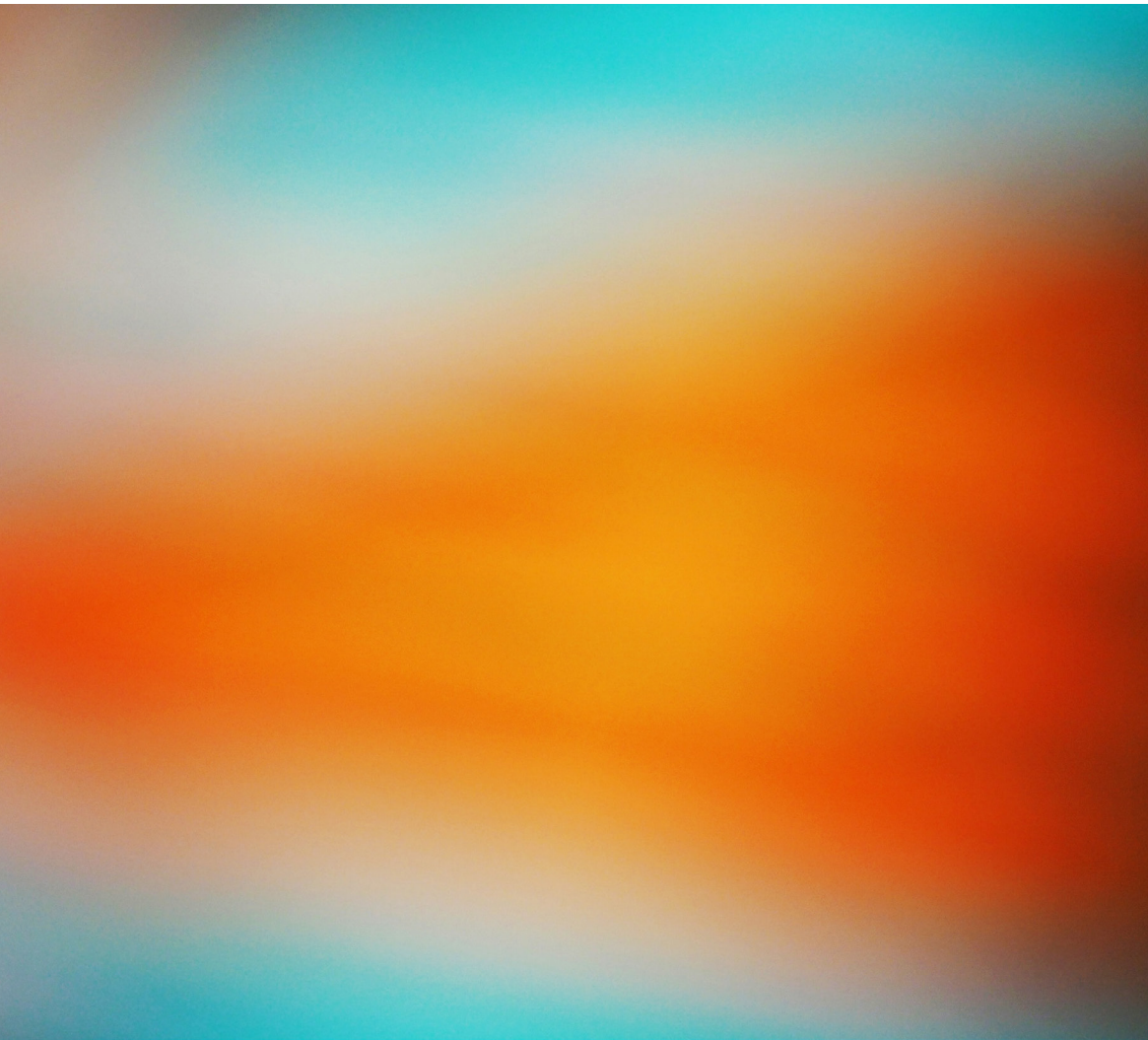
ARUP

APPLYING PROJECT 13

Reimagining Value Creation in Capital Projects



Despite many successes, the approach that we take to deliver and manage major capital programmes and projects is in spotlight. As a sector, how can all of us in infrastructure and construction improve our track record and create high-performing infrastructure that better serves society?

We need to change the narrative about how we define success, and we need to change the way we reward parties that contribute to success. Arup, as with many of our clients, contributed to and support Project 13, an industry-led response launched by The Institution of Civil Engineers (ICE). Project 13 begins to address a new narrative and a new way of thinking. It proposes a new business model that moves away from traditional transactional arrangements. It's based on parties working together as an enterprise to boost certainty and productivity, improve whole-life outcomes and support a more sustainable, innovative, highly skilled industry.

As we help infrastructure owners and suppliers translate Project 13's principles into practical interventions, we want to stimulate a conversation about its development and application. This paper is the first step in a series of conversations, which we are having with our stakeholders – including investors, owners, regulators and suppliers.

Our proposition to these stakeholders can be summarised as:

- Matters of time and cost, often driven by political measures, have allowed for a misplaced interpretation of what represents value for money. We must adopt a value based commercial model to avoid the low-margin trap where turnover has primacy.
- Investment in capital projects needs to create value for both society and shareholders. This creation of value will allow for contracted parties in a value based commercial model to be incentivised based on their contribution to outcomes and risk reduction.
- Owners are best placed to rebalance an emphasis between value and price. They hold the purse, sit at the centre of relationships between benefactors and those that deliver. They influence what is delivered and how capital projects are delivered. Leadership of change is likely to be required at every level of an owner's organisation, not just by procurement and delivery teams.
- Whoever makes a first move to rebalance value, price and reward will need other parties to reciprocate by focusing efforts on ways to support the creation of a pan-industry "movement for change". Accountability sits with all of us and not just the first mover.

We hope our proposition and paper encourages industry players to consider how they can also contribute to changing the narrative on value, price and reward.

MATTHEW WALKER,
Associate Director, Strategy and Insights,
Arup

£600bn
of projected investment in UK infrastructure by 2028[1]

700
projects in the UK Infrastructure pipeline[2]

3.1m
people employed in the construction sector in the UK[3]

9%
of the United Kingdom workforce works in construction[4]

The Queensferry Crossing was the largest infrastructure project in a generation in Scotland and sustains critical socio-economic connectivity.

© Transport Scotland

EXECUTIVE SUMMARY

Applying the Principles

Project 13 aspires to more than reinventing existing delivery and commercial models. What sets it apart is one of its commercial principles, which states contracted parties should be incentivised for their contribution to outcomes and risk reduction. While this may seem simple, achieving it requires a step change in the way the construction sector thinks about total value – to society as well as shareholders.

So how can the sector evolve? How can Project 13's principles be applied? This paper groups the issues into three areas: outcomes, digital, and capability and collaboration – asking:

Outcomes

- How can outcomes be incentivised?
- How can we all avoid the low-margin trap?
- What does integration mean and who is responsible for it?

Digital

- What factors influence the shape and source of data and technology for projects?
- How can the sector embrace data collaboration and 'bytes not bricks'?
- How important is it to invest in new business models and data literacy?

Capability and collaboration

- As a sector, how do we develop leadership to match the aspirations of Project 13?
- How can trust between people and teams become the norm?

At Arup we believe it's important to play our part in helping the sector understand how to achieve the ambitions Project 13 sets out. If, together, we can transform the way we work, we will all be helping to shape a better industry and a better world.

London's King's Cross station upgrade created a dynamic transport hub and made the station a destination for passengers in its own right.

© Hufton Crow

Outcomes

Put simply, focusing on outcomes means focussing on making life better for the people who use and depend on infrastructure and are impacted by it. Improved connectivity, a reliable drinking water supply and cleaner energy are three examples of desirable outcomes.

This section of our paper examines how the sector can put outcomes at the heart of procuring and constructing high-performing infrastructure.

HOW CAN OUTCOMES BE INCENTIVISED?

Realising outcomes requires responsible businesses to connect corporate social responsibility with delivery and operations. This is easier to say than it is to do. It requires investors and owners to understand what benefactors (society as well as shareholders) value, how much they are prepared to pay for an outcome and how they are prepared to compromise between price and performance. This means drawing insight from customer analytics, making bold decisions where consensus is difficult to find and prioritising investment in line with outcomes.

Although regulated industries and some government companies are beginning to get benefactors more engaged in the process of informing value-based trade-offs between price and performance, end users anecdotally seem reluctant to engage. Is this because they feel powerless to influence? Is it because they take infrastructure for granted? Or is it because they don't see a culture of accountability from those that invest in, develop, deliver and operate the built environment?

> An honest application of reward is an owners greatest tool for securing accountability.

Securing accountability means being honest about outcomes achieved versus price paid, rewarding those who helped achieve the outcomes and holding poor performance to account. How should this be done? Not

by using complex sets of performance indicators to assess individual contributions to outcomes and risk reduction. This only encourages gaming the system.

What if parties were to present a self-assessment of performance, calibrated against others, through collective agreement by all parties engaged in delivery? In circumstances when outcomes have only been partially achieved, a transparent process would be needed to direct unallocated reward to end users. If taxpayers are paying for a project that falls short of intended outcomes, we should consider ways in which to compensate them.

HOW CAN WE ALL AVOID THE LOW MARGIN TRAP?

As a sector, we must move away from a procurement model which encourages a low-margin trap. If a contractor's profit margins are single-digit, the only way it can make more profit is to increase turnover. The result is a turnover-driven race to the bottom.

What's needed is an evaluation process that emphasises transparency of price build up, robustness of price and credibility of opportunities to outperform. To provide headroom for outperformance, parties should be contracted on a price which excludes substantive opportunities and evaluated on an ability to outperform outcomes. Promises of delivering opportunities outside their sphere of control should be considered with caution.

> Contract on a robust price, evaluate and award on an ability to outperform.

This approach is materially different from how many services are procured today. It differentiates parties not simply by price but by innovation and their potential to outperform outcomes. This elevates the importance of contributions from small to medium enterprises. Unconstrained by unwieldy governance, it's these smaller firms that often have the freedom to think up innovative solutions to challenges, mitigate risk and create value. Shouldn't they be given the chance to do this, and rewarded when they succeed?

For this approach to work, an owner must be clear about its role – as well as the roles and responsibilities of other parties. It must also be clear on what each contracted party must adopt and where there is freedom to adapt – in areas such as functional requirements, performance specification, planning conditions, governance arrangements, data and technology.

Finally, we contend that an owner is best placed to size, hold and manage a risk pot. Money saved by proactively mitigating risks should be transferred to a reward fund for sharing among contracted parties. This should encourage all parties to proactively manage risk, on a proviso that money resulting from risks that fail to materialise, and don't require mitigating, flows back to end users.

WHAT DOES INTEGRATION MEAN AND WHO IS RESPONSIBLE FOR IT?

The best ideas come from those who are given time to be creative; are provided with the means to share and incubate thoughts amongst a diverse pool of players and; importantly, are provided with a means to be rewarded for their contribution to outcomes and risk reduction. Any high-performing team needs a coordinator and an evaluator to integrate others and provide impartiality to aid decision making. This is particularly important in a world of growing complexity. Value from integration comes in many forms:

– Data and information – using analytics and sharing data to draw insight and foresight that aids decision making and stakeholder management.

– Ideas – bringing a mix of disciplines and expertise together in an environment that's conducive to incubating ideas and creating innovative solutions.

– System – taking a whole-system, integrated approach to design, manufacture, build and operations.

– Decision making – establishing a controlled environment and understanding the consequences of decisions.

Each form of integration requires different combinations of capabilities, work aptitudes and emotional intelligence. This means no single individual or organisation can be responsible and carry the risk for them all. Responsibility for collaboration and delivery at interfaces should reside with affected contracted parties, whether they're designers, contractors or others.

Integrators facilitate integration, interfacing parties deliver it.

Out-sourcing the role of integration should be done with caution. If you were building a house you wouldn't appoint a third party to solve a problem at the interface between the roofer and the bricklayer, would you? You would get them to sort it out between themselves and reward them when the house is weatherproof. The same principle applies and can be scaled to any project. You can hold people and parties to account for delivering a shared objective. Responsibility for managing interfaces rests with the interfacing parties themselves. An integrator can facilitate the process of integration but should not be relied on as a surrogate.

£211bn

potential economic benefit to the UK of Heathrow Expansion[5]

850K

jobs could be created by Northern Powerhouse Rail[6]

4,000miles

of additional motorway capacity created by the Smart Motorways plan 2015-2020[7]

Metrolink station upgrades in Manchester's St Peter's Square provided an opportunity for infrastructure to help improve the inclusivity and quality of place.

© Latz Partner | Stalwart Films

Pioneering use of data and technology like digital twin requires our sector to adapt to new ways of working.

Digital

Through computer-aided design, building information modelling, virtual and augmented reality, and ‘digital twin’, digital technologies are now permeating every aspect of the built environment.

They can enable the sector to realise better outcomes – for example through standardisation, automation and by upgrading existing assets so that new ones aren’t needed. Yet, for all the exciting possibilities digital technology presents, it is not a self-fulfilling prophecy. This section of the paper explores three challenges associated with acquiring and deploying capabilities in data and technology.

WHAT FACTORS INFLUENCE THE SHAPE AND SOURCE OF DATA AND TECHNOLOGY FOR PROJECTS?

There is no one-size-fits-all approach to digital technology. At a project level, decisions must take into account the value which an investment in data and technology will add – at each point in the lifecycle of the affected assets and to the enduring operations of the owner.

A value-based approach is particularly important for enterprises – teams of individual parties working for a shared goal with incentives based on outcomes. While enterprises are similar in many respects to the businesses that form them, their temporary nature means more emphasis is needed on:

- Exactly what value is sought through an enterprise
- What capabilities are needed to deliver this value
- How capabilities map to the processes and people that run them
- What data and technology are needed to feed and run processes and make informed decisions to create solutions.

Sourcing data and technology to meet the needs of capital projects can involve considerable investment. Basing incentives on outcomes and risk reduction can provide opportunities for an owner to manage investment costs by using data and technology from other parties.

This also has a benefit of limiting a 'magpie' tendency to acquire the next shiny new application, when existing approaches borrowed from others may be good enough. But each party must be clear on what data and technology they are required to bring (and adapt) and what an owner may stipulate as compulsory (and they must adopt).

HOW CAN THE SECTOR EMBRACE DATA COLLABORATION AND 'BYTES NOT BRICKS'?

Through analytics and the resulting insights, data from sources such as the internet of things (IoT) and remote sensing provides opportunities to optimise the performance of existing assets. This minimises the need to create new ones. While this has huge potential to generate efficiencies, it requires data collaboration, such as an open data approach, and jettisoning the misconception that ownership of data equates to ownership of value.

Take the time to seek out and experiment with untapped data.

While there are obvious challenges in sharing data across entities, data sets within organisations are often untapped. In setting up any project, owners should encourage all parties (including their own organisation) to understand:

- What data they have
- What can be shared and reused
- How combining data sets could help to solve complex asset, operational or organisational problems.

The value of rethinking how to use data may not be immediately obvious. It may only become apparent through experimenting with different combinations of data sets – such as combining data sets on operational performance to reveal how best to integrate new assets into existing operations. This experimentation takes time, so all parties need to allow for a period of 'discovery' in their post-contract schedules, rather than a 'race to the finish line'.

HOW IMPORTANT IS IT TO INVEST IN NEW BUSINESS MODELS AND DATA LITERACY?

Data literacy and analytical aptitude is particularly important for owners, because operational excellence comes, in part, from having a command of the numbers. Operational insights are also a critical informer of risk-based asset management. Operational know-how and advanced analytics are not, however, obvious bedfellows. Developing a closer relationship between these skills is an increasingly important aspect of organisational development for all parties involved in the built environment.

Venturing provides an opportunity to capture the potential of emerging technology.

Creating digital literacy does not mean we all need to be experts. The balance of 'making' versus 'buying' capabilities will be unique to an organisation. Venturing presents an opportunity acquire new capabilities. This involves owners co-investing in start ups that may not have scale or business insight into the full potential of their ideas but do have digital acumen to modify solutions for one product to benefit another. To capture emerging digital solutions and to stay ahead of disruptive technologies, whether through ventures or alternative means, incentives based on outcomes and risk reduction remain key.

£7bn

Greater data sharing could release an additional £7bn across the UK infrastructure sector[8]

30%

Savings created by data sharing in construction through Building Information Modelling[9]

Digital technologies are challenging our sector to rethink how we operate, compete, and ultimately shape the built environment.

© Chris Foster

Applying Project 13 principles will require a new level of leadership, relationships and multiple first movers to help change attitudes and behaviours.

Capability and collaboration

Early adopters are applying Project 13 on one-off projects, some are considering how to apply it to groups of projects. This is a welcome start. But to reach a tipping point where advocacy exceeds ambivalence across the construction sector will require transformational change.

Such a change is not without precedent: 20 years ago, the idea of putting wind turbines in the sea would have seemed impossible, but offshore wind is now expected to generate 10% of the UK's electricity by 2020. The decision was made to pursue this approach and it was followed at scale. The same is about to happen with electric vehicles. Today they are unusual; soon they will be the norm.

The approach advocated by Project 13 will take time to evolve and it will often be experienced as messy, challenging and uncertain. To address in-the-moment challenges for which no pre-prepared answer exists will require a new level of leadership, relationships and multiple first moves to help change attitudes and behaviours.

HOW DO WE DEVELOP LEADERSHIP TO MATCH THE ASPIRATIONS OF PROJECT 13?

As a sector, we are often reliant on a small pool of trusted people to lead our major capital projects. This is creating a gap to the next generation of leaders who are developing basic skills and experience in corporate know-how, emotional intelligence and delivery through teams. So, how should we as a sector help develop current and next-generation leaders? It's vital that we do, because without them we will not have high-performing teams.

The appetite for leadership to embrace accountability for outcomes is growing.

Firstly, we see heightening awareness of the importance of, and approaches to, taking accountability for outcomes. This requires setting stretch assignments for all kinds of leaders:

- Leaders in continuous improvement as well as those in transformational change
- Leaders in project direction as well those in corporate strategy
- Leaders in matrix management as well as those in political statesmanship.

Performance conversations should inform the pace and direction of promotion. This is a significant step change: currently assignment to leadership positions is too often based on what individuals have done and the relationships they hold, rather than the outcomes they have achieved.

Secondly, we see a need to move from training programmes to development journeys. This means integrating different forms of learning, with different groups of practitioners, rather than relying on 'another away day'. There is nothing better than hands-on experience to embed skills and learning from those who have been through it before. Exposure to different situations, with space and time to try (and fail) new techniques and to understand the consequences of action and inaction, is essential to create a pipeline of leaders, at all levels, in all organisations shaping the built environment.

HOW CAN TRUST BETWEEN PEOPLE AND TEAMS BECOME THE NORM?

Trust carries people and teams through difficult situations, and the likelihood of thinking and doing anew is influenced by the level of trust leaders inspire. But relationships between contractual parties often start from a position of mistrust.

Trust carries people through difficult situations.

This is partly a result of the attitudes and behaviours associated with a 'race to the bottom' on price. The resulting mindset limits our sector's ability to experiment and innovate through alternative ways of working. So, how can we all build better relationships which go beyond contractual boundaries – in ways guided more by shared purpose?

Contracted parties, regulators, third parties and benefactors need to spend time together, building an understanding of each other's personal (as well as corporate) agendas, ambitions and capabilities. Understanding what each wants from an endeavour helps to establish a common purpose. Practically, this means leaving 'baggage' at the door and basing conversations on hard truths, in ways that level power differences.

To put this into action requires courage and a willingness to take personal risks in committing to new ways of working. Demonstrating some vulnerability (both at personal and corporate level) creates an opening for others to do the same. This is more likely to generate conversations which have a genuine sense of curiosity; even the 'elephants in the room' can then be discussed without fear of reprisal. In most situations the owner has power to convene others and to make the first move.

Well intentioned first moves are being made by owners, some with greater effect than others. Common pitfalls however remain. For example, behavioural assessments during procurement can help understand individual attributes and how teams will work together – but only with a commensurate focus on building collaboration-in-action following contract award. Currently this is often lacking, and it's simply assumed all parties will get on.

We also see unconscious relapses into old habits of tell, transact, protect. Whichever party makes the first move they must be prepared to relinquish some power and be consistent and persistent with following up actions. If they do, they will be rewarded with a greater chance of success.

21%

Since 1997 construction productivity is on average 21% lower than the rest of the UK economy[10]

£56bn

Economic boost if infrastructure productivity grows by 0.25% a year for ten years[11]

The UK's Construction Sector Deal in 2018 highlighted the importance of attracting, training and retaining a highly skilled workforce.

© David J Osborn

CONCLUSION

Owners can lead the way

We see owners as best placed to lead a change in the way the construction sector works. This means doing more than broadcasts on aspirational principles. It means defining what outcomes, integration and incentives mean in terms of corporate purpose. It also requires translation into actions which provide tangible evidence of a move away from a mindset of ‘race to the bottom’ and ‘race to the finish line’.

This will require reflection, and adjustment to business and operating models. It will also need growth in the capacity and strength of leadership at all organisation levels. Businesses (advisors and suppliers) need to reciprocate by focusing efforts on ways to support a movement for change, rather than developing reasons to take it apart.

As a sector, we have many tools at our disposal to deliver differently. Doubtless there is room for innovation to create new ones. It is how we use the tools at our disposal and how we behave through relationships that are of critical importance to stimulating and embedding change.

Accountability sits with all of us, not just the first mover. To succeed together, we must act together, for the benefit of each other, to help shape a better world.

The views we’ve expressed in this paper form the start of an ongoing conversation, and we’d value your contribution.

To join the discussion, contact us at advisory@arup.com.

WE SHAPE A BETTER WORLD

About Arup

The built environment shapes our lives, our work and our prosperity. In a fast-changing world, it's vital to work with a partner who understands how to help you to think long-term, design for success and invest wisely.

Our advisory team brings clarity to your biggest decisions. Independent, creative and pragmatic, we are a global team of strategists, economists, financial advisors, change managers, performance specialists and asset managers.

Every day, we help clients to identify new revenue, manage their risks and improve their performance. Whether you're developing new strategies or reimagining customer experiences, investing for the long-term or refreshing your business model, we can help you to shape a more successful future.

CONTRIBUTORS:

Matthew Walker, Associate Director, Strategy and Insights

Alan Newbold, Director, Digital services

Maria Kordoni, Associate, Digital services

Rob Jones, Director, People and Organisations

Liz Swinstead, Associate, People and Organisations

David Twine, Director, Programmes and Projects

Anna Collinge, Consultant, Strategy and Insights

www.arup.com/advisory
advisory@arup.com

@arupgroup
www.linkedin.com/company/arup

References

[1] https://www.gov.uk/government/publications/national-infrastructure-and-construction-pipeline-2018

[2] https://www.gov.uk/government/publications/national-infrastructure-and-construction-pipeline-2018

[3] https://www.gov.uk/government/publications/construction-sector-deal

[4] https://www.gov.uk/government/publications/construction-sector-dealf

OUTCOMES

[5] https://www.gov.uk/government/publications/airports-commission-final-report

[6] https://transportforthenorth.com/reports/glance-northern-powerhouse-rail/

[7] https://highwaysengland.co.uk/programmes/smart-motorways/

DIGITAL

[8] https://www.nic.org.uk/wp-content/uploads/Data-sharing-in-infrastructure.pdf

[9] https://www.nic.org.uk/wp-content/uploads/Data-sharing-in-infrastructure.pdf

CAPABILITY AND COLLABORATION

[10] https://www.gov.uk/government/publications/construction-sector-deal

[11] https://www.gov.uk/government/publications/transforming-infrastructure-performance

We shape a
better world

www.arup.com