

Street Smart. World Wise.



Infrastructure Ontario AFP Track Record Report

October 16, 2014





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Executive Summary

Background

Infrastructure Ontario (IO) is a Crown corporation of the Government of Ontario that was established in 2005 and in 2011 was merged with the Ontario Realty Corporation. IO delivers large, complex public infrastructure projects using a made-in-Ontario procurement and project management model called Alternative Financing and Procurement (AFP). Since its inception, IO has brought to market a total of 76 AFP projects with a capital value of approximately \$39 billion. As of March 31, 2014, 37 of these projects have reached Substantial Completion, with an approximate capital value of \$10 billion.

IO continues to develop and refine its AFP project management and control processes by drawing upon industry best practices and learning from its contractual experience. In 2013, IO commissioned an external review of the 30 projects that had reached Substantial Completion at that time. The purpose of the report was to assess the track record for **On Time** and **On Budget** performance and to identify lessons learned and opportunities for continuous improvement.

As a leading authority on infrastructure projects, Altus was retained by IO to conduct the second annual review, which included an additional seven projects that had reached Substantial Completion. We were provided access to key data sets and were able to independently assess the results and implications as described in Appendix C. This year's report goes a step further than last year's report to review Total Project Costs in addition to AFP Managed Contract Costs, and we recommend that this analysis continue in future years. The following report summarizes the findings from our analysis.

Overall Findings

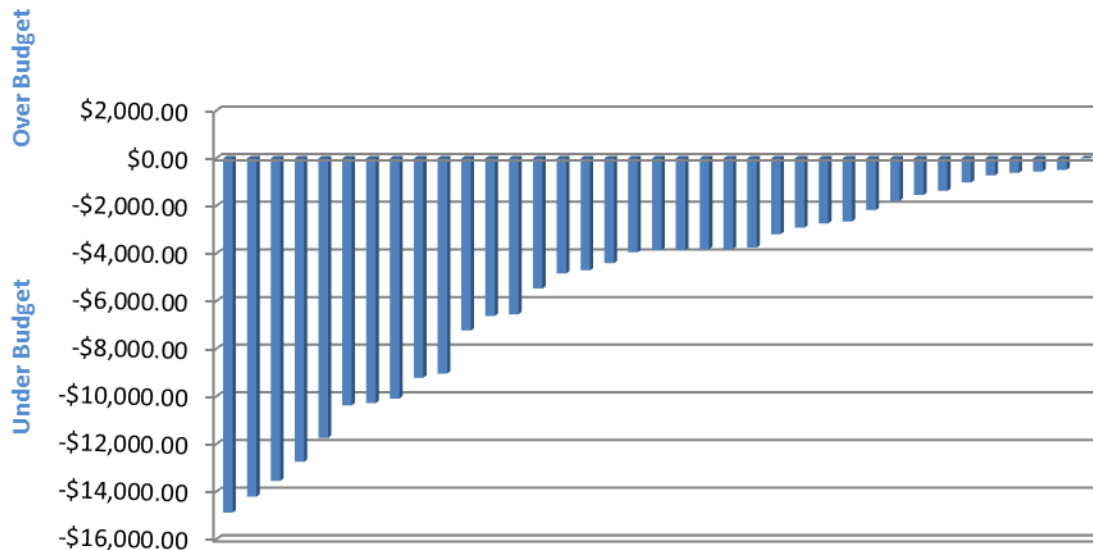
Our findings of the **On Time** and **On Budget** performance of the 37 projects that have reached Substantial Completion exceed generally accepted industry benchmarks with **97%** of projects delivered **On Budget** and **65%** of projects delivered early or **On Time**. Our review of IO's budgeting practices found that they are aligned with industry best practices and the guidelines established in "Guide to Cost Predictability in Construction" prepared by the Joint Federal Government / Industry Cost Predictability Taskforce in November 2012.

On Budget Performance

To assess the **On Budget** performance of AFP projects, we looked at the difference between the Awarded Contract Value and the Actual IO Managed AFP Contract Costs at Substantial Completion. This comparison best reflects **On Budget** performance because it measures IO's ability to ensure that the project achieves the originally specified outcome while managing required scope revisions. IO has been able to deliver 36 of the 37 projects, or **97%**, **On Budget** with only one project going 0.01% over the budgeted IO Managed AFP Contract Costs. This performance demonstrates almost absolute cost certainty within the identified project costs under IO's management, highlighting the effectiveness of the AFP delivery model and IO's project management expertise. Through our review we have identified areas for improvement, which we outline in the Summary of Observations and Recommendations.



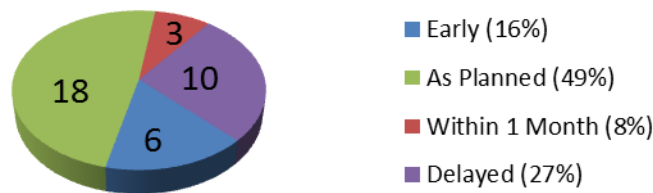
IO Managed AFP Contract Variance for projects that have reached Substantial Completion as of March 31, 2014



On Time Performance

To assess the on-time performance of AFP projects, we looked at the variance between the planned Substantial Completion date at the time of Financial Close and the actual Substantial Completion date achieved. Our review found that 24 of the 37 projects in the sample, or **65%** were delivered early or **On Time**. A further three were completed within one month of their scheduled date, and would still be considered “**On Time**” by many within the construction industry.

IO Managed AFP Schedule Performance for projects that have reached Substantial Completion as of March 31, 2014



A review of each delay reveals that the private sector partner (Project Co) often bore the costs associated with such delays, either in full or in part based on the allocation of risk defined in the Project Agreement. In contrast, had these projects been delivered through a traditional contracting model, it is anticipated that the costs of delays for most of these projects would have been the full responsibility of the public sector owner/authority.

The combined **On Time** and **On Budget** performance demonstrates the high level of effectiveness and efficiency of the AFP model and of IO’s project management processes across a large portfolio of projects and a wide range of asset classes. While a balanced comparison of the performance of the AFP model against the traditional model of public sector construction projects remains challenging, the publically available data and studies indicate this high level of performance would not be considered typical.



Summary of Observations and Recommendations

As part of this track record review, we identified a number of key observations with recommendations to improve the **On Time** and **On Budget** performance on future projects. These include the following:

On Budget

The **On Budget** performance can largely be attributed to the additional rigour and due diligence associated with the private sector financing, along with the overall project management discipline and controls that IO applies at the individual project level. However, it was noted that IO could improve the consolidation and accuracy of reporting actual cost data at the portfolio level.

We recommend that IO make improvements to the reporting and quality control measures specifically related to budget and actual cost data at the portfolio level through better leveraging its project management software platform. Improved reporting and data quality will allow for the identification of issues and facilitate overall project management activities.

Total Project Costs

IO's ability to effectively manage project costs is diminished when the data set was expanded to include Discretionary Variations. Discretionary Variations are typically not required to deliver the current functional program, design or scope, and are typically managed by the public sector owner/authority, and not by IO directly. This would include changes to the approved Functional Program, changes that have an operating or service delivery impact, or other changes that impact the agreed scope of the Project that are initiated by the public sector owner/authority. Examples of a Discretionary Variation would include; additional breaker panels or rough in for future cabling (IT), a change in quality of flooring or finishes, or additional door operators not required by code. Though less common, some Discretionary Variations can involve significant scope alterations. An example of this would be the addition of policy-directed surface areas or entire floors when additional funding or program requirements occur after the initial planning stage.

We recommend that Discretionary Variations and Other Project Costs be reported directly to IO, as part of its overall project management to ensure that appropriate oversight and accounting of the Total Project Costs are maintained to a standard consistent with the IO managed Non-Discretionary Variations. This should allow for a more complete and accurate understanding of all costs associated with the project, and their performance in relation to the approved budgets.

Variations

There appears to be some subjectivity in the classification of Discretionary and Non-Discretionary Variations. During the day-to-day project management through construction, multiple issues and specific elements may be negotiated or combined to facilitate resolution. Occasionally, some portion of the costs designated as a Discretionary Variation may be partially related to an issue which was Non-Discretionary in nature or vice versa.

IO should consider measuring **On Budget** performance based on the Total Project Cost to avoid differentiating between the types of variations and to capture the full cost of the project to the Province. IO should follow the established protocol for the approval of Non-Discretionary Variations, with sufficient and readily accessible funding in accordance with the allocated Post Contract Contingency.

Schedule

Although the Province did not incur any additional costs as a result of the delay in most cases, the more pertinent measure of **On Time** performance is if the facility was able to be used according to the original schedule.



IO should consider a cost benefit analysis of incentives that could drive better on time performance and ensure planned occupancy dates, schedule buffers and contingency plans are sufficient to deal with schedules that are not as reliable.



A. Background & Objectives

A1 Mandate

Altus Group Limited was retained by IO to perform the following:

- ▶ Review the performance of the 37 AFP projects that have reached Substantial Completion as of March 31, 2014;
- ▶ Assess these projects to understand the extent to which these projects were delivered **On Time** and **On Budget**;
- ▶ Investigate the use of the Post Contract Contingency (PCC) budgets through the construction phase;
- ▶ Assess the project budget development process relative to industry best practices; and
- ▶ Identify trends and lessons learned to help improve future AFP delivery.

A2 Altus Group Limited Background

Altus Group Limited (Altus) is a multi-discipline advisory firm and the leading authority on infrastructure project finance, procurement, construction, operations, technical risk assessment, cost and schedule planning, control and management in the private and public sectors in Canada. Altus has extensive experience in advising lenders, owners and investors in AFP/PPP and traditional project delivery.

Our ability to deliver independent professional services is enhanced by our ongoing relationships with leading lenders, owners, developers, contractors and other professionals throughout Canada, the U.S. and internationally. Altus has a proven track record, demonstrating our ability to provide reliable and impartial expert advice.

Our experience with traditional infrastructure delivery projects encompasses various aspects including: risk analysis, costing, and project monitoring services through the planning, construction, and operations phases. Through our past experience in AFP / PPP and traditional procurement, Altus has participated in and tracked data, including risks and their associated budget and schedule impacts, on a wide range of projects.

A3 Infrastructure Ontario Overview

Infrastructure Ontario (IO) is a Crown corporation of the Government of Ontario that was established in 2005 and in 2011 was merged with the Ontario Realty Corporation. IO plays a key role in the Province of Ontario's long-term infrastructure plan to repair, rebuild, and renew the Province's roads and highways, bridges, public transit, post-secondary institutions, hospitals, and justice facilities, including detention centres and courthouses, in communities across Ontario.

IO partners with public sector agencies, including provincial ministries, Crown corporations, municipalities and not-for-profit organizations to renew infrastructure across Ontario.

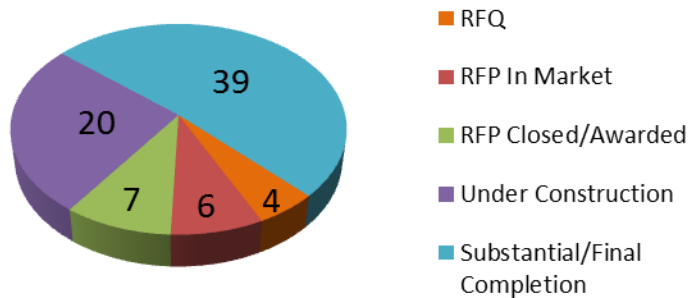
On behalf of the Province of Ontario, IO procures and delivers large projects using an alternative financing and procurement (AFP) delivery model.

Projects delivered by IO are guided by five key principles:

- ▶ Transparency;
- ▶ Accountability;
- ▶ Demonstrating value for money;
- ▶ Maintaining public ownership and control; and
- ▶ Ensuring the protection of public interest.

A4 Projects Assessed

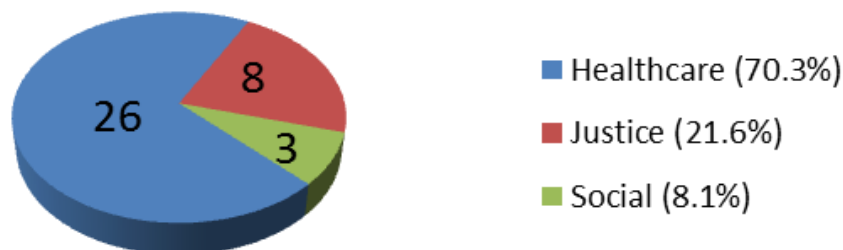
Since its inception, IO has brought to market a total of 76 projects valued at approximately \$39 billion in capital. As of the publication date of this report, these projects have progressed through various stages of the delivery process as shown below.



As of March 31, 2014, 37 AFP projects had reached Substantial Completion, which will be the focus of this review.

Of the projects assessed, the majority were infrastructure relating to healthcare (hospitals), in addition to justice related projects (courthouses & detention centres), and other social infrastructure projects (forensics services & data centre).

These projects by asset type are summarized below:



These completed projects were delivered through the following AFP delivery models:

Design-Build-Finance-Maintain (DBFM)

- ▶ Private sector is generally responsible for design, construction, maintenance, capital rehabilitation (lifecycle) and financing (both short-term and long-term).
- ▶ The Capital Cost of the project is paid for by the public sector owner/authority, in part, by lump sum payment at completion of construction and through blended capital and service payment instalments over the fixed maintenance period, usually 25 to 30 years.

Build-Finance-Maintain (BFM)

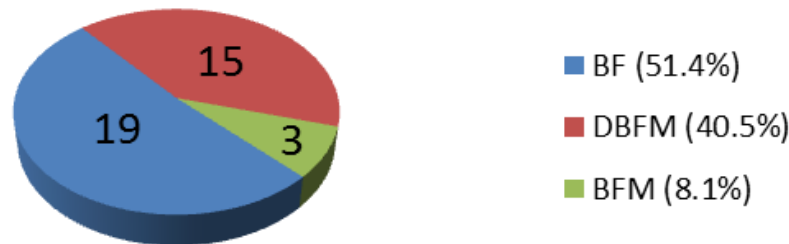
- ▶ Private sector is generally responsible for construction, maintenance, capital rehabilitation (lifecycle costs) and financing (both short-term and long-term).
- ▶ The Capital Cost of the project is paid for by the public sector, in part, by partial lump sum payment at completion of construction and through blended capital and service payment instalments over the fixed maintenance period, usually 25 to 30 years.
- ▶ The public sector owner/authority is responsible for developing the detailed design of the facility.
- ▶ This model was used to transition early projects and is no longer used by IO.

Build-Finance (BF)

- ▶ Private sector is generally responsible for construction and short-term financing during the construction period.
- ▶ The Capital Cost of the project is typically paid for by the public sector in a lump sum at the completion of construction.
- ▶ Public sector retains design and ongoing maintenance after completion of construction responsibilities.



Of the 37 completed projects, the delivery model employed was as follows:



A detailed listing of the projects assessed as part of this assignment is included as **Appendix B** to this report.

B. Scope & Approach

B1 Scope of Review

The scope of this review included an assessment of project performance on both an individual project basis and at an aggregate level by asset class and delivery model. The review focused on the following project attributes:

Budget Development Process

- ▶ Review of budget process and relevant milestones.
- ▶ Comparison of described process with industry practice.
- ▶ Recommendations and Lessons Learned from process review.

Project Bid Analysis

- ▶ Quantification and review of the submitted RFP bid amounts for each project.
- ▶ Comparison of Winning Bid to Average and Highest Bid Submissions.
- ▶ Comparison of Winning Bid to Pre-RFP Approved Budget and actual Awarded Contract Amounts.

Project Budget Accuracy

- ▶ Review and comparison of established Project Budgets at significant project milestones including:
 - A** – Pre-RFP Budget Amount as approved by Government.
 - B** – Awarded Contract Amount at Financial Close.
 - C** – Final Project Costs at Substantial Completion.
- ▶ Determination of whether the achievement of the **On Budget** criteria was met.
- ▶ Where this criteria has not been met, evaluation of the reasons for the budget variance.

Post Contract Contingency Usage and Budget Performance

- ▶ Analysis of allocated Post Contract Contingency at Financial Close, compared to actual usage during construction.
- ▶ Assessment of Discretionary and Non-Discretionary variations and their contribution to the Final Project Costs at Substantial Completion.
- ▶ Identification of Other Project Costs incurred during the construction phase and the impact on the Final Project Costs at Substantial Completion.

Project Scheduling

- ▶ Determination of whether the achievement of the **On Time** criteria was met.
- ▶ Where this criteria has not been met, evaluation of the reasons for the schedule variance.
- ▶ The nature and impact on scheduling related to retained and transferred risks.



B2 On Time and On Budget

The key measures assessed in this review of AFP projects are the **On Time** and **On Budget** performance. These measures are consistent with the previous track record review undertaken in 2013 for continuity and comparison purposes and are defined as follows:

On Time

- ▶ When the actual Substantial Completion Date occurs prior to, or within five business days of the Scheduled Substantial Completion Date (as defined in the Project Agreement at the time of Financial Close).

On Budget

- ▶ When the project's actual IO Managed AFP Contract Costs at Substantial Completion are less than the amount budgeted at Financial Close.

The actual IO Managed AFP Contract costs include all payment obligations within the executed Project Agreement and any Non-Discretionary Variations that have occurred through the construction period. The transaction and the IO fees are also managed by IO and were excluded from this analysis because they are fixed costs.

The budgeted IO Managed AFP Contract costs include the Awarded Contract value and the budgeted Post Contract Contingency allocated at Financial Close.

B3 Data Verification & Validation

In order to measure and assess the appropriate performance indicators and benchmarks, a comprehensive review of the available data supplied by IO was undertaken. This data was verified against multiple sources, including publicly-disclosed information where available and applicable. The outcome of the Data Verification and Validation exercise is summarized in **Appendix C**.

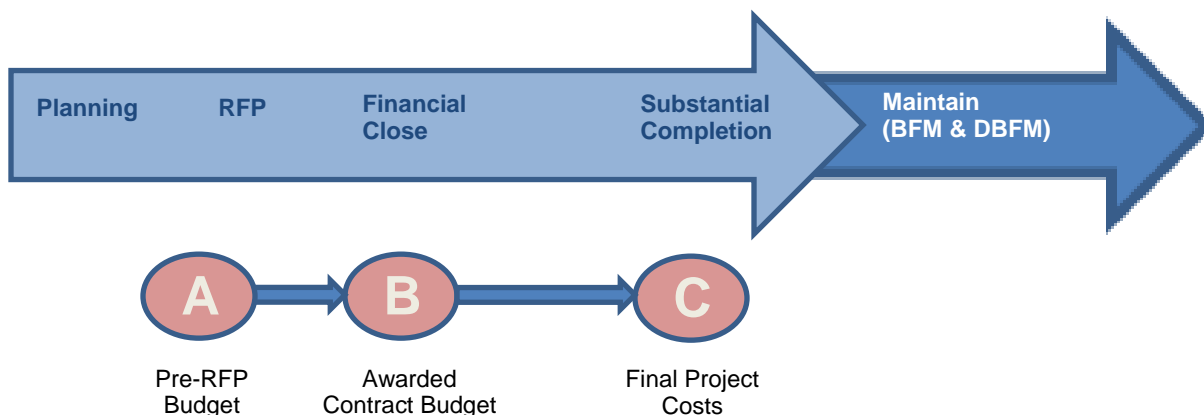
Specific sources used to verify and validate the data considered in this assessment are described in **Appendix D**.

C. Budget Development

C1 Overview and Milestones

A project is assigned to IO by Government for delivery through an AFP model, allocating a total approved budget typically based on an initial functional program and associated cost estimate.

Once the project has been assigned to IO it generally follows the process and key budget milestones outlined below:





Through the planning phase, as the project is developed and refined, the budget is further revised and updated to reflect the improved level of information. These updates would typically be reported back for approval to Government.

C2 AFP Project Cost Estimates

The budgeting process adopted by IO is consistent with general best industry practice. On each project, IO works closely with professional cost consultant advisors with the appropriate expertise and familiarity with traditional construction of large-scale infrastructure projects and alternative project delivery models, such as AFP. This process is aligned with the guidelines established in “Guide to Cost Predictability in Construction” prepared by the Joint Federal Government / Industry Cost Predictability Taskforce in November, 2012. These guidelines refer to the following classes of estimates:

- ▶ **Class D:** Based on the initial functional program and broad concept approach, expected variance of 20 to 30%.
- ▶ **Class C:** Based on a schematic design (construction documents) development estimate, where the program is set, and the design is generally completed up to 33%, expected variance of 15 to 20%.
- ▶ **Class B:** Based on working drawings and more detailed dimensioning. Depending on the project, this estimate can be developed when construction documents are at 50%, 66% or 95% complete, expected variance of 10 to 15%.
- ▶ **Class A:** Based on construction documents that are 100% complete, expected variance of 5 to 10%.

Given the early stage of the project when the initial estimate is developed, particularly within an AFP framework where the design is not fully established, these estimates are often developed based on the initial functional program or exemplar design. Depending on the project complexity, a variance of between 20-30% could be anticipated when compared to the median bid received.

For DBFM and DBF projects, where the design is not developed to any significant extent the project budget is not likely to be based on any better than a Class D Estimate, within 20-30% of the median bid, but should improve as the project scope is better defined through the planning stages prior to RFP release.

For BF/BFM projects, a revised budget based on the fully developed design at the time of RFP release could be expected to be within 5-10% of the median bid received.

C3 Lessons Learned & Recommendations

One challenge identified in the budgeting process is the lag between the formal approvals and the real-time progression of a project as it is advanced and refined, particularly as specifications and contract documentation is developed in preparation for the RFP release to market.

In many cases the Final Pre-tender Estimate varies from the Pre-RFP Approved Budget due to further scope refinement, updated cost estimates, and revised financing assumptions. Where the Final Pre-tender Estimate remains below the Pre-RFP Approved Budget, the variance is not of concern and does not create any approval impediment to the release of the RFP. However, if the Final Pre-tender Estimate exceeds the Pre-RFP Approved Budget, the expectation is that a new formal approval would be obtained prior to the release of the RFP. Given this requirement, and the associated timing and scheduling impacts for the procurement process, there is a risk that potential changes which would otherwise have an effect on the Final Pre-tender Estimate may be diminished or subject to an optimism bias in order to avoid exceeding the Pre-RFP Approved Budget.

A consistent formal approval process for the Final Pre-tender Estimate immediately prior to the RFP release would ensure that the current best estimate is established, approved and able to provide a consistent benchmark for project budget assessment.

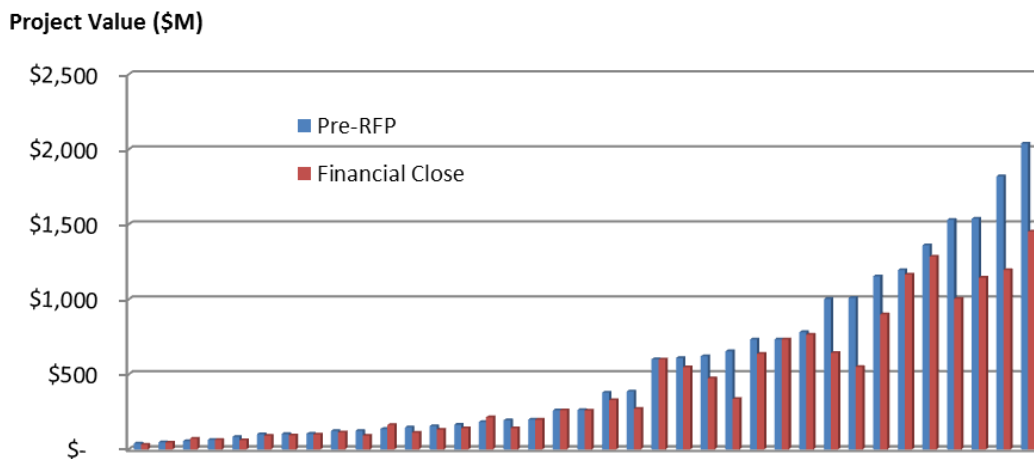


D. A to B: Approved Pre-RFP Budget to Awarded AFP Contract Budget

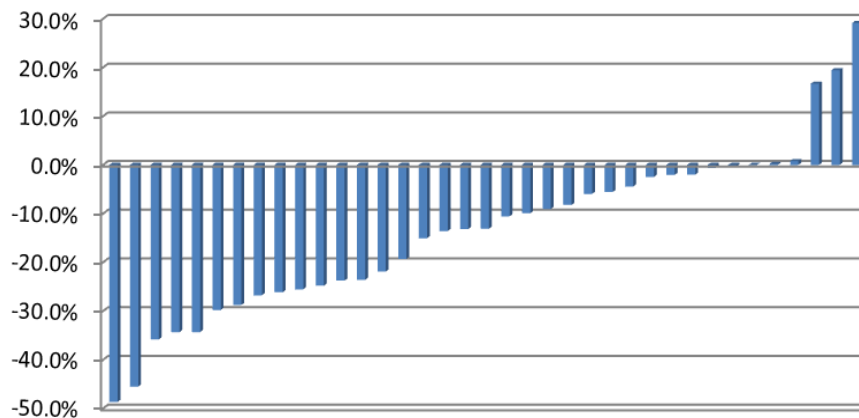
D1 Budget Comparison

A comparison of the AFP Contract Value from the Pre-RFP Approved Budget to the Awarded AFP Contract Budget provides an indication of the accuracy of the estimation process and the validity of the assumptions used. The Pre-RFP Approved Budget for the 37 AFP Contract Values totalled \$20.7 billion, which after the RFP process resulted in \$16.4 billion at Financial Close, a reduction of \$4.3 billion.

A to B: AFP Contract Value Comparison



A to B: Budget Variance (%)



In 32 of the 37 projects analysed, the AFP Contract Value at Financial Close was within the corresponding AFP Contract estimate contained in the Pre-RFP Approved Budget. Of these 32 projects, the following five projects, each delivered through a DBFM model, came in under the AFP Contract cost component of the Pre-RFP Approved Budget by more than 30%.

In two instances, the AFP Contract value at Financial Close only moderately exceeded the AFP Contract cost component of the Pre-RFP Approved Budget by less than 1%.

In three instances, the AFP Contract value at Financial Close significantly exceeded the AFP Contract cost component of the Pre-RFP Approved Budget by up to 29%.



Given that these three instances are all BF projects, these variances are higher than expected when compared to general industry benchmarks. However, in aggregate the BF projects perform most closely to their Pre-RFP Budgets, so there does not appear to be a systemic issue driving these variances.

Overall, the variance between the approved Pre-RFP budgets and the actual Awarded AFP Contract value performs quite well and is consistent with general industry best practice.

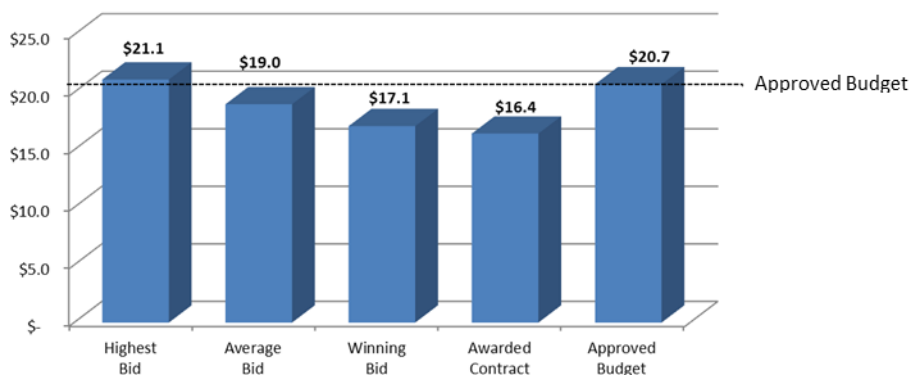
D2 Project Bid Analysis

Through the AFP procurement phase, usually three (DBF and DBFM) or five (for BF) pre-qualified and experienced project consortia review the project scope and requirements and competitively price their proposed solution.

A review of bid submissions, aggregated across the AFP portfolio, reveals the general range of solutions and respective costs among the winning, average, and highest cost bidders, based on the requirements specified in the RFP and applicable AFP Contract.

This bid data is also compared to the AFP Contract Value included in the Pre-RFP Approved budget and at Financial Close, which incorporates the revised financing costs resulting from the credit spread reset protocol and any negotiated elements with the identified preferred proponent after the RFP bid submission.

Aggregate AFP Contract Bid Values



On a portfolio wide basis, the Pre-RFP Approved budgeted AFP Contract Values compares to the bid submission values as follows:

- ▶ 2% lower than the highest bid
- ▶ 9% above the average bid
- ▶ 21% above the winning bid

The AFP Contract value at Financial Close in comparison to the bid data as follows:

- ▶ 4.0% lower than the winning bid
- ▶ 13.7% lower than the average bid
- ▶ 22.3% lower than the highest bid

The variance between the winning bid and AFP Contract value reflects changes that occur between the RFP submission and Financial Close dates. This variance is primarily attributed to the revised financing costs reflective of the updated credit spreads and changes to the underlying base rates over this time period as well as any negotiations relating to innovations or value engineering items between the public sector owner/authority and Project Co.

The winning bid is cumulatively 10% lower than the average bid and 19% lower than the highest bids. This variation between the winning and other bids is often a result of the inherent level of innovation and efficiency encouraged under significant competitive tension through the established RFP process, as well as combining design and long term maintenance.



These bid submission ranges help to validate the cost estimates informing the Pre-RFP Approved Budget, generally within the IO target of two bids below and one bid above the government approved budget.

A comparison of budget performance by delivery model indicates that the DBFM model has typically experienced the largest variances between the approved budget and awarded contract, with an average variance of 25% compared to less than 10% for the BF and BFM models. These variances are in line with expectations given the achievable class of estimate for each model.

This differential can be partially attributed to the challenges associated with forecasting the long-term maintenance, lifecycle and financing costs associated with the DBFM model, through the 30 year concession term, along with the limited design detail available prior to RFP release, in comparison to the BF and BFM models where the design is specified. The inclusion of design allows for greater flexibility and opportunity to incorporate innovative approaches to both design development and construction, at a lower overall cost.

D3 Lessons Learned

Considering the extensive pre-qualification process, bid participation is generally limited to teams with significant experience and relevant qualifications. It is expected that the variation between the winning and other bids is often a result of the level of innovation and efficiency, under significant competitive tension, particularly where design and long-term maintenance and lifecycle responsibilities are included, within the AFP contract.

E. B to C: Awarded Contract to Substantial Completion

E1 Awarded Contract to Substantial Completion

In assessing the budget performance during construction, it is important to differentiate between the IO Managed AFP Contract costs and the Total Project Costs that extend beyond those elements directly included as part of the AFP Contract.

The actual IO Managed AFP Contract costs include all payment obligations within the executed Project Agreement and any Non-Discretionary Variations that have occurred through the construction period. These Non-Discretionary Variations are tied to unforeseen risks retained by the public sector and are intended to be paid through the allocated Post Contract Contingency established at Financial Close.

The balance of the Total Project Costs are either related to the transaction process (fixed costs for IO fees and advisors) or costs directly controlled by the public owner outside of the AFP Contract framework including any Discretionary Variations, such as owner directed scope changes, and the actual expenditures relating to the owner's ancillary and other costs. IO does not manage or control these costs.

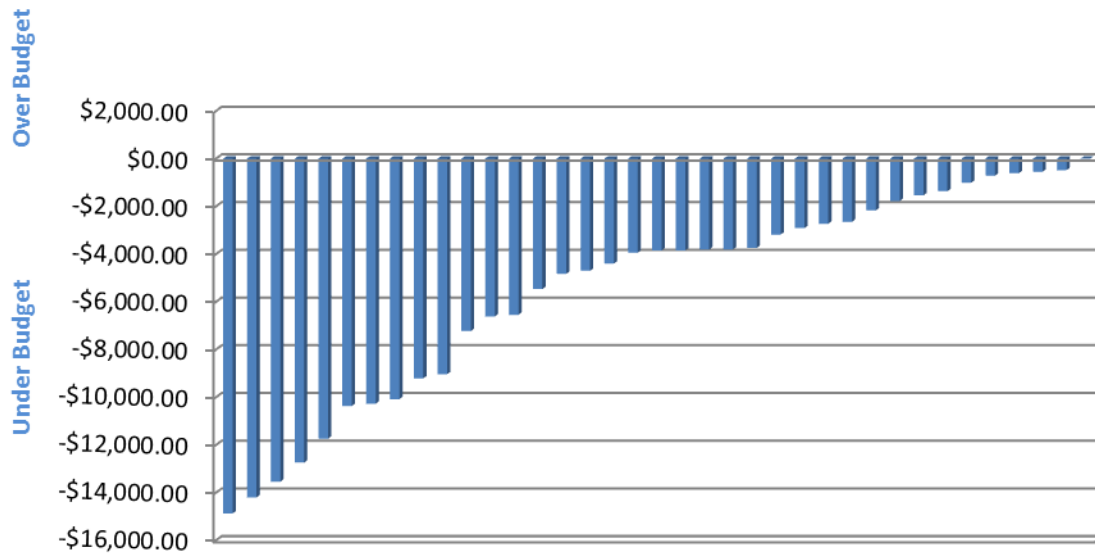
E2 IO Managed AFP Contract Costs

The IO Managed AFP Contract Costs are used to determine the **On Budget** performance of a project.

Thirty-six projects or **97%** of the projects assessed can be strictly considered to be delivered **On Budget** with respect to the IO Managed AFP Contract Costs, as of Substantial Completion. The one remaining project was completed using 100.01% of the IO Managed AFP Contract Costs.

This performance demonstrates almost absolute cost certainty within the identified project costs under IO's management, highlighting the effectiveness of the AFP delivery model and IO's project management processes.

B to C: IO Managed AFP Contract Variance

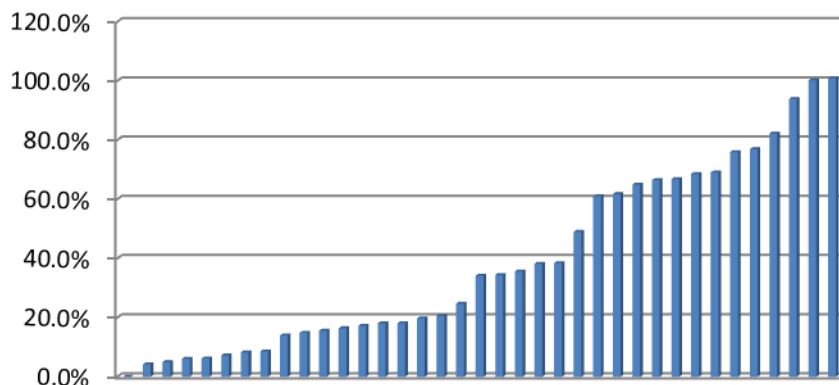


All delivery models and asset classes have consistent performance with respect to the total IO Managed AFP Contract Costs with the aggregate Actual Costs achieving **98.9%** of the allocated budget at Financial Close.

One project exceeded its allocated PCC amount as a result of Non-Discretionary Variations during the construction period by 0.02%.

The overall variation between the IO Managed AFP Contract costs at Substantial Completion compared to the allocated budget at Financial Close is reflected in the total amount of the Post Contract Contingency (PCC) used through the construction period.

Post Contract Contingency Usage by Project



On an aggregate basis for all projects, 36% of the available Post Contract Contingency is used to address Non-Discretionary Variations through the construction period. While this could indicate some opportunity to reduce the amount of PCC allocated, the trend appears fairly linear on a project by project basis from minimal usage to utilizing the entire amount.

In cases where significant Discretionary Variations were approved, leading to additional new project scope during construction, the available Post Contract Contingency was adjusted to reflect the increase in scope.

Some challenges were noted with respect to the practical application and management of the allocated PCC during the implementation phase, resulting in inconsistent treatment (how they were identified) and



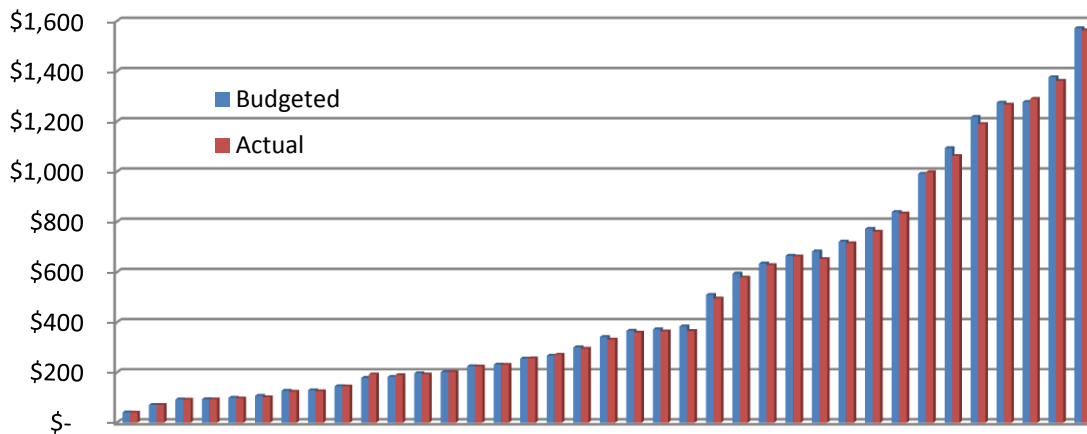
accounting of the Non-Discretionary Variations. Another challenge was the ability to access PCC funding in accordance with the allocated PCC; access to this would be beneficial in managing these costs during construction.

E3 Total Project Costs

Total Project Costs are assessed at Substantial Completion and include both the IO Managed AFP Contract Costs, Transaction Fees, direct IO fees for delivering the project, Discretionary Variations and any other costs relating to the project managed by the public sector owner/authority.

B to C: Total Project Cost

Project Value (\$M)



On an aggregate basis, all delivery models and asset types perform fairly well when comparing the budgeted Total Project Costs at Financial Close to the actual costs at Substantial Completion.

Thirty-five of the 37 projects at Substantial Completion are below, or within two percent of the budgeted Total Project Cost at Financial Close. On a Total Project Cost basis, this indicates a high level of overall project cost control and performance.

The two projects that exceeded the budget at Financial Close by more than two percent were both the subject of significant scope changes introduced by the respective public sector owner/authority (i.e. Discretionary Variations) during construction which contributed to this outcome.

While introducing additional scope during the construction phase is generally not desirable, in instances where additional new funding becomes available, improving or expanding the facility can be accommodated. The decision to seek additional funds and approve these scope changes are maintained by the public sector owner/authority and applied based on their direction. The appropriateness of any resulting schedule impacts should be assessed in relation to the added benefit introduced.

E4 Lessons Learned & Recommendations

Generally, project performance during construction compares quite favourably to the Awarded Contract budget.

A limited level of information is currently available to fully represent the Total Project Costs. A more detailed review of the two projects that appear to have exceeded their budgets should be considered to ensure that all related costs have been recognized.

There appears to be some subjectivity in the classification of Discretionary and Non-Discretionary Variations. During the day-to-day project management through construction, multiple issues and specific elements may be negotiated or combined to facilitate resolution. Occasionally, some portion of the costs designated as a Discretionary Variation may be partially related to an issue which was Non-Discretionary in nature, or vice versa.



Part of this challenge is likely related to the difficulties accessing the PCC funding in a timely and responsive manner during construction. It would be beneficial to have sufficient and readily accessible funding to access the allocated PCC funding when following the protocol for the approval of Non-Discretionary Variations.

Further consideration should be given to assessing **On Budget** performance based on the Total Project Cost to avoid differentiating between the types of variations and to capture the full cost of the project to the public sector owner/authority.

F. Schedule Analysis

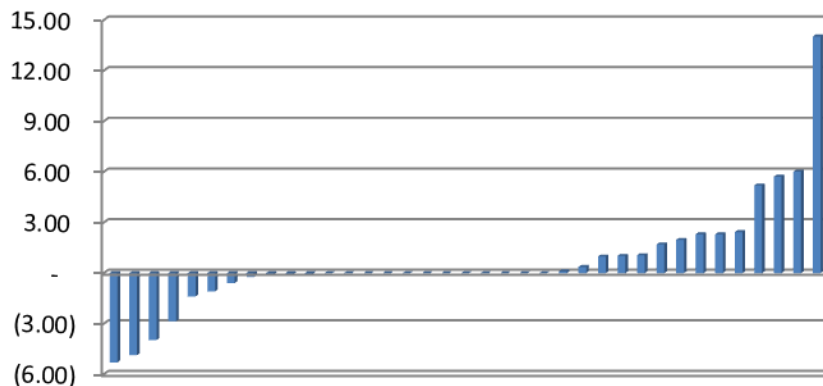
F1 On Time Performance

A key objective in the assessment of a project is whether it can be considered to have been delivered **On Time**.

A project would be considered to have been completed **On Time** when the Substantial Completion Date of the project, as certified by an independent third party, occurs earlier than or within five business days of the Scheduled Substantial Completion Date (as defined in the Project Agreement at the time of Financial Close).

The following illustrates the variance between the scheduled and actual Substantial Completion Dates for each project.

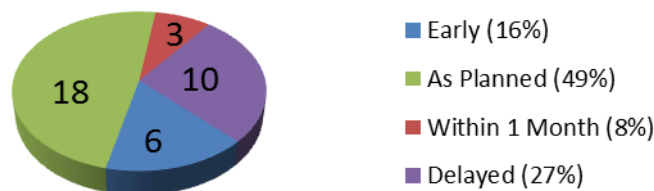
Project Schedule Variance: Scheduled to Actual (Months)



The majority of projects had minimal or no variance from the Scheduled Substantial Completion Date. The earliest project was delivered over five months early and the latest project over 14 months after the Scheduled Substantial Completion Date.

A detailed assessment of the projects by delivery model and asset class examined overall schedule performance and identified where projects were delivered:

- ▶ **Early** – More than one month ahead of the Scheduled Substantial Completion Date.
- ▶ **As Planned** – Within the month prior to, or no later than five days after the Scheduled Substantial Completion Date.
- ▶ **Delayed** – More than five days after the Scheduled Substantial Completion Date.





Overall, 24¹ of the 37, or about **65%**, of the assessed projects successfully achieved **On Time** performance, within five days of the Scheduled Substantial Completion Date.

F2 Late Project Assessment

There does not appear to be any significant trend by either delivery model or asset class, based on the limited sample sizes of some project types.

For the thirteen projects that have experienced delays, the primary cause has been assessed along with the party who bore the associated risks relating to the delay.

Project Asset Class	Year Complete	Delivery Model	Delay (days)	Primary Cause	Prov. Risk	Shared Risk	Proj Co. Risk
Healthcare	2010	BF	11	Schedule Management		✓	
Justice	2013	DBFM	30	Provincial Trade Strike: Elevators / Project Co. Management		✓	
Healthcare	2012	DBFM	31	Unknown Site Conditions	✓		
Healthcare	2009	BF	32	Strike		✓	
Social	2009	BF	52	Schedule Management/Winter Conditions			✓
Justice	2013	DBFM	60	Provincial Trade Strike: Elevators / Project Co. Management		✓	
Justice	2014	DBFM	70	Provincial Trade Strike: Elevators		✓	
Healthcare	2009	BF	70	Design Errors by Province	✓		
Social	2013	DBFM	74	Site Conditions		✓	
Justice	2014	DBFM	158	Provincial Trade Strikes: Elevators/Terrazzo/Roofers		✓	
Healthcare	2013	BF	174	Schedule Management /Errors & Omissions		✓	
Healthcare	2011	BF	183	Resourcing/ Technical Deficiencies			✓
Healthcare	2012	BF	427	Schedule Management / Scope Change		✓	

Review of Delay Causes and Impacts

The AFP Contract framework endeavours to transfer project risk to the public or private party best positioned to manage it. Achieving this balance is critical to ensure that efficient pricing and optimal value is achieved. As a result, while the majority of construction related risks are transferred to the private contractor, some risks remain with the public owner. Should these risks materialize, the potential of a delay remains and achieving 100% **On Time** delivery is not likely.

Of the 13 delayed projects, Project Co. either fully retained or partially shared primary responsibility for the delay on all but two projects. In contrast, it is anticipated that many of these delays would have been the full responsibility of the Province had the project been delivered traditionally.

The design error related delay retained by the Province under the BF model would have been a risk transferred to Project Co. under the DBFM model.

Strike Related Delays – Five projects

¹ One project was comprised of two distinct sites. One of the sites was completed 148 days early, while the other site was 101 days late. For the purpose of this report, the net result was to consider the project to have been delivered On Time.



A number of the recently completed projects were delayed primarily as the result of province wide trade strikes. Under the AFP contract, such an event is a shared risk between both the private and public sectors where the Project Co. has an obligation to make commercially reasonable efforts to mitigate the strike impact. This obligation likely reduced the overall extent of the delays and limited the cost impacts to the Province.

Schedule Management Related Delays – Four projects

Under the AFP model, the risk of schedule management related delays are entirely the responsibility of the Project Co. As a result, the Province bears no additional financial responsibility for costs associated with this type of delay.

Unknown Site Conditions – Two projects

The risks associated with the discovery of unknown site conditions that were not readily inferable from the available reliable data are retained by the Province. For the most part this risk is easily managed through comprehensive site investigations prior to transaction initiation. In some cases the ability to undertake these investigations may be limited due to timing or access constraints. These two projects should be reviewed to understand the reason for these conditions to remain undiscovered and the relevant site investigation protocols should be adjusted, as appropriate.

Design Errors & Scope Changes – Two projects

Scope changes introduced by the owner during construction that cause delay are at the owner's risk. The potential for a related delay should be understood and considered as part of the decision to initiate any change in scope during construction, as the Province would be fully responsible for the costs associated with the scope change and any related delay. For one project, with the greatest overall delay (~14 months) it is understood that about two months of the delay could be directly attributed to the introduction of new scope. The balance (~12 months) was related to Project Co. schedule management.

F3 Lessons Learned

Schedule performance might be better benchmarked using public commitments, requirements to efficiently transition operations from existing facilities, or through anticipated coordination with other related works.

In establishing these commitments and deadlines, full consideration should be given to the project risk profile and allow for suitable schedule contingency to accommodate these risks. In addition to providing an appropriate schedule contingency, alternative transition and occupancy plans should be developed and reflected in the schedule to minimize negative impacts of the delay to the Province.

A sampling of publically available information on recent non-IO public infrastructure projects delivered in Ontario, through a traditional delivery model, indicates a general trend of significant schedule delays:

- ▶ **Spadina Subway Extension** – The TTC has confirmed that the \$2.6B Spadina subway extension to Vaughan will open about a year later than originally scheduled.
- ▶ **Pape Station Renovation** – Completed more than 18 months behind schedule.
- ▶ **Clarkson GO Station Parking Lot** – Estimated delay of about one year
- ▶ **Burlington GO Station** – Estimated delay of about one year

G. Review of 2013 Project Track Record Review Recommendations

The initial AFP Track Record Review, undertaken in 2013 articulated four key recommendations for review. Over the past year, IO has considered these recommendations and, where appropriate, taken measures to address these findings. The following key recommendations were provided:

Budget Development

Recommendation



- ▶ The current processes for setting PCC budgets should be reviewed to see if the % benchmark is appropriate and whether there is an opportunity to reduce the magnitude of unspent PCC funds across the portfolio, particularly in cases where there is substantial risk transfer.

IO Action

- ▶ IO's due diligence practices during the transaction period allow IO to carry a PCC generally lower than the typical best practice approach in a stipulated price contract. Preliminary discussions have been initiated and opportunity to reduce the magnitude of underutilized PCC funds is to be investigated further upon the build up of their dedicated Capital Budget team.

A to B Budget Review

Recommendation

- ▶ For two outlier projects where Awarded Contract Amounts were more than \$500M lower than pre-RFP budgets, additional investigations should be undertaken to better understand the reasons for the magnitude of this variance.

IO Action

- ▶ A project specific review was conducted on three projects, which yielded a number of key recommendations that IO is now incorporating.

Schedule Performance

Recommendation

- ▶ For two outlier projects that were substantially delayed, additional investigations should be undertaken to determine if there are any lessons learned that can be used to inform future AFP scheduling and project delivery.

IO Action

- ▶ A project specific review was conducted on another project. Lessons learned were focused on one of the projects that was considered more relevant to future projects. A number of recommendations came out of the review and have been incorporated into current processes and practices.

Continuous Improvement

Recommendation

- ▶ Identified an opportunity to establish a project review protocol, based on % or \$ thresholds or benchmarks, that would trigger a review of specific AFP projects upon completion to help avoid/mitigate risk on future projects and to ensure that projects are completed on time and on budget, without reducing scope.

IO Action

- ▶ IO now conducts a project specific review for any project that is late or over budget and has established a Vendor of Record to conduct third party project reviews. IO has developed a formal tracking tool, the Lessons Learned Register, which captures all current lessons learned recommendations from audit reports and project review reports.
- ▶ A corporate-wide Lessons Learned Program is currently being developed. The program is targeted to be rolled-out to all business units later this year.



Appendices



Appendix A – Glossary of Terms

- ▶ **Alternative Financing & Procurement (AFP):** AFP is an innovative way of financing and procuring large, complex infrastructure projects. Under AFP, the public sector owner/authority establishes the scope and purpose of the project while the work is financed and carried out by the private sector. In some cases, the private sector will also be responsible for the maintenance of a physical building or operation and rehabilitation of a roadway.
- ▶ **Ancillary Costs:** Are costs for all the technical advisors (designers, architects, and engineers) and are billed to the public sector owner/authority on a pass-through basis.
- ▶ **Awarded AFP Contract Budget:** Represents the budget for the project taking into account the value of the actual AFP Contract with the successful bidder (Project Co) at Financial Close, including an updated Post Contract Contingency amount based on Project Co's construction costs, and any remaining other project related costs.
- ▶ **Build Finance (BF):** Type of AFP project delivery model in which the private sector is generally responsible for construction and short-term financing during the construction period. The Capital Cost of the project is paid for by the public sector in a lump sum at the completion of construction. The public sector sponsor is responsible for developing the detailed design of the facility and ongoing maintenance after completion of construction.
- ▶ **Build Finance Maintain (BFM):** Type of AFP project delivery model in which the private sector is generally responsible for construction, maintenance, capital rehabilitation (lifecycle costs) and financing (both short-term and long-term). The Capital Cost of the project is paid for by the public sector, in part, by partial lump sum payment at completion of construction and through blended capital and service payment instalments over the fixed maintenance period, usually 25 to 30 years. The public sector owner/authority is responsible for developing the detailed design of the facility. This model was used to transition early projects and is no longer used by IO.
- ▶ **Capital Costs:** Include the construction, financing and other project costs associated with the implementation of the project. Capital Costs do not include costs associated with operations, or lifecycle activities.
- ▶ **Discretionary Variations:** Variations and/or change orders to the Project Agreement that are initiated by the public sector owner/authority. Discretionary Variations amend the scope of the project.
- ▶ **Design Build Finance Maintain (DBFM):** Type of AFP project delivery model in which the private sector is generally responsible for design, construction, maintenance, capital rehabilitation (lifecycle) and financing (both short-term and long-term). The Capital Cost of the project is paid for by the public sector owner/authority, in part, by lump sum payment at completion of construction and through blended capital and service payment instalments over the fixed maintenance period, usually 25 to 30 years.
- ▶ **Final Pre-tender Estimate:** The estimate of total project costs developed by an external cost consultant reflecting the project scope immediately before release of the RFP.
- ▶ **Financial Close:** The time at which the Project Agreement is executed with the successful Project Co.
- ▶ **IO Managed AFP Contract Costs:** Include all payment obligations within the executed Project Agreement and any Non-Discretionary Variations that have occurred through the construction period. It does not include Transaction Fees or direct IO fees for delivering the project.
- ▶ **Non-Discretionary Variations:** Variations and/or change orders to the Project Agreement that arise when risks borne by the public sector owner/authority under the Project Agreement materialize. These variations and/or change orders do not relate to functional scope changes of a project.
- ▶ **On Budget Performance:** When the project's actual IO Managed AFP Contract costs are less than the budgeted IO Managed AFP Contract costs at Financial Close.
- ▶ **On Time Performance:** When the actual Substantial Completion Date occurs prior to, or within five business days of the Scheduled Substantial Completion Date, as defined in the Project Agreement at the time of Financial Close.
- ▶ **Post Contract Contingency (PCC):** The budget allocation established at Financial Close to fund Non-Discretionary Variations through the construction period, based on the anticipated risk profile, level of design development, and the Project Co established construction costs.



- ▶ **Pre-RFP Approved Budget:** The approved total budget allocated in the annual Letter of Direction prior to the actual RFP release.
- ▶ **Project Agreement:** Contract between the public sector owner/authority and private sector consortium (Project Co) setting out the requirements and obligations of each party to complete the project.
- ▶ **Project Co:** The private sector consortium comprised of differing parties and expertise (depending on the AFP delivery model) which, together with its Lenders, executes the Project Agreement and is responsible for completing the project.
- ▶ **Request for Proposals (RFP):** The second step of the two-stage AFP procurement process in which the public sector owner/authority solicits competitive bids for the completion of the defined project scope from prequalified bidders passing the RFQ stage.
- ▶ **Request for Qualifications (RFQ):** The first step of the two-stage AFP procurement process in which the public sector owner/authority solicits qualifications from private sector consortia for a potential project, resulting in the prequalification or “short-listing” of a selected number of consortia.
- ▶ **Scheduled Substantial Completion Date:** The date, first bid by the successful Project Co and as specified in the Project Agreement, when construction of the Project is scheduled to be completed. For the purposes of this report, the Scheduled Substantial Completion Date is that date defined in the Project Agreement at the time of Financial Close within five business days.
- ▶ **Substantial Completion:** The time when the construction of the project is completed in accordance with the Project Agreement, as certified by the Independent Certifier (BFM/DBF/DBFM) or the Consultant (BF), and the time when maintenance of the facility, either by Project Co (BFM/DBFM) or the public sector owner/authority (BF/DBF) begins.
- ▶ **Total Project Costs:** Includes both the IO Managed AFP Contract Costs, other IO Managed costs relating to the transaction process, direct IO fees for delivering the project, Discretionary Variations and any other costs relating to the project managed by the public owner.
- ▶ **Transaction Fees:** Transaction fees are a fixed fee to cover the costs of advisors (financial, fairness, legal and process advisors) required in the development of the agreements for the RFQ and RFP, and in negotiations leading to Financial Close.



Appendix B – Project List

Project ²	Type	Delivery Model
Kingston General Hospital	Healthcare	BF
OPP Modernization Project	Justice	DBFM
Sunnybrook Health Sciences Centre	Healthcare	BF
Hamilton Health Sciences - Henderson Site	Healthcare	BF
Lakeridge Health, Oshawa	Healthcare	BF
Bluewater Health, Sarnia	Healthcare	BF
Sault Area Hospital	Healthcare	BFM
Trillium Health Centre	Healthcare	BF
The Ottawa Hospital	Healthcare	BF
Rouge Valley Health System	Healthcare	BF
LHSC/SJHC - M2P2	Healthcare	BF
Runnymede Healthcare Centre	Healthcare	BF
Hamilton Health Sciences - General Site Redevelopment	Healthcare	BF
North Bay Regional Health Centre	Healthcare	BFM
Roy McMurtry Youth Centre	Social	BF
Durham Consolidated Courthouse	Justice	DBFM
Guelph Data Centre	Social	DBFM
St. Joseph's Health Care, London - Grosvenor Restructuring (M2P1)	Healthcare	BF
Quinte HealthCare	Healthcare	BF
Forensic Services & Coroner's Complex	Social	DBFM
Waterloo Regional Consolidated Courthouse	Justice	DBFM
Niagara Health System	Healthcare	DBFM
Toronto Rehab Institute	Healthcare	BF
Toronto South Detention Centre	Justice	DBFM
Centre for Addiction & Mental Health	Healthcare	DBFM
Windsor Regional Hospital	Healthcare	BF
Woodstock General Hospital	Healthcare	BFM
Trillium Health Partners (Former Credit Valley)	Healthcare	BF
L'Hopital Regional de Sudbury	Healthcare	BF
Bridgepoint Hospital	Healthcare	DBFM
Royal Victoria Regional Health Centre	Healthcare	BF
Thunder Bay Consolidated Courthouse	Justice	DBFM
St. Joseph's Health Care - West 5th Campus	Healthcare	DBFM
Quinte Consolidated Courthouse	Justice	DBFM
Waypoint Centre for Mental Health Care	Healthcare	DBFM
South West Detention Centre	Justice	DBFM
St. Thomas Consolidated Courthouse	Justice	DBFM

² Montfort Hospital was excluded from the analysis as it was initiated prior to the establishment of IO, and did not include private sector financing, a key consideration in AFP project delivery.



Appendix C – Data Verification & Validation

The specific sources used to verify and validate the data considered in this assessment are described in **Appendix D**.

Budget Data

A – Pre-RFP Approved Budget

In most instances, the project-specific allocations in the annual Letter of Direction issued to IO (issued to IO before the RFP is released) were used to establish the Pre-RFP Approved Budget.

In a few instances, the allocations in the Letters of Direction issued to IO immediately following release of an RFP were used to establish the Pre-RFP Approved Budget, provided that such post-RFP issuance Letters of Direction were only used when:

- ▶ the relative short timeframe of the Post-RFP Letter of Direction issuance reasonably indicated that the Pre-RFP Approved Budget had actually been approved by government before the RFP release date;
- ▶ the Pre-RFP Approved Budget set out in the Post-RFP issued Letter of Direction was consistent with the figures supplied to IO senior management and executives for the purposes of obtaining internal approval to release; and,
- ▶ the content of the Post-RFP issued Letter of Direction was consistent with a known change in the project delivery model or payment structure which was not reflected in the previously issued annual Letter of Direction.

These budget approvals prior to RFP release were typically made for the anticipated Total Project Costs associated with a project and do not provide details corresponding to the AFP Contract, Post Contract Contingency, or Other Project Cost estimates.

In some cases, this information could be confirmed through corresponding AFP budget documents or the Pre-RFP Release Presentations to executive groups.

For a number of the early projects, the cost components necessary to assess budget performance between milestones A and B could not be reconciled or were unavailable and therefore could not be verified or validated. Generally, data availability and consistency has improved for the more recently delivered projects.

In order to present a comprehensive assessment of project performance between milestones A and B, along with the respective comparisons to the respective bid data results, the AFP Contract Costs identified in the previous 2013 AFP Track Record were used as indicative data, but cannot be considered to be validated as part of this assignment.

B – Awarded AFP Contract Budget (Financial Close)

The Awarded AFP Contract Budget reflects the actual AFP Contract value negotiated at Financial Close with the successful Project Co, an updated Post Contract Contingency based on the revised construction costs, and the remaining approved Other Project Costs.

The budget items encompassing the Awarded Contract Budget, used to establish **On Budget** performance, are readily available and verifiable through IO's annual Results-based Planning (RbP) submissions to government and IO's Construction Status Reports that are used to track budget utilization through the construction period.

C – Project Costs at Substantial Completion

The actual IO Managed AFP Costs and Total Project Costs are compiled by IO upon achievement of Substantial Completion. These costs reflect the net changes in project costs from the Awarded Contract Budget including the following:

- ▶ Non-Discretionary Variations;



- ▶ Discretionary Variations;
- ▶ Unused Post Contract Contingency Amount; and,
- ▶ Unused/Additional Other Costs.

These amounts were compiled directly from the responsible staff teams at IO.

Bid Data

IO provided a summary of the Winning, Average, and Highest AFP Contract bid submissions on either a project, or aggregate basis to support the relevant analysis described in this report.

Given the proprietary nature of this data, the direct source material contained within the actual bid submissions was not made available and therefore could not be verified.

Schedule Data

All schedule related data required for each project's **On Time** assessment was confirmed through the relevant formal contract documents, as described in **Appendix D**.

General project timeline data, including the RFP release date, was verified through publicly available information.

Where a project is made up of multiple sites, the Scheduled and Actual Substantial Completion Dates for the latest sites were used for the **On Time** analysis.

Lessons Learned & Recommendations

As noted above, the format and level of detail available for the budget related data created challenges in fulfilling the data verification and validation exercise part of this assignment, particularly for many of the earlier delivered projects.

A number of factors have been identified that contributed to these inconsistencies:

- ▶ The timing lag between the annual Letter of Direction, and budget development/revisions;
- ▶ Inconsistent level of detail/summary of budget information;
- ▶ Poor data management/record keeping; and
- ▶ Limited access to source data.

These inconsistencies appear to have improved over time, with the data available for the more recent projects being more comprehensive and in a format that allows consistent interpretation and comparison.

Similarly, the reporting and documentation of actual costs incurred during construction appears to have not been consistently tracked and controlled. Specific deficiencies identified are:

- ▶ Expected Post Contract Contingency usage (for Non-Discretionary Variations) could not be verified due to intentional reallocation of funds from other line items in the project budget. Such reallocation was done in order to make timely payment to Project Co pursuant to the Project Agreement since the approval requirements for the actual use of funds allocated as Post Contract Contingency are onerous and would otherwise lead to untimely payment;
- ▶ Inconsistent classification and treatment of expenses during construction; and
- ▶ Official records of expenses and payments for completed projects were not available.

Schedule data was readily available and easily verified through multiple sources and official documentation.

It is recommended that IO:

- ▶ Undertake a comprehensive review of its budgeting documentation requirements to ensure consistency and accuracy throughout the project delivery and implementation phases, with clear linkages between approved budgets and subsequent revisions;
- ▶ Assign responsibility to a single entity to manage and account for all costs associated with the Project from initiation to Substantial Completion;



- ▶ Make improvements to the available Construction Status Reports, with appropriate staff training, to ensure consistent treatment and reporting of project costs during the construction phase; and
- ▶ Issue a formal report following project completion that accounts for all costs incurred during construction, reconciling with the associated budget items.



Appendix D – Data Sources

Budget Data

A – Pre-RFP Budget Amount as approved by Cabinet

Budget Item	Data Source(s)
Approved Total Project Cost	<ul style="list-style-type: none"> ▶ Letter of Direction dated prior/adjacent to RFP release ▶ Pre-RFP Release Presentation to IO Executive Group
AFP Contract Estimate	<ul style="list-style-type: none"> ▶ Pre-RFP Release Presentation to IO Executive Group ▶ Detailed AFP Budget
Post Contract Contingency	<ul style="list-style-type: none"> ▶ Pre-RFP Release Presentation to IO Executive Group ▶ Detailed AFP Budget
Other Project Costs	<ul style="list-style-type: none"> ▶ Pre-RFP Release Presentation to IO Executive Group ▶ Detailed AFP Budget

B – Awarded Contract Budget at Financial Close

Budget Item	Data Source(s)
Awarded Total Project Cost	<ul style="list-style-type: none"> ▶ Results-based Planning Submissions ▶ Confirmed with IO Construction Status Reports
Awarded AFP Contract	<ul style="list-style-type: none"> ▶ Results-based Planning Submissions ▶ Confirmed with IO Construction Status Reports
Allocated Post Contract Contingency	<ul style="list-style-type: none"> ▶ Results-based Planning Submissions ▶ Confirmed with IO Construction Status Reports
Other Project Costs	<ul style="list-style-type: none"> ▶ Results-based Planning Submissions ▶ Confirmed with IO Construction Status Reports

C – Final Project Costs at Substantial Completion

Budget Item	Data Source(s)
Non-Discretionary Variations	<ul style="list-style-type: none"> ▶ Compiled and provided directly from IO
Discretionary Variations	<ul style="list-style-type: none"> ▶ Compiled and provided directly from IO
Final Ancillary/Other Costs	<ul style="list-style-type: none"> ▶ Compiled and provided directly from IO
Other Final Project Costs	<ul style="list-style-type: none"> ▶ Compiled and provided directly from IO Status Reports

Schedule Data

Schedule Milestone	Data Source(s)
RFP Release Date	<ul style="list-style-type: none"> ▶ IO Website ▶ Press Releases
Financial Close Date	<ul style="list-style-type: none"> ▶ IO Website



Schedule Milestone	Data Source(s)
	▶ Press Releases
Scheduled Substantial Completion Date	▶ As defined in Executed Project Agreement, available on IO Website
Actual Substantial Completion Date	▶ Official Project Substantial Completion Certificate(s)