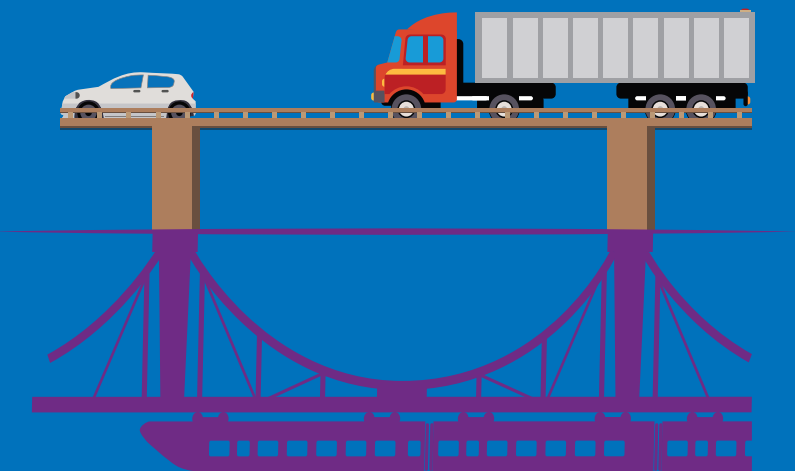




Collaborate to survive

**Construction and the
Red Queen hypothesis**



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All talk and no action?

Infrastructure must do more to collaborate. There's never been a better time to start



Richard Threlfall

Head of Infrastructure,
Building and Construction



Emma-Jane Houghton

Associate Director,
Deal Advisory

Greater collaboration in infrastructure development is not a new idea. Voices within the industry have been making and reiterating the case since the 90s, yet in large part, it remains an aspiration.

Projects typically involve a tangled web of contractors and subcontractors with sometimes-difficult relations, diverging objectives and too little focus on what the customer actually wants. Organisations sit in silos. Meanwhile layers of management, a fragmented supply chain and a legacy of adversarial culture separate the commissioners and creators from the end-users of their infrastructure.

Why does all this matter? Our calculations show that the industry's failure to embrace collaboration is costing the UK £8 billion in lost economic output. Infrastructure customers want to see greater collaboration - 82%¹ of clients told us they expect to see more in the coming years – yet infrastructure has struggled to find a way of making real collaboration the norm.

Other sectors are lighting the way. In the past 10 years, the collaborative economy, with its shared apps and peer-to-peer services, has radically re-moulded industries from transport to accommodation to financial services. At their core, these businesses allow organisations and consumers to share information and resources, and together, produce goods or provide services to the benefit of all. The advances and innovations of the B2C markets have important lessons for an infrastructure sector that suffers from inertia.

Businesses may be working under different regulatory regimes, dealing with more customs and duties and fewer EU grants. And finally, companies may find it more difficult to move and recruit the skills they need. A focus on collaboration could prove to be a much-needed shot in the arm.

¹ <https://www.kpmg.com/TR/tr/sectorler/Gayrimenkul-ve-Altyapi/Documents/2015-global-construction-survey.pdf>

Construction is a risk-filled world. From uncertain weather and labour issues to fluctuating commodity prices and ground conditions, multiple factors can derail apparently straightforward ventures. Achieving true collaboration is complex, but many current initiatives barely scratch the surface. For too long collaborative barriers have raised those obstacles by stopping the supply chain taking a collective overview of the entire construction process.

It is not all bad news. More use of tools such as BS11000 and the Alliancing Code of Practice is an

encouraging step forward. There are some excellent examples of real collaborative success. But much more can be done. Infrastructure leaders need to start from the premise that infrastructure creation is a collaborative action. They must attack the practical, cultural and behavioural barriers head on. Industry must be brave about leading collaborative action to reap the reward.

In this report we examine this mighty opportunity and we set out how to grasp it.



Evolve or face extinction

Infrastructure and the Red Queen hypothesis

" A lack of innovation in the construction sector has held productivity levels constant for almost 20 years "

The Red Queen hypothesis proposes a biological arms race, where species constantly evolve to keep pace with advances in others. Organisms that reproduce clones of themselves risk extinction while organisms that combine characteristics evolve and have a better chance of survival.

Seen through the lens of the Red Queen hypothesis, much of the UK infrastructure industry looks vulnerable; organisations continue to work in silos, with technology and processes that have not evolved significantly in years. There is an absence of innovation.²

Collaboration is the best way to access the intelligence and best practice of other organisations. Such approaches should be central to the industry. Our research suggests the collective failure to collaborate has cost the industry billions in missed opportunities.

A lack of innovation in the construction sector has held productivity levels constant for almost 20 years, while the quality of infrastructure itself is in decline. The World Economic Forum ranks the quality of Britain's overall infrastructure 24th in the world, down from 19th in 2006 and behind Iceland and the US.³

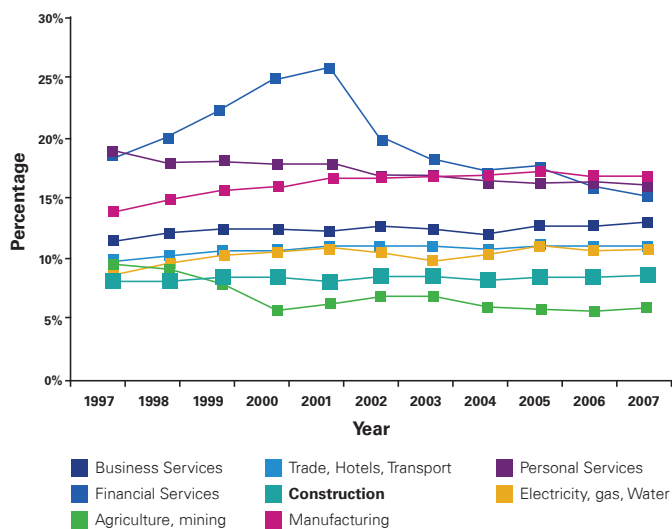
In fact, the construction industry innovates less than almost all other sectors. Research foundation Nesta shows the level of innovation against a broad and complex range of measures in Figure 1.⁴ Construction (in turquoise) can be viewed as almost 40% less innovative than other UK sectors with manufacturing more than twice as far ahead.

² Van Valen, Leigh (1973). "A new evolutionary law" (PDF). *Evolutionary Theory* 1: 1–30.

³ [Life in the slow lane | The Economist](#)

⁴ [Nesta-the innovation foundation](#)

Figure 1: Resources committed to innovation activities relative to gross value added in the sector, 1997-2007



Source: Nesta

The impact of this poor innovation strongly correlates with the industry's poor productivity (shown in Figure 2) from the Office for National Statistics.⁵

Since 1997 construction has barely increased rates of productivity and now lags 20% behind the UK average. Increasing productivity to meet the UK average could generate up to £8 billion a year in additional economic output.

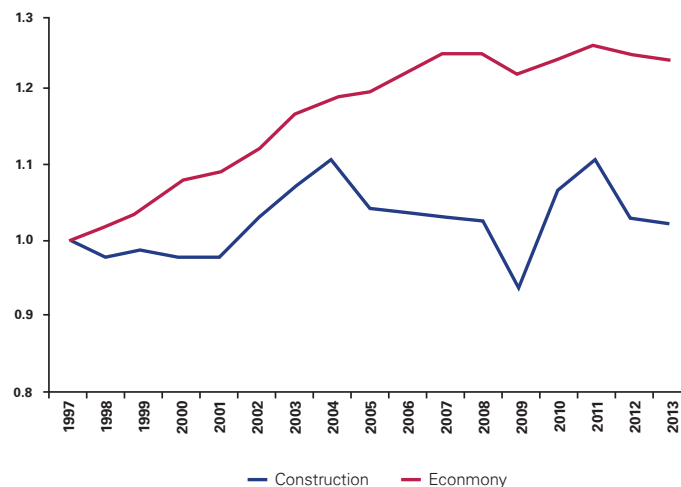
Improving productivity is about innovating and doing more with less. The peaks and troughs demonstrate that gains in productivity are not sustained, and have even reversed.

Companies that pool their energies and resources will win the evolutionary arms race. Anglian Water, for example, started to think about alliancing 15 years ago. As a result, they are in a virtuous cycle, where innovation saves money and those savings are reinvested to anticipate future need.

Many companies express the intention to form collaborative structures only to see initiatives fall by the wayside. Vision must be underpinned by real collaborative action. Ideally, contracts must support this collaboration.

But how many clients would really be happy to contract on the basis of who shows the most collaborative behaviour and ability to innovate? It feels more comfortable to contract around fixed numbers and outputs, rather than recognising that relationships deliver long-term value.

Figure 2: UK Productivity (1997=100)⁷



Source: Office for National Statistics (ONS)

Unless organisations embed collaboration in their people, pay structures and commercial models, there is a danger that it can become little more than a box-ticking exercise. Companies can game the system by putting their most diverse and inclusive people through the assessment process and then subsequently fielding a completely different team. People can say the right things in a day-long behavioural assessment, only to return to siloed working back at base.

The industry needs to move to a situation where collaboration is the norm. Twenty years ago, health and safety moved front and centre of the industry's culture – collaboration needs the same sponsorship if we are serious about delivering better value.

Organisations, just like organisms, have to evolve constantly. As the Red Queen in *Through the Looking-Glass* said: "It takes all the running you can do, to keep in the same place."⁶ The government's strategy to 2025 is looking for 33% lower costs and 50% faster delivery from the construction industry.⁷ Greater productivity is essential if it is to meet these targets. But to do so, companies must innovate. And to innovate, they must collaborate.

"The industry needs a culture shift towards greater innovation to maintain long-term productivity gains"

⁵ [UK productivity-how the construction industry can help | NBS](#)

⁶ Carroll, L., 1871. *Through the Looking-Glass and What Alice Found There* London: Macmillan

⁷ [Construction 2025: strategy-Publications-GOV.UK](#)

Collaborative models

It's not enough to focus on outcomes. Commercial models must also address 'how' to collaborate

Successful infrastructure collaborations require both shared objectives and joint working. It might seem like common sense, but it still escapes many potential collaborators. Silos and divisions persist within and between organisations, making it almost impossible to deliver effective alliances. The construction industry has been talking about deeper collaboration for years but examples of good practice remain sporadic. All too often, the perceived 'leap of faith' puts people off.

Successful collaborations need to start with the right commercial model. It should not just speak to 'what' the alliance is seeking to achieve, but also motivate 'how' the specific collaboration will deliver it. The 'how' is difficult and requires an understanding of the practical steps needed to enable collaborative action. Alliance leaders must smooth the path towards joint working, building the culture to allow collaboration to thrive.



“ Collaboration is a route to smarter structures, networks that last longer and infrastructure that works harder for users ”

Motivating the “What”

Experience shows that the more partners’ incentives match, the higher the chances of a successful alliance. A true, deep alliance requires a full sharing of the same risk and reward in which all partners reap the financial and PR benefits. Equally, no single alliance partner can ‘fail’; stakeholders work together to overcome problems and share the fruits of their labour. The result is a ‘best for project’ culture, in which individual agendas are subsumed for the greater good. A great example is the Norton Bridge flyover recently delivered by the Staffordshire Alliance, on budget and 18 months early.⁸

Putting fine words into practice

Having the same aims is important, but it is only part of the answer. Delivery partners then need to design upfront ‘how’ they intend to collaborate – agreeing clear, tangible actions. Lastly, partners need to measure and reward the collaboration they see.

Too few organisations have yet to introduce incentives around how they collaborate. The Olympic Delivery Authority for London 2012 is a notable exception. Their programme-level incentives encouraged teams to integrate and work together.⁹ The Australian deep alliance model embeds this further, by advocating the measurement of collaborative behaviour and culture alongside more widely seen key result areas like health and safety, quality, environment and community.

Get it right and the financial results are real. Partners that are more closely integrated are more likely to perform, to overcome challenges and less likely to

waste resources on litigation. Clients need to do more to ensure that their collaborative commercial model flows through to the supply chain and that fixed price contracts do not unravel the collaborative potential.

Partners may well not see the financial rewards of an alliance for a year or more. But creating long-term relationships between clients and the supply chain makes sense on all sides. For contractors that perform, there is that utopic state: a pipeline of guaranteed work. For clients, there are savings stretching into the millions as they avoid repeat tenders, improve working practices and drive innovative solutions.

Collaboration is a route to smarter structures, networks that last longer and infrastructure that works harder for users. Clients need a smart incentive structure that focuses equally on both the outcomes-based ‘what’ and the collaborative ‘how’. Creating the right commercial model will support long-term partnerships and deliver innovative value for all parties.

“ Creating the right commercial model will support long-term partnerships and deliver innovative value for all parties ”



⁸ http://www.networkrail.co.uk/browse%20documents/cdf/dec2015/collaborative_awards_2015.pdf

⁹ <http://learninglegacy.independent.gov.uk/documents/pdfs/procurement-and-supply-chain-management/191-delivery-partner-approach-pscm.pdf>

Culture creates collaboration

Promoting collaboration from within



Organisational culture and behaviour drives collaboration. Contracts can support alliances, by sharing risk and reward incentives, but they cannot create a collaborative environment by themselves. Without a positive, open, flexible approach from leaders and staff, any partnership will fail.

A lack of collaboration affects the speed, costs and standards of construction. Infrastructure providers have to collaborate by definition – no single company is capable of delivering major initiatives like HS2 or a new motorway by themselves – but the traditional model is less one of collaboration, than a hierarchical relationship between client and suppliers. This must change.

So how can organisations promote integration? Many companies are very good at working out project plans, delivery milestones and hard objectives, but the 'softer' emotional side of a collaboration gets lost along the way. Taking the time to get this right at the beginning of any alliance will lay the foundations for success. This softer element is the hardest to get right.

“ Construction is a collaborative activity and creating the right culture is essential ”

Individuals engaging in collaborations need:

- A flexible and open approach
- To be able to work as part of a team – listening and integrating with people whose style and approach may be very different from their own organisation's
- To take off their corporate hat – understanding that they are working towards a shared outcome, not just for the benefit of their individual organisation
- The humility and flexibility to move between roles – on one venture they may lead, on others they may need to follow
- To build strong and effective teams where openness and challenge is the norm.

It is up to the organisational leaders to set the tone. Effective collaboration and team working, which have strong corporate values, underpin high performance. Organisations that fail to promote the constructive behaviour needed for collaboration risk making staff anxious about the need to follow rules and engaging in empire building rather than working together.

An industry backed development programme to show leaders how to promote collaborative behaviour would be a good start. It is leaders who must set the strategy, bring people together, decide how they want them to work, and model that behaviour in their teams.

However, it is more than just development: an organisation needs to embed collaboration in its values, performance management approaches, and pay and reward. Organisational leaders must be prepared to call

out staff who are not collaborating well, in addition to rewarding those who are working effectively together.

Building joint outcomes into contracts helps articulate the objectives of any collaboration. For example, asking suppliers and clients to work together to find ways to complete asset upgrades with minimum disruption to the customer. Some standard forms of construction contracts, for example the NEC3 and the project partnering contract suite have clauses to promote collaborative working and governance.

But contracts cannot be used as a safety blanket. Without the appropriate culture, a good contract cannot create a positive environment (although a bad one can certainly destroy it). The last thing a collaborative venture needs is for partners to be referencing rights and obligations every time they have a conversation. Multiple clauses specifying delivery and performance metrics perpetuate a parent-child relationship and undermine any move towards collaborative structures.

The industry recognises there is a problem. Companies want to move towards more collaborative environments but they are often alarmed at the prospect of letting go of traditional working models. It can be difficult to overcome a history of adversarial relationships and a belief that they can mitigate risk by pushing it onto someone else down the supply chain.

Overcoming this legacy takes time and determination. Construction is a collaborative activity and creating the right culture is essential. The industry requires a cultural overhaul, to promote collaboration above separate interests. Building incentives into contracts can only go so far. The leaders of the future need the skill to drive collaborative competencies into their organisation, developing people to work together and promoting the right behaviours to share knowledge and ideas in a mature collaborative environment.



On the right track?

Government and regulators must help industry innovate

Government and regulators need to make collaboration possible. Regulation of areas that affect public safety are sacrosanct. But at the same time, organisations need enough flexibility to update working practices, motivate their people and partner with the supply chain to drive innovation. A fresh approach, focussing on broader outcomes would give clients the freedom to innovate and work together with their partners.

The rail industry faces particular challenges here. The Office of Rail and Road (ORR) regulates Network Rail over five year periods. The Department for Transport grants franchises to train operating companies (TOCs) for seven to 10 years. While both have objectives around passenger safety and satisfaction, they are measured on different outputs and over different periods.

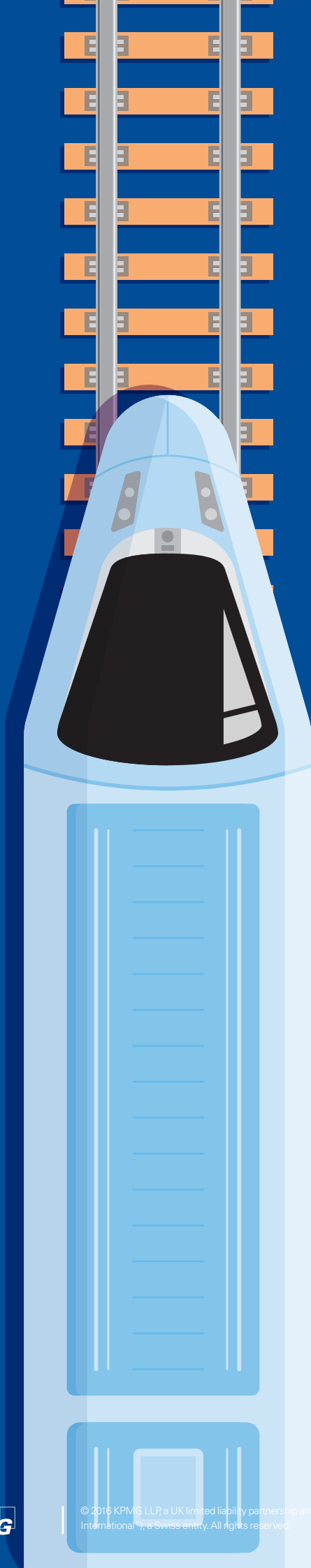
The recent Shaw Report on the future of Network Rail highlights these misaligned incentives: “Efforts to establish collaborative working in the interests of customers, passengers and freight will be more effective the sooner this is resolved,” the report states.¹⁰

Innovation and deeper collaboration would increase much-needed efficiency. According to the National Audit Office, labour and materials for track renewals cost more than expected, and Network Rail missed half of its signalling efficiency targets in the five years to 2014.¹¹



¹⁰ Shaw, N., 2016. [Shaw report: the future shape and financing of Network Rail \(web version\)](#) Ref: ISBN 978-1-84864-177-8 pp 58-59

¹¹ <https://www.nao.org.uk/wp-content/uploads/2015/08/Network-rail-short-guide1.pdf>



Organisations within the system want to collaborate. But it is not easy. The dissolution of the Wessex Alliance in June 2015 served as a timely reminder of how hard it is.¹²

Output and cost-focussed regulation encourages a bureaucratic approach to running organisations like Network Rail, making collaboration difficult. This stifles innovation for the benefit of end users, and as the Shaw report highlights, “input based economic regulation ... has evolved over time to become more central to funding flows than Network Rail’s customers.”¹³

Greater autonomy for Network Rail’s routes, as proposed in the Shaw Report, would help collaboration. TOCs and their local Network Rail route boards would be more likely to work together to achieve common goals. Aligning incentives at a route level could be the catalyst for new alliances and help attract finance partners. But to achieve this, the ORR must structure regulatory incentives to encourage (and not hinder) collaboration.

A helpful approach is to focus on outcomes. The water industry does this particularly well. OFWAT gives water companies the freedom to determine the ‘how’ of delivery, as long as they achieve their overall targets – things like customer satisfaction, effective systems management and cost reduction. Objectives and reward structures are clear and consistent, so water companies can create effective alliances, like Anglian Water’s @one Alliance.

Aligning risk and reward incentives is a challenging process, even when regulation periods and objectives do tally. Reaching a commercial agreement is only the first phase in any alliance. Actually translating that to action – getting people to talk to each other, share knowledge and skills and work towards a set of common objectives – requires strong leadership and a supportive environment to put plans into action.

Regulators can help industry deliver a truly collaborative culture. They need to work with government to align processes and regulatory structures, and build collaboration into the targets they set. Regulators that hobble companies with mismatched incentives or excessive focus on detail, condemn them to repeating the mistakes of the past. It is not possible to innovate when wearing a straitjacket.

¹² [Southwest Trains and Network Rail Wessex ‘Deep Alliance’ ends two years early | Rail.co.uk](#)

¹³ Shaw, N., 2016. [Shaw report: the future shape and financing of Network Rail \(web version\)](#)
Ref: ISBN 978-1-84864-177-8 p 40



If you'd like to discuss further, get in touch
with KPMG's UK Collaboration team



Richard Threlfall
Head of Infrastructure
Building and Construction

T: +44 (0)113 2313437

E: richard.threlfall@kpmg.co.uk



Emma-Jane Houghton
Associate Director
Deal Advisory

T: +44 (0)20 76948605

E: emma-jane.houghton@kpmg.co.uk

Contributors:-

Ian Lithgow, Partner

Jon Dayton, Director

Gerard Whelan, Director

Daniel Berrill, Assistant Manager

Emmanouil Gouvianakis, Assistant Manager

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