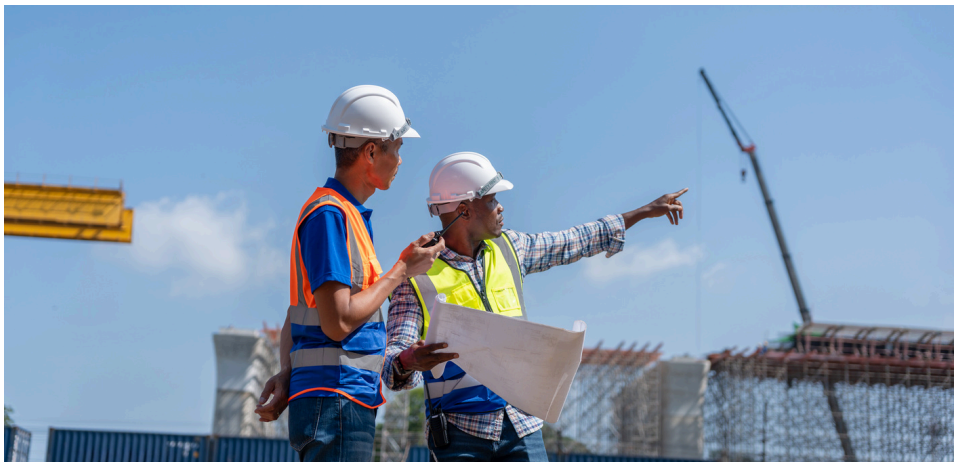
November 2025

Commerce & Contract Management Institute

Infrastructure's hidden constraint: is commercial capability your strategic bottleneck?

THE LEADING EDGE

London's Crossrail, the £18.9 billion railway project now known as the Elizabeth Line, was split into 36 separate main contracts rather than a smaller number of larger ones, creating extensive interdependencies between different contractors' work. This fragmented approach, combined with inadequate processes for managing those dependencies, contributed to the project running 3.5 years late and nearly doubling its original £9.9 billion budget [1].



The UK Parliament's investigation found that "no one was coordinating the activity of all contractors and acting as an effective 'controlling mind,' despite the fact that the programme partners, Bechtel and Transcend Ltd, were originally contracted by Crossrail Ltd to fulfill" this role. The National Audit Office report concluded that, as contractors developed detailed designs for their individual works, conflicts began to occur because of failures to manage integration. Design changes ended up adding £714 million to costs.

The project's technical achievements were remarkable.

Tunnelling under one of the world's most complex urban environments was completed successfully. But as auditors concluded, the project's integrated nature "made it difficult to hold a single contractor to account when delays arose." By 2016, contractors had raised 21,000 compensation event notices.

The constraint wasn't engineering capability - it was commercial and contract management capability. And as all of us know, Crossrail is far from alone. We mostly expect major projects to suffer form delays and cost overruns. Dig into the details, and a pattern emerges: projects fail because organizations cannot effectively coordinate multiple contracts, manage interdependencies between parties, adapt agreements to changing circumstances, and maintain accountability across complex networks of relationships.

The infrastructure revolution

So now we are embarking on an incredible wave of infrastructure investment. McKinsey estimates $106 trillion in infrastructure investment will be required globally through 2040. Capital expenditures on data center infrastructure alone are expected to be $1.7 trillion by 2030. Using them as an example, these projects represent a fundamental transformation in how infrastructure is conceived, delivered, and operated. Data centers constitute critical infrastructure alongside roads and power grids. Electric vehicle corridors require seamless integration of utilities, highway systems, and digital payment platforms. Smart cities demand coordination across water, energy, transportation, and telecommunications networks.

This transformation has a name: **cross-vertical infrastructure integration**. And Crossrail is just one example that exposes a critical organizational weakness that most boards haven't addressed: commercial capability is the strategic bottleneck.

The capability crisis

Cross-vertical assessment exposes a capability crisis that spans industries. Recent research across 650+ project-based organizations—including infrastructure developers, technology companies, industrial firms, and engineering contractors—reveals systemic gaps in commercial capability: [2]

- Only 23% of organizations rate their ability to manage uncertainty and contract change as "mature" or "optimized"
- Fewer than 30% have sophisticated approaches to multi-party negotiation and coordination
- Just 18% report strong capabilities in relationship and portfolio management across complex supplier/partner networks

This matters because modern infrastructure requires these diverse players to work together seamlessly. As we have already illustrated, EV corridors demand coordination among power utilities, highway authorities, and digital payment platforms. Data centers require integration between operators, power providers, and

water infrastructure authorities. When a traditional infrastructure player (18% with strong portfolio management capability) must coordinate with a software company (potentially unprepared for complex contracting) and a utility (also capability-constrained), the weakest link determines the outcome.

The data positioning

Senior executives systematically ignore or underestimate how critical these capabilities are to business performance. CCM remains viewed as an administrative function, something that happens after strategic decisions are made and which monitors and reports on failure, not a capability that enables or constrains cross-vertical delivery and keeps performance on track. As the recent CCM Institute benchmark report observes, top management is increasingly appreciating that commercial and contract management are catalysts for change, not its consequence. They can be used as a lever to change the system. Consider:

Requirements definition across boundaries: When a data center must integrate with power grids, water systems, and digital networks, requirements can no longer be defined in isolation. On Crossrail, the contractual approach "depends on contractors handing over work sites to other contractors when needed," yet the project lacked processes or motivators for coordinating these interdependencies effectively. The WorldCC research suggests that most organizations still lack systematic approaches to coordinating requirements across multiple interdependent contracts with different parties, technical standards, and regulatory frameworks. The planning-execution gap: Digital twins can improve capital and operational efficiency by up to 30 per cent by modeling complex infrastructure systems and identifying interdependencies before construction begins [3]. This allows decision-makers to test scenarios, evaluate trade-offs, and identify potential risks before committing billions to large-scale projects. But modeling the complexity is just the start. You must then determine whether you are able to contract for it. For example, a digital twin might reveal that EV corridors require precise coordination between power utilities, highway authorities, and payment platforms. They may show that data centers must optimize across power, cooling, and network provisioning. They would identify bottlenecks where multiple contractors' work intersects, but if commercial teams lack the capability to translate these insights into workable multi-party agreements, the digital twin becomes an expensive way to document what you can't deliver. On Crossrail, design coordination tools existed, but subsequent review identified that failures to manage integration still added £714 million in costs. The constraint wasn't visibility—it was the commercial capability to act on what was visible.

AI is transforming crew planning, predictive maintenance, and digital signaling. How many of your 20-year infrastructure contracts can incorporate these capabilities when digital twins show they're needed?

Value generation versus risk transfer: Crossrail initially used target cost contracts because they were seen as the fairest allocation of risk and copied from the 2012 London Olympics approach. But there were no mechanisms to ensure shared responsibility so contractors regularly encountered delays (often caused by other contractors) that were outside their control, resulting in a compensation event process which added £936 million to project costs. Traditional infrastructure contracts focus on allocating risk, defining deliverables, and establishing liability. Cross-vertical infrastructure demands contracts that enable adaptation, incentivize collaboration across organizational boundaries, and support experimentation. When governments create enabling regulatory environments to attract private capital into infrastructure, the contract model must align public and private value creation, not just follow traditional practices which transfer risk from one party to another.

The governance vacuum: A 2024 government report on Crossrail found that sponsors "did not have either the personal gravitas that comes from having led and delivered complex projects...or the contractual mechanisms under the sponsors agreement and project development agreement to land the message" when concerns mounted [4]. Modern infrastructure projects require coordination between operators, multiple utilities, public agencies, regulators, and investors. In this network of interdependent contracts, who is ultimately accountable for system-level outcomes? Who has authority to make trade-offs when objectives conflict across vertical boundaries? Most organizations haven't answered these questions and as a result, their contracts and contract management processes certainly don't.

Why this matters to you and your board

The strategic implications of this must be addressed and that requires executive focus and leadership because the changes are significant and cut across today's organizational models.

- **Speed to market is commercially constrained**: Your ability to deliver infrastructure projects on schedule increasingly depends on your capability to negotiate, coordinate, and adapt multiple interdependent contracts. Engineering and financing excellence won't compensate for commercial process inadequacy. Despite Crossrail being declared 90% complete in February 2018 and "confidently predicting" a December 2018 opening, the line didn't fully open until 2022. The problem was that physical construction (tunneling, tracklaying, and station structures) was substantially complete by early 2018, but integrating and testing 500,000 physical and digital assets from multiple contractors proved far more complex than anticipated.
- **Risk concentration is shifting**: When commercial capabilities are weak, risks that should be managed through contracting processes get pushed into delivery. Projects that appear technically feasible become commercially undeliverable. What

looks like execution failure is often contracting failure that was not recognized or addressed. That's because contracts rarely focus on outcomes or the dependencies for success. On Crossrail, "despite contractors meeting only 30 percent of milestones on average throughout 2019 and early 2020, Crossrail continued to base its plans on more optimistic levels of productivity."

- **New entrants are disadvantaged**: Software companies, AI firms, and digital platform operators entering infrastructure lack the commercial understanding that traditional players developed over decades. Equally, the traditional players do not investigate or understand the commercial models that are typical for these new entrants. Unless both parties align their capabilities
- **Value is being destroyed at intersections**: The economic value in cross-vertical infrastructure emerges at the connections, for example where EV charging integrates with grid management and payment systems, where data centers optimize across power, cooling, and network provisioning. Achieving value at intersections requires coordination across contracts. When commercial capabilities are weak or mismatched, these intersection points become value-destruction zones.

Three questions

Your board probably reviews major infrastructure investments, project delivery performance, and risk exposure. But do they review commercial capability and ask question such as:

1. Can we name our three most critical cross-vertical dependencies in current or planned infrastructure projects? If not, we haven't mapped the commercial coordination challenge we face.
2. What percentage of our project delays or cost overruns in the past three years were rooted in contractual rigidity, multi-party coordination failures, or inadequate change management processes? On Crossrail, changes to design and contractors' delivery schedules increased contract costs by approximately £2.5 billion between 2013 and 2018. If we don't track these patterns, we're treating commercial failures as delivery problems and solving the wrong problem.
3. Where does commercial and contract management report in our organization, and does that positioning reflect its strategic importance to infrastructure delivery? If CCM reports several levels below the executives making infrastructure commitments, there's a structural misalignment between where decisions are made and where commercial capability resides. And equally, that low-level status most likely means you are employing administrators, not people who truly manage performance.

What strategic commercial capability looks like

Organizations that are ready for cross-vertical infrastructure demonstrate:

Systems orientation: Commercial teams that understand second-order effects and can map interdependencies across multiple contracts and stakeholders. The National Audit Office suggested Crossrail's root cause lay in how the project was contractually structured—the splintered setup meant the organization "never managed to achieve a realistic, ground-up, programme-wide schedule of works" [5].

Adaptive frameworks: Contracting approaches that enable evolution rather than lock in static requirements:

- **Modularity** – Break down scope, deliverables, and obligations into components that can be adjusted independently.
- **Optionality** – Pre-agreed fallback options or “menus” (pricing, service levels, terms).
- **Shared Governance** – Joint forums for decision-making, escalation, and rebalancing risk/reward.
- **Learning Orientation** – Regular reviews, lessons learned, and mechanisms for contract evolution.

Collaborative principles: Multi-party negotiation and relationship management capabilities that move beyond bilateral, adversarial positioning toward joint problem-solving. Crossrail attempted additional incentives "to get contractors to collaborate," but "these ultimately had limited success because the incentives became less attractive as more work and cost was added to contracts, or were based on dates which subsequently proved to be unachievable."

Portfolio orchestration: Management of networks of related contracts as portfolios, not just individual agreements in isolation

Technical fluency: Commercial professionals who understand digital twins, AI optimization, and grid integration well enough to structure contracts around these capabilities.

Forward-looking organizations are making CCM a board-level concern - not because contracts are interesting, but because commercial capability is about far more than legal principles – it directly determines infrastructure delivery outcomes.

The path forward

Commercial capability can be developed systematically. Organizations that recognize the strategic importance are elevating CCM leadership and demanding greater accountability. They are:

- Investing in capability development: negotiation sophistication, systems thinking, technical fluency, portfolio management
- Redesigning commercial processes from linear (requirements → tender → award → delivery) to iterative cycles of definition, delivery, learning, and adaptation

- Implementing enabling technologies for contract lifecycle management, dependency mapping, and portfolio visibility
- Creating governance structures that give commercial teams authority commensurate with their strategic importance

The organizations that move fastest will win contracts, partnerships, and financing that others can't execute. More important, they will generate the margins that ensure survival and growth. Those that treat CCM as administrative overhead will find themselves unable to deliver on infrastructure commitments because they lack the commercial sophistication the new infrastructure landscape demands.

The $106 trillion question isn't whether cross-vertical infrastructure will happen, it's whether your organization will have the commercial capabilities to participate successfully.

The Elizabeth Line eventually opened in May 2022, with Queen Elizabeth II marking the completion. Since opening, the line has been remarkably successful, carrying millions of passengers and delivering the connectivity London desperately needed. But it took new leadership, restructured commercial relationships, and fundamentally redesigned contract governance frameworks to get there.

Your board should ask: How many of our projects are headed for similar outcomes, and we just don't see the commercial constraint yet?

Infrastructure's hidden constraint: is commercial capability your strategic bottleneck?

About the Author

Tim Cummins
Executive Director
CCM Institute

Want to dive deeper? Tune in to the complimentary podcast episode here: PODCAST

THE LEADING EDGE

Through podcasts and articles, The Leading Edge offers in-depth insights into the key challenges, innovations, and evolving dynamics of the contract and commerce landscape.

Commerce & Contract Management Institute

References

[1] See https://committees.parliament.uk/committee/127/public-accounts-committee/news/98461/taxpayers-let-down-by-delay-and-climbing-costs-of-crossrail/ and https://www.constructionnews.co.uk/civils/crossrail-nao-report-5-things-learned-03-05-2019/

[2] World Commerce & Contracting 2025 Industry Benchmark Report

[3] See McKinsey "What is Infrastructure?" https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-infrastructure

[4] https://www.newcivilengineer.com/latest/report-on-crossrail-lessons-highlights-importance-of-constant-review-of-delivery-model-21-03-2024/

[5] https://www.globalconstructionreview.com/damned-if-they-did-defence-crossrail/