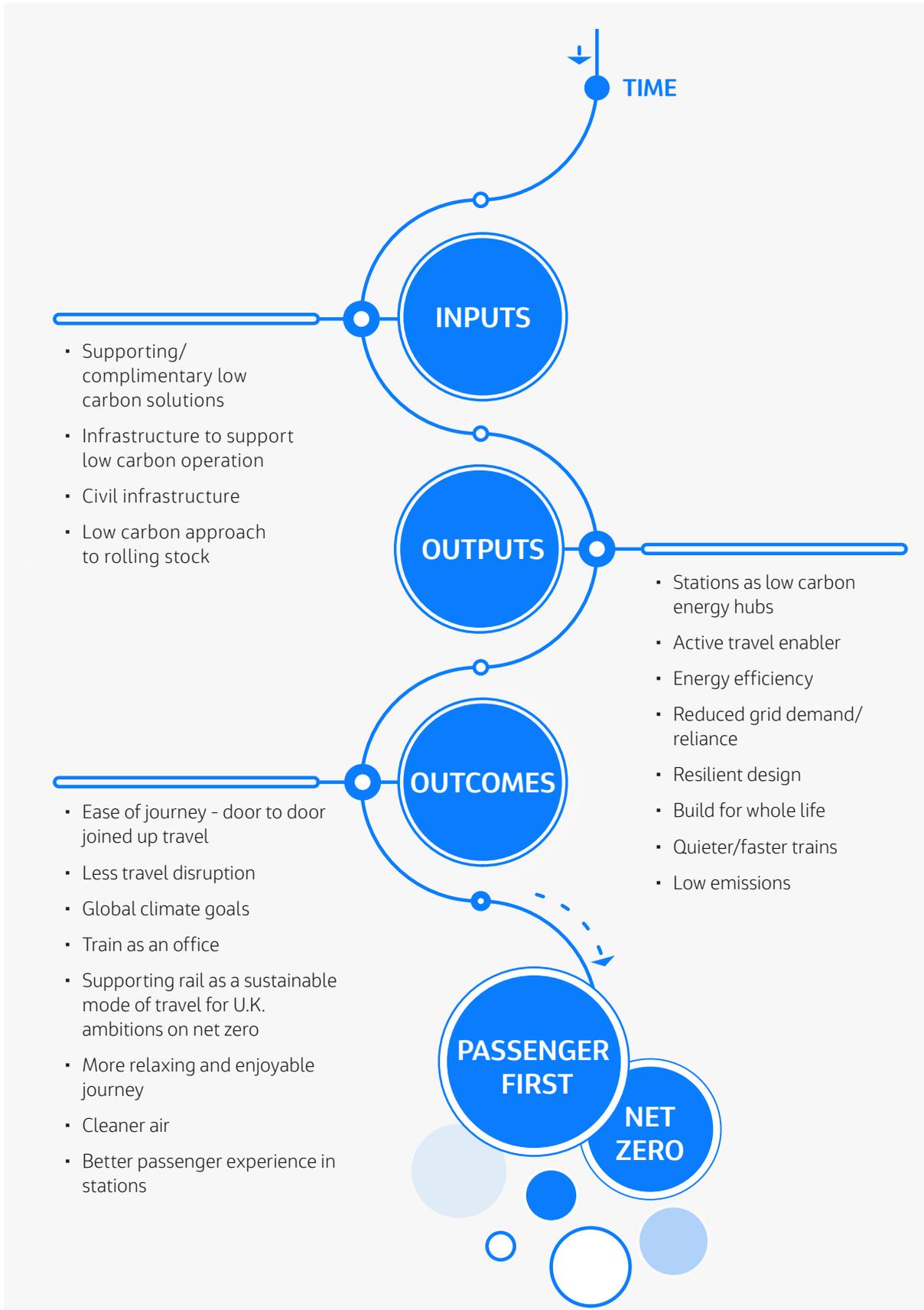


Figure 1: Carbon Management in Infrastructure - Source: PAS 2080

4.2

Figure 2:
Roadmap to a Net
Zero Railway - Jacobs
2020



4.3

This is also the case for how wider environmental, biodiversity and wellbeing net gain is considered and managed.

Much like carbon, our view is simple, that significant change is possible in terms of the IRP's next steps to construct and operate the greenest railway in history.

To achieve this requires this thinking to be properly incorporated at strategic planning, wider placemaking and earlier design phases to allow this value to be understood and maximised.

Those developing the onward specification and delivery of the IRP programme may be interested in our work on behalf of the [Green Infrastructure Partnership](#) and [Natural England](#) in the development of the **Green Infrastructure Design Guide**.

This already sets out what good multifunctional green infrastructure looks like, and how to deliver it so that new proposals offer distinctive, nature-rich, healthy environments that address social inequalities and climate change.

Centred around the draft, new national **Green Infrastructure Standards Framework** due to be launched in 2022, a different way of delivering the railway as societally and environmentally enhancing infrastructure – through net positive outcome definition – is already possible.

However, this will need a combination of both insight and use of enhanced methods of valuation to challenge and change through future design development to see it mainstreamed/brought to reality as part of the costed IRP plans and proposals.



4.4

3. Translating an Integrated Plan to Integrated Outcomes

The Integrated Rail Plan shouldn't be taken as meaning that the outcomes required to be delivered will be automatically integrated.

There is no invisible hand of integration.

As a **"programme of programmes"**, dedicated programme management — as distinct from the skillsets required to manage an individual project or section of upgrade — will need significant investment, as well as significant integration at pan-regional, sub-national and local levels.

As an experienced systems and infrastructure outcomes integrator, we know that the IRP will require both a range of detailed and operational assessment, as well as detailed systems integration to maximise the system benefits of the proposals to the passenger and the wider rail industry.

This will also need a consistent application of vision and outcomes at all scales; much beyond the working of any one organisation.

The critical challenge for all future clients and co-clients/ funders of IRP is to avoid over-specifying particular inputs at a transactional, project-based level, that then prevent their overall achievement at the wider systems level.

Setting outputs that align with the outcomes, and then have performance aligned to them becomes even more important when trying to deliver at speed (cf. Points 1 and 2 above) — as show in Figure 3 below.

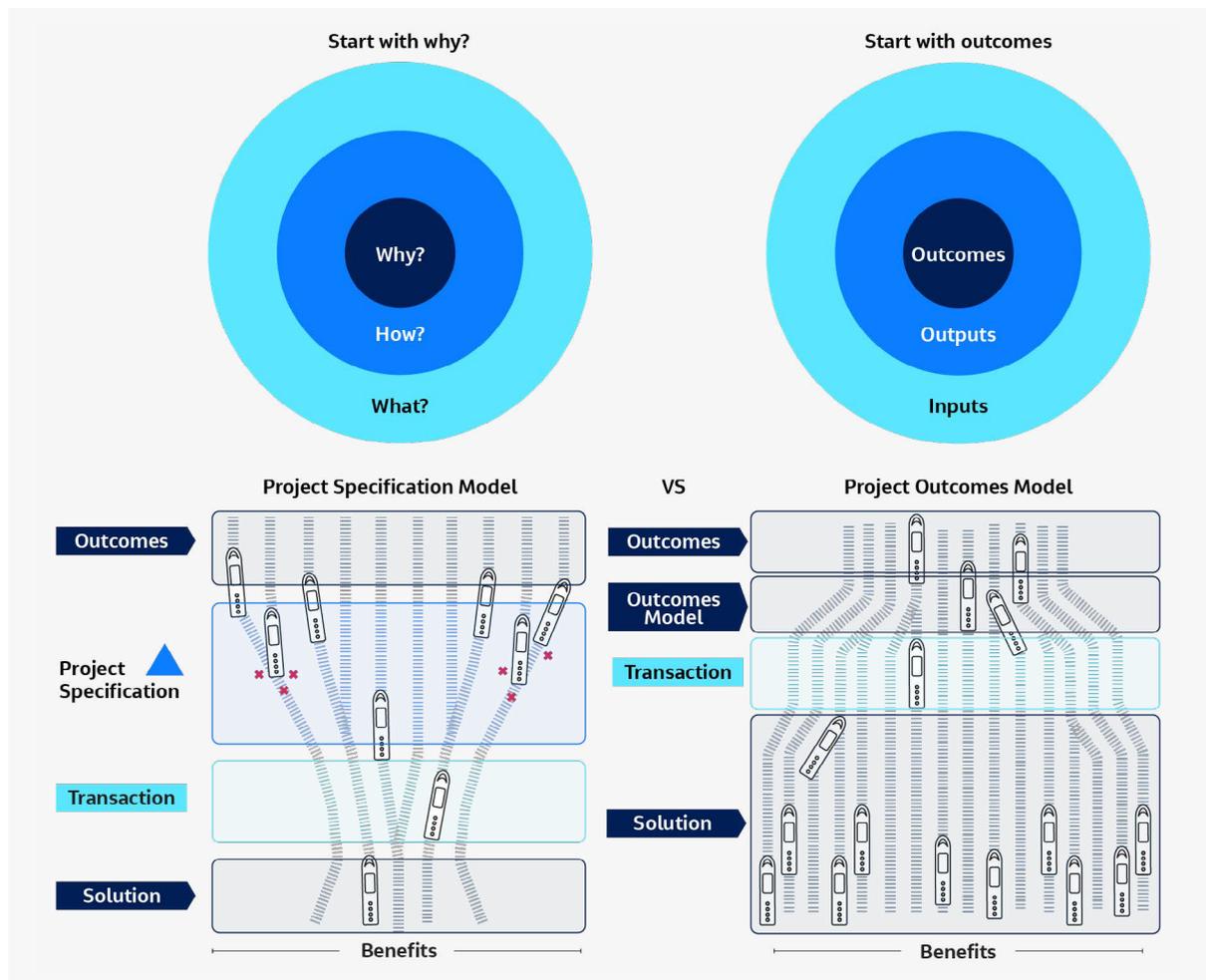


Figure 3: An Integrated Outcomes and Performance Incentivised Approach

4.5

It is clear that the IRP does not yet set out a sufficiently optimised set of outcomes beyond the strategic, national scale.

So stations like Leeds, Birmingham New Street, Manchester Piccadilly, Crewe and Liverpool will continue to play critical junctures on the whole of the IRP's proposals and next steps. How these are developed and the outcomes sought will be critical determinants of the wider success.

Not just for passenger and freight operations, but also for how combined authorities, city regions and other parts of the Midlands and the North can benefit from both released capacity, as well as wider social and environmental benefits of integrating city-regional connectivity planning with IRP network development and programming.

Integration doesn't stop at neatly composed boundaries; nor do passenger journeys, and the outcomes our communities want.

How integration is materially delivered beyond the national-level plan is therefore a critical success factor for future IRP development and delivery in the context of the U.K.'s regional ambitions.

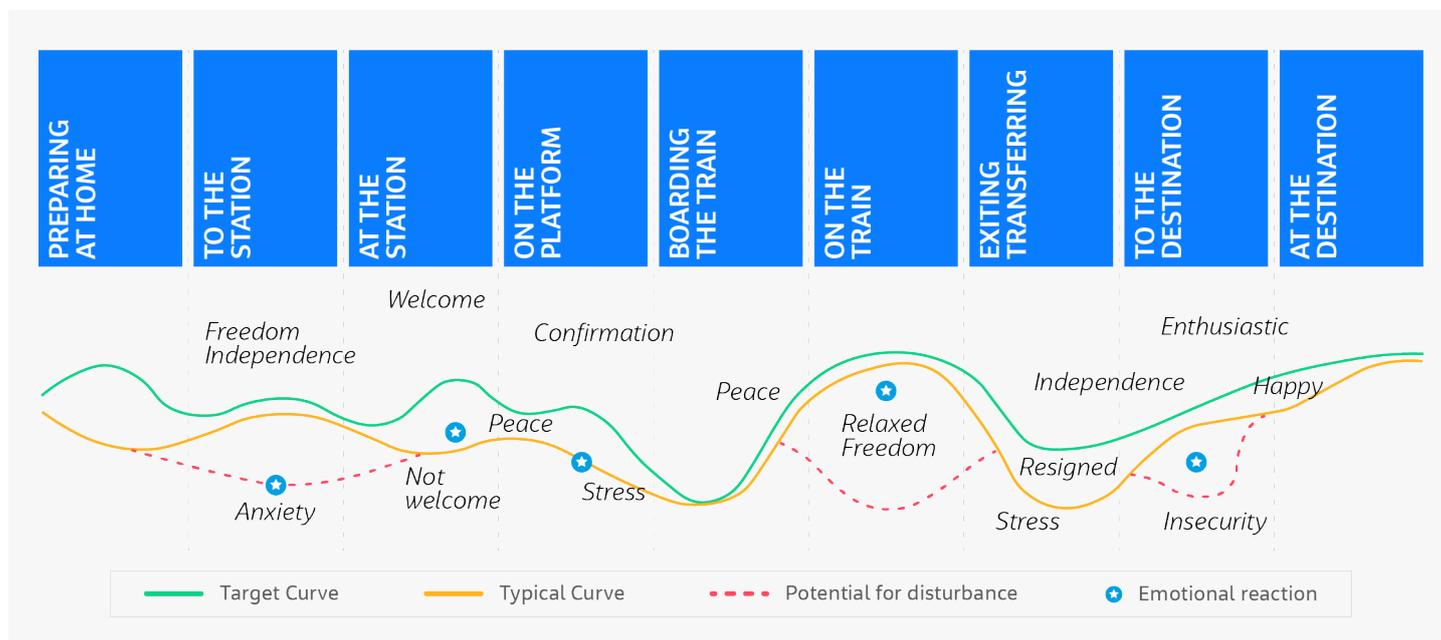
As shown in Figure 4, effective design and delivery integration can be used to tackle many of the passenger "pain points" on the future IRP network that will drive future behaviour, and even more so in a post-pandemic, post Glasgow world too.

This, in turn, will not only drive enhanced passenger and released capacity benefits, but also help beat the conditional outputs set for the network and investment as a whole when considered at an end-to-end journey level — the level at which most passenger choices are made.

Delivering outcomes beyond the railway boundary therefore requires significant integration from dedicated development partners with clear definition of roles across public and private sectors, and at both sub-national and devolved local government levels.

Such roles need to be planned for, and unified under a common vision and an outcomes-focused perspective much beyond traditional railway metrics.

Figure 4:
An Integrated Journey & Customer Experience extends much beyond the Railway



4.6

4. Fast Forwarding and Better Integrating Plans for Hubs

With a longer-term plan comes the ability to drive better outcomes, but also the potential for earlier and more co-ordinated inward investment.

Stations and hubs rightly need to be developed and designed as integrated, modern, green and inclusively considered places. Spaces fit for a 21st century arrival, and that immediately take both first-time and regular visitors to their distinguishing experience and identity.

But whilst the IRP supports a range of future station studies and development proposals, it is critical that future masterplanning and development work around these locations focus not only on the traditional tools and techniques.

The opportunity is too important to end up with more of the same.

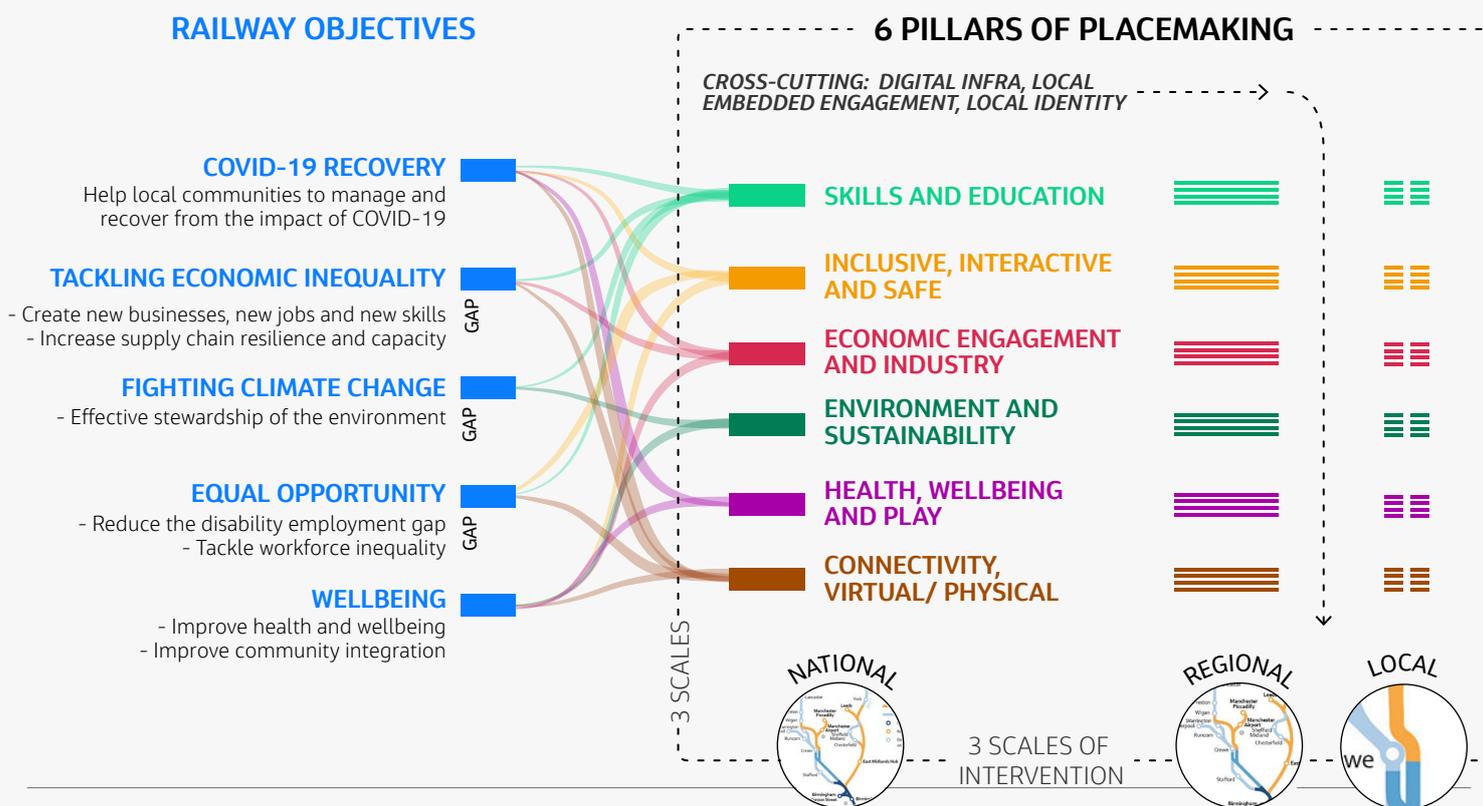
Rather through the IRP, we need to see the opportunity for change. To do things differently through the way we plan and integrate urban development and re-development; and delivery methods for achieving Levelling Up radiating from them too.

This means simultaneously planning for aligned and tactical investments to help capitalise on connectivity to create more productive, smart and "innovation-ready" places, as well as future commercial return.

But it also requires a multi-scalar and integrated urban approach to better co-ordinate inward investment, cross-sector collaboration, and the highly-productive innovation and knowledge clustering required to achieve the broader social outcomes of the IRP at the sub-regional level.

In Figure 5 below, we set out a framework for how these outcomes can be achieved and better aligned. An approach that needs to be much better woven into the fabric, objectives and outcomes of all IRP design processes to better enable local success and legacy, beyond on-time, on-budget railway delivery itself.

Figure 5: How the IRP can better support enhanced local placemaking delivery



4.7

We believe that the fast-forwarding of plans for hubs needs this consistent alignment of outcomes, but also requires integration of all stages and future phases of work.

As proposals around each of the hubs are at such critical points for future private sector investors, they are too important to be left to be developed without dedicated, cross-sector and multi-scalar integration partners.

As the practical advocates of inclusive growth, we need to see such integrator roles emerge alongside delivery to ensure wider translation of this thinking beyond the city and the ever important role of local and combined authorities, and into the actual programming of wider IRP railway delivery itself.

As Programme Integrator for the Meridian Water masterplan, a £6bn, 25-year London regeneration programme led by Enfield Council, bringing 10,000 homes and thousands of jobs around a new rail station, we already understand the benefits of these roles.

Collaborating with partners, including local authorities, developers, local leaders and government agencies, is always key, but the critical part is *how*.

How to help unlock strategic sites with decision-making structures, analysis and governance that binds each party to integrated outcomes, and enables the delivery of outstanding developments.

At Meridian Water, we are responsible for the definition and delivery of a 'Federated Model', as shown in Figure 6.

This is the basis for integrating outcomes. A collaborative digital space that includes a process for collectively reaching a set of 10 inclusive KPI's encompassing all aspects of successful delivery, including funding and finance, sustainability and circular economy, infrastructure requirements, housing delivery and employment uses.

Such digital integration platforms support more responsive, data driven, and longer-term decision making, enabling smarter, more integrated and inclusive outcomes for the authority; more geared towards successfully delivering the overarching vision for the area.

And yet for every station masterplan, supporting innovation district or integrated hub plan, there also needs to be a plan for diversification.

Leaders and city authorities need to be asking how will the rest of their city, district or wider metropolitan area benefit from the hub proposals around the station.

Planning for economic differentiation and understanding the different roles a district's or a city's urban hierarchy will play in both a post COVID and post IRP world has never been more important.



Figure 6:
Example output from
the Outcome Focussed
Meridian Water
Federated Model

4.8

5. Looking beyond traditional funding sources

In a post-pandemic, post Comprehensive Spending Review world, delivery of the wider outcomes of the IRP is critically enabled, but is unlikely to be achieved by reliance upon Her Majesty’s Treasury.

Beyond the actual size of investment into the network, several important steps to set up the future materialisation of this have already been made, and need to be continued at all scales.

How the business case for new IRP infrastructure is delivered beyond the present Strategic Outline Case needs to be continued to be developed to consider a much wider “value” case – both at the programme and individual phase / integration investment level.

Anticipated higher carbon valuation, and long-term whole-life accounting approaches should help play a part in supporting the inclusion of ever greater sustainability measures in both the strategic, but also quantified metrics. Significant advances in other areas, notably Simetrica-Jacobs, innovation in the quantifiable health, wellbeing and social inclusion benefits of such investments, are also critical and need to be sponsored by delivery bodies collaboratively with government.

To make change a reality, it is imperative in the structure and “set up” of IRP governance and future delivery that the validity of the business case is also set up to be assured against, and therefore aligned to become more dependent on the demonstrable social and environmental benefits of such investments.

Such “total value” outcomes will be important in helping shape and attract greater private sector investment and additional future “pooled funding” approaches in these areas, as well as demonstrably align with an outcomes focus approach.

There are also important lessons to be learnt for IRP delivery around the way it is procured. Consents need to be sufficiently flexible, and innovation sufficiently incentivised to continue to drive improvement, throughout the programme of programmes – even on projects which can take ~10 years to come to fruition.

However, delivery of the IRP and its wider integration should not be constrained by Government ability to fund.

We need to see much greater ability for aligned financial planning and powers to develop additional funding options to support delivery; such as land value capture, council tax precepts, earn back, and business rates capture locally.

This is alongside use of the U.K. Infrastructure Bank to help further de-risk aligned private sector and net zero projects to support long-term integrated delivery models, and to act as an important catalyst for integrated connectivity beyond the network of the IRP.

However, they will also require greater collaboration and interface between the DfT, the new Department for Levelling Up & Communities, and organisations such as TfN, city authorities, Environment Agency, HS2 and others across government to realise for downstream design, and to provide best value to future IRP delivery.

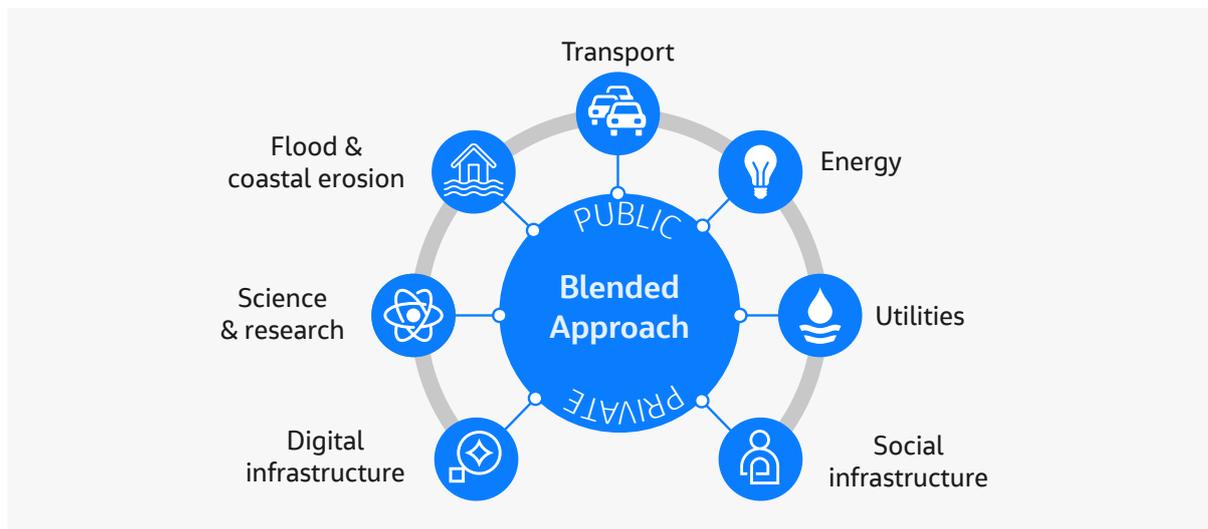


Figure 7: Blended Funding Approach

Final perspectives

5.0

The IRP represents a once-in-a-generation opportunity for making sure future investment in our rail connectivity across the North and Midlands is outcomes driven.

Yet the sizeable commitment to invest must be matched by unprecedented changes in how such schemes are developed and delivered to succeed.

Using our five suggested areas above, and with a focus on delivering differently to enhance speed, reduce cost, maximise wider environmental net benefit, and social access, inclusion and community integration, the IRP, if developed on these principles, can be far more than just a railway.

It can become that critical social infrastructure binding the communities of the North and Midlands much more effectively together, as well as with the rest of the U.K.

Stephenson, Brunel and Barlow were brilliant engineers of their time, but largely delivered separately, and rarely were their works integrated into a wider national picture, or the environmental, community and social conscience of their surroundings.

What makes IRP so exciting is the opportunity to do just that.



Disclaimer

In preparing this report, Jacobs has relied upon, and presumed accurate, information from publicly available sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information available internally and in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report.

Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. Specifically relating to COVID-19, our work product is only one source of information that the user should refer to in making any decisions. The report has been prepared for information purposes only. No responsibility is accepted by Jacobs for use of any part of this report in any other context. By accepting the work product the user agrees that Jacobs has no responsibility or liability for the results. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any party.

COPYRIGHT

© Copyright 2021 Jacobs UK Limited. The concepts and information contained in this document are the property of Jacobs UK Limited. Use or copying of this document in whole or in part without the written permission of Jacobs UK Limited constitutes an infringement of copyright.

Contact

Leighton Cardwell

Cities Director and Northern Powerhouse Lead

E-mail: leighton.cardwell@jacobs.com

Mob: +44 (0) 7869 396396

Michael Emery

Network Rail Client Account Manager

Email: michael.emery@jacobs.com

Mob: +44 (0) 7818 422855

Our Jacobs

At Jacobs, we're challenging today to reinvent tomorrow by solving the world's most critical problems for thriving cities, resilient environments, mission-critical outcomes, operational advancement, scientific discovery and cutting-edge manufacturing, turning abstract ideas into realities that transform the world for good.

With \$14 billion in revenue and a talent force of approximately 55,000, Jacobs provides a full spectrum of professional services including consulting, technical, scientific and project delivery for the government and private sector.

Visit [jacobs.com](https://www.jacobs.com) and connect with Jacobs on [Facebook](#), [Instagram](#), [LinkedIn](#) and [Twitter](#).

