

# UNLOCKING VALUE IN INFRASTRUCTURE

## The Potential Role of the Private Sector



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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.

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## UNLOCKING VALUE IN INFRASTRUCTURE

### The Potential Role of the Private Sector

Across Canada billions of dollars have been committed to infrastructure projects by different levels of government. In addition to ambitious plans to build new transit lines, hospitals, and arenas, there is also a sizeable backlog of repairs and maintenance that needs to be addressed.

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.

Value can come from paying for new highway lanes through smart lanes that can favour transit and provide a faster option home for commuters. New windows and heating systems for schools can be paid for through energy savings. Affordable housing and community amenities can be built within transit stations.

Value can also come from being less prescriptive in how hospitals should be built and evaluating what is most important to patient's recoveries. Smaller projects like bridges can be bundled together to bring savings in design, project management, and offsite construction. Using technology can help identify and rectify problems in the design phase.

There are broadly five buckets where the private sector can add greater value:

- **Revenue opportunity:** where there is an opportunity for long-term revenue through utility bills, user fees, tolls, or rent, there are opportunities for the private sector to finance new infrastructure.
- **Leveraging land value:** rising land values and scarcity especially in an urban setting 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.

## PROJECT EXAMPLES

	Category	Financial	Projects
	<b>Revenue Opportunity</b>	User fees (tickets, passes, entry fees, utility bills), tolls, rent, retail	<ul style="list-style-type: none"> <li>• US36 Express Lanes Colorado</li> <li>• Thames Tideway</li> <li>• Australian Asset Recycling</li> </ul>
	<b>Leveraging Land Value</b>	Long term leases, air rights, tax increment financing, rising property value, rent	<ul style="list-style-type: none"> <li>• Melbourne Convention Centre</li> <li>• YMCA Coquitlam</li> <li>• LA Metro</li> <li>• UK's Regeneration Investment Organization</li> </ul>
	<b>Reducing Capital Costs</b>	Bundled procurement, shared facilities, enabling alternatives	<ul style="list-style-type: none"> <li>• Pennsylvania rapid bridge replacement</li> <li>• Saskatchewan Schools</li> <li>• Long Beach Civic Centre</li> <li>• ATCs US Department of Transport</li> <li>• UK Building Information Modeling</li> <li>• Bruce Power</li> </ul>
	<b>Operating Cost Reductions</b>	Energy bills, labour costs, repair and maintenance bills, better outcomes	<ul style="list-style-type: none"> <li>• Algonquin College</li> <li>• Abbotsford Hospital</li> <li>• Network Rail</li> </ul>
	<b>Unlocking Economic Potential</b>	Property tax revenue, resource royalties, visitor spending	<ul style="list-style-type: none"> <li>• Hudson Yards</li> <li>• Tlcho All Season Road</li> </ul>

## FOUNDATIONS FOR GREATER PRIVATE PARTICIPATION

To encourage private participation in infrastructure there are some key steps governments can take. These largely relate to measures that provide greater transparency, clarity, and certainty.

In the early stages having a long-term infrastructure plan that is based around the economic vision for a city, province or country. Publishing long-term project pipelines provides a visibility that can help organizations work together. To truly get the full value of private sector participation there also needs to be transparent business cases, clearly demonstrating the value that a partnership-based approach can bring.

Processes need to be in place that are flexible enough to enable innovation and encourage partnership. This includes working together to reduce risks around delivering projects. And finally procurement needs to evolve to encourage more dialogue, accept different ideas, and focus on value over cost.

**The following report presents a series of case studies around how the public and private sector have worked together to deliver more and better infrastructure.**

1. Long-term infrastructure plan
2. Public, long-term project pipeline
3. Business case process that incorporates requirement to examine coordination opportunities
4. Lifecycle budgeting of projects, and condition-based asset management plans
5. Intake and process for unsolicited proposals
6. Financial tools and procedural incentives to help make projects reality
7. Reforms to procurement:
  - Early industry and community engagement on projects/solutions
  - Outcome-based/less prescriptive evaluation criteria
  - Lifecycle assessment
  - Flexibility on procurement models
  - Promote pain/gain-share approaches
8. Better shared approach to risk management



# Case studies



# Smart Ways to Fund Expansion

## US 36 Express Lanes Project, Colorado

Tolling normally succeeds under three conditions: it is user friendly; it is for new infrastructure; there is an acceptable free alternative. One approach to funding additional lanes is to add managed lanes funded by toll revenue. The US 36 Express Lanes Project completed improvements to US 36 in Colorado, a congested two-lane highway connecting fast growing cities in the state.

The project involved the construction of one express lane in each direction in addition to the reconstruction of existing general purpose lanes (which continue to be free to all users) and the rebuilding of many aging bridges and a bikeway. The Bus Rapid Transit system runs within the managed lane with minimum travel speeds for buses guaranteed. In return for a 50 year concession this covered the design, build, and finance of the Phase 2 construction. This enabled Colorado to deliver the expansion 20 years earlier than it would have been able to.

# Financing Resilience

## Thames Tideway Tunnel, UK

The Thames Tideway Tunnel sought to draw in private finance for major greenfield infrastructure using a regulated-asset-base model. The project aims to prevent 39 million tonnes of sewage being discharged into the River Thames each year. The \$7 billion project in London was delivered by a specially set up a special purpose company who awarded contracts in three sections. The project uses a pain/gain share mechanism to encourage proactive risk mitigation and incentivizing early and cost effective delivery.

The project managed to attract pension funds and long-term investors. Thames Water customers pay an additional \$12 on their annual water bills toward the tunnel, gradually rising to an estimated \$34-43 by the mid-2020s. The UK government backstopped certain risks and provided a tailored regulatory regime, and crucially revenue streams started immediately during construction to provide returns for investors.





# Assets Funding Infrastructure

## Australia's Asset Recycling Initiative

Australia's asset recycling initiative provides a financial incentive for states to monetize their existing infrastructure to pay for new infrastructure. When a state sells or leases an asset and uses the proceeds to reinvest in new infrastructure, it receives an additional 15% of the proceeds from the Australian federal government.

From 2014 when the initiative was launched to May 2018 12 major public assets were monetized mainly through long-term leases or concessions and raised A\$51.2 billion and is being used to fund projects like the Sydney Metro. It has also been leveraged to fund new projects such as the WestConnex project in NSW, a 33 km highway being built in three phases with the last phase being funded by monetizing earlier phases. This approach has drawn interest from Canadian pension plans such as OMERS and Quebec's Caisse.

A black and white photograph of the Melbourne Convention and Exhibition Centre, a large modern building with a prominent glass facade and a dark, cantilevered upper section. The building is situated near a body of water, with a walkway and some trees in the foreground. The sky is overcast.

# Leveraging Public Funding

## Melbourne Convention and Exhibition Centre, Australia

The convention centre was developed primarily to increase business tourism and facilitate urban renewal. A partnership with the state attracted over \$1 billion additional investment in a five-star quality hotel and a mixed use development. The investment was built off a \$350 million expansion of the convention and exhibition centre.

The project includes a risk-and-reward sharing mechanism that allows significant savings and provides incentives to maintain the asset to a high standard. It was procured on a sole source, negotiated basis after an options analysis found it was the best approach to incorporate additional commercial development and minimize disruption. The process followed four stages a memorandum of understanding to establish a framework for negotiations, a draft request for response for the developer, a builder request for proposals, a proposal from the developer and an evaluation and final contract.

# Partnering to Capture Value

## YMCA Coquitlam, BC

YMCA partnered with the City of Coquitlam and a developer in a three-way partnership that delivered a new state of the art YMCA facility (double the size of the originally planned city facility), a community police station, underground parking, more public space, and residential towers including 2,700 homes, of which 900 are purpose built market rental units and 100 non-market rental suites in partnership with 43 Housing Society.

The project delivers cost savings as YMCA operates the recreation facilities. The developer also enabled the city to leverage land development to unlock additional housing. The investment generated around \$250 million in benefits due to the partnership structure located near a new transit station and is expected to be completed in 2022.



An architectural rendering of a modern, multi-story building with a courtyard. The building features large glass windows and balconies. The courtyard is paved and has several people walking around. There are trees and plants in the foreground. The sky is overcast.

# Transit & Affordable Housing

## LA Metro, California

California is a leader around transit oriented development and has used investment in transit expansion to help address affordable housing shortages. Transit ridership is highest amongst low income households, and by working with private developers and retailers, LA Metro has ensured value is captured by offsetting station development costs, or encouraging development that meets social goals.

LA Metro set an objective that 35% of joint developments portfolio wide will be affordable housing. The transit agency can discount land value of joint development sites by up to 30% of fair market value where sites incorporate affordable housing. Ground leases can also be discounted proportional to the total number of affordable housing units.

In Chicago, the housing authority has developed public-private ventures where affordable housing and market-rate housing is co-located with municipal libraries that have become community hubs.

# Packaging Opportunities

## Regeneration Investment Organization, UK

The Regeneration Investment Organizations was set up with the goal of attracting international institutional investment in UK regeneration projects across the country. At its peak the organization had 200 projects with a value of over \$200 billion with the potential to develop 196,000 new homes and 740,000 new jobs.

The organization published a dynamic pipeline of projects covering all regions, scales and stages of development. Government vetted projects to ensure they were credible and investor ready, then used the UK's trade and investment promotion network around the world to make connections to projects.

On a smaller scale the county of Gloucestershire publishes a pipeline of capital projects that have the potential to support economic growth and seek funding. The county also has a fund that provides interest free loans to unlock stalled or constrained developments.

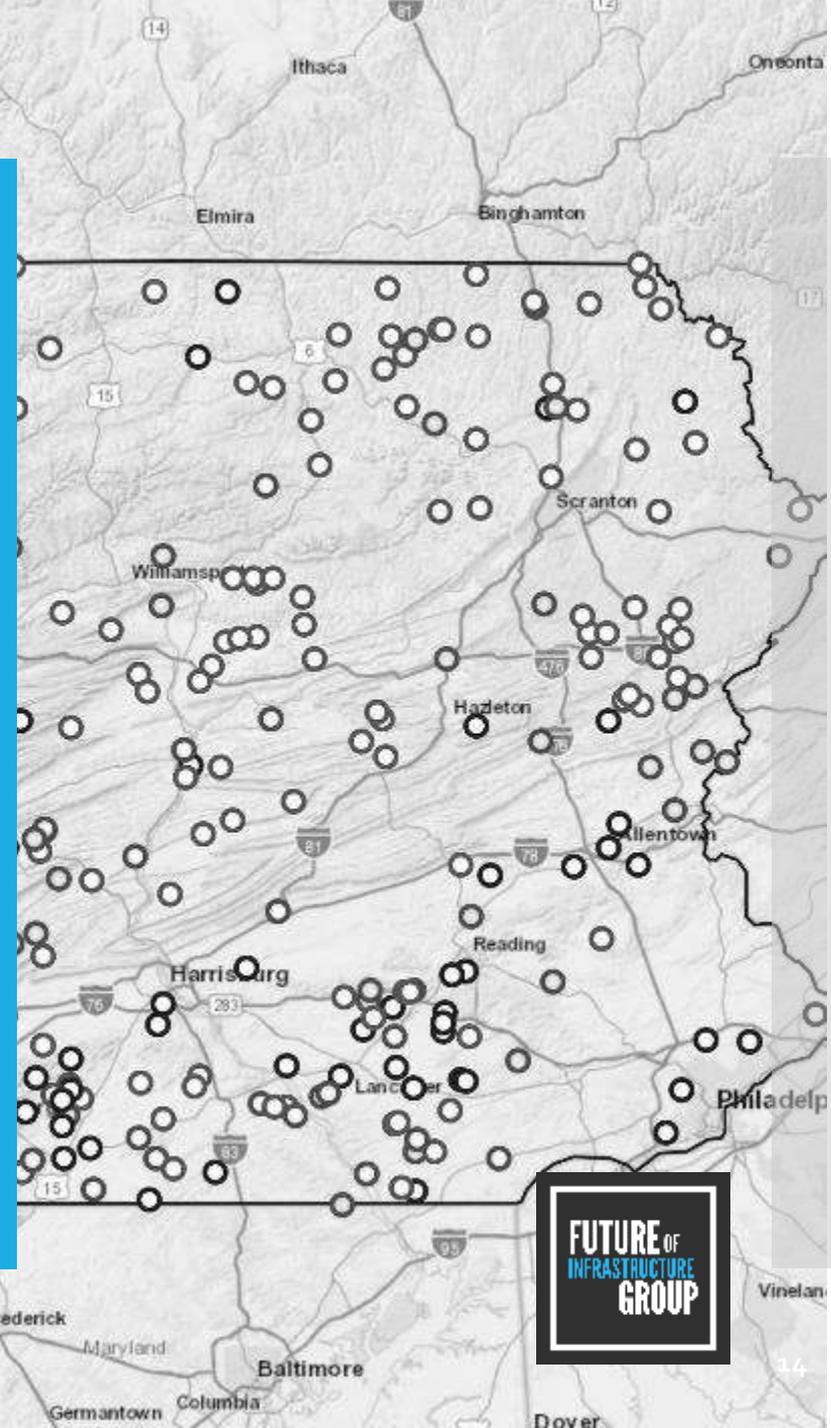


# Bundling Bridges

## Pennsylvania Rapid Bridge Replacement Project, US

Pennsylvania launched a US\$1.1 billion rapid bridge replacement program to replace 558 structurally deficient bridges as a public-private partnership. The bridges are mainly crossings on smaller state highways and enabled the builders to construct bridges quickly using standardized design, and prefabrication off site to deliver best value. It also helped

The consortium used local construction partners to build bridges to last 100 years and will be responsible for maintenance over 25 years upon completion of the bridges. The bundling of projects delivered cost savings of 20% per bridge and was procured in a 12-month timeframe from RFO to commercial close and enabled the bridges to be replaced far quicker.



# Benefits of Bundling

## Saskatchewan Schools Project

With aging school buildings and large repair bills provinces are looking at bundling projects to deliver greater value for money. Saskatchewan did two projects to deliver 18 joint use schools to benefit students and local communities 6-9 years earlier than they would otherwise have been able to and is expected to save \$100 million. Students, teachers, parents, school divisions and the local community members played a hands on role in the design process to deliver facilities that worked for everybody.

Savings come from design and construction costs through economies of scale, efficiencies and speed in rolling out the projects, and shared life cycle maintenance. Bundling has been demonstrated as a good way to save money with Pennsylvania's project to replace over 500 bridges, school projects in Alberta, and OPP detachments in Ontario.



# Efficiency & Transformation

## Long Beach Civic Centre, California

Private developers made a commitment to build US\$520 million worth of public buildings including new offices for the city hall and Port of Long Beach, a new library, and a public park, in return they were able to build profit-making apartments, condominiums, shops and potentially a hotel on the site. The developer is designing, financing, building, operating and maintaining the new civic center for 40 years at the same cost the city was spending annually to maintain the existing complex.

The new city hall is highly efficient and will consume 25% of the energy of the previous building. The building design will also foster better inter-departmental collaboration and better customer service. The mixed use development will help transform the downtown, and deliver a revitalized civic core with a 73,000 square foot plaza. California requires that projects must also look for coordination opportunities as part of their infrastructure business case process which encourages different departments to work together.





# Introducing Different Ideas

## US Departments of Transportation: Alternative Technical Concepts

An ATC is an approach used in the procurement phase when a proponent team can propose an innovation specific and confidential to their team only that will be amended into their contract during the Preferred Proponent phase of the Project. ATCs have been provided on:

- Equivalent or Better – process already exists through Acceptable Equivalent;

- Cost Benefit Analysis – sometimes ATCs are utilized to relax overly stringent requirements identified in the contract (can be for technical or functional items) that from the proponent team's experience will not be required. In other instances, they increase the costs but provide a better functional solution;

- Schedule Analysis – impacts to schedule by the proposed ATC

One ATC accepted on a Mississippi bridge project brought estimated savings of US\$ 7.4 million. Caltrans estimates it saves 10% on its design build projects due to ATCs. One recent example in the US saw US\$111 million in savings from proposed ATCs being accepted

An aerial photograph of a city with a semi-transparent 3D BIM model overlaid on top. The model shows various building footprints and structures in a light grey color, allowing the underlying city streets and buildings to be visible through it. The right side of the image is partially obscured by a blue text box.

# Digital Delivery

## Building Information Modeling, UK

Building Information Modeling provides 3D models that are used by architecture, engineering, and construction to deliver better projects. It delivers a more accurate version of reality, identifies problems earlier, improves collaboration from design to operations, and helps with sequencing projects. As part of a national construction strategy, the UK government required BIM Level 2 for construction of government projects.

Between 2009 and 2016 the UK's Department of Health saw BIM contributing to 14% cost savings, other departments including justice and education found savings of around 20% in the same timeframe. The NHS have also driven savings through developing standard room designs and product selections. The use of BIM has also improved the design of buildings to yield better working environments and reducing patient recovery time. A report in the UK showed that better design can speed hospital recovery times by 27%.



# Hybrid Public-Private Model

## Bruce Power Office Complex and Training, Ontario

Bruce Power used a hybrid public-private partnership/co-development model to construct their new training facility and office complex. The agreement had a pre-construction services agreement which enabled early engagement around good project design and project development. An early works agreement allowed work to start quickly and enabled the project's concurrent funding, design, fixing the ultimate construction cost and schedule, and commercial structuring activity, while meeting immediate critical path milestones.

A leaseback agreement took the place of a typical project agreement. The project team took a balanced approach to responsibilities and risk transfer with a focus on securing the best project outcome for all. The collaborative, hybrid approach could prove more attractive to private investors. This approach demonstrated that public-private partnerships could be successfully used on smaller projects.



# Monetizing Energy Savings

## Algonquin College, Ontario

Through a 20-year energy performance contract Algonquin College in Ottawa the infrastructure upgrades have delivered annual savings of \$3.2 million through reduced energy use. The private sector finances the entire project and is repaid through energy savings.

The program started with a wide range of building renovations to improve energy efficiency. This included new water fixtures, HVAC retrofitting, improved metering and replacing the cooling tower, installing energy-saving light bulbs, intelligent lighting systems, modernized kitchen equipment, and automated building controls.

This included the installation of a natural gas fired cogeneration plant providing four megawatts of electricity and enough heat and power to make the college energy self sufficient. As the college requires up to five megawatts of power a microgrid and building automation redirects energy from where it is not needed. The system can also store energy and determine if it is cheaper to pull from the grid, or use its internal capacity.

# Reducing Structural Cost Burden

## Partnerships BC: Abbotsford Hospital and Cancer Centre, BC

In a new initiative, the new 300-bed hospital ensured patient care and service delivery costs were central to its design by incorporating specific evaluation criteria that were based on real-world data.

Things like travel distances for nurses and medical staff, daylight and acoustics and infection control are known to reduce staff absenteeism, drug costs for patients, number of days in recovery, number of deaths in hospital settings. Data from US facilities bears this out.

British Columbia used this data to estimate savings in the new hospital and the built a better procurement to obtain the long-term structural cost savings.

Of 100 points on offer, the largest portion (30 points) were offered for clinical operations, efficiency and design. Thinking of the life cycle costs of the hospital, facility management and human resources considerations could earn up to 25 points, with construction only worth 10 points.



# Targeted Maintenance

## Network Rail, UK

Network Rail is the UK's biggest builder, investing almost £130 million per week and responsible for over 20% of the UK's infrastructure spend.

By using a combination of smart capital investments and improved design to reduce costs for make maintenance and repair through a whole-life approach. New technology has helped them collect better information about the true state of railway infrastructure. This allows them to predict and prevent potential problems, and focus spending for maintenance where it is most needed.

This enabled them to reduce the cost of operating and running the railway by 40% per passenger kilometre in the last ten years. It has also cut incidents causing delays for commuters by 38% in the last ten years.

# Indigenous Partnerships

## Tlicho All Season Road, NWT

This 97km road connects the Tlicho community to Highway 3 providing year-round connectivity in a contract worth around \$400 million over 28 years to design, build, finance, operate and maintain the road. It also included agreements to employ and train Tlicho citizens.

The Tlicho Government took a 20% equity stake in the project, the first time an Indigenous government has taken an equity stake in a construction project in NWT. The road will also support resource exploration and development projects in the region, boost tourism, and reduce local cost of living.



# Unlocking Investment

## Hudson Yards, New York

New York financed the first extension of its subway system in 80 years to the Hudson Yards district from debt that will be repaid with future property tax revenues from the real estate it will help develop. The New York City government issued bonds to fund the US\$2.4bn project. This provided certainty to developers that the new infrastructure would be delivered.

The city drew boundaries around Hudson Yards and property taxes from new and newly renovated buildings will pay for the infrastructure. Revenue will also come from developers paying to build at greater density, and selling development rights for commercial buildings along a boulevard and park. Developers can build more square feet by building a portion of the boulevard and park. Residential developers building extra density must set aside some units for affordable housing or pay fees to construct affordable housing elsewhere.



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