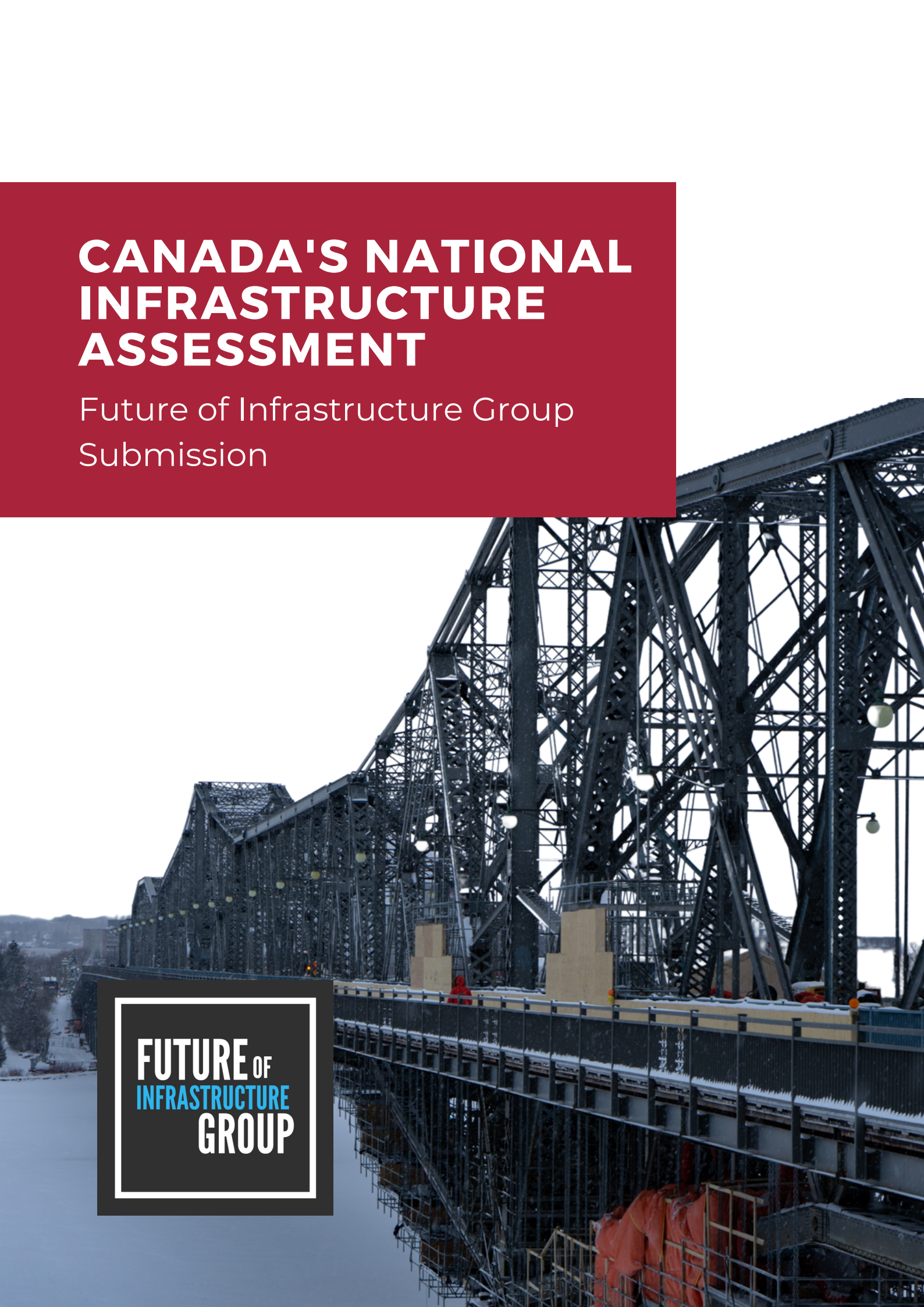


CANADA'S NATIONAL INFRASTRUCTURE ASSESSMENT

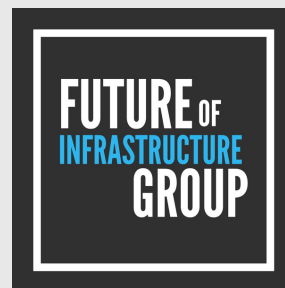
Future of Infrastructure Group
Submission



FUTURE OF
INFRASTRUCTURE
GROUP

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ABOUT THE FUTURE OF INFRASTRUCTURE GROUP

The Future of Infrastructure Group brings together industry leaders in the sector to provide a positive, and coherent voice to help governments across Canada deliver the best value from infrastructure investments. To make the most out of Canada's planned investments, this group discusses and shares their expertise on best approaches to prioritizing, planning, purchasing, constructing, maintaining, and operating infrastructure.

With thanks to FIG members for their input:

Aecon; Altus; Arup; Colliers; Concert Infrastructure; EllisDon; Kiewit; Plenary Group; Pomerleau; Siemens; SNC Lavalin; WSP

June, 2021

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IMPORTANCE OF A FRESH APPROACH

Across Canada there are unprecedented levels of investment in infrastructure. These investments will shape Canada's long-term success in terms of economic growth, improving the quality of life and promoting equity, and mitigating environmental impact.

Public infrastructure is delivered by the public and private sectors together and a more evidence-based, collaborative approach would present a win-win. Countries like Australia, the UK, and New Zealand have recognized that the status quo around planning, procuring, and delivering infrastructure is unsustainable and used assessments as an early step towards building understanding of the issues faced before developed a strategy to get greater value for public investment.

Although the Federal Government is only responsible for delivering and maintaining a small proportion of national infrastructure, it has an important role to play in setting a national direction around reform in the overall approach to infrastructure delivery.

As evidenced by the work of the Australian Government, and in particular Infrastructure Australia, a strong direction provided a basis that states and territories could build on. This starts with having best practice processes and governance for Federal projects, and using a range of tools to encourage reforms at other levels of government that will ultimately ensure that they see greater impact from their investments.

Recommendations

1

Vision: Canada needs to set a national direction for the role infrastructure will play in meeting wider societal, economic, and environmental challenges and the future shape of the sector itself

2

Planning: Produce long-term capital plans developed by independent agencies/experts and driven by data. Publish regularly updated funded and unfunded national project pipelines and encourage stable annual investments

3

Prioritization: Use a clear, standardized methodology and transparent business case approach for prioritizing projects, developed by independent expert-led agencies and shared publicly

4

Procurement: Develop a project initiation approach at the Federal level to shape planning, procurement, delivery, and financing. Simplify procurement to reduce bid costs and develop national guidance on selecting the right delivery model and effective evaluation criteria for different types of projects

5

Delivery: Identify the issues faced in project delivery and goals for reform at all levels of government to ensure investments deliver greater value, and encourage innovation and the adoption of technology to drive greater efficiency

6

Funding and financing: Screen projects to identify where private finance could add value and conduct analysis of the benefits of different delivery models to inform a roadmap for identifying the best delivery models and financing approach for different project types

7

Operations and Maintenance: Ensure all levels of government have asset management plans and dedicated budgets for operations and maintenance as part of project business cases, and consider lifecycle and user experience within procurement

INFRASTRUCTURE MARKET

Sector Issues and Their Impacts

To get true value from public infrastructure investments, a number of issues must be recognized and addressed:

Issues

Impacts

Cyclical investment – infrastructure investments typically come in waves with many similar projects often coming at the same time	➔	Job losses followed by capacity issues and skills shortages, restricts companies from investing in skills and training, and ultimately adds costs to projects
Project certainty – in recent years projects that have been in advanced stages of procurement have been cancelled, delayed, or changed	➔	Cost inflation across other projects, costs to bidders, talent diverted to other jurisdictions, reduced competition, community fatigue, wasted government funding
Growth of megaprojects – a large number of complex mega-projects are planned or underway across Canada	➔	Labour and skills shortages in public and private sector, less quality competition around bids, escalated project risk
Fragmentation – different levels of government and different departments within the same jurisdictions have different standards, processes, and plans	➔	Limited coordination across jurisdictions or departments, less best practice sharing, wasted government resources, additional project costs, uneven quality across country, barrier to addressing climate impacts
Low-cost focus – procurement decisions are primarily based around lowest upfront capital costs and drive a race to the bottom	➔	Creates an adversarial relationship between contractors and owners, creates unsustainable market with a race to the bottom, poor quality assets, less scope for innovation
Bid costs – long bid processes, non-standardized processes and documents, and duplication of requirements	➔	Reduced competition across bids, prevents smaller companies entering markets, adds unnecessary costs for public sector
Project risks – for larger, complex projects risks are often not fully understood and are often dealt with incorrectly and misallocated	➔	Increased costs, project delays, increased litigation and claims, adversarial relationship, lower quality outcomes
Technology uptake – many processes are still paper-based and technology use within the industry is low compared to other sectors	➔	Project delays, reduced communication and visibility across projects, higher project risks, additional costs, less scope for innovation
Maintenance gap – maintenance budgets are often inadequate or can be diverted and/or deferred to cover other department costs	➔	Escalating repair costs, capital budget gaps, poor user experience and outcomes, health and safety considerations, asset failure
Skills shortages – unprecedented and uneven investments across infrastructure sector creates skills shortages across high demand, specialist areas for both public and private sector	➔	Escalated project costs, elevated project risks, potential delays, less innovation, professional burnout, lower quality outputs
Sector health – unprofitable or indebted companies bid low to secure work and maintain cash flow	➔	Market instability, sector bankruptcies, supplier impacts, poor quality assets, less market competition and risk appetite
Lack of data – consistent data on state of assets is lacking, there is insufficient comparative data on performance of different delivery models and project performance	➔	Little improvement from project to project, lower levels of public trust in approach, poor productivity of sector, siloed thinking
Consistency – similar projects done in different jurisdictions often do not benefit from lessons learned and best practices	➔	Project risks and performance issues are left unmitigated and opportunities to improve project delivery and outcomes are missed

1 CANADA'S NEEDS & LONG-TERM VISION

An important lesson from Australia's Infrastructure Audit was to look at social and economic infrastructure together given the large degree of interconnectedness. The UK's first assessment was purely focused on economic infrastructure, as dictated by the prescribed [remit of the National Infrastructure Commission](#), although it did factor in the impact on housing supply. In setting up the [Infrastructure Commission for Scotland](#) it was given the remit to consider all infrastructure needs to meet 30-year economic growth and societal needs.

Vision

Australia highlighted the need for assessments to be guided by a vision that reflects the country's goals around economic growth, quality of life, equity in society, and addressing environmental challenges. [California's Strategic Growth Council](#) was set up to provide a vision for a healthy, thriving, and resilient state. In Michigan the [21st Century Infrastructure Commission](#) was set up in response to the Flint water crisis which exposed residents to contaminated water due to chronic underinvestment in maintenance. Both groups brought together a combination of government departments, industry, and specialists.

At a sectoral level the UK set a vision for the sector through [Construction 2025](#) which has guided subsequent initiatives across government and industry. Its vision is built around talent, technology, sustainability, economic impact, and leadership with goals to lower whole life costs by 33%, lower emissions by 50%, reduce construction time by 50%, and to build an export opportunity for the sector. These goals are often referred to across other initiatives.

At an organizational level, the [Rijkswaterstaat](#) (the Dutch Ministry of Infrastructure and Environment) set out five objectives to unlock innovation in their procurement with a goal to reduce lifecycle costs by 30%, increase functionality by 30%, and increase safety and sustainability by 30%. The Ministry also set a goal of spending 2.5% of its budget on innovation.

Project Prioritization

A standardized, transparent methodology to determining priority projects is one of the most important steps that can be taken in Canada and has become international best practice. [Australia's assessment framework](#) will gauge projects against factors beyond cost-benefit analysis, an updated version in 2021 will include criteria such as strategic fit, societal impact, and deliverability. It ensures projects look at broader strategic and social outcomes as well as economic benefits.

The UK also learned that the process it had developed was too weighted towards return on investment which was baking in regional economic disparities as criteria favoured projects be built in richer areas of the country and changed guidance in 2020. This included placing a stronger requirement on establishing strategic objectives at the start, greater clarity on what constitutes "value for money", new guidance on local impacts and employment, and review of the discount rate for environmental impacts. There has also been a requirement for all the business cases from the government's major project portfolio to be published as of April 2021.

In developing these business cases it must make a clear link between investments, outputs and outcomes. A [study in the UK](#) found that better design could help improve learning in schools by 10 percent, and reduce recovery time in hospitals by 27 percent. Early engagement around a desired outcome (such as reducing travel time across a city at rush hour) and maintaining an open approach around procurement that enables companies to innovate and provide the best possible solutions to the desired outcomes.

Independent Agencies

The UK and Australia are leading jurisdictions around infrastructure governance, with independent, expert-led infrastructure agencies at their core. Agencies set up at the national level have also been successfully replicated across Australia's states and territories, and in [Wales](#), [Scotland](#) and [London](#). In both countries this has developed a strong ecosystem in driving best practices and raising the level of political debate around infrastructure. This has a significant impact on stabilizing the project pipeline, and reducing the risk of projects being cancelled or delayed at an advanced stage due to a change in government.

The mandates of these agencies vary, and in some cases there is one agency focused on policy and forward planning, and the other focusing on financing and delivery. Canada would benefit from having a similar structure, with a central agency focused on independent long-term planning, and another on project delivery focused on the federal infrastructure portfolio. Infrastructure Australia and the UK's National Infrastructure Commission have played a critical role in mitigating some of the instability that comes from political cycles that run shorter than the planning process of large infrastructure projects. The rigorous approach taken by these agencies provides reliable, independent advice that has helped to better inform politicians and build greater consensus around long term plans.

International Best Practice



[Infrastructure Australia](#) – an independent statutory body that provides research and advice for governments, industry and the community on nationally significant infrastructure needs. It leads reform on key issues including means of financing, delivering and operating infrastructure and how to better plan and utilize infrastructure networks.

[Infrastructure and Project Financing Agency](#) – supports the government in making commercially astute decisions on nationally significant infrastructure projects and programs through the provision of independent, whole-of-government commercial and financial advisory services.



[National Infrastructure Commission](#) – provides impartial, expert advice on major long-term infrastructure challenges. It sets a long-term agenda based on major economic infrastructure needs, and the pathways to address them; develops fresh approaches and ideas; independent policy recommendations; and focuses on driving change through building consensus.

[Infrastructure and Projects Authority](#) – the government's centre of expertise for infrastructure and major projects. Core teams include experts in infrastructure, project delivery and project finance who work with government departments and industry.

2 COORDINATION AMONG OWNERS & FUNDERS

Although the Federal Government owns and delivers relatively little infrastructure compared to other levels of government, it can play an important role in driving best practice and better value across Canada. This should start with the development of processes that apply across Federal government infrastructure projects for planning, prioritizing, and delivering infrastructure.

Fundamental to coordination is the regular update of project pipelines covering all projects across all asset types over a certain threshold. Visibility of upcoming plans is a first step towards driving greater coordination between different government departments and levels of government. New York State has ten criteria for evaluating projects and procedural guidelines that promote coordination across government departments. It also provides a basis for further collaboration with the private sector.

Plans and Pipelines

The importance of long-term plans and transparent project pipelines cannot be understated. Publicly available information helps to drive greater coordination between different government departments and maintains discipline in the planning process. For industry it helps provide confidence to invest in people and new equipment.

The UK Government highlighted through the [Construction Playbook](#) that preparing, maintaining, and publishing comprehensive 3-5 year project pipelines is one of the most important things government can do. It helps suppliers see future demand and enables them to plan and invest for the future. The UK's approach to providing a plans and pipelines that are realistic given fiscal constraints provides a more accurate picture. Alberta previously also provided a [full list of funded and unfunded projects](#) within its capital plan, which can provide greater opportunities for coordination and private investment.

The project pipeline updated and published quarterly by [Infrastructure Ontario](#) provides reassurance to the sector. When developed by independent agencies as in the UK and Australia it provides a further level of reassurance that projects will last beyond a change in government through providing greater reassurance across political parties that priorities are evidence based and provide the most value to communities.



Alberta and British Columbia produce major project lists. Quebec is required by law to produce a 10-year [Quebec Infrastructure Plan](#) which it updates annually through their specialist infrastructure agency the Société québécoise des infrastructures. The plan is built around asset management plans drawn up by each government department and public body involved in delivering infrastructure. This ensures priorities are based around the actual infrastructure conditions and requirements for future service capabilities. The plan prioritizes asset maintenance and replacement, and a rigorous approach to planning new major projects. Critically it maintains a consistent level of funding from year to year to avoid significant peaks and troughs seen elsewhere.

Chile's approach sees projects go through the [Ministry of Housing and Urban Planning's National Investment System](#) which assesses projects using standard forms and metrics and rejects a quarter to a third of projects. The final decision on which projects move forward is made by the Ministry of Finance. [Oklahoma's Long-Range Capital Planning Commission](#) is an appointed group of eight experts with experience in asset management and capital finance. They are responsible for putting forward an 8-year plan with priority projects listed which is submitted to the state legislature. Legislators have 45 days when they can remove projects from the list but cannot add any projects.

Project Development

Work in the early stages of projects have the biggest impact on project success, cutting costs and saving time. The UK's Infrastructure and Projects Authority developed a [Project Initiation Routemap](#) builds on best practices provides early steps to ensure larger, more complex projects start on a good footing. This provides guidance on business case development, risk identification and management, governance, and delivery models. New Zealand also has a tick list for [standards of good practice](#).

Infrastructure Australia's [Decision Making Principles](#) aim to provide greater accountability and transparency and ensure projects only move forward once proper planning and assessment is conducted. This helps to ensure decisions are made in the public interest and backed by evidence and sound processes to consider the best options. This includes properly consulting the local community, examining all financing options, and ensuring adequate work has been conducted to allow a project to move forward, especially to construction where mistakes can be very costly. The application of these principles is being monitored, and the Australian Government is moving towards making funding contingent on jurisdictions applying these principles to their project development.

Australia and the UK are both driving towards earlier participation of industry in projects through early supplier engagement. This helps to explore a wider range of solutions, identify project risks, and get buy in on delivery approaches.



Procurement Reform

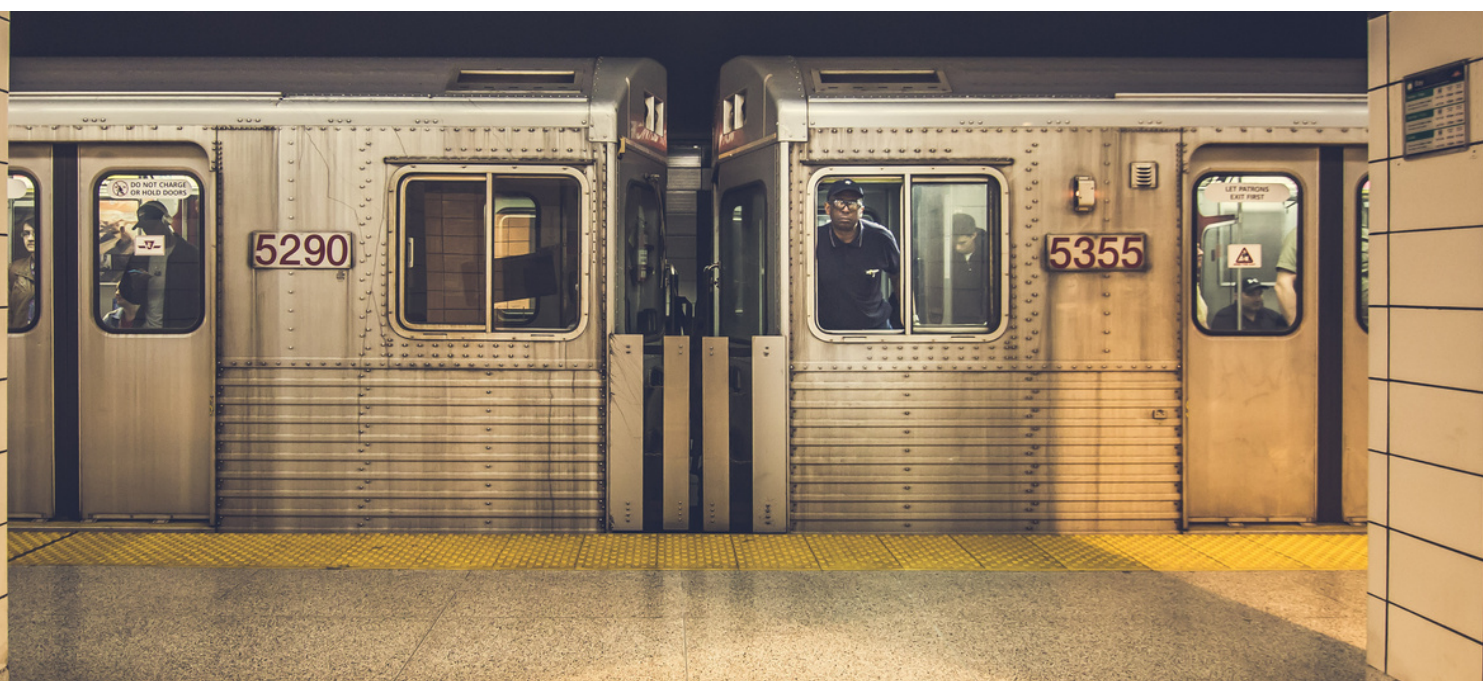
Both Australia and the UK have put heavy emphasis on the need for procurement reform to move from a transactional model to a more relationship-based approach. Around the world procurement driven by low-cost bidding against tightly crafted technical specifications has created an adversarial environment across the supply chain, and has eroded trust in the sector. Without a change in the way governments buy across Canada the relationship between public and private sector will remain strained.

Australia has recognized that the length of the bid process and the cost to bid is a major issue, the same is true for Canada where procurement sucks up expertise who would be better deployed delivering projects. Getting to shortlists quickly and keeping shortlists small to allow people to lose early and move on. A study in the UK found that duplicative prequalification processes cost the industry £500 million annually that could be streamlined through common assessment standards.

In collaboration with industry the UK Government released the Construction Playbook that sets out how capital projects are assessed, procured and delivered. Developed as a collaboration between public and private sectors it recognizes the important role that the government plays in transforming the sector with a requirement that government departments embed the Playbook into their processes. It promotes policies such as designing appropriate outcome-based specifications that allow more innovation, favouring long-term contracting, and creating win-win contracting arrangements that incentivize better outcomes.

New Zealand also has a transparent process for selecting the right procurement model with best practice guidelines around market engagement, risk management, whole of life considerations, overviews of different delivery models, and factoring in sustainability and emissions reduction. It has also developed a set of template documents and contracts. The approach to procurement is highly fragmented across Canada, with different departments, provinces and municipalities and government departments at the sub-Federal level all using different approaches, platforms, and documents.

Procurement still largely focused on securing low upfront capital costs, a major opportunity is being missed to add value and reduce the environmental impact of construction and across the many years this infrastructure will be in operation. Assessing procurement against lifecycle costs will provide better overall value for government by reducing operations and maintenance costs over many years, as well as emissions, allow greater scope for innovation, and reduce emissions. The Value Toolkit, developed by the UK's Construction Innovation Hub provides a comprehensive approach to defining value and risk, and building a procurement approach most appropriate to the client and type of project, while getting the greatest social, environmental and economic value and delivering a more sustainable model for the industry.



Efficient Delivery

Project delivery as it stands requires multiple interactions and approvals from different levels of government. This process takes up time and risks knocking schedules off track. This is one area the Federal Government could play a role in smoothing out delivery by encouraging reform or providing fast track, one stop processes. There is precedent in other markets with the UK proposing a [National Infrastructure Planning Reform Programme](#) through the National Infrastructure Strategy. The UK Government also set up [Project Speed](#) to accelerate project delivery at every stage of the project lifecycle. This includes providing a simpler framework around environmental regulations, reform the planning system, ensuring effective decision-making with streamlined approval processes, embedding good design, and developing skills and major project expertise.

Elsewhere Ireland has designated [Strategic Development Zones](#) where land is specified as being of economic or social importance, mostly based on their proximity to major public transit corridors. Once designated it allows planning authorities to fast-track the process. Within Canada, Hamilton updated its zoning by-law to include a transit-oriented corridor designation to streamline approvals through a quick, straightforward and predictable process. This set minimum heights of buildings, maximum parking limits, and provisions around future stations. The city planner is also responsible for economic development, tourism and culture, transportation, business licensing, and parking which helps to ensure development is integrated and delivers value.

Industry Dialogue & Culture

The relationship across the infrastructure supply chain from public sector owners, to contractors, to suppliers is fractious around the world. The [Farmer Review](#) in the UK provided a stark illustration of the systemic issues facing the construction sector and the wider impacts, as well as providing recommendations for change.

More formal channels are being established to promote dialogue between government and industry to drive shared goals and encourage collaboration. One interesting approach is the [New Zealand Construction Accord](#) which was born out of a shared commitment to transform the sector. The erosion of trust in New Zealand, the UK, and Australia have all been a major focus for reform. The Accord started from a basis of shared goals around increasing productivity, raising capability, improving resilience, and restoring confidence, pride and reputation. It provided a set of shared principles that has evolved into a permanent agency and leadership group working against a Transformation Plan.

The [New South Wales Government](#) set up a Government Construction Leadership Group made up of all the key agencies engaged in the delivery of infrastructure. In 2018 it released a Ten Point Commitment to the Construction Sector Action Plan which focuses on the need to work together with the private sector to drive quality, innovation, and cost effectiveness.

Digitalization

The performance of the sector could be transformed by greater use of digital tools. Better collection of data provides a basis and this should align with international standards to better compare and learn to drive greater productivity. Technology and data can help make processes and decision-making become more systematic. A study by the [Centre for Digital Built Britain](#) found that better information management delivered benefits across the lifecycle, with every £1 invested delivering up to £6.00 of labour productivity gains and up to £7.40 in direct cost savings. Jurisdictions such as the [UK](#) require that projects use Building Information Modelling on government projects and [Singapore](#) developed a roadmap to encourage adoption, and the Federal Government should follow a similar approach starting with federal projects.

Encouraging Change

At the provincial, territorial, and municipal level there is a lack of consistency in planning infrastructure, most do not have long-term capital plans, and few publish comprehensive project pipelines across all infrastructure classes if at all. The Federal Government should use a range of tools to help drive a consistent high standard of project planning, delivery, and operations across Canada. Examples used elsewhere include:



Innovation Funding – the UK water regulator established a £200 million innovation competition to address some of the water sector's biggest challenges around five strategic themes. This included responding and adapting to climate change, restoring ecologies, understanding long-term resilience, testing new ways to add value, exploring opportunities around data.



Technology Adoption – Ontario offered funding for municipalities to find efficiencies in service delivery, primarily through the use of digital tools. Many used the funding to digitize the municipal building permitting process.



Funding Criteria – Australia is moving towards embedding federal Decision Making Principles within business cases and attaching some level of funding to how well other levels of government have applied the principles in their own planning.



Project Best Practice – Under New Zealand's Construction Sector Accord the agency profiles Beacon Projects of best practice that align with the agreed government-industry principles. The UK also uses major projects as learning opportunities with Crossrail, at one stage the largest construction project in Europe, having a dedicated Learning Legacy website.



Development Funding – Canada took a positive step via the Canada Infrastructure Bank in carving out funding for project acceleration, with \$500 million to support project development in the early stages.



Training and Standards – the Infrastructure and Projects Authority in the UK launched the Government Projects Academy to enhance skills across government, as well as launching the Government Project Delivery Framework to set out core requirements at each stage of project planning and delivery.

5 FUNDING & FINANCING

With the impact of COVID the fiscal situation across Canada is strained. Private finance will play an important role in meeting investment needs and help promote trade, unlock more housing affordability, accelerate the green transition, provide better access to services, and ensuring our cities can compete to attract talent and investment from around the world. Canada also has world leading public pension plans with huge investments in infrastructure and could play a greater role within Canada. These funds typically prefer to invest in brownfield assets due to the risk involved in project delivery. Steps taken to identify and manage risk, and the work of the Canada Infrastructure Bank, will help to make greenfield projects more investible, with the CIB taking on the financing of some project risk that would otherwise make projects prohibitive to investors.

Tools such as the UK's [Construction Playbook](#) and [Project Initiation Routemap](#) provide a process for analyzing where projects would be a good fit for private financing. The Federal Government should consider introducing a project screen starting with the Federal infrastructure portfolio, and encourage provinces to review their project pipelines to see if value could be added through innovative financing across the lifetime of the infrastructure. The Australian government provides guidance on potential [innovative financing approaches](#) for infrastructure.

Different levels governments are using innovative approaches to drawing in private sector financing, especially to accelerate progress to meeting climate targets. Bristol in the UK publishes the [City Leap Prospectus](#) to present investment opportunities. [The Atmospheric Fund](#) in Toronto was a pioneer in drawing in finance to meet climate goals in a model now emulated across Canada.

In project development the government should assess commercial structures that could attract investors and leverage a specialist internal project delivery agency at the federal level to guide the process to ensure all options are assessed and the government gets the best value for money across the project's lifecycle. This should include capital costs, operations and maintenance costs, project risk, innovation, social value, user experience, resilience, and environmental performance. Canada could benefit from a single project delivery body for federal infrastructure projects to provide greater continuity, reduce siloes, and secure greater value from investments.

Australia within their Australia Infrastructure Audit recognized that lifecycle contracts needed to build in flexibility to allow for innovation to provide a better experience. This ensures that the government and end users continue to see value for user fees that ultimately pay for infrastructure. The high profile failure of Carillion in the UK provided the catalyst for the [UK Parliament](#) to look at the government's approach to contracting and recognize that the government cannot expect to drive down costs and get good services for end users.

Adding Value Through Financing

With governments facing extreme fiscal challenges there is an opportunity for the public and private sector to reinvent how they work together to deliver more value for infrastructure investment. There are broadly five buckets:

Opportunity

Revenue streams: where there is long-term revenue through utility bills, user fees, tolls, or rent, the private sector can finance new infrastructure.

Leveraging land value: rising land values and scarcity provide partnership opportunities, especially when there is a strong need for additional housing or public amenities.

Reducing capital costs: reducing the cost of building infrastructure frees up government funding that can be spent on additional projects.

Operating cost reductions: operating costs can represent 80% of the overall cost of an asset, by reducing those costs in the long term it can be used to finance capital investments.

Unlocking economic potential: future tax revenue from new resource or property developments and engaging local communities to invest in their economic future can enable investments in critical job-enabling infrastructure.

Financing

User fees (tickets, passes, entry fees, utility bills), tolls, rent, retail

Long term leases, air rights, tax increment financing, rising property value, rent

Bundled procurement, shared facilities, enabling alternatives

Energy bills, labour costs, repair and maintenance bills, better outcomes

Property tax revenue, resource royalties, visitor spending

Examples

- US36 Express Lanes Colorado, US
- Thames Tideway, UK
- Melbourne Convention Centre, Australia
- YMCA Coquitlam, BC
- LA Metro, US
- Pennsylvania Rapid Bridge Replacement, US
- Saskatchewan Schools, SK
- Long Beach Civic Centre, US
- ATCs US Department of Transport, US
- Bruce Power, ON
- Algonquin College, ON
- Abbotsford Hospital, BC
- Network Rail, UK
- Hudson Yards, US
- Tliche All Season Road, NWT

More detail on examples available in the FIG report: [Unlocking Value in Infrastructure](#)

SUMMARY

With huge investments coming in the United States it is important that Canada builds a strong system that promotes stability, enables companies to compete on value and innovation, and focuses on improving delivery across the project lifecycle in order to remain an attractive place for companies to invest and operate. The National Infrastructure Assessment is an important first step that will help lay out a comprehensive approach to build an evidence-based, independent approach to planning and delivering infrastructure across the country. There are many lessons to learn from jurisdictions that are further ahead in their journeys and from which Canada can build on and a national approach would help to position Canada as a leader in the sector.





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