An Independent Study
Commissioned by

RESIDENTIAL AND
CIVIL
CONSTRUCTION
ALLIANCE OF
ONTARIO

RCCAO

Constructing Ontario's Future


# INFRASTRUCTURE ONTARIO:

## A Key Agency to Implement the Long-Term Infrastructure Plan


RESIDENTIAL AND
CIVIL
CONSTRUCTION
ALLIANCE OF
ONTARIO

**Constructing Ontario's Future**

RCCAO
25 North Rivermede Road, Unit 13, Vaughan, Ontario L4K 5V4
Andy Manahan, executive director
e: manahan@rccao.com p: 905-760-7777 w: rccao.com

The Residential and Civil Construction Alliance of Ontario (RCCAO) is composed of management and labour groups that represent a wide spectrum of the Ontario construction industry.

The RCCAO's goal is to work in cooperation with governments and related stakeholders to offer realistic solutions to a variety of challenges facing the construction industry and which also have wider societal benefits.

RCCAO has independently commissioned 45 reports on planning, procuring, financing and building infrastructure, and we have submitted position papers to politicians and staff to help influence government decisions.

For more information on the RCCAO or to view copies of other studies and submissions, please visit **rccao.com**

**RCCAO members include:**

- Carpenters' Union
- Greater Toronto Sewer and Watermain Contractors Association
- Heavy Construction Association of Toronto
- International Union of Operating Engineers, Local 793
- International Union of Painters and Allied Trades, District Council 46
- Joint Residential Construction Association
- LiUNA Local 183
- Ontario Formwork Association
- Toronto and Area Road Builders Association

# INFRASTRUCTURE ONTARIO:
# A Key Agency to Implement the Long-Term Infrastructure Plan

## Recommendations for Selecting and Building the Right Infrastructure in Ontario

**Part 1:** Considerations for Improving Ontario's Infrastructure Planning and Project Selection

**Part 2:** A Look at Infrastructure Ontario's Alternative Financing and Procurement (AFP) Program

An independent research report commissioned by the Residential and Civil Construction Alliance of Ontario (RCCAO) examining infrastructure procurement in Ontario

By
Michael Fenn,
Former Ontario Deputy Minister and founding CEO of Metrolinx
Author of "Megatrends: The Impact of Infrastructure on Ontario's and Canada's Future"

**SEPTEMBER 2017**

# TABLE OF CONTENTS


Author and Acknowledgements 6
A Note on Methodology 6
EXECUTIVE SUMMARY 7
FINDINGS, OBSERVATIONS AND RECOMMENDATIONS (FOR) 9
GLOSSARY 12
Budget and Contingency 13
INFRASTRUCTURE – SETTING THE STAGE 14

PART 1: CONSIDERATIONS FOR IMPROVING ONTARIO'S INFRASTRUCTURE PLANNING AND PROJECT SELECTION 15

INFRASTRUCTURE PLANNING 16
Strategic Planning for Infrastructure 17
The Private Sector and Public Infrastructure 18
**Table 1:** Ontario's multi-year infrastructure plans 19
Keeping the public interest in public infrastructure 20
Problems with Planning 20
INFRASTRUCTURE PROJECT SELECTION 21
Who should set priorities and evaluate projects – and how? 21
Informing budget decisions with evidence 22
Who should plan infrastructure projects? 23

PART 2 – A LOOK AT INFRASTRUCTURE ONTARIO'S ALTERNATIVE FINANCING AND PROCUREMENT (AFP) PROGRAM 28

THE PLUSES AND MINUSES OF AFP 29
The Debate Over Public-Private Partnerships (P3s) and AFP 29
Traditional Infrastructure Procurement 30
**Table 2:** Auditor General's illustration of models of infrastructure delivery 31
**Table 3:** Infrastructure Ontario update to August 24, 2017 32
**Table 4:** Traditional procurement vs. P3 or AFP models 32
EVALUATING AFP 33
Has AFP proved its value? 34

**Global Experience with P3s** 35
**Infrastructure Ontario's AFP model** 36
The impacts of P3 and AFP financing 37
Not "off-the-books" financing 38
Is public financing better – or cheaper? 38
The impact of private debt financing 39
**Table 5:** The impact of differential costs of capital 40
**The Impact of AFP Process Costs** 41
Municipal projects 41
The risks of using construction finance as leverage 42
Refinancing AFP projects 43
**Understanding Infrastructure Ontario's "Value-for-Money" Analysis** 44
Delivering Better Value-for-Money in the AFP Process 46
**Key Capital Questions for the Ontario Government** 48
Why can't conventional public procurement achieve what AFP achieves? 48
Real savings – or low-hanging fruit? 49
**WIDENING PARTICIPATION, INCREASING COMPETITION** 50
**Creating and Sustaining a Competitive Marketplace of Qualified Bidders and Sponsors** 50
Do size and experience matter? Opening AFP to more bidders 51
The impact of large-scale projects 52
Does AFP unfairly favour international competition or penalize the domestic construction industry? 53
**Widening AFP's Reach and Lowering Barriers to Participation at the Local Level** 53
Involving municipalities 55
**PROJECT INNOVATION** 57
**Where's the Innovation?** 57
Sustainable innovation 58
What is innovation worth? 59
**BIBLIOGRAPHY** 61
**ENDNOTES** 69

# AUTHOR AND ACKNOWLEDGEMENTS

Michael Fenn is a consultant and board director. Over the course of an extensive career in public service, he has been an Ontario Deputy Minister under three Premiers, municipal chief administrator in Hamilton and Burlington, and the founding CEO of both Metrolinx and the Mississauga Halton Local Health Integration Network (a regional health authority serving one million residents from Etobicoke to Georgetown). Mr. Fenn is a board director of the $85-billion OMERS AC pension fund and with the Toronto Board of Education's realty arm, the Toronto Lands Corporation.

Mr. Fenn acknowledges the support and advice of the Board and members of the Residential and Civil Construction Alliance of Ontario (RCCAO), especially Phil Rubinoff, board chair, and Andy Manahan, executive director, in the development of this project. Mr. Fenn also wishes to thank the many useful contributions made to the development of this report, both directly and by their writings, by industry leaders, academics (including particularly, Prof. Matti Siemiatycki), and decision-makers in the public and private sectors. Special thanks are owed to those who reviewed earlier drafts of the report, notably Dr. Enid Slack, former Ontario Infrastructure Minister David Caplan and his colleague John Allen, as well as several current and former Ontario public servants.

The viewpoints expressed in this report are those of the author and not necessarily the opinions of RCCAO or its members, the report's contributors and reviewers, or the organizations with which Mr. Fenn is associated. Any errors or shortcomings in the report are entirely the responsibility of the author.

## A note on methodology

There is much conflicting opinion on the topics of infrastructure planning and the alternative models for delivering it. An extensive bibliography has been included with this report, which demonstrates the range of views on these topics.

In undertaking this research assignment, an effort was also made to reach out to a cross-section of knowledgeable and experienced players in the infrastructure construction and infrastructure finance fields in Ontario.

Construction and project finance are active and competitive markets, with significant business, labour and political implications. These are topics affecting intellectual property, shareholder interests and competitive advantage; opinions about them are therefore closely guarded. There was an understandable reluctance on the part of some of those invited to be interviewed to volunteer their opinions freely, to provide detailed business information, or to discuss project failures and shortcomings. Fortunately, most of those consulted were willing to discuss specific issues on a "Chatham House rules" basis, i.e., without personal attribution and subject to the assurance of the researcher that their views would remain confidential.

This kind of research reflects those limitations. A number of this report's findings and conclusions are based more on the considered opinions or prevailing consensus of those interviewed, rather than simply citing academic research or other publicly available data sources. In some instances, the reader will have to exercise his or her own judgment about the weight they are prepared to give the report's individual assertions, conclusions and resulting recommendations. In all cases, however, these are important issues and this report aims to stimulate a timely discussion among proponents, critics, decision-makers – and citizens.

**Michael Fenn**
**Burlington, Ontario**
**September 2017**

# EXECUTIVE SUMMARY

Credits: Infrastructure Ontario


An artist's rendering of the Eglinton Crosstown LRT at a future Toronto underground stop.


The Union Pearson Express train, linking Union Station in downtown Toronto with Pearson International Airport in Mississauga.

As Ontario and Canada embark on a multi-billion dollar program of infrastructure building, there is much debate about how public infrastructure projects should be planned, built, financed and operated over the next decade. But this report focuses on the crucial steps of:

- selecting what is needed, and
- the best procurement approach to deliver it.

The following findings, observations and recommendations are drawn from confidential interviews with a cross-section of those involved in public infrastructure, as well as research drawn from academic, auditing and trade literature. This report aims to give practical, evidence-based guidance to decision-makers.

Looking at the processes Ontario uses to plan and select infrastructure priorities, recommendations are made to improve these processes. There is solid potential for making infrastructure projects more cost competitive, advanced and innovative. This report also acknowledges significant progress made recently in infrastructure planning and delivery, but also suggests how to avoid the persistent risks affecting selection, design and investment potential of infrastructure projects. If recent storm events in Texas and Florida tell us anything, it is that the infrastructure of tomorrow will need to be more robust and resilient, in both its planning and its design.

With over $200 billion earmarked for Ontario infrastructure over 12 years, many of the signature projects in this potential Golden Age of infrastructure[1] will be delivered by Infrastructure Ontario (IO). IO will use its Alternative Financing and Procurement (AFP) version of public-private partnerships (P3s), which also is examined.

The elements of AFP appraised here include value-for-money analysis, the structure of financing, contract terms, the level of competition, and working with project sponsors and bid consortia. It concludes that, in most cases, the added cost of AFP can be justified as reasonable insurance against recurrent cost overruns, project delays and poorly conceived projects.

The report also highlights the opportunity for greater participation in AFP (and P3s generally), especially among domestic contractors and in the crucial local government sector. The findings suggest practical measures to achieve both.

It is also suggested that AFP can be improved, and that there is potential for greater innovation in all aspects of capital procurement.

The Ontario government faces an exciting challenge: adapting the current model to enable innovation to have a greater impact on price, utility and future adaptability.

Finally, this report is a reminder that today's well-justified infrastructure projects may seem expensive, but yesterday's forward-looking projects are now recognized as wise investments.

The Ottawa Cancer Centre.

Women's College Hospital

Credits: Infrastructure Ontario

# FINDINGS, OBSERVATIONS AND RECOMMENDATIONS (FOR)

## PART 1: PLANNING AND SELECTING THE RIGHT INFRASTRUCTURE

1. The Ontario Cabinet should distinguish and sequence its infrastructure planning, its capital planning and its consideration of the capital component of its annual operating budget. Political leadership should allocate sufficient time and focus to making integrated, advanced infrastructure plans and infrastructure investment decisions.

2. The justification for infrastructure projects should be made with clear, publicly available and objective business cases. Those doing the business case analyses should be thoroughly versed in the subject matter – design, construction, finance and operations – and have an awareness of emerging trends that could affect the ultimate selection of projects.

3. Ontario needs an explicit process for dealing with private-sector sponsored public infrastructure proposals, such as those being advanced for the Canada Infrastructure Bank for unsolicited bids.

4. With the support of the Ontario Ministry of Infrastructure and its provincial and federal counterparts, the Canada Infrastructure Bank should collect, analyze and disseminate the cost and other relevant data associated with major public infrastructure projects across Canada, both those delivered using traditional procurement processes and those using some variant of public-private partnership.

5. The Ontario government should develop a better capacity to make infrastructure plans that go beyond sectoral fiscal planning or politically oriented decision-making. Governments at all levels need a comprehensive framework for infrastructure decisions. This must include over-arching public policy objectives that are more precise than the objectives in the governing statute. It should also ensure that project-related policy decisions are individually priced.

6. Infrastructure planning should be holistic and, as such, it should precede capital budgeting. Infrastructure and other capital expenditure matters should also be considered separately from the operating budget, in order to permit decision-makers sufficient time to evaluate infrastructure's scale, impact and complexity.

7. Today's well-justified infrastructure projects may seem expensive, but yesterday's forward-looking projects are now recognized as wise investments.

## PART 2: BUILDING AND DELIVERING INFRASTRUCTURE THROUGH AFP

8. Not all AFP projects should contain a contribution to future refurbishment, if it increases the cost to the taxpayer. Can public authorities see so clearly into the future that they will want to pay over time to recover project infrastructure in good order, even if the need for it has been displaced by time and technology, as may prove to be the case with, for example, public transit, recreational or energy facilities?

9. Is the relatively higher cost of AFP fully offset by reducing the risks of cost overruns due to project "scope-creep", overdue delivery, change orders and deficient delivery? On balance, the evidence suggests that it is.

10. While the early approaches to P3s ran into problems, the weight of evidence now suggests that well-structured, current generation P3s and AFP are good public policy, and provide good value for money. In addition, like any good flood or fire insurance, the premium paid for AFP-delivered projects is justified by the size of the prospective risk.

11. Part of the answer to the financial and capacity challenges facing domestic firms may lie in Canadian firms combining their assets and expertise through mergers or broadening their ownership base, to scale up for bigger domestic and foreign projects. It may also lie in participating at higher levels (and through equity participation) with internationally led consortia.

12. To put downward pressure on infrastructure costs, it would be worthwhile for sponsors to report and compare as-delivered unit costs for construction projects, whether using AFP or traditional procurement.

13. Where an AFP project's success creates an opportunity, there should always be a mechanism through which completed-project refinancing, equity sales and further development benefits are shared by all parties, including the taxpayer.

14. To deliver better value for money, IO should consider:

i. Taking measures to reduce the aggregate estimate of individual risks.

ii. Adopting in-house measures that ensure contrary viewpoints are heard when evaluating candidate projects for AFP.

iii. Reassessing (and in specific instances, reducing) the risks that should belong with the private partner in an AFP project, as well as the contractual measures used to impose them.

iv. Strengthening bidding opportunities for local firms by encouraging mergers to generate scale, eliminating inappropriate risks, and having government assist with the permitting process.

v. Updating the current and projected cost assumptions used in the value-for-money model to reflect the contemporary construction cost and labour cost environment prevailing in Ontario, and actual experience with individual projects' cost elements.

15. Particularly when faced with influential stakeholders or in-process project developments, both governments and broader public-sector entities will frequently fail the Auditor's test: "… a willingness and ability on the part of the public sector to manage the contractor relationship and enforce the provisions when needed." Historically and overall, the record surveyed here shows the cost of those recurrent failures greatly exceeds the additional cost of AFP.

16. Adopting IO's approach and / or using IO as a contract manager on procurement might offer a bridge between full-blown AFP and traditional municipal procurement.

17. Beyond promoting beneficial bid and price competition, international participation in AFP should enhance, not undermine, the effort to increase the capacity of the domestic infrastructure industry, especially in large project management.

18. Promoting international competition should be accompanied by government efforts to build local knowledge and capacity to enable greater participation.

19. An expanded marketplace of qualified bidders – and awards to a wider number of bidders – are the best protections against the risks of a narrow, uncompetitive Ontario public infrastructure construction environment.

20. Building on growing familiarity with one another's operating environments and areas of expertise, IO and the municipal sector should be able to develop a more cost-effective version of AFP to meet municipal needs across the province.

21. At its most effective, AFP is about more than money. Innovative solutions to infrastructure challenges – and encouraging them at an early stage in procurement – can produce lower-cost approaches and additional capacity at the same or a comparable price.

22. Innovation can also produce opportunities to incorporate productivity-enhancing or maintenance-reducing technologies and to achieve future-oriented economic, environmental and social objectives.

23. Innovation in AFP could translate into potential multi-billion dollar savings across the emerging Long-Term Infrastructure Plan, while advancing social, environmental and economic goals.

# GLOSSARY

While there is some variation in the use of the terms, **public-private partnerships (P3s)** and **Alternative Financing and Procurement (AFP)** are part of a continuum of procurement options, although AFP is Infrastructure Ontario's branded variation of P3. The role of the public sector and the private sector in procurement varies, based on where the burdens of project risk and responsibility fall.

Within AFPs, there are many abbreviated sub-categories of projects that readers of this report should be aware of. They include:

- **DBB** (design-bid-build), in which the project sponsor contracts with separate entities for the design and construction of a project; also known as a traditional public tender or request for proposals (RFP)
- **DB** (design-build)
- **DBF** (design-build-finance)
- **BF** (build-finance)
- **BFM** (build-finance-maintain)
- **DBFM** (design-build-finance-maintain)
- **DBFOM** (design-build-finance-operate-maintain)
- **privatization** (long-term concession, sale or transfer to the private sector).

To expand on what these terms mean:

- **Design:** primary responsibility for designing the infrastructure's specifications; project selection generally precedes design, although there may be an opportunity for reconsideration following the design phase.
- **Build:** the primary responsibility for building the infrastructure to the design specifications
- **Finance:** the winning bidder is responsible for financing construction, and it may extend to financing the operation and maintenance of completed infrastructure.
- **Maintain:** the ongoing responsibility of the builder of the infrastructure to maintain the major building components and systems (e.g., road surfaces, pipes, roofs, HVAC or IT), for some agreed period of years.
- **Operate:** the continuing responsibility of the infrastructure builder to operate and deliver the programs and services provided through the completed infrastructure for some agreed period of years.

In a **design-build** project, the public authority indicates the type of infrastructure it requires, citing performance characteristics and a maximum price, but leaves the design and construction to the winning bidder. The public authority finances the project during construction, and takes it over upon satisfactory completion.

In a **build-finance** (BF) or **build-finance-maintain** (BFM) project, the private sector bids on and accepts the design specifications developed by the project's public sector sponsor.

Under **privatization**, the responsibility for building, financing, funding, operating and renewing the infrastructure and the programs and services it delivers is transferred to a private operator or consortium, as a multi-year or renewable concession, or in perpetuity, and the public authority no longer plays a role, beyond regulation.

The term **"scope-creep"** used in this report refers to the practice of adding to the scale or components of a project after the contract has been awarded, often resulting in a bigger project budget or an extension to the completion date, or both.

**FOR** is this report's abbreviation for Findings, Observations and Recommendations.

## BUDGET AND CONTINGENCY

Infrastructure Ontario's budget and contingency processes might be summarized as follows:

### Budget:

Initial budgets are developed by level of design/program information available, which typically results in a Class D to Class C level of estimate.[2] This estimate is intended to determine fair market value for construction and not a prediction of low bid. The estimate helps form the Total Project Cost, which includes ancillary costs, FF&E (fixtures, furniture and equipment), lifecycle/maintenance (if applicable) and other appropriate allowances based on the level of design/development. In addition, the Total Project Cost includes a Post Contract Contingency (PCC).

### Contingency:

The PCC is the contingency amount set for non-discretionary costs at the planning and budgeting stage based on the complexity of the project and the probability of unknowns and the retained risks occurring during construction. IO identifies contingency within its AFP budgets up front when working with clients/projects sponsors. Generally this will range typically between five and -15 per cent. The amount of this contingency is identified during project/budget approvals as its own category in order to maintain transparency (note: PCC percentage or number is not made public).

For an AFP project to be completed on budget, the Final Project Costs (Awarded Contract Amount plus utilized PCC) at Substantial Completion would be less than or equal to the Awarded Contract amount plus budgeted PCC set at Financial Close (FC). In essence, for a project to be completed on budget, Infrastructure Ontario conducted due diligence and risk transfer in the planning and procurement of projects and was able to manage the majority of unforeseen changes undertaken during construction within the allocated PCC allowance.

# INFRASTRUCTURE – SETTING THE STAGE

The public infrastructure investment "deficit" has been allowed to accumulate for a generation. In response, there is now a trillion-dollar commitment by governments at all levels to rebuild public infrastructure across North America, with over $200 billion earmarked for Ontario alone.[3]

Given the impact that infrastructure has on the evolution of the economy and our society, there are two equally important issues: building the ***right*** infrastructure and building that infrastructure ***right***.

The infrastructure challenge within Ontario raises two fundamental questions:

**What public infrastructure should be built and rebuilt?**

and,

**How should infrastructure be designed, built, financed and operated?**

This two-part report examines these questions from these perspectives:

**From the vantage point of infrastructure planning and project selection:**

1. Who should plan infrastructure projects in and for Ontario, and how?
2. How should infrastructure projects be selected? On whose recommendations?

**From the vantage point of infrastructure delivery:**

3. How do contemporary public-private partnerships (P3s), including Ontario's Alternative Financing and Procurement (AFP) model, perform in the public infrastructure field? Has "value for money" been achieved compared with traditional approaches?
4. If there is merit in AFP, how can participation in AFP be widened, both for owners / sponsors and for contractors? How can more local governments make effective use of AFP?
5. How and when can greater innovation be introduced into infrastructure designs, financing, delivery and ongoing operations?

# PART 1:

# CONSIDERATIONS FOR IMPROVING ONTARIO'S INFRASTRUCTURE PLANNING AND PROJECT SELECTION

Credit: Rick Fadell

The Waterloo ION LRT construction site.

Priority-setting choices about public investment in public infrastructure have historically been a product of political decision-making and public tendering (or its request-for-proposals equivalent). Since public funds underpin the construction and operation of most public infrastructure, final responsibility for those decisions should rest with governments.

As the range and cost of proposed public infrastructure projects expand, however, even today's massive investment commitments by governments run up against the constraints on public finances and the limits on the "social licence" for undertaking major projects.

Governments must make crucial decisions about the kinds of infrastructure needed to sustain the economy, the ecology and society into the future. Those decisions mean looking beyond simply replacing or refurbishing existing and legacy infrastructure, much needed as it may be (Auditor General, 2015, p. 290).

Infrastructure priority setting should also consider the future: to identify new kinds of infrastructure and new ways to design, build, finance and operate infrastructure (PBS, 2016). If Ontario is to continue to grow and prosper, Ontario's infrastructure must be modern, efficient, adaptable and anticipate the future (Fenn, 2015).

> If recent storm events in Texas and Florida tell us anything, it is that the infrastructure of tomorrow will need to be more robust and resilient, in both its planning and its design.

Infrastructure planning and project selection are only part of the story. Infrastructure Ontario (IO) is the primary capital procurement authority of the Ontario government for many major infrastructure projects identified in the long-term infrastructure plans of Ontario and its regional and local authorities (e.g., hospital boards and Metrolinx). For the most part, IO will use its Alternative Financing and Procurement (AFP) methodology to deliver infrastructure projects. The contrast between AFP and traditional procurement is summarized in Table 4. The pluses and minuses of AFP and related issues are addressed in Part 2 of this report.

## STRATEGIC PLANNING FOR INFRASTRUCTURE

Infrastructure is more than simply an enabler for the movement of people and goods, or for meeting their needs, like energy, water or telecommunications, or for the delivery of government programs, like education, justice and health care. Like information technology, infrastructure does more than simply provide support: it creates new opportunities and sets new directions. Infrastructure shapes our communities, protects our environment and widens economic prosperity. Infrastructure improves our quality of life and opens new possibilities for society.

Important as these objectives are, infrastructure-related finance, engineering and program needs are just ingredients in infrastructure planning. Above all, infrastructure planning must be strategic, holistic and visionary. Infrastructure planning needs to allow for the synergistic interplay of different types of infrastructure; it also reveals new ways of meeting the needs of our society and adjusting to the trends in our economy. As the "Megatrends" report argued, Ontario's infrastructure must be modern, efficient, adaptable and anticipate the future.[4]

Some criticisms of infrastructure planning and implementation reflect ideological objections to specific operating or ownership models. More pragmatically, however, critical attention is usually focused on the financing criticisms of Auditors-General or on those who favour alternative project designs and choices and / or financing mechanisms. Most of these latter criticisms are essentially tactical. As noted above, the most fundamental infrastructure decisions should initially be **strategic**: building great communities and dynamic economic regions, supporting clusters of research and innovation, expanding societal opportunity, and so on.

> Too often, infrastructure planning in government is folded into annual fiscal plans and, into capital planning. Unfortunately, if infrastructure planning is just part of capital planning, then infrastructure decisions are inevitably more oriented to: "What can we afford in the near term?" rather than "What do we need for the long term?"

Treating infrastructure as a fiscal and budgetary matter leads to capital investment being evaluated in competition with decisions about annual operating budgets. Since capital budget decisions are amortized, they have limited near-term impact on annual budgets, deficits or taxes. As a result, both infrastructure plans and capital budgets typically receive much less time and

scrutiny from political decision-makers than the more pressing, political implications of current operating budgets and programs. Some might even suggest that the growth of the infrastructure deficit over time owes a lot to infrastructure investment and asset management being pitted annually against more compelling and immediate fiscal demands, like constraining taxes or increased program spending.

It does not have to be this way. In the U.K. and Australia, infrastructure planning is well developed, using a separate, whole-of-government approach and an integrated, business-case model of decision-making.

Closer to home, many progressive Ontario municipalities have similarly de-coupled infrastructure planning and long-term capital planning from their subsequent annual operating budget process. In the municipal world, infrastructure planning is commonly a discreet set of decision-making processes, focused on plans for physical services and facilities to support urban growth, redevelopment or sustainability. Once municipalities make multi-year infrastructure-planning decisions, an annual capital budget review and approval process follows. The discussion and debate about the annual municipal operating budget comes later, incorporating the multi-year impact of infrastructure capital financing decisions.

This sequence ensures that decision-making is logical and integrated. More practically, it means that infrastructure plans and capital issues receive both the time and analysis that they deserve from decision-makers. The Ontario government now appears to be moving in this direction.

**FOR 1:** The Ontario Cabinet should distinguish and sequence its infrastructure planning, its capital planning and its consideration of the capital component of its annual operating budget. Political leadership should allocate sufficient time and focus to making integrated, advanced infrastructure plans and infrastructure investment decisions.

## THE PRIVATE SECTOR AND PUBLIC INFRASTRUCTURE

Since building the transcontinental railways, Canada has seen a shared responsibility (and a dynamic tension) between private-sector proponents and builders of infrastructure serving the public and commerce, and their governmental counterparts. More recently, infrastructure policy and fiscal policy have evolved to include an explicit promotion of so-called public-private partnerships (P3s), including the Ontario variant known as alternative financing and procurement (AFP).

These P3 ventures range in scope from designing, financing, building and – in some cases – maintaining and operating new or refurbished infrastructure (Ditta et al, 2015, pp. 36-37, Table 6, Figure 1). Canada has also seen an emerging role for procurement and financing agencies, such as Partnerships BC, Infrastructure Ontario and the Canada Infrastructure Bank.

The latest round of Canadian infrastructure investment proposals expands the private sector's role. The private sector may now take a leading role in conceiving, planning and financing huge infrastructure projects serving the public. An example is La Caisse de dépôt et placement du Québec's $6-billion Montréal region automated rapid transit system (REM). With the advent of the Canada Infrastructure Bank, there is now an explicit invitation to investment consortia to put forward major infrastructure proposals, rather than waiting for governments to initiate them, or even propose them.[5]

These trends raise important public policy issues, both for procurement agencies like Infrastructure Ontario (IO), and for fiscal planning and priority-setting entities, including Ontario's and Canada's Treasury Boards and their Infrastructure and Finance Ministries.

Canadian governments at all levels are initiating a generation of infrastructure projects. For its part, Ontario has laid out an ambitious, multi-year, multi-billion dollar program of infrastructure investment, covering a range of sectors, as noted in Table 1, and in its Infrastructure Plan (BuildON, 2017) and its evolving "Ontario's Long-Term Infrastructure Plan" (LTIP).

**Table 1: Ontario's multi-year infrastructure plans**

| Sectors ($M) | 2014-15 Actuals | 2015-16 Actuals | Outlook 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 | 2025-26 | 12-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Public Transit | 3,554 | 3,967 | 5,381 | 6,632 | 8,053 | 8,528 | 7,656 | 6,742 | 4,983 | 3,378 | 2,112 | 1,807 | 62,791 |
| Highways & Other Transportation* | 2,323 | 2,372 | 2,919 | 3,163 | 3,248 | 3,340 | 2,947 | 2,582 | 2,287 | 2,047 | 1,966 | 1,946 | 31,139 |
| Health | 3,568 | 3,225 | 3,192 | 2,745 | 2,774 | 2,775 | 3,062 | 2,243 | 2,339 | 2,816 | 2,952 | 1,914 | 33,603 |
| Education | 1,833 | 1,590 | 2,561 | 1,932 | 1,865 | 1,808 | 1,686 | 1,558 | 1,434 | 1,432 | 1,432 | 1,396 | 20,526 |
| Postsecondary | 519 | 624 | 1,091 | 1,035 | 593 | 450 | 466 | 467 | 468 | 464 | 459 | 456 | 7,093 |
| Justice | 144 | 150 | 255 | 314 | 566 | 626 | 573 | 396 | 230 | 217 | 216 | 216 | 3,903 |
| Social | 231 | 267 | 814 | 353 | 243 | 183 | 68 | 54 | 52 | 51 | 51 | 51 | 2,419 |
| Other** | 645 | 556 | 1,184 | 1,299 | 1,936 | 2,071 | 1,935 | 2,072 | 2,647 | 3,555 | 1,680 | 1,676 | 21,256 |
| Total Infrastructure Expenditure | 12,817 | 12,751 | 17,396 | 17,474 | 19,277 | 19,779 | 18,393 | 16,113 | 14,440 | 13,960 | 10,869 | 9,463 | 182,731 |
| Less: Other Partner Funding & Federal Contributions | 1,661 | 1,931 | 3,240 | 2,498 | 2,331 | 1,357 | 1,481 | 1,300 | 1,337 | 1,349 | 1,293 | 1,214 | 20,991 |
| **Total** | **11,156** | **10,820** | **14,156** | **14,975** | **16,947** | **18,422** | **16,912** | **14,812** | **13,103** | **12,611** | **9,576** | **8,249** | **161,740** |

*Other transportation includes highway planning activities, property acquisition and other infrastructure programs.

**Other sector includes government administration, natural resources, culture and tourism sectors.

Table source: BuildON 2017 Infrastructure Update, Ontario Ministry of Infrastructure. Found at: https://www.ontario.ca/page/buildon-2017-infrastructure-update

### Keeping the public interest in public infrastructure

As noted, it is important for ideology and jurisdictional biases to be removed from many decisions about planning, owning and operating infrastructure. The business case and rigorous value-for-money analysis, not political philosophy or past custom, should guide most infrastructure decisions. In the 21st century, government may be the best custodian of some public infrastructure, while in other cases, that role may be better discharged by the private sector under concession, long-term contract and / or regulation.

For its part, Infrastructure Ontario asserts that its primary criterion in making decisions on proposed AFP projects and their components is: "What is in the public interest?"

## PROBLEMS WITH PLANNING

One of the primary justifications for P3 models worldwide has been the need to add more rigour to project planning and, correspondingly, to resist costly changes to an approved project's scope after choices have been made.

> Since major projects have a long gestation period and require public patience and social licence, the desire to promise great results and to show early, material progress can undermine prudent planning.

Securing approvals by using overly optimistic assessments of project impacts or performance, or underestimating project costs, represent threats to the integrity of many traditionally procured major public infrastructure projects.

Some observers suggest that a procurement system traditionally built around "lowest bid wins" has also had a detrimental long-term impact on the accuracy of bids received, and the quality of the end product.

Leading infrastructure project management authority Oxford Prof. Bent Flyvbjerg points out, however, that taking too much time to decide, design and commission a project can be equally damaging to its notional budget (Flyvbjerg, 2004). And pace is not the only consideration: making the right, foresighted infrastructure investment choices are as important as making timely decisions.

Waterloo's consolidated courthouse.

Credit: Infrastructure Ontario

# INFRASTRUCTURE PROJECT SELECTION

### Who should set priorities and evaluate projects – and how?

For ambitious infrastructure initiatives to be successful over the next few decades, we must find ways to use the allocated funds more effectively, including leveraging those funds with investments from others. It is equally important to improve the processes used to identify and prioritize infrastructure projects, making best use of evidence and results-oriented public policy criteria.

Decisions about investing public infrastructure involve public priorities and taxation. It is, therefore, appropriate for the government to make these decisions. However, choosing among priorities and among complex, expensive projects is both important and difficult work. As a result, governments should make full use of the analytical expertise and experience of their procurement authorities, like Infrastructure Ontario and Partnerships BC. This is especially important if – for fiscal or other reasons – governments are unable to develop that in-house capacity.

As the Auditor General observes, an inadequately resourced Treasury Board function now acts as gatekeeper in the current process (Auditor General, 2015, p. 300). As a result, overall infrastructure planning has not always been done well. Priority setting and project selection are determined by the bureaucratic or political leadership, but too often without whole-of-government criteria, using narrow, functionally specific business cases and, too frequently, with short-term objectives.

The use of objective criteria – such as economic and fiscal impacts (Smetanin, 2014, 2015) – would help to produce more and better infrastructure with the financial resources available. Moving infrastructure decisions to the level of societal benefit would also enable "breakthrough" infrastructure decisions that go beyond narrow functional or value-for-money considerations.

**FOR 2:** The justification for infrastructure projects should be made with clear, publicly available and objective business cases. Those doing the business case analyses should be thoroughly versed in the subject matter – design, construction, finance and operations – and have an awareness of emerging trends that could affect the ultimate selection of projects.

Even at the modest level of individual projects, the addition of "community benefit agreements" can leverage public infrastructure investment in a way that program budgeting for those benefits cannot often achieve. In addition, community benefit agreements can often facilitate securing the "social licence" to proceed with a disruptive project or its unwelcome local impacts, without having to make politically driven, sub-optimal and costly mitigation adjustments to infrastructure design and operations.[6]

Capacity to set priorities across government will become even more challenging with the advent of unsolicited proposals, like La Caisse de dépôt's Montréal regional transit scheme

(REM) or public-asset disposition proposals related to infrastructure renewal. Unless they are part of a framework, like the Canada Infrastructure Bank or Australia's asset recycling policy, these proposals operate outside the normal fiscal plan and the budgetary competition for capital funds. The experience of former New York City Mayor Michael Bloomberg's approach to the multi-billion dollar transit and real estate project known as Hudson Yards may be both a model and an indication of things to come, especially since it involves a major Canadian pension plan.[7]

How would comprehensive, privately promoted infrastructure schemes lead to selection for either AFP or traditional tendering? (Valverde, 2017c) Additional governmental capacity will be required to evaluate these proposals in relation to government's own infrastructure priorities and plans, in the competition for scarce tax dollars and public policy objectives. Where should that analysis and decision-making be undertaken, and by what process?

**FOR 3:** Ontario needs an explicit process for dealing with private-sector sponsored public infrastructure proposals, such as those being advanced for the Canada Infrastructure Bank for unsolicited bids.

### Informing budget decisions with evidence

IO makes the case that planning and implementation decisions should be made using empirical evidence, including the record of cost overruns or completion delays on similar projects. While international efforts are being made to track this kind of information (Gilbert, 2017), IO's goal buffets against the political environment in which projects are undertaken. With provincial auditors and other P3 critics ready to pounce on any project missteps, transparency can be an early casualty (Valverde, 2017a; Siemiatycki, 2007). Developing transparent and comparable summaries that contain admissions of failure or shortcomings for both traditionally and alternatively procured projects is not something that political leaders are inclined to do.

At a minimum, data should be collected to counter (or confirm) the assertion by some project sponsors and authorities on procurement that the per square metre or per kilometre delivered cost of AFP construction projects is typically higher than the equivalent per unit construction cost of similar projects delivered through traditional procurement. Data should also be collected to measure the performance of projects that are delivered in the traditional fashion. This may be a task for the "best practices" function within the Canada Infrastructure Bank.[8]

Are there measures that might be undertaken to insulate the planning and implementation functions more effectively in this field? If so, the taxpayers and project sponsors would inevitably benefit from using hard data and recent experience to guide their recommendations and decisions. Removing project decisions from the rigour of professional analysis, either because it is not available or because it is insufficiently valued, predictably results in flawed and shortsighted infrastructure decisions.

One of the most promising mechanisms for ensuring that project selection meets the requirements of objective performance criteria and implementation "best practices" was proposed by Prof. Matti Siemiatycki. In his RCCAO report, "Implementing a Canadian Infrastructure Investment Agency", he made the case for a project-evaluation capacity in Federal infrastructure-finance decision-making, perhaps within the (then) proposed Canada Infrastructure Bank (Siemiatycki, 2016b). The enabling legislation for the infrastructure bank speaks to a centre of expertise, which responds in part to the proposal in his RCCAO report. As a corollary, Statistics Canada recently undertook a survey of municipal infrastructure assets, which would bolster this capacity.[9]

**FOR 4:** With the support of the Ontario Ministry of Infrastructure and its provincial and federal counterparts, the Canada Infrastructure Bank should collect, analyze and disseminate the cost and other relevant data associated with major public infrastructure projects across Canada, both those delivered using traditional procurement processes and those using some variant of public-private partnership.

### Who should plan infrastructure projects?

While much of the debate about the merit of P3s and AFP focuses on cost and timeliness comparisons to traditional tendering for infrastructure, logically the examination should begin earlier in the infrastructure procurement process.

Flyvbjerg produced an insightful, evidence-supported exploration of the dynamics of cost overruns and project delays. Supported by considerable project data and analysis, he suggests that P3s may work better than conventional procurement, but procurement success may be as much a matter of "best practices" in infrastructure planning and project selection, along with proper governance and regulatory oversight of infrastructure projects (Flyvbjerg, 2014; 2004, pp. 29-30).

In September 2015, an independent research report commissioned by the Residential and Civil Construction Alliance of Ontario (RCCAO) on the future of infrastructure made the case for a whole-of-government approach to the planning of infrastructure (Fenn, 2015, pp. 89-93). It proposed cross-government infrastructure priority setting, broader societal involvement and benefits, and the evaluation of infrastructure proposals in light of future trends and their impact on productivity.

While IO can apply its expertise to structuring and implementing infrastructure projects, it does not have the capacity (or the mandate) to make fundamental choices on infrastructure priorities, or to decide among competing infrastructure proposals, especially in unrelated fields. IO may have an informed view about the wisdom of a project or a project's design, but those broad decisions are made beforehand, primarily in the political realm. (IO does not select infrastructure projects, nor does it recommend them for AFP consideration. Those steps precede its formal role.)

The 2015 RCCAO report proposed a separate infrastructure ministry, a master-planning exercise, and an evidence-based approach to support infrastructure decisions. Those recommendations implied a shift from "near-horizon" decision-making, to an emphasis on long-term fiscal, economic and operational impact, productivity enhancement and sustainability. That report also recommended that government recruit the talent necessary to staff this capacity, recognizing that it might need to go beyond its traditional civil service talent pool and compensation regimes, as has proved beneficial for IO and for major Ontario-based pension funds investing in infrastructure.

As IO's Ehren Cory observed in a published article last year:

> *"… Delivering large public projects is different in important ways from managing smaller projects or for that matter from the core policy, budgeting, regulatory and legislative functions of many public organizations … Successful public infrastructure project management involves more than good project delivery models and contracts. People – and their knowledge, experience and behaviours – matter just as much if not more." (Cory, 2016)*

Since that RCCAO report, the Ontario government's response has been encouraging. There has been a return to a separate infrastructure ministry headed by an experienced infrastructure minister, Hon. Bob Chiarelli.[10] New legislation (*Infrastructure for Jobs and Prosperity Act*, 2015) was passed requiring the evolving Long-Term Infrastructure Plan (BuildON, 2017), to take an across-the-board approach by government that moves beyond the silos of capital planning that has been the pattern observed by the Auditor General of Ontario (Auditor General, 2015, pp. 289-291).

In Ontario, the central evaluation and priority-setting responsibilities typically have been distributed among the Ministries of Infrastructure and Finance, Treasury Board, Cabinet Office and the Premier's Office. Economic and fiscal analyses and other decision-support activities are still undertaken by civil servants and political staff in those various loci of power. Some interviewees for this study have suggested that the rigorous "business case" and economic analysis that was undertaken as part of Ontario's capital planning in the past, on which IO relied in its early years, has diminished over the past decade. The associated problems remain: lack of in-depth expertise and high rates of turnover in key analytical positions in the Treasury Board (Auditor General, 2015, p. 291).

Other related criticisms also persist. For example, the analysis being undertaken within government remains largely focused on individual ministries' proposals. There is now an obligation to include an estimate of maintenance and lifecycle costs (Treasury Board, 2015, Article 5.3.2) but those costs are not fully funded for traditional procurement or those AFP projects without a long-term maintenance and / or operating component. (See discussion on "three screen" analysis (Freeman, 2017) later in this report, dealing with innovation). In addition, budget allocations continue to be politically influenced, with a weighting towards new infrastructure spending rather than less exciting rehabilitation and renewal projects (Auditor General, 2015, p. 289).

Short-term thinking is as much a risk in infrastructure, as it is proving to be in other areas of politics and business. Despite changes in accounting and auditing rules to reflect the need to amortize infrastructure costs on a lifecycle or financing-term basis, too often the decisions about infrastructure "cut the suit to fit the cloth." Political considerations associated with four-year electoral terms at all three levels of government can weigh in favour of short-term considerations over prudent, longer-term factors. A long-term approach is essential to the provision of high value infrastructure that takes into account emerging societal, technological and economic trends and future policy objectives.

Spending more now, to achieve better results or cost savings later, is difficult to achieve due to the constraints of the annual capital budgeting process. "Sticker shock" on major infrastructure projects can lead to very costly decisions to break comprehensive, integrated infrastructure undertakings into smaller projects. It can also lead to jettisoning socially or economically beneficial opportunities in exchange for short-term fiscal or "political marketing" considerations. Similarly, it can lead to deleting – or adding – project elements for policy, budgetary, political or even project-marketing reasons, without adequately and transparently illustrating the total cost or foregone benefits.

In combination, these revisions and re-profiling undermine efforts to make comprehensive, evidence-supported, whole-of-government decisions about infrastructure and related productivity enhancement. Across many projects, there has been a tendency to give disproportionate weight to factors that can lead directly to controversial infrastructure decisions, like some of the Toronto and southern Ontario transit project choices, or the pre-election cancellation of gas-fired electric power generating plants.

There is emerging, however, a demonstrable effort by the Ontario government to look at infrastructure issues on a more comprehensive, cross-government basis. LTIP has the potential to address infrastructure issues on a holistic basis, by approaching community building on an integrated basis and supporting more dynamic regions and economic clusters. To live up to its potential, LTIP must focus on infrastructure needs and opportunities, rather than seeing infrastructure investment initially and primarily as a fiscal and capital planning matter.

Responding to the tendency to functionally siloed budgeting for infrastructure, Treasury Board and the Secretary of Cabinet have established the Infrastructure Development Leadership Council (IDLC) of deputy ministers. This body is mandated to take a "portfolio" approach to infrastructure planning, in order to overcome the silo-based approach that is a consequence of infrastructure plans being developed ministry by ministry and sector by sector. The IDLC aims to improve comprehensive decision-making on infrastructure, as well as overseeing project selection and implementation. Whether that evidence-based, portfolio approach is an effective counter-balance against political exigencies remains to be demonstrated.

As the Auditor General reported in her 2015 report, measures have been taken to coordinate infrastructure project spending and to track its implementation:

*"To strengthen key project oversight, Treasury Board/Management Board of Cabinet issued a new Directive for Major Public Infrastructure Projects to clearly articulate the approval process for large infrastructure projects and require ministries to report quarterly on the status of major projects." (Auditor General, 2015, p. 292)*

That directive outlines, in part, the roles of Treasury Board / Management Board of Cabinet and Infrastructure Ontario, for major projects, as follows:

*"TB/MBC is responsible for:*

- *Reviewing and approving Major Public Infrastructure Projects based on requests from sponsoring ministries and recommendations from Treasury Board Secretariat. For greater clarity, review and approval of transaction structuring (including confirmation of the delivery model) remains the responsibility of the Infrastructure Ontario Board, for large, complex Major Infrastructure Projects …" (Treasury Board, 2015, p. 8)*

The directive adds, in part that the …

*"… Infrastructure Delivery Leadership Council is responsible for:*

- *Reviewing and recommending delivery models for Major Public Infrastructure Projects to TB/MBC;*
- *Reviewing and approving variations to TB/MBC-approved project scope, timing, project financing and/or delivery model, and referring variations with a significant fiscal or public policy impact to TB/MBC …"*

*(Treasury Board, 2015, p.9)*

Each of these measures contributes to better infrastructure planning and project execution, particularly by senior public servants. As long as the Province's annual budgeting process continues to lump capital and operating budgets together, however, big-picture infrastructure planning will suffer in a time-limited and operationally focused Treasury Board approval process.

**FOR 5:** The Ontario government should develop a better capacity to make infrastructure plans that go beyond sectoral fiscal planning or politically oriented decision-making. Governments at all levels need a comprehensive framework for infrastructure decisions. This must include over-arching public policy objectives that are more precise than the objectives in the governing statute. It should also ensure that project-related policy decisions are individually priced.

**FOR 6:** Infrastructure planning should be holistic and, as such, it should precede capital budgeting. Infrastructure and other capital expenditure matters should also be considered separately from the operating budget, in order to permit decision-makers sufficient time to evaluate infrastructure's scale, impact and complexity.

Future generations will appreciate foresight, as Marcus Gee argues in his thought-provoking article "Short-sighted City Planning Continues to Cost Toronto" (Gee, 2016). Today, Torontonians do not regret the money spent on the Bloor Viaduct's 1918 transit substructure, and appreciate that the subway has provided service to the east of the Don Valley since the mid-1960s. Similarly, the scale and design of Toronto's R.C. Harris water treatment plant (Micallef, 2016), or the decisions to build Hwy. 401, or to extend hydro-electricity to rural Ontario are not questioned by society. A key lesson of infrastructure history in Ontario is clear:

**FOR 7:** Today's well-justified infrastructure projects may seem expensive, but yesterday's forward-looking projects are now recognized as wise investments.

Credit: Metrolinx


Main and inset: Toronto's Eglinton Crosstown LRT project during the tunnel boring stage.

# PART 2:

# A LOOK AT INFRASTRUCTURE ONTARIO'S ALTERNATIVE FINANCING AND PROCUREMENT (AFP) PROGRAM

# THE PLUSES AND MINUSES OF AFP


Credit: Ellis Don

Oakville-Trafalgar Memorial Hospital

## THE DEBATE OVER PUBLIC-PRIVATE PARTNERSHIPS (P3s) AND AFP

Since the adoption of P3s and AFPs began in Ontario and Canada this century, there have been strong advocates (Della Rocca, 2017; Lammam, 2013), and equally persistent critics (Whiteside, 2015, 2017; Hancock, 2017; OPSEU, 2014; Murray, 2006), and a few more nuanced perspectives (Siemiatycki, 2009). This reflects a similar debate over P3s in Australia and over Britain's Public Finance Initiative (PFI) (Duffield, 2008; ACCA, 2002; Scrutiny Unit, 2008; Hicks, 2008).

IO has been the centrepiece of the Ontario government's capital construction program and its claims of reliability in cost control and on-time project delivery through AFP are widely cited. However, those claims and others are routinely challenged, most notably in the reports of successive Auditors-General (Auditor General, 2014, p. 199; 2012, p. 213 ff.; 2008, pp. 11 ff.; 1999; 1998, p. 33 ff.).

Both successes and shortcomings can also be cited with traditional (non-AFP) capital procurement. There are also many examples of traditional procurement infrastructure projects that take far too long and cost too much, including the Spadina-York subway extension, the Calgary West LRT project, or Montréal's Dorval interchange with Hwy. 20.

Which are valid criticisms – and which are without adequate or convincing validation? If, as is claimed, AFP and IO are successful overall, are there still problems? How might these be addressed? How have those in the private sector who design, build, finance, maintain and operate infrastructure responded to the challenges inherent in the AFP / P3 model?

As noted above, IO and AFP are only part of the story. Preliminary to AFP and the role of IO come planning and project selection. Do decision-makers have what they need to make these decisions? The answers to these questions affect the conclusions we reach on AFP.

For a public policy direction with such significant and lasting fiscal and economic impacts on Ontario as AFP, one thing is clear. In the eyes of the broader public and the mainstream media – governments, industry proponents, and IO itself have not always done the best job of dispelling myths, demonstrating progress on results, or describing reforms to sub-optimal processes, in response to recurrent and often valid complaints.

More broadly, even some advocates believe that P3s generally have been an operational success, but a public relations failure, for reasons discussed elsewhere (Fenn, 2014, pp. 40-50; Fenn and Kitchen, 2016, p. 29).

## TRADITIONAL INFRASTRUCTURE PROCUREMENT

An understanding of the traditional context of infrastructure planning, construction and funding helps to explain successive governments' choice of P3s/AFP.

The decision by Ontario and other jurisdictions to move to a new delivery model for capital projects came after a century of experience with the traditional delivery model. Many large projects were routinely over budget and delayed, causing fiscal, organizational and political problems for governments. Recurring examples of delayed and over-budget infrastructure eroded public trust in the ability of government to deliver large-scale infrastructure.

Equally significant, from the perspective of economic prosperity and quality of life, citizens and businesses could no longer rely on modern, efficient public infrastructure. Governments also enjoyed and frequently used the discretion of reducing the allocation of public resources to maintain and refurbish infrastructure, shifting expenditures to other competing fiscal and budgetary priorities, including lower taxes. As an illustration, the lack of maintenance on the Scarborough Rapid Transit line and the Gardiner Expressway in Toronto are examples of major costs incurred due to annual maintenance budgets being diverted elsewhere (known somewhat euphemistically in municipal finance as 'deferred maintenance').

Infrastructure projects have traditionally been conceived and designed by government officials, often with private-sector consulting advice (e.g., civil engineering). Project costs then were estimated for budget approval purposes and public announcements. Following environmental assessment and political approvals, the project plan was tendered to the construction industry using detailed specifications and a formal competitive bidding process.

Under the traditional procurement model, successful bidders financed their construction activities and ensured their profits through regular installment payments from governments during construction, with a final payment upon transfer of the satisfactorily completed project to the public entity. Construction firms were paid as phases of work were completed, with any necessary alterations being funded through "change orders", usually attracting additional payments to contractors.

At the end of the project, payment of the last portion of the contract was held back until the governmental entity was satisfied that the work met contract specifications and any deficiencies were corrected. Once complete, the facility was turned over to the public entity, which then assumed long-term financial responsibility for its operation, maintenance and refurbishment, subject to some time-limited warranties.

The risks in this process are easily identified.

Since design and construction responsibilities are separated, problems or disagreements during construction may be due to designers or constructors, but predictably, each blames the other. Too often, the resolution of such conflicts falls to government, as project sponsor. The solutions are either expensive change orders or unanticipated scaling back of the project, either in the form of so-called value-engineering or simply by cutting out project components.

While theoretically available through contract-enforcement provisions, the sanctions of discontinuing the work or seeking recourse through protracted and unpredictable construction litigation are very unattractive options for governments – and recognized as such by the other project parties.

Holdbacks on installment payments may or may not drive a solution. Since payments track expenditures, general contractors may simply refrain from making significant further expenditures on a particular project until disputes are resolved or a compromise is negotiated into the original terms.

In this environment, procurement authorities have pointed to a recurrent business strategy that might be summarized as: "Bid low to win the job, and then change order your way to profitability." Nor does all the blame fall on the construction industry. Some projects, for example, appear intentionally priced optimistically by their sponsors, seeking to move ahead with badly needed infrastructure. Some observers have described this as a case of seeking forgiveness rather than permission.

By contrast, P3 advocates view successful project completion as largely a financial matter, using compelling financial incentives. Simply refusing to pay anything until the project is satisfactorily completed gives the project sponsor a strong bargaining position in relation to deficiencies and cost overruns, and even project delivery delays.

Tables 2 and 3 demonstrate the scope and range of AFP projects, while Table 4 illustrates the components of traditional capital procurement that may be combined in AFP/P3 projects.

**Table 2: Auditor General's illustration of models of infrastructure delivery**

| Sector | DBFM | BF | DBF | BFM | DBFOM | Total |
|---|---|---|---|---|---|---|
| **Health care** | 13 | 27 | 4 | 3 | – | 47 |
| **Justice** | 9 | 1 | – | – | – | 10 |
| **Transit*** | 3 | – | 2 | – | 1 | 6 |
| **Transportation** | 4 | – | – | – | – | 4 |
| **Pan Am Games** | – | 1 | 3 | – | – | 4 |
| **Education** | – | – | 3 | – | – | 3 |
| **Information technology** | 1 | – | – | – | – | 1 |
| **Total** | **30** | **29** | **12** | **3** | **1** | **75** |

*For two transit projects (Ottawa light rail transit and Waterloo light rail transit), Infrastructure Ontario is acting only as an adviser to the municipalities.

Table source: Auditor General, 2014, p. 196; See Glossary re: explanation of AFP models.

## Table 3: Infrastructure Ontario update to August 24, 2017

| Sector | DBFM | BF | DBF | BFM | DBFOM | Total |
|---|---|---|---|---|---|---|
| Health Care | 16 | 30 | 6 | 3 | – | 55 |
| Justice | 10 | 1 | 1 | – | – | 12 |
| Transit | 5 | 2 | 10 | – | 2 | 19 |
| Transportation | 5 | – | 1 | – | – | 6 |
| PA Games | – | 1 | 3 | – | – | 4 |
| Education | – | – | 3 | – | – | 3 |
| Information technology | 1 | – | – | – | – | 1 |
| **Total** | **37** | **34** | **24** | **3** | **2** | **100** |

Table source: Infrastructure Ontario, August 24, 2017

## Table 4: Traditional procurement vs. P3 or AFP models

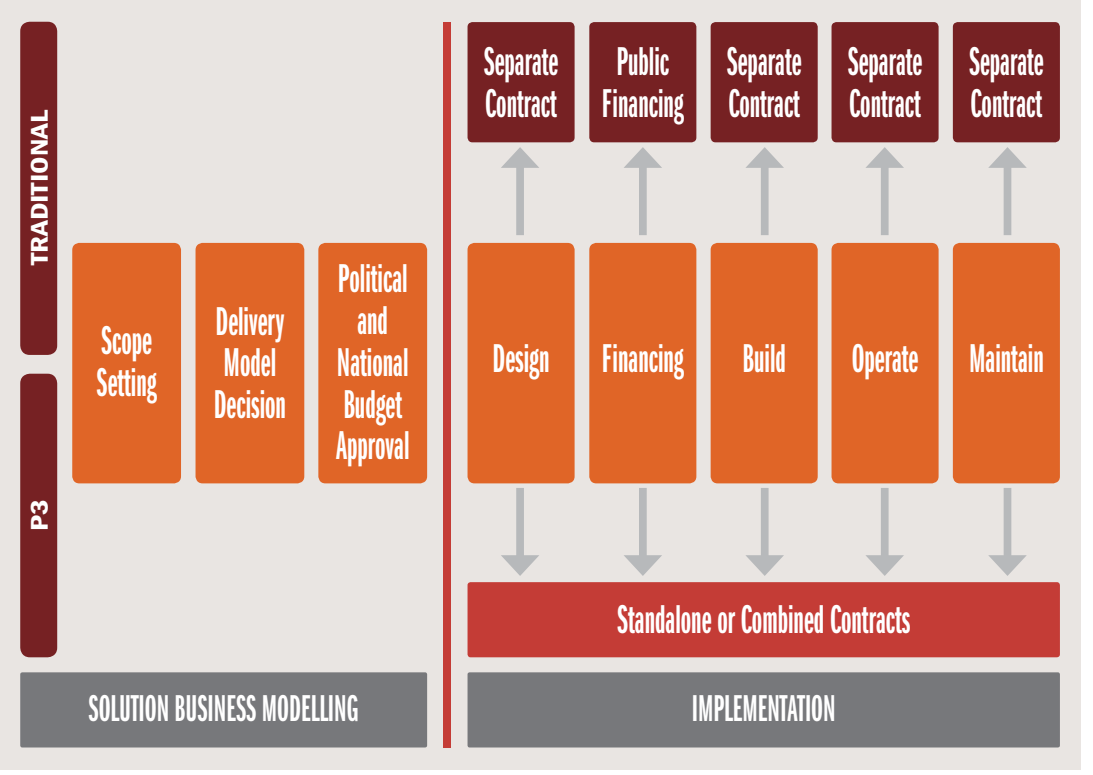


Table source: Boothe et al, 2015, p. 6, Figure 1. Found at: https://www.ivey.uwo.ca/cmsmedia/1964203/comparing-p3-and-traditional-approaches.pdf; p. 6.

## EVALUATING AFP

At its root, AFP is a form of P3. There are a range of P3 models, including: design-build-finance-operate-maintain (DBFOM); design-build-finance-maintain (DBFM); build-finance-maintain (BFM); design-build-finance (DBF); and, build-finance (BF). (See: Glossary section). In Ontario, while there may be interest in full DBFOM and other long-term project structures in some quarters, as Table 3 (above) demonstrates, the AFP options selected tend to reflect the latter three models.

Most P3 proponents argue the case for including ongoing operation and routine maintenance functions to promote design innovation and quality. Crucially, including the additional responsibilities gives the private sector scope for synergistically managing costs among the various inter-related components of a P3 venture. Particularly in design and operations, the private sector may be able to draw on global expertise, analogous experience and organizational depth that are not typically available in the civil service. However, for a majority of its AFP projects, Ontario has chosen to forego these opportunities.

For a variety of historical and political reasons, the scope for non-construction elements in AFP projects has typically been scaled back. In hospital AFPs, for example, major maintenance of HVAC systems may be included, while catering, cleaning and laundry facilities and services may not. In transit AFP projects, major system maintenance and refurbishment may be included, but transit operations and routine vehicle maintenance may not be. While there may be sound public policy reasons for eschewing these options, the decision should be made with a clear understanding of the foregone opportunities and the cost to taxpayers of that decision.

The AFP terms also make it clear that facilities will remain in public ownership and may revert to public-sector operation at the conclusion of the term of the AFP contract. AFP contracts may specify and assure required minimum facility conditions upon reversion, even several decades away.

This raises an important question about investment foresight.

**FOR 8:** Not all AFP projects should contain a contribution to future refurbishment, if it increases the cost to the taxpayer. Can public authorities see so clearly into the future that they will want to pay over time to recover project infrastructure in good order, even if the need for it has been displaced by time and technology, as may prove to be the case with, for example, public transit, recreational or energy facilities?

Although the foregoing factors have a long-term perspective, the focus of AFP is on the front-end: structuring financial arrangements that motivate construction consortia to complete work on time, resisting scope changes, and within budget, using the obligation to finance the construction phase privately through to completion as a primary motivation.

## Has AFP proved its value?

To continue to enjoy public and political support, there are two fundamental tests that the AFP approach will have to meet:

**1. That AFP provides better overall value for delivering public infrastructure than traditional tendering processes.** As a procurement methodology supported by overt fiscal policy, it must be shown that, on balance, the inherent additional costs of AFP are fully offset by demonstrably better overall results for the taxpayer: on-time delivery, cost-overrun risk transfer, greater productivity and innovation, and ongoing efficiency and effectiveness.

**2. That AFP is the right solution to a particular infrastructure challenge.** A rigorous value-for-money (VfM) analysis needs to be undertaken, and decision-makers and taxpayers need to have confidence in the factors that are being considered, the validity of the assumptions, and the appropriateness of the decision to use, or not use, some variant on the AFP model.

While some early AFP and P3 ventures may be faulted for failing to demonstrate their superiority to traditional procurement (Whiteside, 2015), much has been learned and incorporated into today's IO program.

More than 100 hospital projects, including 23 full rebuilding projects have been undertaken in the past decade, many of them using AFP.[11] As a result, hospital AFP projects have been a major source of ideas for improving the AFP process, as well as a high-profile target for those who dismiss the value of AFP and P3s across Canada (Whiteside, 2015, 2017; OPSEU, 2014).

Using accounting models, the Auditor General of Ontario and others have suggested that the evidence for net savings and risk transfer from the public sector to the private sector have not been definitively demonstrated. As Matti Siemiatycki observes, however, there should be more to the evaluation than financial accounting (Siemiatycki, 2009).

Independent evaluations commissioned by IO in 2014 and 2015 confirmed that AFP met its claims for budgetary and schedule reliability, although a small sample of traditionally procured projects did almost as well (Altus, 2014; Hanscomb, 2015). The 2016 evaluation made similar findings (49 of 51 projects were on budget), but noted that the burden of missing schedule or bid-price goals fell on the consortium, rather than the public entity in 11 of 14 instances (Turner and Townsend, 2016).

As noted elsewhere in this report, it is relatively a straightforward exercise to determine the "delta" between the cost of money to governments, including municipal governments, and the cost of delay and cost-overruns, and then to decide if that cost differential and other benefits justify using private financing to avoid those costs.

For infrastructure projects that incorporate both construction and long-term operation / maintenance, the calculation is more complex and more vulnerable to assumptions. Examples would be the selection of discount rates and projections of higher cost of capital differentials between governments and privately financed infrastructure, if interest rates rise in the future. Still, it is possible to project the cost impact of adequate maintenance over time, whether with the purchase of jet fighters or HVAC systems.

One aspect of AFP that is not frequently noted outside major metropolitan areas is the role that regional markets have played. Conspicuous traditional hospital procurement failures in Thunder Bay and Sudbury, for example, served as part of the original justification for AFP. As the AFP program developed, often-neglected regional infrastructure markets saw more interest from major construction firms. Moreover, the quality of their work in regional markets was influenced by the fact that IO offered the chance to bid on a steady stream of projects across Ontario to those bid consortia that could demonstrate satisfaction with their work.

## GLOBAL EXPERIENCE WITH P3S

Since the Ontario sample size is not large in global terms, let us look at the broader record in Canada and analogous jurisdictions, when evaluating P3s.

In 2010, for 55 so-called "second wave" P3 projects examined across Canada, the Conference Board of Canada noted that none had to that point exceeded budget and of 19 projects achieving substantial completion, 17 were completed on schedule (Iacobacci, 2010, p. iii).

The University of Melbourne compared the performance of 25 Australian P3 projects to 42 traditionally delivered projects, finding P3s 31.5 per cent better than traditional projects in terms of on-budget performance. P3 projects' average cost escalation post-contract award was only 4.3 per cent, compared to 18 per cent for traditionally delivered projects (Duffield, 2007, 2008).

A report assessing value-for-money analysis in AFP projects added the following data: in a U.K. Treasury evaluation, traditional procurement was on average 17 per cent late and 47 per cent over budget (referenced in: Fraser Institute, 2013); for 54 projects in Australia, traditional projects had 35 per cent cost overruns, compared to 11.6 per cent for P3 projects; and, in the U.S., 23 of 30 conventional highway projects with a value in excess of $100 million had costs increases ranging from two per cent to 21 per cent, with half increasing by more than 25 per cent (IO, 2015, p. 13). The U.S. experience was confirmed by Flyvbjerg's extensive database, with actual project costs exceeding estimates fully nine times out 10 for transportation projects, and for all capital projects, an average cost escalation of 28 per cent (Flyvbjerg, 2014; 2004, p. 5).

With the foregoing as a foundation, the fundamental question is this:

> **FOR 9:** Is the relatively higher cost of AFP fully offset by reducing the risks of cost overruns due to project "scope-creep", overdue delivery, change orders and deficient delivery? On balance, the evidence suggests that it is.

Added to this fundamental question would be these refinements:

- Are there alternative financing arrangements that can reduce the cost to the bidders and to the taxpayer without sacrificing the financial incentives that private financing produce?
- Are there measures that could be undertaken to lower the process costs and process cycle time associated with AFP, without undermining necessary due diligence and risk evaluation?

- Are there ways that smaller projects or replicable projects could make more or better use of the AFP methodology?

This report's research suggests several promising areas for exploration and enhancements.

**FOR 10:** While the early approaches to P3s ran into problems, the weight of evidence now suggests that well-structured, current generation P3s and AFP are good public policy, and provide good value for money. In addition, like any good flood or fire insurance, the premium paid for AFP-delivered projects is justified by the size of the prospective risk.

## INFRASTRUCTURE ONTARIO'S AFP MODEL

With this background, let us examine the Alternative Financing and Procurement (AFP) model employed by IO.

Bechtel Corporation is the largest civil engineering and infrastructure construction company in the United States and the ninth largest in the world, having built the English Channel Tunnel, the Hong Kong Airport, the Los Angeles Olympics facilities, and nearly half of the nuclear plants in the United States. Late last year, CEO Brendan Bechtel said this in USA Today, about the proposed trillion-dollar Trump infrastructure program proposal:

> "… The P3 approach developed and used today by Infrastructure Ontario is a world-class model and should be considered and adapted for use here in the U.S." (Bechtel, 2016)

In stark contrast, Ontario Auditor General Bonnie Lysyk is the latest in a succession of Ontario Auditors-General who have criticized the use of public-private partnerships by the Ontario government to undertake capital projects. In her 2014 report, she said:

> "… For the 74 infrastructure projects where Infrastructure Ontario concluded that private-sector delivery would be more cost-effective, the tangible costs (such as those for construction, financing, legal services, engineering services and project management services) were estimated to be nearly $8 billion higher than if the public sector would have been able to directly deliver these infrastructure projects on time and on budget …" (Lysyk, 2014)

Who is right? Is there an element of truth in both positions? The following discussion will try to answer those questions.

## The impacts of P3 and AFP financing

Under pure P3 models, as well as AFP, the successful bid consortium faces two powerful financial incentives to complete work closely in line with contract terms, including bid price and delivery schedule.

First, by incurring responsibility for privately financing the whole project, the bid consortium may not receive any substantial payment for work done until all the work is done. In conventional procurement, early expenditures are reimbursed on a pay-as-you-go basis; under P3s, they are generally not reimbursed until the successful completion of the construction phase of the entire project.

Second, as matters come into dispute, or as circumstances cause delays in completing the work, the bid consortium cannot easily pass those costs along to the project sponsor. With a fixed-price bid and with private project financing, delays (or cost overruns or change-orders) add to the cost of private financing and eat into the projected profit margin of the bid consortium.

If a P3 project includes a long-term operational or maintenance component, with an associated stream of monthly payments, the incentive to do good quality work during design and construction and to reduce ongoing and future costs is further increased, since the project consortium must live with the results of their work. For example, repairs and maintenance will cost more if inferior products or systems are employed.

While traditional public works projects engage and contract with different parties on a sequential basis, many P3s put all the design, financing, construction and even operational players together into a single consortium, bound by a single overall contract and with a single ultimate point of responsibility. As a result, the dynamics within the consortium favour finding solutions within the context of the contract, rather than seeking relief from the project sponsor. These incentives can lead to practical trade-offs among design, construction, finance, allocation of profit, equity investment and future responsibilities, without affecting the essence of the overall project.[12]

As some project sponsors related, however, this does not stop the winning consortia from trying to shift the risk back onto the public sector through IO's "variations" process. IO contracts incorporate contingency provisions, known as Post-Contract Contingencies (or PCC; See Glossary re contingency). PCC allowances typically range from a minimum of five per cent to as much as 15 per cent of the total estimated cost of a project. "Change orders" related to project scope are routinely refused by IO and project sponsors. Even so, "force majeure" and matters not disclosed in the risks and conditions information initially provided by the sponsor to bidders form the basis for so-called "variations." With some recent major transit projects, for example, it is suggested that variations are frequently allowed. If contingencies are budgeted and used, the project sponsor may, in effect, find itself paying more for a project, despite paying for the more expensive front-end AFP process that was designed to avoid cost escalation.

Complex projects cause bidders to price in the cost of uncertainty risk. Since its inception, IO has been dedicated to following a standardized approach, with a predictable set of documents

and consistently applied legal and financial conditions. This standardization of documents is attractive for bidders, especially in contrast to the bidding milieu for traditional tenders and requests-for-proposals (RFPs).

> For traditional procurement in Ontario, particularly by municipal and transit authorities, the absence of standardization means many idiosyncratic and punitive contract conditions and processes continue to confront bidders and drive up costs.

With consistency over time, however, the incentive to price in uncertainty is progressively reduced and bid prices should improve to the benefit of the taxpayer. In fact, given progressively increasing predictability and standardization in AFP contracts (and as the construction industry periodically faces factors like reduced Canadian petroleum industry market demands), some informed interviewees asked whether we should not be seeing lower AFP process costs and a corresponding decline in project bid prices.

Putting these financial risks and contract compliance burdens on the winning consortium does exact a high price, which ultimately must be paid by the taxpayer in most cases. Piling-up financial and legal obligations on bidders also requires bidders to have a robust balance sheet and typically, access to extensive credit. These are not always available in Canada at competitive rates, if at all, for mid-size firms. The net effect is to discourage and limit bidding by smaller and not-so-small domestic firms, as well as to increase costs to the project sponsor.

### Not 'off-the-books' financing

In the past, and in other jurisdictions, some of the justification for using P3s was to take the cost of specific capital projects "off the books" by framing the project as non-governmental or at least as assets without recourse to a government covenant. This was common where the level of budgetary deficits or public debt was a constraint against necessary investments in new or existing public infrastructure.

Canadian accounting and auditing standards have made it clear that any infrastructure project that is ultimately dependent on government funding for its financial sustainability should be reflected as such in the public accounts. There is no "free money." The same logical conclusion applies to accounting for projects that mix capital construction and long-term maintenance and operation, or with intergovernmental sponsorship. With that clarity, the case for AFP quite properly lies in demonstrating better financial and delivery results than predecessor or traditional procurement processes.

### Is public financing better – or cheaper?

Private financing is more expensive than public financing, even in a long-term, low-interest-rate environment. That is equally true for national, provincial and local governments in Canada.

Municipal critiques of P3s rightly point out that larger municipal or regional governments have a lower cost of capital than any private consortium. Many larger municipalities have ready access to internal borrowing from development-charge reserves and other sources. In Ontario, some major municipalities have better credit ratings than the Province. Municipalities generally have no difficulty securing credit from Canadian and foreign financial institutions, or even borrowing from IO itself, in the case of smaller municipalities.

As a result, it is certainly the case that private-sector financing is more expensive than public financing, even if the cost of capital to the Ontario government reflects its need to borrow with a diminished credit rating. Despite this, Plenary's Brian Budden writing in McKinsey's *Commentary* concludes: "Financing costs are higher, but the results are worth it." (Budden/ McKinsey, 2017).

There are other considerations.

One informed observer wondered if European infrastructure entities with close ties to their domestic financial institutions or other unconventional sources might have access to credit not readily available to Canadian or U.S. firms when bidding on AFP projects.

Some have also argued that the need to secure significant tranches of private financing effectively disqualifies otherwise capable Canadian construction firms. Domestic firms may be unwilling or unable to pledge their balance sheets to support an AFP financing scheme. That financial barrier reduces the number of potential bidders, and correspondingly, reduces the competitiveness of the bid process. It also directly affects the willingness of firms to incur the added cost of bidding more innovative solutions.

**FOR 11:** Part of the answer to the financial and capacity challenges facing domestic firms may lie in Canadian firms combining their assets and expertise through mergers or broadening their ownership base, to scale up for bigger domestic and foreign projects. It may also lie in participating at higher levels (and through equity participation) with internationally led consortia.

### The impact of private debt financing

The fundamental question is whether the typically higher cost of private debt is justified by project savings or other benefits produced by AFP (timeliness, limitations on scope-creep, fewer change orders, etc.). The answers lie in three aspects of the cost of capital in P3s.

First, how much financial leverage is required to create the productive incentives outlined above?

The goal should be to place a financial burden on the bidders equal to a large proportion of the risks that they can control. Conversely, if the bidders are asked to finance risks beyond their control, it may not be in the public interest to add to the private financing obligation. Dealing with unforeseen costs beyond the control of the contractor is something for which the public sector is often much better positioned to cover, and its cost of insuring against that risk is materially lower.

The solution, therefore, is to answer these questions for each project: At what point does the cost of capital unnecessarily increase project costs? Could there be a sharing of the cost of capital in a way that reduces the cost without sacrificing the powerful financial motivation for the bid consortium to meet contract terms?

There is also a material difference between private capital financing during the construction period, and private capital financing for a 30-year operating and maintenance agreement. Different or more conventional financial arrangements may make more sense for the portion of AFP projects that contains ongoing operating and maintenance agreements. IO is already doing this for social infrastructure projects, once construction reaches substantial completion, and the resulting lower cost of private capital can be reflected in lower bid prices.

Second, what is the typical incremental cost of private capital, and to what extent do other factors, likely timely delivery and fewer change orders, make it a price worth paying?

The broad cost differential between the cost of borrowing for private entities and for governments is easy to calculate at any point, even if the specific cost of private capital is not revealed. A cost differential can then be calculated for the construction period for the quantum of the project. For example, the cost of a 24-month construction loan from a financial institution can be contrasted with the Ontario government's own average cost of borrowing for the same period. Like the carrying costs on an interest-only residential mortgage, the cost of construction financing is typically a small percentage of the overall project cost, based on the estimated final cost of the construction project.

### Table 5: The impact of differential costs of capital

By way of illustration, consider a $100-million infrastructure project built over 24 months, with similar costs of construction for both AFP and traditional procurement.

**1. TRADITIONAL PROCUREMENT PROJECT**

While regular payments are made during the course of the contract with a conventional tender, the government still must finance the whole project over its useful life. The cost of construction financing would be (say) 2.5 per cent per year, for two years, on $100 million worth of work, or $5 million.

**2. AFP PROJECT**

By contrast, let us assume that the cost of capital to a bid consortium for the $100-million, 24-month AFP project may be as much as twice that of the public entity.[13] With a payout on successful completion, the cost of capital for the bid consortium is (say) five per cent annually for two years, so the cost of private financing would be $10 million, or an additional cost to the project of $5 million.

Under this simplistic scenario, any combination of project delays or cost increases that exceed 2.5 per cent (i.e., five weeks or $5 million) makes the traditional public tendering model more expensive, since the private consortium cannot charge back those costs to the project sponsor.

Using this simple example above, the AFP/P3 project is incurring a $5-million financing premium over a traditionally financed project. This premium acts as an insurance policy for the owner. In the AFP/P3 world, the project owner / sponsor is generally not on the hook for cost overruns or late delivery. To the extent that project issues cost more than $5 million, the owner is actually saving money.

Third, the differential between public and private financing costs is not a static relationship. A record of success by established and successful P3 consortia could lower the cost of credit to bidders and reduce the financial risk to firms. Pools of capital are increasingly interested in infrastructure investment and that will lead to a greater willingness to invest at more competitive rates of return, for both debt and equity.

By contrast, however, it has been shown that an increase in the prevailing interest rates widens the gap between the public sector's cost of capital and the private sector's cost of capital, which would translate into relatively more expensive P3 projects, at least in terms of capital costs.

## THE IMPACT OF AFP PROCESS COSTS

While much emphasis is placed on the cost of private capital, another very significant feature of P3s is ancillary process costs – including so-called "pursuit costs" by the bidders. With P3 projects, it is important to have more professional "eyes" on the deal: both for the procurement authority and its governmental sponsor, and another "set of eyes" for the various participants within the successful bid consortium. Many of these costs are also incurred before the final award ("financial close") of the P3 contract.

To these high process costs, one also should add the similar costs incurred by unsuccessful bidders, who must do the same amount of bid preparation and as much due diligence as the successful bidders, at least through the early qualification stages. Those supporting traditional procurement would point out that many of the professional services firms engaged on P3s by both bidders and sponsors (financial services, legal, engineering, etc.) are not required to nearly the same extent when governments tender traditional projects (with detailed and prescriptive specifications, a well-established legal context, and industry-standard construction financing arrangements).

While unsuccessful AFP bidders quite properly are partially reimbursed for their "pursuit" costs, the "price of admission" is high, as are the commercial consequences of being unsuccessful. To reduce these barriers to competition, there should be a constant effort by the government (and IO) to streamline document requirements and processes.

### Municipal projects

High process costs are a recurrent and valid criticism of P3 and AFP processes, and an excuse not to use them for many smaller or municipal projects and for those with in-house capacity, such as transportation and environment ministries and agencies.

With the advent of the Canada Infrastructure Bank and more municipal projects, there are arguments to be made for an AFP model that uses more public financing, and less private financing (or more equity) (Siemiatycki, 2016a). However, such a model must not sacrifice one of the primary financial incentives for project innovation and contract compliance inherent in P3s: i.e., private financing.

In recommending that any infrastructure bank adopt "lean" principles, McKinsey & Co. highlights these ingredients, which are equally applicable to IO:

> *"… requiring less documentation for smaller, less risky, or simpler projects setting bankability standards, so that sponsors know what would-be investors need …*
>
> *"… working in cross-functional teams oriented around projects in the same sector or geography …*
>
> *"… ensuring accountability at every stage by clarifying who is responsible, who approves, who supports, and who is consulted on any decision …*
>
> *"… building a culture of continuous improvement". (Duvall et al., 2017)*

## The risks of using construction finance as leverage

As noted, placing the financial burden of meeting contract provisions on the general contractor or bid consortium is the essence of the P3 model. The AFP model places even more financial pressure on the general contractors, since AFP projects are often largely confined to the design and construction phase of infrastructure implementation, with less opportunity to share the financial risk and burden with other consortium partners over time.

Imposing financial sanctions on the general contractor for failing to meet contract conditions is not unique to P3s. It has always been a feature of traditional tendering, through the use of contingent construction payments to contractors and end-of-project deficiency holdbacks. Under AFP, however, project financing must be secured privately and usually for the full term of the entire construction period, including the early implementation phase. It is a powerful motivator for good performance, but it is not without its consequences for that reason.

The Charbonneau Commission noted that as many as 75 per cent of Québec contractors decided at some point not to bid on a public project – but not because firms did not have the interest or capacity. They evidently feared cash-flow restraints from dispute-related withholding of reimbursement for completed work for which they had already paid all the labour, materials and subcontractor costs (Pitre, 2015).

Several industry observers suggest that AFP costs are not coming down as much as one would expect, given the well-worn path that has been developed and the wealth of cost data that IO now has in hand. To some extent, this may be the inevitable consequence of too few bidders and recurring consortium partners in certain infrastructure sectors.

**FOR 12:** To put downward pressure on infrastructure costs, it would be worthwhile for sponsors to report and compare as-delivered unit costs for construction projects, whether using AFP or traditional procurement.

Deferring reimbursement pending substantial and satisfactory project completion is a mitigation tool, and not primarily a financing technique. The financial pressures inherent in the AFP deal structure should be sufficient to motivate the desired results, but not so onerous that bidders refuse to bid, or build in unnecessary additional costs to cushion business risk. Recognition of this necessary balance in long-term, build-and-operate AFP infrastructure projects is reflected in IO's decision to distinguish project construction from project operation, by reducing the project-financing requirement by between 60 per cent and 85 per cent upon satisfactory completion (Cory, 2016).

### Refinancing AFP projects

There is another, equally important consideration from the perspective of the taxpayer, particularly in so-called "greenfield" projects, or where the bid consortium must pay top dollar to secure private capital because of perceived project risk.

Once AFP projects that include an ongoing maintenance / operation component have reached substantial completion and with favourable experience during the early roll-out period, the bid consortium, or its financial partner, is often able to refinance the project at much more favourable rates, using the now-established infrastructure as security. Since the project's profitability is based on the initial cost of capital, and with low long-term interest rates available for stable investments, this refinancing dividend can be very substantial, adding materially to project profits (Whiteside, 2015; Fenn, 2016a).

Ironically, this substantial windfall is a product of the public procurement authority successfully shifting much of the risk to the private party under the AFP regime.

For longer-term AFP infrastructure serving the public, it is reasonable for public authorities to want a role in understanding major changes in the AFP bid consortium (participants, equity ownership, debt levels, etc.) and in project refinancing. Refinancing, in particular, should include an expanded mutual-benefit feature, with benefits for the project sponsor and taxpayers. While some benefit-sharing models are now being employed by IO, these must be designed in a manner that preserves incentives for productivity and innovation, while enhancing the public interest.

Particularly in infrastructure projects with a real estate component, or where infrastructure enhances the value of adjacent property, a "participation agreement" could help to ensure mutual gains for the taxpayer long after the construction period, as well as in "downstream" project consortium equity sales.

**FOR 13:** Where an AFP project's success creates an opportunity, there should always be a mechanism through which completed-project refinancing, equity sales and further development benefits are shared by all parties, including the taxpayer.

Finally, placing financial obligations on the project consortium only makes sense if it contributes to the pressure felt by the consortium to complete the project according to the specifications, on time and on budget. If the added costs simply flow through to the sponsoring public entity, or drive up fixed costs for bidders, no beneficial purpose is served.

As a result, IO has modified AFP in three respects relating to project financing:

- It has reduced the post-construction obligation for private financing on social infrastructure projects (e.g., hospitals), reflecting the financial realities of hospital funding and operations.
- It has decided to pay eligible "pursuit costs" to unsuccessful bidders directly, rather than asking the successful bid consortium to do that, since this simply increases the private sector's financing costs without adding any performance incentive.
- It has reduced the amount in "letters of credit" required to assure bids move through to the financial close stage of the bidding process, since these costs are also an added project cost that is likely a flow-through directly to the taxpayer.

## UNDERSTANDING INFRASTRUCTURE ONTARIO'S 'VALUE-FOR-MONEY' ANALYSIS

A variety of large infrastructure projects may be recommended to IO by government, for consideration as candidates for AFP. An analytical process known internationally as "value-for-money" (VfM) analysis underlies IO's decision to use (or not use) AFP for a capital project commissioned by the Ontario government. It is essential to understand IO's version of VfM to evaluate the performance of AFP in Ontario.

VfM compares a project's total costs using traditional tendering / RFP processes (the so-called "public sector comparator"), contrasted against the estimated cost to the public sector of delivering the same project, with similar specifications, using the AFP procurement model. The calculated difference represents the "value for money" of an AFP approach (IO, 2015, pp. 2-3). Cost estimates from quantity surveyors contracted by IO and IO's past AFP contracts also inform the calculations.

VfM assessment incorporates a number of assumptions and inputs (excluding land costs). These inputs include estimated construction, maintenance and other lifecycle costs, where applicable, as well as project financing costs, and directly related ancillary costs, such as the cost of professional advisers (IO, 2015, p. 4). A key ingredient in VfM is an assumption-based

assessment of potential project risks facing the public-sector project sponsor (government or other public entity), and the extent to which those risks are transferred to the successful private-sector bid consortium. The risks identified are numerous and detailed, as are the experience-based assumptions about the degree and probability of those risks, the extent to which those risks are transferred, and the associated cost of those risks. As noted earlier, IO makes it clear that the ultimate test in evaluating an AFP candidate is: "Is it in the public interest?"

There is no single database or set of comprehensive data that reliably estimates those risks. As a result, the assumptions are a product of the professional experience and judgment of IO staff, their external advisers, and subject-matter experts from the project sponsors, who collectively quantify the risks under each delivery model. These experts are brought together in a so-called VfM risk "workshop" which includes both industry experts and key stakeholders. It is followed by in-house application of the model by IO staff. The product of that analysis is the calculation of VfM using the formulae in the VfM model (IO, 2015, p. 9).

The VfM model is complex. It incorporates a wide range of factors and has many moving parts. To the uninitiated, it has the hallmarks of technical reliability. Fundamentally, however, VfM is a synthesis of informed opinions by functional experts, supplemented by anecdotal experience and case histories. The VfM process is certainly not an exact science, and the Auditor General and others have persuasively made that point (Whiteside, 2015). See also: "Infrastructure Public-Private Partnerships: Delivering Value for Money?" (Siemiatycki and Farooqi, 2012).

By its nature, the VfM evaluation process may attract those with implicit biases (including some who favour P3s and others who simply assume that government projects routinely run over time and over budget) (Auditor General, 2014, pp. 198-199). The VfM workshop and evaluation are conducted in a closed session.

Although IO staff are conscientious in comparing delivery methods, in the analytical phase, VfM may be without sufficient exposure to those who might take a contrary view on the nature of the risks, their value or their probability under both scenarios. As part of its ongoing efforts to make improvements to its VfM process, IO should find practical ways to institutionalize the useful potential and impact of contrary viewpoints.

Efforts to refine and bolster the VfM process over time have focused on more transparency and empirical reliability. These reforms include use of more objective, experience-supported data, both domestic and international. Progressive elimination of results-biasing embedded costs is also incorporated in this new process, including financial assumptions, such as the distorting effect of imputed discount rates.

Prior to the 2014 Auditor General's report on Ontario's AFP program, IO began a process to update its VfM methodology and associated calculations. The major changes were:

**a) Simplified risk matrices** (all risks are independent/unique; all definitions were clear; why AFP is better/different at handling a risk; and, risk values are stress-tested and defensible);

**b) Introduction of an innovation factor** (establishment of the "innovation factor" that recognizes the value creation that can come from an integrated scope under AFP);

**c) Introduction of lifecycle adjustment factor** (to reflect the fact that AFP must fund lifecycle and so-called "hand-back" costs, while traditional projects may not, even with asset management plans); and,

**d) Removal of competitive neutrality concept** ("normalizing" insurance and tax allowances between traditional procurement and AFP).

Some continue to challenge IO to do more in decision-making and project award transparency (Valverde, 2017a; Siemiatycki, 2007). The fact that IO now makes public the summary results after projects receive the go-ahead contributes to greater transparency, but the process remains somewhat opaque during the deal-evaluation phase.

### Delivering Better Value-for-Money in the AFP Process

The Auditor General and others, as well as IO's own self-examination, generated a list of shortcomings or concerns with the AFP and VfM processes, as well as raising the important issue of project selection. As a result of the identified concerns, many of these issues have been addressed by IO (Cory, 2016, pp. 24-27).[14]

Despite these changes, three other continuing cost-driving factors deserve more scrutiny.

First, while individual risks and the probability bands of these risks are well documented, barring a "black swan" event, it is unlikely that all or most of those risks would ever befall a project. There would be merit in mitigating the aggregate potential impact of risk in some fashion, based on the record of the substantial number of projects that have now undergone AFP delivery. Although some bidders may price in this consideration to some extent, the size of the typical contingency (known as "Post Contract Contingency" or PCC) should likely be reduced, to reflect both the unlikely aggregate impact of individual risks and the experience to date. (For description of PCC, see Glossary re: Contingency).

Second, there is also a recurring need to decide which specific risks belong with the private sector bidders. While IO may ask the private sector bidder to accept a risk and the private sector bidder may accept it to win the contract, some risks do not belong with the private sector. Stringent legal terms then bolster the effort to shift those risks to bidders. Eliminating the effort to transfer inappropriate risks to the private sector bid consortium should reduce the actual costs being paid by the owner and, by extension, the taxpayer. It also would help to expand the list of otherwise qualified firms, notably mid-size or regional firms, that can justify bidding.

For example, some environmental factors, such as unforeseeable soil conditions, may be unknown by both sponsors and bidders. As a result, bidders would have little capacity to remediate them within the bid price. It is likely more reasonable for the public sector to absorb that potential risk as part of its large portfolio of environmental remediation obligations. The alternative is forcing bidders to pledge their balance sheets on – at best – an educated guess, or to try to insure against the risk, which likely results in fewer, more costly bids or on big contracts, existential risks to Ontario firms.

A similar case could be made for other costly "unknowns", such as poorly documented underground services in a dense urban environment. Later in this paper, the potential for reducing "permitting" risk is cited as another example of placing a risk in the hands of those with true mitigation capacity.

Third, after over a decade, the AFP market has matured.

Successful repeat bidders have become quite adept at identifying where specific costs can be reduced and where identified risks are overstated. Some interviewees questioned whether IO's inventory of actual experience is being used effectively to drive down the risk estimate or costing for value-for-money (VfM) comparison purposes.

Like property appraisals, the quantity surveying and construction cost estimates employed by IO tend to mirror the past. That history may not reflect current and predictable future costs. IO should likely be reducing its cost estimates to reflect the contemporary regional construction environment.

**FOR 14:** To deliver better value-for-money, IO should consider:

- **i.** Taking measures to reduce the aggregate estimate of individual risks.
- **ii.** Adopting in-house measures that ensure contrary viewpoints are heard when evaluating candidate projects for AFP.
- **iii.** Reassessing (and in specific instances, reducing) the risks that should belong with the private partner in an AFP project, as well as the contractual measures used to impose them.
- **iv.** Strengthening bidding opportunities for local firms by encouraging mergers to generate scale, eliminating inappropriate risks, and having government assist with the permitting process.
- **v.** Updating the current and projected cost assumptions used in the value-for-money model to reflect the contemporary construction cost and labour cost environment prevailing in Ontario, and actual experience with individual projects' cost elements.

## KEY CAPITAL QUESTIONS FOR THE ONTARIO GOVERNMENT

### Why can't conventional public procurement achieve what AFP achieves?

To many, especially among the critics of the P3 model, the question is whether it is necessary to take on the cost and complexity of AFP to avoid the recurrent failures of public procurement? This is the essence of the Auditor General's 2014 contention that traditional procurement should be able to replicate AFP's results at a lower cost. She believes that this should be possible, in part, by using lower-cost public finance. This lower-cost funding source would be complemented by practices used successfully by AFP: transferring appropriate risk to the private sector via contract; using good project governance and project management to avoid scope-creep and change orders; and, providing incentives and penalties to encourage completing a project on time and on budget, and maintaining it in good working order (Auditor General, 2014, p. 199).

Fundamentally, AFP shifts "judgment calls" on mitigation from the public authority to the construction consortium. For traditional procurement, government funders may have the determination to require both contractors and dependent public entities to respect contract conditions, particularly for straightforward work, like highway resurfacing. For more complex projects, the record is replete with demonstrations to the contrary.

**FOR 15:** Particularly when faced with influential stakeholders or in-process project developments, both governments and broader public-sector entities will frequently fail the Auditor's test: "… a willingness and ability on the part of the public sector to manage the contractor relationship and enforce the provisions when needed" (Auditor General, 2014, p. 199). Historically and overall, the record surveyed here shows the cost of those recurrent failures greatly exceeds the additional cost of AFP.[15]

The Auditor General's comments could be construed as being somewhat idealistic but they are not without merit. There is certainly a case to be made for incorporating several positive AFP provisions and practices into traditional tendering and procurement. This is especially valid for smaller projects where full-blown AFP cannot be justified. AFP-type provisions in traditional procurement processes can help to bolster the ability of public authorities to resist mid-course corrections and to dampen optimism bias (scope-creep, change-orders, budget adjustments, etc. [Siemiatycki, 2010b]). They can also provide more incentives for innovation, quality and timeliness.

**FOR 16:** Adopting IO's approach and / or using IO as a contract manager on procurement might offer a bridge between full-blown AFP and traditional municipal procurement.

### Real savings – or low-hanging fruit?

The comparison of AFP to conventional procurement, both through VfM and in absolute terms, relies on an apples-to-apples comparison. However, subtle factors, such as the use of the discount rate on long-term AFP projects can materially affect the result.

Under AFP, if one is trying to keep within budget and on schedule, there is an undeniable incentive to be generous in the initial estimates of both cost and the delivery schedule (Auditor General, 2014, p. 199).

Conventional procurement processes have the reverse bias. Too often, projects developed and tendered through the traditional public procurement process suffer from low estimates. That may be innocent enthusiasm, or it may be tactical. Initially, low project estimates of cost and delivery time and optimistic service performance projections may help to secure approvals from rationed capital budgets. Later, along with construction cost inflation and scope-creep, they may be undermined by the amount of time taken to select and authorize infrastructure projects (Siemiatycki, 2010b).

In Ontario, both big provincial ministries and larger municipalities can ultimately fall back on multi-year portfolio funding of capital expenditures. Overages on one project can be offset by delaying or re-profiling others.

These risks were confirmed by Oxford's Bent Flyvbjerg, in "Cost Underestimation in Public Works Projects: Error or Lie?" and then reconfirmed in 2014 (Flyvbjerg, 2002; 2014). He found that for traditionally delivered public sector projects, actual project costs were 28 per cent higher than estimated. In nine out of 10 transportation infrastructure projects, costs were underestimated.

## CREATING AND SUSTAINING A COMPETITIVE MARKETPLACE OF QUALIFIED BIDDERS AND SPONSORS

Ontario taxpayers will be better served if there are a healthy number of qualified bidders for major infrastructure projects. That logic extends to very large projects, where the scale of the work runs the risk of eliminating many competent smaller domestic firms, at least as general contractors or major consortium participants. Smaller firms are eliminated either because they do not have the experience or in-house expertise to complete required procurement documents to the required level. Moreover, they may decide that taking on the business risks associated with complex, uncertain and expensive projects are too high. In addition, the procurement authority may not trust their ability to deliver, whether for lack of financial assurance, technical capacity reasons, previous shortcomings or perceived lack of equivalent experience.

In particular, project managers with proven success managing large, integrated infrastructure construction projects are in great demand and in short supply. This is an area where large international firms claim an advantage.

It is unfortunately equally the case that some public agencies have also made the traditional procurement process cumbersome, expensive and unpredictable. In some instances, overt political involvement can contribute to the complexity. Overly detailed specifications and unique, business-affecting legal and financial assurances add to the challenge of securing a range of qualified bids. For traditional procurement in Ontario, particularly by municipal and transit authorities, the absence of standardization means many costly idiosyncratic and punitive contract conditions and processes continue to confront bidders and inevitably, drive up costs.

The overall result is that many small and some not-so-small firms decline to bid on public tenders and requests-for-proposals. These are patterns that can produce fewer return bidders and less competition. Those that do bid predictably price in the added cost and risks of uncertainty. Too often, successful bidders appear to aim to achieve profitability through scope alteration and change orders during the construction phase. The loser in this process is the taxpayer.

For its part, IO has responded by suggesting that global infrastructure firms, with experience building similar infrastructure in other jurisdictions, will be part of the solution (Wall, 2016).

> Ontario-based firms have also developed a significant capacity to build so-called social infrastructure – such as hospitals and jails. However, some have suggested that larger, integrated infrastructure projects – like rapid transit and energy generation – can be too much of a financial and engineering challenge for purely domestic consortia.
>
> Domestic industry leaders disagree, arguing that such attitudes by procurement authorities and global bid consortia leave domestic construction firms "on the sidelines" for some of the largest infrastructure projects. They also point to examples of larger projects, where they claim global firms unfamiliar with Ontario conditions and local requirements failed to deliver as promised.

AFP can help to provide a platform for domestic firms to learn international best practices from larger global firms. The government (and IO) should adopt measures that make it as easy as possible for domestic firms to participate in major infrastructure projects, through training, requiring project open houses, publicizing opportunities and the weighting of bid-evaluation criteria.

The public policy question may not be one of whether more international competition should be introduced into the Ontario infrastructure market; but rather, where, on what terms, with which partners, and with what legacy for Ontario and its economic and project management capacity?

**FOR 17:** Beyond promoting beneficial bid and price competition, international participation in AFP should enhance, not undermine, the effort to increase the capacity of the domestic infrastructure industry, especially in large project management.

**FOR 18:** Promoting international competition should be accompanied by government efforts to build local knowledge and capacity to enable greater participation.

### Do size and experience matter? Opening AFP to more bidders

IO does note that bigger is not necessarily better for some infrastructure assignments. The effect of combining many unrelated elements of a project in the hands of a successful bidder without the expertise to integrate them can introduce a range of integration and delivery risks.

One might consider the famous example of cost overruns in the Boston airport tunnel ("Big Dig") project, which combined unrelated work in a huge single contract, simply to achieve scale. Such projects run the very real risk of costly integration problems, where incentives work against cost reduction and innovation. They create a greater risk of duplication, higher total procurement costs and an inability to effect cost-reducing value engineering across the whole venture (Cory, 2016).

Some argue for breaking up very large infrastructure projects, so that Ontario-based firms would have a greater opportunity to participate in the bidding consortia and so the domestic consortia themselves would be more easily able to secure the contingent financing necessary to win AFP projects.

Others rightly caution, however, against efforts to disaggregate large, integrated infrastructure projects into smaller digestible phases or components. Synergies of networked and integrated infrastructure can easily be lost, and with it some of the unique advantages of attracting global firms with that experience.

While IO appears to understand the problem, its track record would suggest that it has yet to find the solution. The goal of ensuring best value by promoting competition among bidders seems to fail when few firms bid or are successful on IO engagements (Auditor General, 2014, p. 210).

AFP is a work in progress. Recurrent winning bidders are becoming better at dealing with the process. Greater transparency in those winning bids and the way that they were scored would assist other aspirants to compete more successfully for future AFP contracts.

There are precedents for efforts to widen the marketplace for contractors on public projects. In the past, substantial efforts were made to widen participation in contracts for maintenance of Ontario government properties. Despite those efforts, several major firms continue to dominate in both AFP and traditional contract awards (Auditor General, 2014, p. 210).

As part of its response to the desire to widen the market, IO points to the recent round of bids for major transit projects, which have attracted a wide and diverse array of bidders, with bid consortia combining both domestic and foreign participants (Wall, 2017).

### The impact of large-scale projects

The other major threat to a vibrant and competitive marketplace for construction-related services is the increasing scale of infrastructure projects. While no one would discount the complexity of hospital or courthouse projects, or the challenges of delivering the multi-venue 2015 Pan Am Games facilities on time, they are an order of magnitude below the kinds of transportation, energy and city-building projects currently underway or being contemplated.

For its part, IO claims that early indications, based on ongoing rapid transit and rail projects, is that the market has matured and is capable of taking on the billions in infrastructure projects in the offing. IO appears satisfied that domestic firms have developed expertise and capacity, and that large foreign firms are enlisting them as part of bid consortia. The test of this confidence will be in the number and quality of the bids received, the availability and competence of project managers, and in the value-for-money evaluation of their bids (Wall, 2017). IO appears to realize the importance of assuring there is adequate demand to keep the industry working and adequate domestic and foreign market capacity to meet those demands.

**FOR 19:** An expanded marketplace of qualified bidders – and awards to a wider number of bidders – are the best protections against the risks of a narrow, uncompetitive Ontario public infrastructure construction environment.

### Does AFP unfairly favour international competition or penalize the domestic construction industry?

In looking to attract international firms to bid and build projects, one must be conscious of how and why it is done. Among domestic firms and trades, some worry about processes that have the net effect of biasing bidding in favour of international consortia, whether for AFP projects or traditional procurement.

> In practice, foreign firms use domestic sub-contractors and local labour. But the structure of the consortia may make subcontracted work unprofitable for domestic contractors and by extension, depress wage rates and squeeze local suppliers.

Similarly, there may be an assumption that foreign firms with global experience and scale can produce results that domestic firms cannot. In fact, there are examples of very large and competent domestic firms being deemed unqualified or inexperienced for some projects.

> Only when the foreign firms prove unable to deliver on optimistic delivery times or produce work unsuitable for Canadian conditions is justification for excluding domestic firms called into question.

## WIDENING AFP'S REACH AND LOWERING BARRIERS TO PARTICIPATION AT THE LOCAL LEVEL

Something in the order of 60 per cent of public infrastructure in Canada is owned and operated by local authorities of various kinds.[16] Theoretically, this should be a primary market for P3 and AFP infrastructure projects, as well as for the consulting expertise of IO. This mutual engagement has begun with rapid transit and the 2015 Pan Am Games, although the result has often been to use provincial and federal funding to move projects away from direct local control.

Why are municipalities and other local authorities, other than hospital boards, slow adopters of AFP and P3? There appear to be three primary reasons.

First, larger Ontario municipalities usually have a very low cost of capital and in many cases, a capacity to finance capital projects from extensive reserves. Some of the biggest Ontario municipalities have a credit rating that's better than the Province. They view the added cost of P3 private financing as an unnecessary and avoidable expenditure.

However, in moments of candour, some interviewees from that sector also suggested that they

tend to underestimate the offsetting risks of cost overruns, delay and unforeseen circumstances specifically addressed in IO's VfM matrix. But as noted above, larger municipalities have a capacity to offset over-budget projects elsewhere in their multi-year portfolio of capital projects.

Second, beyond major public transit and city-building infrastructure, the scale of municipal infrastructure projects can be seen as too small to justify the significant up-front costs and due diligence required by AFP processes. While local governments may have the majority of public infrastructure, that is an aggregate number made up of thousands of small infrastructure facilities and systems.

Third, AFP and P3 processes require expertise and experience not readily found in local government. Much of local government infrastructure has been designed, built and financed by public authorities and / or by the land-development industry. The construction industry, the financial services industry, and the Ontario ministries that provide regulatory oversight (and, on occasion, funding) play very specific and circumscribed roles in municipal projects.

Municipalities are generally unwilling to engage the range of expensive third-party professionals that are required to mount and execute an AFP or P3 project, unless it is an explicit condition of provincial and federal funding. They are also frequently unwilling, for political and labour relations reasons, to transfer to the private sector or others the responsibility for owning or operating municipal infrastructure.

With these impediments in mind, the Government of Canada and the Federation of Canadian Municipalities, which is negotiating on behalf of the municipal sector, appear to have defaulted to the traditional cost-sharing formulae for conventional procurement (Bryden, 2016). There is risk in this approach. The amount of funding to be leveraged by the provincial and federal infrastructure programs (such as through the Canada Infrastructure Bank) anticipates significant private-sector financial participation, which has been virtually non-existent in traditional Canadian municipal infrastructure procurement, outside of major transit and energy projects.

Much has been made of the great potential for public-sector pension plan investment in Canadian infrastructure, and the willingness of pension funds to invest for a reasonable risk-adjusted rate of return for their pensioners. OMERS' investment in Bruce Power's nuclear reactors refurbishment is a multi-billion dollar case in point. But La Caisse de dépôt's Montréal regional transit project (REM) is unlikely to have been proposed as a conventional municipal project. Pension-fund investment in infrastructure is a broader topic than can be addressed here; but there is need to recognize the preference of large pension funds for infrastructure projects with a minimum scale, a proven track record, and regulatory certainty when making their investments.

Are municipalities leaving money on the table and diminishing the range of potential projects by avoiding AFP and P3 processes? It certainly seems unlikely that municipal projects would be attractive to the Canada Infrastructure Bank under these conditions (Bryden, 2016; Siemiatycki, 2016a; Infrastructure Canada, 2017).

## Involving municipalities

There are ways in which local governments could benefit from AFP and P3 processes and some have had success doing so, especially for large projects or where their internal financial and technical capacity is insufficient or strained to undertake a large infrastructure project.

Much of municipal, school board and transit infrastructure is generic (local bridges, water lines, wastewater treatment and sewers, storm water infrastructure, public housing, elementary schools, etc.). Municipal procurement would likely benefit from fewer costly idiosyncratic designs, more intermunicipal collaboration, and advanced construction techniques. Much more of that local infrastructure could be standardized to benefit from economies of scale and from international industry-standard specifications, with transit vehicles, firefighting apparatus and facilities-management systems being potential examples. As motivation to use AFP/P3s, municipalities and other local bodies certainly have had too much historical experience with traditional capital projects being over budget, delayed, or abandoned due to lack of capacity or indecisiveness.

There is an opportunity for IO and the appropriate municipal associations to work together to develop AFP options that would be more suitable for the local government context. The same might apply to other local bodies, like school boards or social housing authorities. Among other considerations, it would help to avoid the current pattern of individual local governments endeavouring to craft their own P3 models, with all the risks and costs that entails.

One option that has been successfully employed is "project bundling." Under this process, similar kinds of work (e.g., county bridges in need of refurbishment and ongoing major maintenance, or OPP detachment buildings across Ontario) are tendered to a single general contractor or bid consortium, in a time-limited, set-price contract. The winning bid consortium uses repetitive processes and standardized designs to effect savings, often employing local delivery agents bound to centrally determined design specifications and execution provisions.

> *"One example of the power of bridge bundling is found in Missouri, which in the fall of 2008 launched an ambitious $685 million program to improve or replace 802 bridges statewide within five years. The 554 bridges slated for replacement were bundled into a 2009 mega design-build contract – the first of its kind in the nation – with a joint-venture contractor comprising national industry players. With an aggressive target completion date of December 2014, the contractor tackled the project by engaging, among other firms, more than 100 Missouri contractors and subcontractors, which lowered costs and boosted local knowhow. Such efficient sourcing, combined with collaboration and economies of scale unprecedented in bridge rehabilitation programs, contributed to the 554 bridges being replaced a full year early – and under budget." (Price, 2016)*

Another recent example of the potential of a bundling project is the Pennsylvania Rapid Bridge Replacement Project, which aims to replace 558 bridges across the state under a P3 contract (Pennsylvania, 2015).

In other cases, financial services entities, like pension plans, bundle the debt obligations associated with a number of projects, such as transit lines and buses, thus simplifying and standardizing the financing arrangements needed for procurement, construction and revenue guarantees.

It should be noted, however, that not all bundling is beneficial. As IO has said, consolidating unrelated activities does not create synergies and can dramatically reduce the number of firms with the capacity or willingness to bid on such contracts (ReNew, 2013). Procurement authority Stephen Bauld also cautions about the procurement risks of bundling (Bauld and Ackerley, 2013).

Provincial support would also be necessary to encourage project bundling, for schools and municipal projects, where appropriate. (Perhaps the Canada Infrastructure Bank can play a role?) For example, over time, pension-fund financing and/or bundling of school projects has produced progressively better results, originating in Nova Scotia and New Brunswick, but ultimately being refined in Alberta and Saskatchewan.

With the Ontario municipal sector, IO's experience goes beyond AFP. IO has an active program of successful debt financing for small municipalities with limited and otherwise expensive access to the credit market. For several of the Pan Am Games and major transit projects (Waterloo Region, Ottawa), IO has positioned itself as the Owner's Adviser, rather than the municipality's procurement agent, enabling municipalities to maintain more control of the project but accepting much of the discipline and expertise of the AFP process.

**FOR 20:** Building on growing familiarity with one another's operating environments and areas of expertise, IO and the municipal sector should be able to develop a more cost-effective version of AFP to meet municipal needs across the province.

This might include the potential to undertake a slate of analogous or "generic" projects. It might equally be used to promote evidence-supported, business-case analysis to plan and to justify projects. Both options have the additional benefit of insulating municipal projects more effectively from the risks of what the investment world calls "moral hazards," such as estimate optimism, weak business cases, political intervention, lack of objective regulation, and in-process "scope-creep."

One of the areas where municipalities, in collaboration with the Province, could reduce the risk profile facing bidders is to address the risks associated with "permitting." One of the big barriers to timely project completion can be an inability to secure requisite and timely inspections and approvals from public authorities. Implicitly, bidders are accepting that risk when they guarantee a delivery date. In practice, the timetable for producing permits is usually much more in the hands of public authorities than permit applicants. By playing a more active role in guaranteeing timely processing of permits for their own infrastructure projects, public authorities can reduce the risk facing bidders. This, in turn, would reduce both bidders' costs and municipal project costs.

# PROJECT INNOVATION

## WHERE'S THE INNOVATION?

In 2015, IO commissioned Altus to explore the degree of innovation that has been achieved using AFP and what measures might be taken to increase innovation (IO, 2015). Altus drew on an earlier study and industry survey undertaken by the engineering consulting firm MMM Group, to suggest that innovation could produce savings of 10 per cent to 15 per cent, and in some cases as high as 20 per cent to 30 per cent (Altus, 2015a; MMM Group, 2011, p. 6).

Logically, design specifications that are less prescriptive and focus more on infrastructure outputs / outcomes would enable bidders to offer solutions that are viable alternatives to those anticipated by the public entity and its design consultants (which would have traditionally been reflected in detailed specifications). Civil engineering industry designers and construction firms typically have a wealth of experience in similar projects. Conversely, while the project sponsor's staff will have a more intimate knowledge of the underlying needs of the sponsor, they may only be involved in a few analogous major projects during their careers.

Both Valverde and Siemiatycki observe that moving away from a contract-specifications approach in P3s, to a more organic partnership between sponsor and builder can produce synergies and solutions that were unlikely to have been produced alone by either side of a P3 transaction (Roberts and Siemiatycki, 2015; Valverde, 2017b).

Moving away from detailed tender specifications has its risks. So-called performance-based specifications open the door to omissions, subjectivity or mistakes that might have been captured in detailed specifications. Some oversights or imprecision may not reveal themselves until construction delays and cost overruns emerge at a later point in the project.

There is often a temptation to go into considerable detail in specifying contract conditions, theoretically to ensure greater clarity. However, the more the project proponent specifies its "input" requirements in detail, the fewer the options that remain to bidders to address construction and other issues with innovative alternative or equivalent approaches.

If, however, project sponsors can resist this temptation, in favour of inviting bids that propose clear and practical project results or objectives (i.e., "outputs" or even, "outcomes"), the dynamics within the consortium can often generate innovative and risk-sharing solutions. In fact, IO reports that more results-oriented specifications routinely produce a wider variety of proposed solutions to meet project requirements.

But bidders remain cautious, fearing that innovative solutions may have a lower prospect of success than conventional solutions, even though such innovations require a greater investment in time and money to develop. Some bidders report a belief that alternatives are not always being seriously solicited, given the weight they are given in scoring criteria, especially if the project sponsor is predisposed to a predetermined infrastructure concept. There are also concerns that in-process innovative solutions put forward by winning bidders once work is underway are rarely accepted by the public sponsor and can delay the project.

It may be simply a case of the public sponsor (or IO) clearly signalling its preferences. For bid consortia, that can be done through either guidelines or revealing the bid-scoring criteria at the pre-qualification stage. In project design, preferences can be signalled by requiring less in costly initial submission details, when the preferred course might still be altered with innovative or competitive bids, but moving to much more precise requirements in the subsequent phases. This should result in more ideas being put forward by more bidders, but with less expense to bidders, until a more advanced stage in awarding the contract.

### Sustainable innovation

Innovation involves more than measures to improve the bid price, construction processes or the design of the infrastructure. Innovation can also make a material contribution to promoting lifecycle costing of infrastructure (in both traditional and AFP delivery), to reducing the carbon footprint of projects (both in construction and during operational performance and refurbishment), and to selecting the "best available solutions" (e.g., natural mitigation vs. culverts and concrete in stormwater systems).

The development of this so-called "three-screens" approach has been supported by a number of industry participants and advocated to government, as part of procurement reform. As the federal and provincial governments develop their infrastructure criteria, this "three screens" approach may be a much more practical than ill-defined policy commitments to sustainability or good asset management practices (Freeman, 2017).

**FOR 21:** At its most effective, AFP is about more than money. Innovative solutions to infrastructure challenges – and encouraging them at an early stage in procurement – can produce lower-cost approaches and additional capacity at the same or a comparable price.

**FOR 22:** Innovation can also produce opportunities to incorporate productivity-enhancing or maintenance-reducing technologies and to achieve future-oriented economic, environmental and social objectives.

Both P3s and AFP had their origins in financial considerations. IO's roots are in the financial services industry and much of the innovation that IO and AFP represent were achieved through financial (and legal) innovation. With maturity, IO's staff must continue to reflect the full range of professional disciplines on which infrastructure success depends, including design, construction, network systems and ongoing operations.

Performance-based specifications may have a particular advantage for IO. The range of expertise around the table in the VfM workshop, for example, examines risks from more than simply a financial perspective, even if the results are expressed in dollar value calculations. It is a positive dynamic in a field too often constrained by precedent and conventional approaches.

As projects become larger and more complex, innovation should increasingly come from design, engineering, construction techniques, technology, and facilities management, and their synergistic integration and replication. The focus for IO should be to encourage innovation from those non-financial fields, both for cost containment and for infrastructure performance.

### What is innovation worth?

If AFP succeeds in achieving project innovation, the dividends for the taxpayer are potentially very considerable. Savings in infrastructure budgets also make possible additional infrastructure investments. Altus found that an "innovation adjustment factor" of at least five per cent, and up to 12 per cent, is defensible for a project delivered through a DBF delivery model. (See Glossary re: DBF and DBFM). For a more comprehensive DBFM delivery model, it raised the "innovation adjustment factor" to between 11 per cent and 18 per cent (Altus, 2015a, p. 22).

IO's own analysis, using specification-based AFP estimates contrasted against actual AFP bids, shows a range of potential innovation-related cost-savings from seven per cent to 12 per cent for typical DBFM projects and in the range of 10 to 15 per cent for DBFM projects, if the full AFP approach is used (IO, 2015, p. 6).

One caution persists. IO suggests that specification flexibility (and competition) led to lower average bids than the projected cost of projects. It attributes this to "innovation." This is a financial measure, in keeping with IO's traditional financial orientation to design, construction and operation. Although potentially warranted, some of the savings appear to stem for scaling back the volume of construction required, by reducing building footprints and eliminating unnecessary design features.

Some reduction by redesign may be "innovation."

- Transit stations do not need to be architectural statements that are difficult to integrate with rapid transit lines. As Madrid Metro demonstrated, there is merit in rapid transit stations that are utilitarian, customer-oriented and easily replicable. When they are, capital and operating costs come down and passengers move more efficiently.
- Grand, costly hospital atriums were a symbolic justification for the creation of AFP. Hospitals and courthouses do not require signature architecture to meet the needs of those they serve. However, if innovation means cramped common areas and surgical suites, crowding patients in an emergency room, or eliminating storage capacity, those changes are parsimony, not innovation. Value engineering's measure must be both reducing cost and sustaining the same or better functional performance.

Research into the full range of innovation potential at various stages of design, financing, construction and operation is beyond the scope of this report. It is further complicated by the fact that there are greater innovation opportunities in projects with greater scale and complexity – commensurate with their higher risk profile. The potential for innovation also increases with the introduction of operation and maintenance features in AFP projects. More routine and generic individual projects may have less innovation potential. However, a high-level evaluation, based on the percentages determined by the studies mentioned above, suggests a potentially significant "innovation dividend."

Considering the ranges suggested (five to 18 per cent savings through innovation), the potential savings could be at least 10 per cent of project costs, when balanced out across a diverse portfolio like the Long-Term Infrastructure Plan and related federal and local government projects.

Whether by innovation or modesty in design, if cost reductions in the order of 10 per cent can be realized, the potential savings to Ontario would be very significant. The proposed "Ontario's Long-Term Infrastructure Plan" projects approximately $160 billion over 12 years. The Ontario capital plan forecasts more than $125 billion in net capital expenditures over the remaining next nine years of that plan (see Table 1).[17] An innovation "dividend" of 10 per cent would be very significant if it could be achieved over that portfolio.

**FOR 23:** Innovation in AFP could translate into multi-billion dollar potential savings across the emerging Long-Term Infrastructure Plan, while advancing social, environmental and economic goals.

# BIBLIOGRAPHY


Akbiyikli, R. and D. Eaton (2006). "*A Value For Money (VFM) Framework Proposal for PFI Road Projects*", in *Sustainability and Value Through Construction Procurement*, (Salford, U.K.: November 29, 2006); pp. 18-36; found at: https://www.irbnet.de/daten/iconda/CIB1848.pdf

Altus Group (2015a). *Assessment of Innovation through AFP Project Delivery*, Infrastructure Ontario (Toronto: September 22, 2015) 22 pp.

Altus Group Limited (2015b). *Value for Money Risk Analysis Review, Hospital Projects: Design, Build, Finance, Maintain* (Toronto: March, 2015).

Altus Group Limited (2014). *Infrastructure Ontario AFP Track Record Report* (Toronto: October 16, 2014); 29 pp.; found at: http://www.altusgroup.com/newsroom/blog/2014/infrastructure-ontario-afp-track-record-report/

Association of Chartered Certified Accountants (ACCA) (2002). *ACCA Members' Survey: Do PFI Schemes Provide Value for Money?* (London, U.K.: September 2002); 34 pp.

Auditor General of Ontario (2015). *2015 Annual Report*, Queen's Printer for Ontario (Toronto: December 5, 2015); 774 pp.

Auditor General of Ontario (2014). *2014 Annual Report*, Queen's Printer for Ontario (Toronto: December 9, 2014); 595 pp.

Auditor General of Ontario (2012). *2012 Annual Report*, Queen's Printer for Ontario (Toronto: December 12, 2012); 455 pp. 213 ff.

Auditor General of Ontario (2008). *2008 Annual Report*, Queen's Printer for Ontario (Toronto: December 8, 2008); 498 pp.

Auditor General of Ontario (1999). *1999 Annual Report*, Queen's Printer for Ontario (Toronto: November 16, 1999).

Auditor General of Ontario (1998). *1998 Annual Report*, Queen's Printer for Ontario (Toronto: 1998).

Bauld, Stephen and Glenn Ackerley (2013). "*All Wrapped Up: how a balanced approach to bundling construction projects could minimize its negative effects on industry and promote growth of local communities*," *ReNew Canada*, Actual Media Inc. (Toronto: December 4, 2013); found at: http://renewcanada.net/2013/all-wrapped-up/

Bechtel, Brendan (2016). "*Emergency, emergency, this is America's infrastructure calling: Brendan Bechtel*," in USA Today, Nov. 27, 2016: found at: http://www.usatoday.com/story/opinion/2015/11/26/infrastructure-spending-building-bechtel-column/76267138/

Boothe, Paul, Felix Boudreault, Dave Hudson, David Moloney and Sandra Octaviani (2015). *The Procurement of Public Infrastructure: Comparing P3 and Traditional Approaches*, Lawrence National Centre for Policy Management, Ivey School of Business, Western University (London, Ont.: 2015); 27 pp.; found at: https://www.ivey.uwo.ca/cmsmedia/1964203/comparing-p3-and-traditional-approaches.pdf

Bryden, Joan (2016). "*Smaller towns may not benefit from infrastructure bank: Morneau*," Maclean's, (Toronto: November 22, 2016); found at: http://www.macleans.ca/politics/small-municipalities-infrastructure-bank-morneau/

Budden, Brian (2017). "The debate over private infrastructure financing in the United States: Financing costs are higher, but the results are worth it," *Commentary*, McKinsey and Company, Washington, DC: April 2017); found at: http://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/the-debate-over-private-infrastructure-financing-in-the-united-states?cid=other-eml-alt-mip-mck-oth-1704&hlkid=f3a4ca5d283d47faba9b3cb48d1880d2&hctky=9924686&hdpid=2b4d9a1d-0063-474b-a7cf-b5606b4787a2

"BuildON: 2017 Infrastructure Update" (2017). Government of Ontario, Ministry of Infrastructure (Toronto: January 17, 2017); found at: https://www.ontario.ca/page/buildon-2017-infrastructure-update

Canada, Government of (2017). *Canada Infrastructure Bank Act*, Division 18, section 403, of the *Budget Implementation Act*, 2017, No. 1, Royal Assent June 22, 2017 (Bill C-44, 2017) (Ottawa: June 22, 2017); found at: http://www.parl.ca/DocumentViewer/en/42-1/bill/C-44/first-reading#enH12005

Cory, Ehren (2016). "*Building Better Assets: Success factors in modern project delivery*," *ReNew Canada* September/October edition, Vol. 13, No. 5, Actual Media, Toronto, pp.24-27; available on-line as "*Modern public infrastructure project delivery*," in *ReNew Canada*, posted July 4, 2016; found at: http://renewcanada.net/2016/modern-public-infrastructure-project-delivery/

Della Rocca, Michael, "*The rising advantage of public-private partnerships*" (Della Rocca, 2017), McKinsey & Co. (New York: July, 2017); 5 pp.; found at: http://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/the-rising-advantage-of-public-private-partnerships#

Ditta, Sara, Michael Fenn, Matthew Mendelsohn, and Robert Puentes (2015). *Vital Capital: Using Alternative Procurement and Financing Models to Capitalize on the 'Infrastructure Moment' in the Great Lakes and St. Lawrence Region*, Council of the Great Lakes Region and the Mowat Centre, Research Paper #114, (Toronto: December, 2015) 58 pp., notably Table 6 on page 36; found at: http://mowatcentre.ca/vital-capital/

Duffield, Colin, and Peter Raisbeck (2007). *Performance of PPPs and Traditional Procurement in Australia: Report to Infrastructure Partnerships Australia*. The Allen Consulting Group & The University of Melbourne (Melbourne: Nov. 30, 2007); 57 pp.; found at: http://www.irfnet.ch/files-upload/knowledges/IPA_Performance%20of%20PPPs_2007.pdf

Duffield, Colin, Peter Raisbeck, Ming Xu (2008). "*Report on the performance of PPP projects in Australia when compared with a representative sample of traditionally procured infrastructure projects*," National PPP Forum – Benchmarking Study, Phase II, Melbourne Engineering Research Institute, University of Melbourne (Melbourne Australia: December 17, 2008); found at: http://www.cefoppp.org/upload/pdf/Report_on_the_performance_of_PPP_projects_inAustralia_when_compared_with_a_representative_sample_of_traditionally_procured_infrastructureprojects_20120524154505.pdf

Duvall, Tyler, Mike Kerlin, and Rob Palter (2017). "*Creating an infrastructure bank: Principles of success*," McKinsey and Company, (Washington DC: April 2017); found at: http://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/creating-an-infrastructure-bank-principles-of-success

The Economist (2016). "*Rigging the bids: Government contracting is growing less competitive, and often more corrupt*," (London: Nov. 19, 2016); found at: http://www.economist.com/news/europe/21710315-government-contracting-growing-less-competitive-and-often-more-corrupt-rigging-bids

Fenn, Michael (2015). "*Building Our Tomorrow: The Future of Ontario's Infrastructure – How the impact of megatrends and rise of new infrastructure will change the province (and Canada)*," Residential and Civil Construction Alliance of Ontario (RCCAO) (Vaughan, Ont.: September 2015); found at: http://www.rccao.com/news/files/RCCAO_Future-of-Infrastructure_Sept2015.pdf

Fenn, Michael (2016a). "*Government Inc. A new book questions the efficacy of public-private partnerships.*" Literary Review of Canada (Toronto: January-February 2016); http://reviewcanada.ca/magazine/2016/01/government-inc/

Fenn, Michael (2016b). *Megatrends: The Impact of Infrastructure on Ontario's (and Canada's Future*, Residential and Civil Construction Alliance of Ontario (Vaughan, Ont.: July 2016) 68 pp. found at: http://rccao.com/research/files/RCCAO_Future-of-Infrastructure_JULY2016_WEB.pdf

Fenn, Michael (2014). *Unlocking Ontario's Advantages: Building new infrastructure on the foundation of existing public assets*, Residential and Civil Construction Alliance of Ontario (RCCAO) (Vaughan, Ont.: December 2014) 122 pp.; See: "The 'Elephant in the Room' – The impact of Ontario's Highway 407 Electronic Toll Road Experience," pp. 40-50; found at: http://www.rccao.com/news/files/RCCAO_Infrastructure-Investment-Study_Dec2014.pdf

Fenn, Michael and Harry Kitchen (2016). *Bringing sustainability to Ontario's water systems: A quarter-century of progress, with much left to do*, Ontario Sewer and Watermain Construction Association (Mississauga, Ont.: May 2016), notably p. 24; found at: https://www.oswca.org/uploads/oswca_may2016_waterstudyreport_final_001.pdf

Flyvbjerg, Bent (2014). "*What You Should Know About Megaprojects and Why: An Overview*," Project Management Journal, April/May 2014; 14 pp.; found at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2424835

Flyvbjerg, Bent, Mette K. Skamris Holm and Søren L. Buhl (2004). "*What Causes Cost Overrun in Transport Infrastructure Projects?*" Transport Reviews, vol. 24, no. 1 (London: January 2004), pp. 3-18. found at: https://arxiv.org/pdf/1304.4476.pdf and http://www.tandfonline.com/doi/full/10.1080/0144164032000080494a

Flyvbjerg, Bent, Mette Skamris Holm, and Søren Buhl (2002). "*Underestimating Costs in Public Works Projects: Error or Lie?*" Journal of the American Planning Association, Vol. 68, No. 3 (Chicago: Summer 2002), pp. 279-295; found at: http://flyvbjerg.plan.aau.dk/JAPAASPUBLISHED.pdf

Fraser Institute (2013). "*Using Public-Private Partnerships to Improve Transportation Infrastructure in Canada*" (Vancouver: May 2013)

Freeman, Aaron (2017). "*New Economy Infrastructure*," Pivot Strategic Consulting (Toronto: 2017); 3 pp.

Gee, Marcus (2016). "*Short-sighted City Planning Continues to Cost Toronto*," Globe and Mail (Toronto: Dec. 30, 2016)

Gilbert, Richard (2017). "*International coalition creates new system for measuring construction costs*," Daily Commercial News (Toronto: Feb 2, 2017) http://dailycommercialnews.com/Infrastructure/News/2017/2/International-coalition-creates-new-system-for-measuring-construction-costs-1021468W/

Hacker, Jacob S. and Paul Pierson (2016). *American Amnesia: How the War on Government Led Us to Forget What Made America Prosper*, Simon and Shuster (New York: 2016); found at: http://www.simonandschuster.com/books/American-Amnesia/Jacob-S-Hacker/9781451667837

Hancock, Mark (2017). P*ay More, Build Less: Why the Canadian Infrastructure Bank is a bad deal for Canadians*, *ReNew Canada* (Toronto: January/February 2017) pg. 34; See also response: Andy Manahan, Best Practices, Best Infrastructure, *ReNew Canada* (Toronto: March/April 2017); p. 5.

Hanscomb (2015). *Infrastructure Ontario Track Record 2015 Report* (Toronto: September 30, 2015) 35 pp.

Hicks, Steven (2008). *The negative side of PFI, Health Service Review* (London UK: March 2008); p. 13.

Iacobacci, Mario (2010). *Dispelling the Myths: A Pan-Canadian Assessment of Public-Private Partnerships for Infrastructure Investments*, Conference Board of Canada (Ottawa: January, 2010) 83 pp.; found at: http://www.conferenceboard.ca/Libraries/NETWORK_PUBLIC/CTI_DispellingTheMyths_Jan2010.sflb

Infrastructure Canada (2017). "*Canada Infrastructure Bank*," Infrastructure Canada (Ottawa: April 12, 2017); found at: http://www.infrastructure.gc.ca/CIB-BIC/index-eng.html

*Infrastructure for Jobs and Prosperity Act*, 2015, S.O. 2015, c. 15 (2015). Legislative Assembly of Ontario (Toronto: 2015)

Infrastructure Ontario (IO, 2015). "*Assessing Value for Money: An Updated Guide to Infrastructure Ontario's Methodology*," Queen's Printer for Ontario (Toronto: March 2015); 33 pp.

Lammam, Charles, Hugh MacIntyre, and Joseph Berechman (2013). *Using Public-Private Partnerships to Improve Transportation Infrastructure in Canada*, Fraser Institute (Vancouver BC: May 2013) 78 pp.; found at: https://www.fraserinstitute.org/studies/using-public-private-partnerships-to-improve-transportation-infrastructure-canada

Lysyk, Bonnie (2014). "Reflections," 2014 Annual Report of the Office of the Auditor General of Ontario, Queen's Printer for Ontario (Toronto: December 9, 2014); p.7.

Manahan, Andy (2017). "*Industry Perspectives: Creating an infrastructure bank requires a thoughtful approach*," Daily Commercial News (Toronto: June 21, 2017); found at: http://dailycommercialnews.com/en-US/Government/News/2017/6/Creating-an-infrastructure-bank-requires-a-thoughtful-approach-1024923W/

McGuinness, Kevin, and Stephen Bauld (2009). *Municipal Procurement*, 2d ed., LexisNexis Canada (Markham: 2009).

Micallef, Shawn (2016). *Frontier City: Toronto on the Verge of Greatness*, Signal Books, McLelland and Stewart (Toronto: 2016); 272 pp.

MMM Group (2011). "*Budgeting and capital costs in the transit and highway sector: Difference between Design-Bid-Build & Alternative Financing and Procurement*," (Toronto: January 2011).

Murray, Stuart (2006). "*Value for Money? Cautionary Lessons About P3s from British Columbia*," Canadian Centre for Policy Alternatives (Vancouver: June 2006); 10 pp.

Ontario Public Service Employees Union (OPSEU, 2014). "*Epic Fail: A Short History of Privatization in Ontario*," 4th Edition, OPSEU (Toronto: Spring 2014); 15 pp.; found at: https://opseu.org/sites/default/files/2014-05_epic_fail_single_pages_fourth_edition_reduced.pdf

PBS (2017). "*Is Crumbling Infrastructure Inhibiting American Productivity?*" PBS News Hour, Dec. 1, 2016; aired March 10, 2017. http://www.pbs.org/newshour/bb/crumbling-infrastructure-inhibiting-american-productivity/

Pennsylvania Department of Transportation (2015). "*Pennsylvania Rapid Bridge Replacement Project, Statewide*" (Harrisburg PA: July 2015); found at: https://www.transportation.gov/policy-initiatives/build-america/Pennsylvania%20Rapid%20Bridge%20Replacement%20Project%2CStatewide See also: http://bipartisanpolicy.org/wp-content/uploads/2016/10/BPC-Infrastructure-Rapid-Bridge.pdf

Pitre, Stéphane and Yvan Houle (2015). "*Charbonneau Commission Report*," Borden Ladner Gervais LLP, (Montréal: November 25, 2015); found at: http://blg.com/en/News-And-Publications/Publication_4317

Price, Chris (2016). "*Crumbling bridges: Now is the time to take action*," Think Infrastructure Solutions: HNTB Viewpoints 2016, HNTB Corporation (a century-old, employee-owned US infrastructure services firm); found at: http://www.hntb.com/HNTB/media/HNTBMediaLibrary/HNTB_Viewpoint_CrumblingBridges_1.pdf

Public Sector Executive magazine (2012). "*The potential pitfalls of PPP*," (Manchester UK: June 1, 2012)

Rendell, Mark (2017). "*International firms emerge as potential Aecon buyers*," Globe and Mail Report on Business (Toronto: Aug. 27, 2017), pp.1-2.

*ReNew Canada* (2013). "*Bundling Projects Wastes Tax Dollars, CDAO Says*," Actual Media Inc. (Toronto: August 12, 2013); found at: http://renewcanada.net/2013/bundling-projects-wastes-tax-dollars-cdao-says/

Roberts, D.J. and Matti Siemiatycki (2015). *Fostering Meaningful Partnerships in Public-Private Partnerships: Innovations in Partnership Design and Process Management to Create Value*. Environment and Planning C: Government and Policy, Sage Journals (Vol. 33, No. 4) Jan. 2015); pp. 780-793

Scrutiny Unit (2008), *Private Finance Initiative – its rationale and accounting treatment*, House of Commons (London, U.K.: June 2008); 40 pp.

Siemiatycki, M. (2009). "*Academics and Auditors: Comparing Perspectives on Transportation Project Cost Overruns*". Journal of Planning Education and Research. 29: pp. 142-156.

Siemiatycki, Matti (2016a). *Creating an Effective Canadian Infrastructure Bank*, Residential and Civil Construction Alliance of Ontario (RCCAO) (February 2016); 52 pp. found at: http://www.rccao.com/research/investmentFunding.asp

Siemiatycki, Matti (2016b). *Implementing a Canadian Infrastructure Investment Agency*, Residential and Civil Construction Alliance of Ontario (RCCAO) (September 2016); 33 pp.; found at: http://www.rccao.com/research/investmentFunding.asp

Siemiatycki, M. (2010b). "*Managing Optimism Biases in the Delivery of Large-Infrastructure Projects: A Corporate Performance Benchmarking Approach*". European Journal of Transport and Infrastructure Research. 10: pp. 30-41.

Siemiatycki, M. (2012). "*Public-Private Partnerships: At the Intersection of Finance and Design*". In Khamsi, J. (Ed), Huburbs: Creating Transit Supportive Communities. Daniels School of Architecture, University of Toronto. (Toronto: 2012); pp. 23-28.

Siemiatycki, M. (2007). '*What's the Secret? The Application of Confidentiality in the Planning of Infrastructure Using Private-Public Partnerships*". Journal of the American Planning Association.73:4, pp. 388-403.

Siemiatycki, Matti and N. Farooqi (2012). "*Infrastructure Public-Private Partnerships: Delivering Value for Money?*". Journal of the American Planning Association, 78:3, pp. 283-299.

Smetanin, P., D. Stiff, D., and P. Kobak. (2014). *Ontario Infrastructure Investment: Federal and Provincial Risks & Rewards*. The Canadian Centre for Economic Analysis (CANCEA) (Toronto: July 2014); 36 pp.

Smetanin, P., and D. Stiff (2015). *Investing in Ontario's Public Infrastructure: A Prosperity at Risk Perspective, with an analysis of the Greater Toronto and Hamilton Area*. The Canadian Centre for Economic Analysis (CANCEA) (Toronto: 2015); 61 pp.

Turner and Townsend (2016). "*Alternative Financing and Procurement Track Record 2016 Infrastructure Ontario*". (Toronto: Dec. 22, 2016); 30 pp.

Valverde, Mariana (2017a). *The performance of transparency in public-private infrastructure project governance: the politics of documentary practices*, unpublished article (Toronto: April 2017)

Valverde, Mariana (2017b). "*Planning by contract*", an overview of 2013-17 research project funded by Social Sciences and Humanities Research Council of Canada, University of Toronto; for unpublished article by M. Valverde, F. Johns and J. Raso, "*Producing Innovation: from rules to deals and back again*" (Toronto: April 2017)

Valverde, Mariana (2017c). "*OP-ED: Does Canada need a federal infrastructure agency?*" Spacing [online magazine] (Toronto: June 20, 2017); found at: http://spacing.ca/national/2017/06/20/op-ed-canada-need-federal-infrastructure-agency/

Wall, Don (2017). "*Transit a big focus of Ontario infrastructure update*," Daily Commercial News (Markham, Ont.: February 27, 2017); found at: http://dailycommercialnews.com/Infrastructure/News/2017/2/Transit-a-big-focus-of-Ontario-infrastructure-update-1022026W/

Whiteside, Heather (2017). "*Canada infrastructure bank plays poker with public assets: Whether highways or hospitals, the bottom-line determines the rules of the game and private partners are hording the gains*," Toronto Star: March 17, 2017; found at: https://www.thestar.com/opinion/commentary/2017/03/17/new-canada-infrastructure-bank-plays-poker-with-public-assets.html

Whiteside, Heather (2015). *Purchase for Profit: Public-Private Partnerships and Canada's Public Health Care System*. U of Toronto Press (Toronto: July 2015); 224 pp.; found at: http://www.utppublishing.com/Purchase-for-Profit-Public-Private-Partnerships-and-Canada-s-Public-Health-Care-System.html

# ENDNOTES

1 If proper evaluation processes are used to select projects, there is the potential to see a new Golden Age of infrastructure in Ontario. This figure ($200 billion) is a rough estimate of projected spending by both the federal government within Ontario, as well as the Ontario government's own planned spending over 12 years. It does not include municipal projects outside of the federal / provincial infrastructure investment programs. It should be noted that the original Golden Age of infrastructure in Ontario and Canada occurred in the 1950s and 1960s when infrastructure spending represented at least five per cent of Gross Domestic Product.

2 For information on detail of estimates, see: "Cost Estimate Definitions", Public Services and Procurement Canada; Found at: https://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/conn-know/couts-cost/definition-eng.html

3 This figure ($200 billion) is a rough estimate of of projected spending over 12 years by the federal government within Ontario, as well as the Ontario government's own planned spending. It does not include municipal projects outside of the federal / provincial infrastructure investment programs.

4 See: Fenn, Michael (2016b). "Megatrends: The Impact of Infrastructure on Ontario's (and Canada's Future", Residential and Civil Construction Alliance of Ontario (Vaughan, Ont.: July 2016) 68 pp. found at: http://rccao.com/research/files/RCCAO_Future-of-Infrastructure_JULY2016_WEB.pdf
This report made the case that infrastructure should anticipate the future, using designs and construction techniques that are lighter, more adaptable and employ new techniques, processes and materials.

5 Section 7 (1)(c) *Canada Infrastructure Bank Act* (Canada, 2017)

6 An example of using community benefit agreements is Metrolinx's Eglinton Crosstown project. Found at: http://www.thecrosstown.ca/about-us/community-benefits

7 See: https://en.wikipedia.org/wiki/Hudson_Yards,_Manhattan

8 *An Act to establish the Canada Infrastructure Bank* – Functions of Bank

7 (1) In order to carry out its purpose, the Bank may do only the following:

(d) support infrastructure projects by, among other things, fostering evidence-based decision making;

(e) act as a centre of expertise on infrastructure projects in which private sector investors or institutional investors are making a significant investment;

(f) provide advice to all levels of governments with regard to infrastructure projects;

(g) collect and disseminate data, in collaboration with the federal, provincial and municipal governments, in order to monitor and assess the state of infrastructure in Canada and to better inform investment decisions in regards to infrastructure projects (Canada, 2017)

9 Statistics Canada, "Canada's Core Public Infrastructure Survey (CCPI)," (Ottawa: July 21, 2017); found at: http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5173

10 Ontario has had standalone infrastructure ministries in the past, notably the Ministry of Public Infrastructure Renewal, established by the McGuinty Government in 2003, of which David Caplan was Minister until being appointed Health Minister in 2007. Current Minister Bob Chiarelli also had infrastructure responsibilities from August 2011 to February 2013.

11 Ontario Ministry of Infrastructure, "BuildON 2017 Infrastructure Update," p. 24; found at: https://www.ontario.ca/page/buildon-2017-infrastructure-update

12 The real test can be reconciling the competing interests and incentives of the individual consortium participants, as was learned by Transport for London's ill-fated Metronet concession, contrasted with the Tube Lines concession (Fenn, 2014, pp. 34-36).

13 "… the premium ranges from 130 to 220 basis points relative to pure public financing. The figure depends largely on the robustness of the project structure and state of the private-debt markets." (Budden/McKinsey, April 2017).

14 For a detailed discussion of the various process improvements being advanced by IO, see the article prepared by Infrastructure Ontario Divisional President (and now CEO) Ehren Cory (Cory, 2016).

15 Infrastructure Ontario maintains an informal summary, supported by media accounts, of the performance of major public infrastructure projects built using traditional procurement methodology. It lists cost overruns and completion delays for 72 major Canadian infrastructure projects, for which typical percentage cost overruns range from the high single-digits to more than double original estimates.

16 Federation of Canadian Municipalities, citing Statistics Canada, National Economic Accounts Division, 2013; found at: https://fcm.ca/home/issues/infrastructure.htm

17 BuildON 2017 Infrastructure Update, Ontario Ministry of Infrastructure; found at: https://www.ontario.ca/page/buildon-2017-infrastructure-update

Design by Actual Media
actualmedia.ca

View this report and more at

**rccao.com**