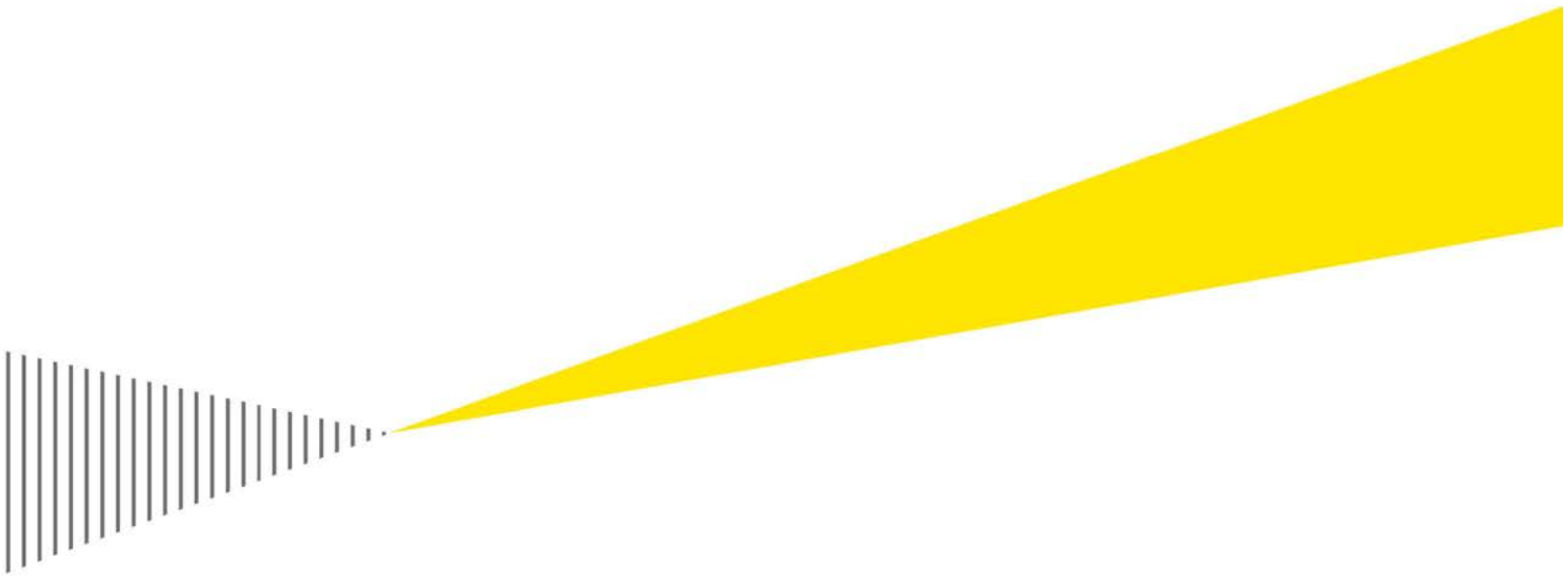
Waterfront Toronto

Port Lands Flood Protection and Enabling Infrastructure

FINAL Report

July 2016



Building a better working world

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Notice

Ernst and Young Orenda Corporate Finance Inc. ("**EY**") was engaged by Waterfront Toronto to assist in analyzing the viability of delivering all or part of the Port Lands Flood Protection and Enabling Infrastructure Project (the "**Project**") via a Public-Private Partnership ("**P3**") approach. This report (the "**Report**") highlights the methods, tools and findings of the procurement/delivery options analysis, qualitative analysis (including multi-criteria analysis and market sounding), quantitative analysis (including risk and value for money) and integrated recommendations for the Project.

This Report was prepared on Waterfront Toronto instructions solely for the purposes of the Waterfront Toronto. It should not be relied upon for any other purpose. The Report is based on objective analysis and information provided to us by Waterfront Toronto and third parties and does not necessarily represent EY views, comments, conclusions and opinions.

The Report may not have considered issues relevant to any third parties. Any use such third parties may choose to make of the Report is entirely at their own risk and we shall have no responsibility whatsoever in relation to any such use and to the fullest extent permitted by law we do not accept or assume responsibility to anyone other than Waterfront Toronto for our work, for this Report or for the opinions formed.

Our Report to Waterfront Toronto is based on inquiries of, and discussions with, Waterfront Toronto and its consultants. We have not undertaken any form of investigation, audit, substantiation or verification procedures for the information, data and projections provided to us. We have not sought to verify the accuracy of the data or the information and explanations provided.

Our work has been limited in time and scope and a more detailed / lengthy exercise may reveal material issues that this review has not addressed. The methodologies applied in undertaking this Report were based on market-tested and modified PPP Canada and Infrastructure Ontario methodologies for conducting value for qualitative and quantitative analyses (including value for money). No obligation is assumed by EY to revise this Report to reflect any circumstances or information that become available subsequent to the date of this Report.

1. Executive Summary

Ernst and Young Orenda Corporate Finance Inc. ("**EY**") was engaged by Waterfront Toronto to assist in analyzing the viability of delivering all or part of the Port Lands Flood Protection and Enabling Infrastructure Project (the "**Project**") via a Public-Private Partnership ("**P3**") approach such as Infrastructure Ontario's Alternative Financing and Procurement ("**AFP**") model. This report (the "**Report**") highlights the methods, tools and findings of the P3 suitability screening, qualitative analysis (including multi-criteria analysis and market sounding), and quantitative analysis (including risk and value for money) for the Project.

1.1 Project Overview

The Port Lands Flood Protection and Enabling Infrastructure Project is a comprehensive strategy for protecting the south east district of downtown Toronto – including parts of the Port Lands, South Riverdale, Leslieville, and the First Gulf/Unilever development site – from potential loss of life and costly flood damage associated with a major storm event.

Working together over the past decade, Waterfront Toronto, Toronto and Region Conservation Authority ("**TRCA**"), and the City of Toronto have developed and refined a solution for flood protecting Toronto's Port Lands and adjacent areas through the creation of a new, naturalized mouth for the Don River and other flood protection measures. Beyond these flood protection measures, the Project also includes the major municipal infrastructure that must be constructed, so as to maintain functional transportation and servicing networks, and the finishing of the floodplain and adjacent upland areas to provide new publicly-accessible green space and parks.

The primary objectives of the Project are two-fold. Completing flood protection for the Lower Don River area will both strengthen Toronto's climate change resiliency and unlock residential and commercial development value in and around the Port Lands.

1.2 P3 Suitability Screen

The P3 suitability screen was undertaken based on PPP Canada's methodology to determine the potential or suitability of the Project for delivery under a P3 model. Based on the applied scoring methodology, the P3 suitability screening yielded a score of 28 out of a possible 60 points (normalized result of 47%). The PPP Canada methodology typically dictates that if the P3 screen yields a score of less than 30 (under 50%), the P3 option should not be retained for further analysis. Despite these results, Waterfront Toronto directed EY to conduct further qualitative and quantitative assessments of P3 applicability in order to respond to the Province's request to give full consideration to using a P3 approach and in light of the market sounding participants' feedback regarding interest in and market capacity for delivering the Project as a P3.

1.3 Market Sounding

A market sounding was conducted to gauge the level of market interest, capability, and capacity for delivering the Project. The thirteen (13) participants provided market perspective on the unique scope and requirements proposed for the Project. Participants noted that a large bundle of Project components would be preferable to many smaller Project bundles, as larger projects tend to generate greater market interest and maximize competition during procurement.

All participants asserted that there is currently sufficient market capacity and interest in delivering the Project under a design-build-finance ("**DBF**") or traditional model. It was noted, however, that the timing of the procurement may align or interfere with other large infrastructure projects projected to be in-market or under development in spring 2017.

All participants identified permitting and approvals delays, specifically those related to environmental approvals, as high risk items. Environmental and site contamination issues were discussed at length as key Project risks. Allocations for environmental risks were noted as a significant issue for both constructors and lenders and required consideration. Participants also expressed some concerns related to soil contamination, remediation and treatment on the brownfield site for this Project.

Participants recommend that a clear identification of the contractual counterparty prior to the procurement phase would provide comfort to the market. Should the Project move forward as a P3, participants recommended the use of established P3 procurement processes and template documentation thoughtfully adapted to the specific needs of the Project to minimize bidding costs. Participants noted a keen interest in bidding on the Project given the information provided, regardless of the application of a P3 or traditional model.

1.4 Qualitative Assessment

The qualitative assessment considered the long-listed procurement options against qualitative assessment criteria in order to determine which procurement options should be short-listed for detailed quantitative analysis. The long-listed options (the "**Procurement Options**") included:

- Design-Bid-Build ("**DBB**")
- Design-Build ("**DB**")
- Construction Manager / General Contractor ("**CM/GC**")
- Build-Finance ("**BF**")
- Design-Build-Finance ("**DBF**")
- Design-Build-Finance-Maintain ("**DBFM**")
- Design-Build-Finance-Operate-Maintain ("**DBFOM**")

Market sounding participants noted that the operations and maintenance components related to the Project scope were relatively small in comparison to total capital costs. As such, it was discussed that there would not be sufficient operations and maintenance scope to create value or efficient risk transfer. Following discussion with Waterfront Toronto, the DBFM and DBFOM delivery options were removed from the long list of options.

In order to evaluate the long list of procurement options through a suitable qualitative process, multi criteria analysis was applied to each of the long-listed Procurement Options. The table below summarizes the applied scoring of the procurement options against the identified Evaluation Criteria.

Table 1: Qualitative Scoring Summary

Criterion	Design Bid Build (DBB)	Design Build (DB)	Construction Management / General Contractor (CM/GC)	Build Finance (BF)	Design Build Finance (DBF)
Overall Score	**83**	**94**	**111**	**96**	**136**

The table above shows that the DBF model emerges as the highest scoring procurement option. For the purposes of this report, the CM/GC model was carried forward as a second alternative delivery model for analysis to serve as comparative "baseline"/traditional option for current Waterfront Toronto procurement/delivery processes.

1.5 Quantitative Assessment

Value-for-money ("**VFM**") is expressed quantitatively as the difference in cost of delivering an infrastructure project using the traditional public sector project procurement model and an alternative delivery model. In the case of the Project, the comparative "traditional" model is assumed to be CM/GC (based on the results of the qualitative analysis and Waterfront Toronto past practice for larger scale municipal infrastructure projects) and the alternative delivery model for consideration is the DBF model.

The VFM analysis involves a detailed quantitative assessment of the two (2) procurement options, CM/GC and DBF, with the objective to assess whether the DBF procurement model is likely to achieve greater VFM to the public as compared to the CM/GC procurement model.

The analysis concluded that the DBF model produces VFM as compared to the CM/GC delivery option. However, the existence of Project VFM is only one factor that needs to be considered when determining which delivery option is the appropriate choice for project procurement. The different Project finance procurement options each have differentiating characteristics such as increased risk transfer or reduced flexibility that can provide Waterfront Toronto with various outcomes that can be beneficial or restrictive. All options considered should be thoroughly tested for VFM, while taking careful consideration of the defining characteristics of the delivery option and Project specific elements. The table below summarizes the VFM results under the base case assumptions for the DBF procurement model.

Table 2: Base Case Comparative Value for Money Results

Base Case Comparative Value for Money Results		
Base Case Value for Money Results ($M)	**CM/GC**	**DBF**
Total Cost	$881.43	$799.52
Estimated Value for Money (cost difference)		**$81.91**
Estimated Value for Money (% difference)		**9.29%**

2. Introduction

Ernst and Young Orenda Corporate Finance Inc. ("**EY**") was engaged by Waterfront Toronto to assist in analyzing the viability of delivering all or part of the Port Lands Flood Protection and Enabling Infrastructure Project (the "**Project**") via a Public-Private Partnership ("**P3**") approach such as Infrastructure Ontario's Alternative Financing and Procurement ("**AFP**") model. This report (the "**Report**") highlights the methods, tools and findings of the P3 suitability screening, qualitative analysis (including multi-criteria analysis and market sounding), and quantitative analysis (including risk and value for money) for the Project.

The Report is organized into the following six (6) major sections based on EY's scope of work:

- Introduction;
- P3 Suitability Screen
- Qualitative Analysis;
- Market Sounding;
- Quantitative and Risk Analysis; and
- Findings and Other Considerations.

2.1 Project Overview

The Port Lands Flood Protection and Enabling Infrastructure Project is a comprehensive strategy for protecting the south east district of downtown Toronto – including parts of the Port Lands, South Riverdale, Leslieville, and the First Gulf/Unilever development site – from potential loss of life and costly flood damage associated with a major storm event.

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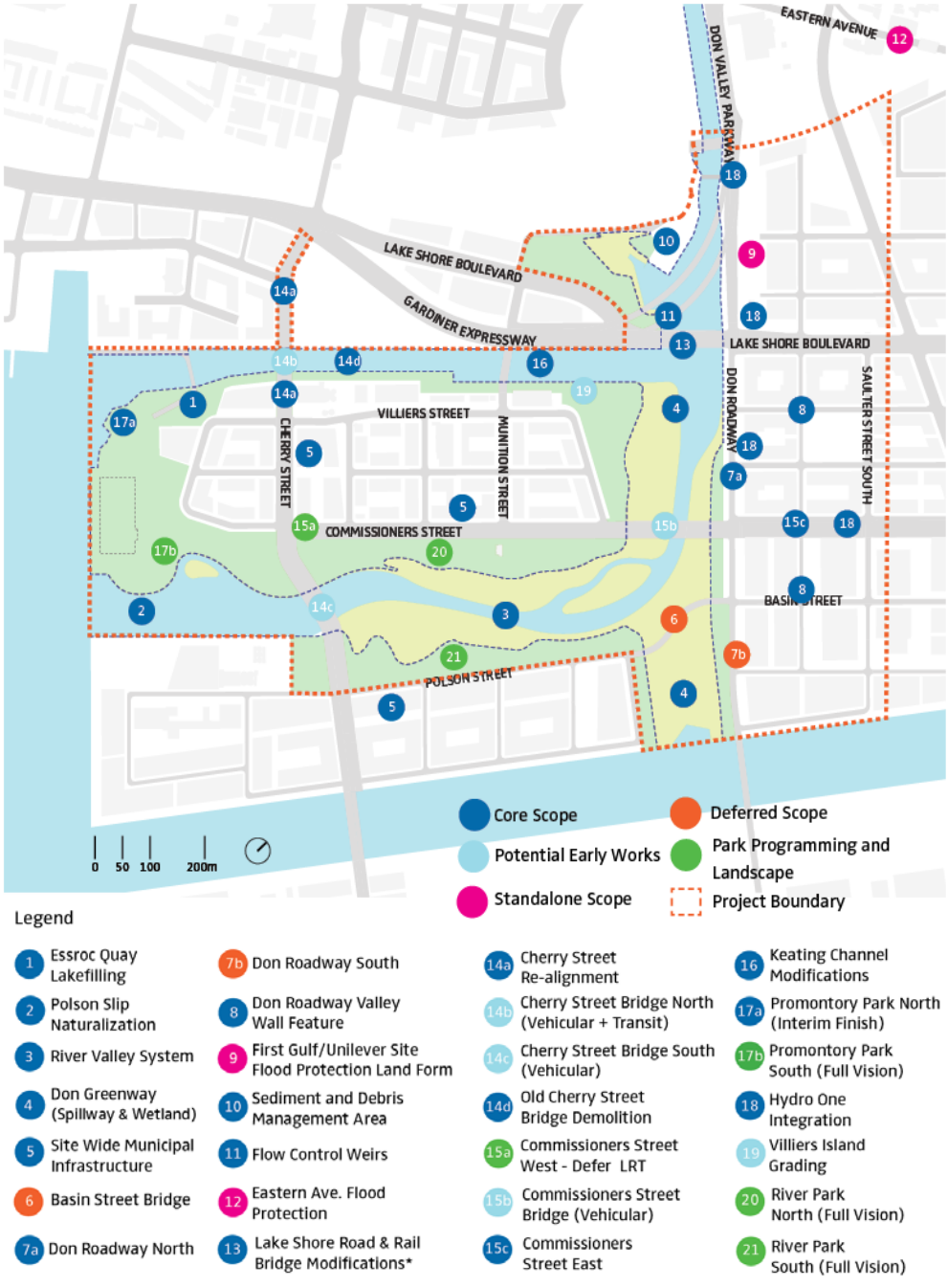
The primary objectives of the Project are two-fold. Completing flood protection for the Lower Don River area will both strengthen Toronto's climate change resiliency and unlock residential and commercial development value in and around the Port Lands.

2.1.1 Project Scope

The Project encompasses flood protection infrastructure, marine works, parks and naturalized areas, and enabling municipal infrastructure (bridges, roads, and services) in the vicinity of the new flood protection works. Figure 1 shows the approximate Project boundaries and identifies the major Project components. "Deferred" components are currently outside the scope of the Project for construction and maintenance purposes, but may need to be considered to some extent during the design and approval phases.

Figure 1: Project Boundaries and Major Project Components



An estimated 1.5 million cubic metres of soil excavation and 1.1 million cubic metres of earth fill plus 0.45 million cubic metres of gravel, rock, and other specialized fill materials will be required to complete the Project. In keeping with Waterfront Toronto's commitment to sustainability, a target of 80-85% soil re-use has been established.

Waterfront Toronto and its partner organizations have been collaborating with the Ministry of the Environment and Climate Change ("**MOECC**") to develop a feasible and mutually acceptable approach for the regulatory approval of this unique and complex Project. Waterfront Toronto anticipates that the environmental management of the Project site will be effected using a combination of regulatory tools, which include a Community Based Risk Assessment

("**CBRA**") process carried out in consultation with MOECC, and site-specific risk assessment ("**RA**") processes that may be carried out under Ontario Regulation (O. Reg.) 153/04. The design and construction specifications for the Project will incorporate a variety of environmental risk management measures to address the current environmental condition of the site.

The target date for Project completion is late 2023. The potential scope of services initially considered for inclusion in a P3/AFP Procurement was as follows, without limitation:

- Design and construction of flood protection infrastructure, marine works, parks and naturalized areas, bridge structures, roads, and municipal services;
- Maintenance and repair of flood protection infrastructure, including weir and dockwall structures, channel dredging, debris removal, and flood damage restoration; and
- Maintenance of parks and trails, bridge structures, roads, and municipal services.

Following the market sounding exercise, it was determined that some of the above noted scope was not suitable for inclusion under a P3 delivery model.

3. P3 Suitability Screen

The P3 suitability screen is designed to assist procuring Authorities (municipal, provincial, territorial) in determining the potential or suitability of a particular infrastructure project for delivery under a P3 model. The objective of the P3 screening is to consider the applicability of P3 models in the delivery of the Project.

3.1 Methodology

The methodology agreed with the Waterfront Toronto for carrying out this objective was:

1. To utilize PPP Canada's P3 Screen – Suitability Assessment to complete the Project's P3 screening; and
2. To apply the qualitative evaluation scores and recommend whether further investigation of the P3 delivery model is warranted.

It is important to note that the identification of P3 potential does not imply that the P3 approach will be the final delivery approach. Rather, it means that further detailed analysis of potential P3 options is appropriate.

3.2 P3 Screen Criteria

The evaluation criteria applied in the P3 screening process were based on PPP Canada's market-accepted and standardized P3 Screen – Suitability Assessment. Twelve (12) criteria were identified and applied in conducting the P3 screen:

- Asset life;
- Asset complexity;
- Outputs and performance specifications (construction);
- Stability of operational requirements;
- Performance specifications and indicators (operations period);
- Life-cycle costs;
- Revenue generation;
- Private sector expertise;
- Market precedents;
- Nature of the development site;
- Scope for private sector innovation gains; and
- Potential for contract integration.

The table below lists the Evaluation Criteria and corresponding screening questions, along with brief explanations of how they indicate the degree of P3 suitability.

Table 3: Screening Criteria

Criteria	Description
Asset Life: What is the anticipated useful life (i.e. service life) of this asset?	The duration of P3 contracts tends to be tied to the useful life of the asset and, in general, longer-lived assets tend to be better suited to a P3.
Asset Complexity: How complex is the asset both with respect to construction and operations & maintenance?	P3s lend themselves to complex investments. Complexity can arise as a result of the nature of the asset, the site on which it will be constructed, or the number of distinct asset classes involved in the investment
Outputs and Performance Specifications (Construction): What is the availability of output specifications for the construction of the asset?	P3s are characterized by the public sector setting its desired outcomes or outputs in the form of measurable technical output/service/performance specifications that provide the basis for performance based contracts.
Stability of Operational Requirements: Are the long term operational requirements of the planned asset relatively stable and predictable?	Assets with stable and predictable performance and maintenance requirements lend themselves to P3 delivery.
Performance Specifications and Indicators (Operations Period): What is the availability of operations- and maintenance-related performance specifications and indicators?	Establishing and monitoring performance in relation to key performance indicators (KPIs) is an important element of performance based contracts, a foundational element of P3s.
Life-Cycle Costs: Can most of the full life-cycle costs of the asset, mainly related to construction and fit-up (i.e. project costs) and long-term operations, including maintenance, be quantified upfront with reasonable assumptions and/or availability of historic data?	Life cycle costs are very important factor in success of a P3. Should a DBFM or DBFOM approach be adopted, the public sector will pay for maintenance and/or operation through the P3 agreement and expects the asset to be well-maintained and efficiently operated at the lowest cost possible.
Revenue Generation: Does the planned investment have inherent scope to generate any revenue?	Revenue generation is not a requirement for a successful P3. However, where an asset could potentially generate revenue and reduce the burden on public funds, the P3 model is ideally suited to leveraging that potential.
Private Sector Expertise: How many private sector firms have the capacity to deliver and maintain this type of asset?	The availability of private sector expertise is critical for two reasons: (1) ensuring a competitive bidding environment; and (2) ensuring that there is private sector capacity to perform the functions and manage the risks envisioned in the P3.

Criteria	Description
Market Precedents: Have investments with similar requirements and of similar size and scale been delivered through the P3 model?	The existence of P3s for similar assets is a key indicator regarding the viability of a P3.
Nature of Development Site: What is the nature of the development site (greenfield vs. brownfield) and what proportion of this investment involves the expansion/renovation of existing facilities/assets?	In general, investments involving all new construction on previously undeveloped sites lend themselves to maximizing risk transfer to the private sector.
Scope for Private Sector Innovation Gains: To what extent will the public sector be able to rely on output/performance-based requirements/specifications?	The scope for private sector innovation is inversely related to the public sector's need to be prescriptive.
Potential for Contract Integration: Which elements of the potential P3 (i.e., design, build, finance, maintain, operate) can be integrated into one contract?	One of the mechanisms by which P3s generate value is the integration of various elements of the potential P3 (i.e., design, build, finance, operate/maintain). The greater the potential for integration, the more likely a P3 will be viable.

3.3 Application of the Screening Criteria

For each of the screening criteria, the Project Team applied a scale from one (1) to five (5), with five (5) representing a high score and higher Project applicability for the P3 approach. The Project Team applied a scoring methodology based on the market accepted and tested PPP Canada P3 screen methodology. These scores are then normalized to a score out of 100, which can range from 1 to 100.

The PPP Canada P3 Suitability Screen indicates an appropriate level of P3 suitability for the Project being considered and produces a final numerical output that should be assessed against the following:

Score Range	Normalized Score Range	Evaluating Investments for P3 Viability
0 – 30	0 - 50	The P3 option should not be retained for further analysis.
31 – 45	51 - 75	The Project presents a mix of favourable and unfavourable indicators for P3 delivery. Further assessment is necessary.
46 – 60	76 - 100	The Project shows P3 delivery potential and requires further assessment.

Further details on the accompanying scales and scoring indicators are provided in **Appendix E: *The Guide to the new Building Canada Fund P3 Screen – Suitability Assessment*.**

3.3.1 Asset life

Asset life is defined as the anticipated useful life (i.e. service life) of the asset to be delivered. The duration of P3 contracts extending through the operations and/or maintenance phases tends to be tied to the useful life of the asset and therefore the length of the maintenance period. In general, longer-lived assets tend to be better suited to a P3. The longer contract linked to the P3 delivery of infrastructure projects may provide benefits of efficiencies, innovations and long term cost certainty as provided by a private sector partner. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
3	Generally, the Project is expected to have an asset life of greater than 25 years. In some instances, the Project components, such as land reclamation, may exceed asset life of 25 years on their own. The asset life of the Project is conducive to a P3 approach.

3.3.2 Asset complexity

Asset complexity gauges the intricacy of the Project and resulting asset(s) both with respect to construction and to operations and maintenance. P3s lend themselves to complex investments. Complexity can arise as a result of the nature of the asset, the site on which it will be constructed, or the number of distinct asset classes involved in the investment. The Project is highly complex, comprising multiple asset classes. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
3	The construction of the Project is expected to be a highly complex undertaking because of the: diversity of Project components; challenging geotechnical and environmental site conditions; environmental management and other regulatory approval requirements; access and logistics requirements; and multiple interfaces with adjacent projects, requiring extensive coordination. For those Project components needing periodic maintenance (municipal services, roads, bridges, marine structures, the sediment trap, and the public realm), specific maintenance requirements are relatively routine. Much of the total construction investment will be in re-grading, land reclamation, and environmental clean-up, activities which are not accompanied by a need for on-going post-construction maintenance.

3.3.3 Outputs and performance specifications (construction)

P3s are characterized by the public sector setting its desired outcomes or outputs in the form of measurable technical output/service/performance specifications that provide the basis for performance based contracts. The outputs and performance specifications criterion assesses the availability of output specifications for the construction of the proposed asset(s). As the Project includes several different types of infrastructure, multiple output specifications will be required to address the full range of component characteristics and performance requirements. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
3	Existing conventional specifications can be converted into output or performance specifications for most Project components, while some aspects of the design (e.g., the grading plan) must be specified in prescriptive terms. It may prove particularly difficult to translate design excellence requirements into unambiguous output specifications.

3.3.4 Stability of operational requirements

Assets with stable and predictable performance and maintenance requirements lend themselves to P3 delivery. This criterion measures the relative stability and predictability of the long term operational requirements of the planned asset(s). The stability of operational requirements would be dependent on the known factors of Project scope. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
2	Operation and periodic maintenance requirements for certain Project components tend to be relatively stable and consistent with those for the larger networks of roads, services, etc. to which such components will be connected.

3.3.5 Performance specifications and indicators (operations period)

Establishing and monitoring performance in relation to key performance indicators (KPIs) is an important element of performance based contracts, a foundational element of P3s. This criterion assesses the availability of operations- and maintenance-related performance specifications and indicators for the proposed Project. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
1	Given the unique nature of many Project components, there is limited to no data related to performance outputs and indicators for comparable assets. The Project scope related to operations and maintenance is expected to be small, as compared to capital requirements, and much of the infrastructure extends existing networks already being operated and maintained by others.

3.3.6 Life-cycle costs

Life-cycle costs are very important factor in the success of a P3. The public authority will pay for maintenance and/or operation through the P3 agreement and expects the asset to be well-maintained and efficiently operated at the lowest cost possible. In assessing P3 applicability, we measure whether most of the full life-cycle costs of the asset (related both to construction and to long-term operations and maintenance) can be quantified upfront with reasonable assumptions and/or availability of historic data. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
1	The total asset life-cycle costs for some Project components are well understood, and can be accurately estimated. In contrast, asset renewal/refurbishment requirements for flood protection infrastructure will be dictated by the occurrence of major storm events, which are inherently unpredictable, as such, associated life cycle costs may be difficult to establish.

3.3.7 Revenue generation

Revenue generation is not a requirement for a successful P3. However, where an asset could potentially generate revenue and reduce the burden on public funds, the P3 model is ideally suited to leveraging that potential. Consideration was given to whether the planned investment (Port Lands Project) had the inherent scope to generate any revenue. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
1	It is unlikely that the planned investment will generate any revenues.

3.3.8 Private sector expertise

The availability of private sector expertise is critical for two reasons: (1) ensuring a competitive bidding environment; and (2) ensuring that there is private sector capacity to perform the functions and manage the risks envisioned in the P3. A subsequent market sounding exercise will be implemented to gauge market capacity and interest in the Port Lands Project. For the purposes of the P3 screen, however, we generally assessed how many private sector firms have the capacity to deliver and maintain this type of asset given current market conditions. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
5	There are more than 5 private sector firms capable of designing, constructing and maintaining the asset types as required by this Project, however, the market capacity is to be further determined with market sounding interviews.

3.3.9 Market precedents

The existence of P3s for similar assets is a key indicator regarding the viability of a P3. In assessing the applicability of this measure, research was conducted to investigate investments with similar requirements and of similar size and scale to the Port Lands Project having been delivered through the P3 model. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
2	There is P3 market precedent for some municipal infrastructure components of the Project (including roads, bridges, retaining walls, water and sewer networks, etc.); however there is no P3 market precedent for a project involving earth moving and environmental work of this scale and scope.

3.3.10 Nature of development site

In general, investments involving all new construction on previously undeveloped sites lend themselves to maximizing risk transfer to the private sector. This criterion considers the nature of the development site (Greenfield vs. brownfield) and what proportion of this investment involves the expansion/renovation of existing assets or site conditions. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
2	The Project represents a unique development site requiring extensive earthwork, land reclamation, soil and groundwater management, and marine works

3.3.11 Scope of private sector innovation gains

The scope for private sector innovation is inversely related to the public sector's need to be prescriptive. The Project was assessed to determine the extent to which the public sector will be able to rely on output/performance-based requirements/specifications for the Project under consideration. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
3	It is anticipated that the private sector will bring some innovation to the Project by way of efficiencies in the construction approach, sequencing, and schedule and with respect to soil and groundwater treatment approaches, resulting from designer/constructor collaboration and the competitive process. However, the private sector innovations might be limited based on Project approval requirements.

3.3.12 Potential for contract integration

The potential for contract integration considers which elements of the potential P3 (i.e., design, build, finance, maintain, operate) can be integrated into one contract. One of the mechanisms by which P3s generate value is the integration of various elements of the potential P3 contract. The greater the potential for integration, the more likely a P3 will be viable. Below, we provide the score and corresponding rationale for this criterion:

Assigned Score	Rationale
2	Design-build-finance-maintenance and some operations could be integrated into a contract with a single service provider. This is contingent on the scope of operation and maintenance for specific Project elements. The long-term operations and maintenance requirements for this Project are expected to be small compared to the capital requirements.

3.4 Summary of P3 Screen

The table below summarizes the scores applied to the screening criteria.

Criteria	Score
Asset Life	3
Asset Complexity	3
Outputs and Performance Specifications (Construction)	3
Stability of Operational Requirements	2
Performance Specifications and Indicators (Operations Period)	1
Life-Cycle Costs	1
Revenue Generation	1
Private Sector Expertise	5
Market Precedents	2
Nature of Development Site	2
Scope for Private Sector Innovation Gains	3
Potential for Contract Integration	2
Total Score	**28**
Total Normalized Score	**47%**

Based on the applied scoring methodology, the P3 suitability screening yielded a score of 28 out of a possible 60 points (normalized result of 47%). The PPP Canada methodology typically dictates that if the P3 screen yields a score

of less than 30 (under 50%), the P3 option should not be retained for further analysis. Despite these results, Waterfront Toronto directed EY to conduct further assessments of P3 applicability in order to respond to the Province's request to give full consideration to using a P3 approach and in light of the market sounding participants' feedback regarding interest in and market capacity for delivering the Project as a P3. As a result of these discussions, further qualitative and quantitative assessments for both traditional and P3 models are presented in Sections 5 and 6 to determine the applicability of P3 models.

4. Market Sounding

A market sounding was conducted to gauge the level of market interest, capability, and capacity for delivering the Project. The key objectives of the market sounding exercise were to:

- Provide preliminary project information to the market;
- Assess the capability and appetite of the market to carry out the Project under different procurement options; and
- Assist in structuring a transaction that will generate competitive tension and best value to the procuring authority.

4.1 Methodology

Working with Waterfront Toronto and Infrastructure Ontario (AFP subject matter experts and advisors to the project team), EY compiled a list of prospective market sounding participants from a variety of backgrounds to cover the different facets of the Project. A total of seventeen (17) primary companies were identified and approached, thirteen (13) of which agreed to participate in teleconference interviews. This included infrastructure developers/operators, civil infrastructure contractors active in public-private partnership ("**P3**") market, specialty contractors, lenders and equity providers.

The market sounding participants list is included in Appendix A.

A market sounding information briefing document was developed and delivered to prospective participants prior to the market sounding interviews. A copy of this information package has been included in Appendix B of this Report. Note that some details about the Project changed subsequent to the preparation and distribution of this briefing document, but these changes would not be expected to materially impact the Market Sounding Findings.

4.2 Market Sounding Findings

The market sounding interviews were held between 14 January 2016 and 10 February 2016. Comments received from market sounding participants during the interviews were generally supportive of the contemplated Project. In particular, respondents were pleased with Waterfront Toronto's interest in collecting market feedback for consideration in structuring any future transaction. An overview of high-level findings from the market sounding, including issues requiring further consideration are summarized below.

4.2.1 Project scope and size

Based on the information included in the briefing document, participants noted that a large bundle of Project components would be preferable to many smaller Project bundles. Larger projects generally generate greater market interest, lead to economies of scale and maximize competition during procurement.

In considering bundled projects, it was noted that different components may carry varying levels of risk. It was suggested that a well-defined and narrow scope would more suitable for application of a P3 delivery model.

Waterfront Toronto also noted that some components of the Project scope (as detailed in the market sounding briefing package) were potentially suitable for early works. Such components would be removed from the final scope tendered to market.

4.2.2 Preferred Delivery Option

4.2.2.1 P3 Delivery Models vs. Traditional Delivery Model

The majority of participants expressed a keen interest in bidding on the Project regardless of the application of a P3 or traditional model. Several participants noted that a P3 model would be well suited to delivering the Project scope in its entirety. However, many noted that the maintenance component in the current project scope would not be large enough to add value or innovations under a DBFM/DBFOM model, as discussed in Section 4.2.2.2.

One participant highlighted the importance of selecting one delivery option as opposed to using a hybrid model (selecting components from different models), which can introduce a broad range of risks and may not attract the most efficient bidding teams.

The design-build-finance ("**DBF**") model was determined to be the most relevant model to be applied to this Project, given the currently available information and scope requirements. Based on the Project scope, the DBF model was suggested as the most relevant for Project delivery.

4.2.2.2 Scope of Operations and Maintenance

Several participants noted that the maintenance component as detailed in the scope would not be sufficient to provide value in justification of the design-build-finance-maintain ("**DBFM**") or design-build-finance-operate-maintain ("**DBFOM**") models.

A few participants specifically noted that the maintenance related to the flood damage restoration as an area of concern as it would be difficult to transfer these risks to the private sector. The flood damage restoration components were addressed as difficult to price during the procurement phase. As such, this item may be associated with high risk premiums for market sounding participants.

One (1) participant suggested tendering maintenance items separately, to allow for the contracting of specialized firms for maintenance of parks, trails or bridge structures. Marine works were also cited as a particular component which may require more specialized resources or team members in the formation of consortia.

In an effort to integrate further operations or maintenance scope as part of a DBFM or DBFOM delivery model, two (2) participants suggested the inclusion of a large social infrastructure asset within the Project scope, to serve as a maintenance "anchor" component. The asset could include community or recreational facilities, stadiums, or other social infrastructure assets which would entail a long-term operations and maintenance component (typically 30 years).

4.2.3 Site conditions, permits and approvals

4.2.3.1 Environmental approvals and permitting

Any delays in obtaining necessary approvals or permits would have the potential to impact downstream works, resulting in overall schedule delays or additional costs. Open ended timelines can lead to material risk premiums added by bidders.

All participants identified delays in required environmental approvals as a high risk item. Risks associated with environmental approvals and permitting could be mitigated through well-defined rules of engagement with approval agencies and specification in contractual terms with the contractor / private sector consortium ("**Project Co**").

Risk allocations for environmental concerns were noted as a significant issue for lenders. Participants agreed that environmental risks would be transferrable (to a certain extent) to Project Co, however, the transfer of risks would impact overall bid prices and contingencies.

Some participants highlighted concerns related to constraints on private sector innovation resulting from environmental approvals and permitting processes. A few participants noted that regulatory approvals would need to be in place in sufficient time ahead of the bid submission deadline, with clear language and processes related to how approvals will be implemented and enforced. Lenders specifically noted that key permits and approvals would need to be in place prior to financial close. As the time of the market sounding, environmental assessments (EAs) for flood protection and naturalization works and for municipal infrastructure (bridges, roads, transit, and services) had been completed and approved.

4.2.3.2 Site condition and contamination

All participants expressed concern over soil contamination, specifically in terms of expectations for the treatment and re-use of soil excavated from the Project site.

The delineation of potential contaminants was identified as a significant concern, with specific questions raised related to soil remediation, treatment, and re-use. Waterfront Toronto noted the potential to include a target for re-use of soil. Some participants stated that it would be possible to conduct soil remediation and treatment on-site, if requested, to minimize costs and delays associated with soil removal and disposal. Other participants cited that geotechnical and environmental risks should remain with the Project owner.

Participants noted that information on the soil properties, specifically related to dredging components, would need to be released with procurement documentation or publicly prior to tendering competition. Inferable risks based on geotechnical and environmental reports would be comfortably accepted by the participants, but unknown risks (not identified or readily inferable) would require a detailed regime for measurement, containment and management and would need to be detailed in the procurement process.

Some participants noted that if information presented in available environmental or geotechnical reports was insufficient, that additional testing or site visits may be requested by bidders.

4.2.3.3 Utilities

Many participants raised concerns related to interfaces or collaboration with utilities during Project delivery. A detailed understanding of risk allocation related to the utilities component would need to be available to bidders ahead of the commitment of any resources. Several participants noted issues in overall schedule delays related to relocation or removal of utility components. Participants noted that the risk appetite associated with utility related requirements would be determined by the level of control that the contractor/Project Co would have over the utility in the completion of the necessary work, as schedule and control were identified as the largest issues. Any Project relationships with utilities would need to be well defined ahead of the procurement phase.

4.2.4 Procurement considerations

4.2.4.1 Market capacity and interfaces with other projects in market

All participants asserted that there is currently sufficient market capacity and interest in delivering the Project under either a DBF or more traditional model.

It was noted, however, that the timing of the procurement may parallel other large infrastructure projects projected to be in-market or under development in spring 2017. Most participants indicated that the market is resilient enough to handle several large construction projects within similar timelines, but noted that the procurement timing needs to be well coordinated with releases for other major public infrastructure projects.

Participants also highlighted questions related to the Gardiner Expressway Rehabilitation project, which could share interfaces with the Port Lands project, and may result in unexpected or unplanned issues. Should the Project be delivered under a traditional model with multiple separate construction contracts, additional interface and site access issues may arise between parties, which could lead to schedule delays. Participants also raised issues related to relief for damage caused by third parties, over which the contractor / Project Co has no control.

The boundaries of any adjacent projects or interfaces would need to be well defined and aligned to the final Project scope.

4.2.4.2 Timetable

Waterfront Toronto presented an estimated timeline of spring 2017 through 2023 for construction completion. This timeline was deemed to be achievable by all participants under a traditional delivery model.

Participants noted that under a P3 procurement process, the 2023 completion date would be achievable; however, the construction start date of spring 2017 would need to be extended to allow for a longer Project procurement lead time. Under a P3 (DBF), timelines would need to be adjusted to accommodate approximately two (2) to three (3) months for the request for qualifications ("**RFQ**") and at least eight (8) to twelve (12) months for the request for proposals ("**RFP**") processes.

Some participants also recommended the use of regular public communications and advance availability of Project information prior to procurement to facilitate teaming decisions.

4.2.4.3 Procurement documentation

Participants recommended the use of established processes and template documentation, should the Project move forward as a P3. Template documentation from Infrastructure Ontario could be used as a basis given its general acceptance and familiarity by the market, however, it was noted that adaptation would be required to suit the unique needs and characteristics of this Project. One participant suggested that current Infrastructure Ontario templates do not promote innovation, and suggested amendments to allow the private sector with more flexibility to allow for

and incentivize private sector innovations. Part of this adaptation could include creative opportunities through the procurement process to engage in open dialogue and propose innovative solutions.

One participant also noted that evaluation measures and templates would need to be amended and tailored to the Project, citing that selecting teams based on credit-worthiness would be important, but could limit competition to larger market players. As such, it was recommended that several criteria be applied in the evaluation of bidders.

4.2.4.4 Contractual counterparties

Participants will require clear identification of the contractual counterparty prior to the procurement phase. The contractual counterparty identifies the Project owner who will have the assigned authority and committed funding for the Project. The strength of the contractual counterparty provides comfort to lenders through master agreements or commitment agreements outside of the concession agreements (commercial protections).

4.2.5 Financing considerations

4.2.5.1 Lenders concerns

The long construction period anticipated (2017 through 2023) for the Project could have implications in obtaining construction bonding and financing. The anticipated $800 million Project construction cost is not anticipated to be an issue for Canadian lenders.

Lenders noted that concerns are typically associated with uncertainties surrounding common project elements such as geotechnical risk, permits and approvals. As the scope of this Project is unique, the rating of the contractual counterparty would provide significant comfort to lenders. Lenders may seek a development agreement or funding agreement which would clearly articulate how funds would be received from government sources.

4.2.5.2 Payment structure

The majority of participants affirmed that progress payments and/or substantial completion payment would be better received by the market. Larger substantial completion payments reduce the size of both the debt and equity requirements of the Project and therefore careful consideration should be given to the size of such payments. A few participants noted milestone payments as the preferred structure, with the caveat of allowing Project Co the opportunity to identify the selected milestones.

4.3 Additional Considerations

4.3.1 Adjacent Projects

The Port Lands and adjacent areas could become congested with the construction of several projects within similar timeframes. The development of adjacent projects, including the F.G. Gardiner Expressway Rehabilitation, could have impacts on availability or capacity of the market, including bidder, equipment, and material and resource availability. The mobilization and construction of several projects within the same area could also impact traffic through and into the Port Lands area. These interface risks were cited as a major reason that the recent Eglinton Crosstown project did not attract a large pool (greater than four) bidding parties.

Waterfront Toronto should consider scheduling related to tendering, award and construction timeline in relation to other projects of similar size to be completed in the Port Lands area.

4.4 Market Sounding Conclusion

The thirteen (13) participants provided market perspective on the unique scope and requirements proposed for the Project. Participants noted that a large bundle of Project components would be preferable to many smaller Project bundles, as larger projects tend to generate greater market interest and maximize competition during procurement.

The majority of participants also noted that a P3 model, specifically the DBF approach, would be well-suited to delivering the Project scope in its entirety, as the maintenance component in the current Project scope would not be sufficient in providing value to Waterfront Toronto under DBFM or DBFOM delivery models. Participants also noted that the traditional delivery model (CM/GC) would be similarly effective for Project delivery.

All participants asserted that there is currently sufficient market capacity and interest in delivering the Project under a DBF or traditional model. It was noted, however, that the timing of the procurement may align or interfere with other large infrastructure projects projected to be in-market or under development in spring 2017.

Waterfront Toronto presented an estimated timeline of spring 2017 through 2023 for construction completion. This timeline was deemed to be achievable by all participants under a traditional delivery model. Participants noted that under a P3 procurement process, the 2023 completion date would be achievable; however, the construction start date of spring 2017 would need to be extended to allow for a longer Project procurement lead time.

All participants identified permitting and approvals delays, specifically those related to environmental approvals, as high risk items.

Environmental and site contamination issues were discussed at length as key Project risks. Allocations for environmental risks were noted as a significant issue for both constructors and lenders and required consideration. Participants also expressed some concerns related to soil contamination, remediation and treatment on the brownfield site for this Project. .

Another key Project risk that was highlighted is utilities. A clear understanding of risk allocation related to the utilities component would need to be available to bidders early on in the procurement process.

Participants recommend that a clear identification of the contractual counterparty prior to the procurement phase would provide comfort to the market. Should the Project move forward as a P3, participants recommended the use of established P3 procurement processes and template documentation thoughtfully adapted to the specific needs of the Project to minimize bidding costs. Participants noted a keen interest in bidding on the Project given the information provided, regardless of the application of a P3 or traditional model.

5. Qualitative Assessment

The qualitative assessment considered the long-listed procurement options against qualitative assessment criteria in order to determine which procurement options should be short-listed for detailed quantitative analysis. The methodology agreed with Waterfront Toronto for carrying out this objective was:

1. To develop a long list of the key procurement options that could be employed to procure the Project;

2. To develop a qualitative evaluation methodology with which to assess the long list of procurement options and reduce the long list to a reasonable number of potential procurement options on which to carry out a more detailed quantitative analysis;

3. To apply the qualitative evaluation methodology to the long list of procurement options, and recommend the most appropriate procurement options to carry forward to the quantitative evaluation phase.

5.1 Long List of Procurement Options

A long list of the key procurement options was developed to highlight potential options which could be employed in order to procure the Project. The long list was developed from:

1. Traditional procurement methods for public infrastructure assets utilized by Waterfront Toronto, City of Toronto and other government and public sector entities across Canada and globally; and

2. Alternative procurement options identified as potential options for the Project covering a broad spectrum of procurement opportunities with varying degrees of private sector involvement, private sector financing and risk transfer.

The following long-listed options (the "**Procurement Options**") along with a brief description of what each option would entail were agreed at the workshop.

Table 4: Long-list of Procurement Options

Procurement Option	Description
Design Bid Build	• Design-Bid-Build ("**DBB**") procurement has been the most common method of civil infrastructure procurement by the public sector. Under this approach, the public sector is fully responsible for the engineering and design of the asset, which is typically undertaken on its behalf by a private sector consultant. The public sector then invites bids from qualified bidders to construct the works as described in the plans and specifications prepared by the consultant. The bids are evaluated and the contract is awarded to the lowest priced, technically compliant bidder. • Following award, the construction contractor undertakes construction of the works under the general review and administration of the consultant, who owes a duty of care to the public sector to ensure that the contractor follows the plans and specifications and complies with the terms of the construction contract. Following the completion of construction, the asset is commissioned and handed over to the public sector for operation and maintenance. • This approach is well-suited to recurring, repetitive projects for which the public sector has a desire to specify its exact requirements and obtain firm, competitive prices based on a 100%

Procurement Option	Description
	complete design.
Design Build	• Under the Design-Build model ("**DB**") proposals are obtained from qualified teams for the integrated design and construction of the Project in accordance with the public sector's performance or "output" specifications., These submissions are typically evaluated based on a combination of price and technical criteria, in order to identify a "best value" proposal. A contract is awarded to a single entity, the design-builder, which develops a detailed design in compliance with the output specifications. Following design approval for the Project, or a portion thereof, the design-builder proceeds to construct the asset. The public sector assumes operation and maintenance responsibilities following completion. • Compared with the DBB approach, the DB model combines design and construction responsibilities, thus streamlining procurement and project administration processes, as well as allowing for increased innovation. The DB model also enables overlapping design and construction.
Construction Manager / General Contractor	• Under the Construction Manager/General Contractor model ("**CM/GC**"), the public sector separately retains a design consultant and a construction contractor, selected based on a combination of qualifications and price, to collaborate in the development and delivery of a project. CM/GC is based on a similar project delivery model known as Construction Manager "at Risk" used in the vertical (building) construction industry. • The CM/GC model facilitates early contractor involvement, with the CM/GC providing construction planning/phasing/staging services, constructability input, cost estimating, and risk analysis during the pre-construction phase and collaborating with the project team to identify and evaluate options to reduce cost, shorten schedule, and increase value. • Once the design has been sufficiently developed, the CM/GC submits a guaranteed maximum price ("**GMP**") for construction, which may be accepted or rejected by the public sector. The GMP may cover both work competitively bid to subcontractors and work to be self-performed by the CM/GC. If accepted, the CM/GC becomes responsible to complete the work at or below the GMP.
Build-Finance	• Under the Build Finance ("**BF**") model, the public sector transfers the responsibilities and associated risks for the construction and financing of an asset to the private sector. Upon the satisfactory completion of construction, the public sector makes a single payment, which may be subject to a holdback provision. • The BF removes the integration achieved by combining the design and construction elements of a project found in other P3 models, but lender oversight incentivizes timely completion of construction by the private sector.
Design Build Finance	• Under the Design-Build-Finance ("**DBF**") model, the public sector transfers the majority of the responsibilities and associated risks for the design, construction and financing of an asset to the private sector. Upon the satisfactory completion of construction, the public sector makes a single payment, which may be subject to a holdback provision. • The DBF is an extension of the DB option, but with payments linked to satisfactory completion. This provides increased incentive (compared with a liquidated damages regime, which is limited to compensating the public sector for reasonably pre-estimated extended duration costs) for the private sector to complete construction on a timely basis and ensure that the public sector's specifications for the asset are met.
Design Build Finance Maintain	• The Design-Build-Finance-Maintain ("**DBFM**") model is an integrated approach that combines design and construction responsibilities with long-term maintenance and refurbishment under

Procurement Option	Description
	a single contract. • A private sector partner is procured through a competitive tendering process to design, finance, build and maintain the infrastructure in a manner that meets the requirements and specifications of the public sector. • While some elements of operations may be transferred to the private sector under DBFM, these services are typically limited in scope and the operating responsibilities for the asset are retained by the public sector. • DBFM should be considered for those projects where there is sufficient logically related maintenance scope that can be transferred to the private sector. Where the project scope involves limited extensions to similar assets that are already being maintained by others, DBFM may not be commercially feasible.
Design Build Finance Operate Maintain	• The Design-Build-Finance-Operate-Maintain ("**DBFOM**") model differs from DBFM in that it transfers greater operational responsibilities and related risks to the private sector. • As with DBFM, where the project scope involves limited extensions to similar assets already being operated and/or maintained by others, DBFOM may not be commercially feasible.

As per Section 4 above, market sounding participants noted that the operations and maintenance components related to the Project scope were relatively small in comparison to total capital costs. As such, it was discussed that there would not be sufficient operations and maintenance scope to create value or efficient risk transfer. Following discussion with Waterfront Toronto, the DBFM and DBFOM delivery options were removed from the long list of options.

5.2 Qualitative Assessment Methodology

In order to evaluate the long list of procurement options through a suitable qualitative process, multi criteria analysis was applied to each of the long listed Procurement Options.

This involved first developing a list of criteria ("**Evaluation Criteria**") against which to assess each Procurement Option and applying each criterion to each of the long-list of procurement options agreed in order to determine which procurement options meet the evaluation criteria most closely. The assessment was carried out during a half-day workshop facilitated by EY on May 11, 2016, which included participants from Waterfront Toronto, the City of Toronto, TRCA, IO, and other Project stakeholders and subject matter experts representing various provincial ministries.

The Evaluation Criteria were developed in the following categories:

- Alignment with Project, WT, Partner and Stakeholder Objectives
- Value, Cost, and Schedule Factors
- Project Delivery Factors

Weighting of the Evaluation Criteria was considered as high (multiplier of 3), medium (multiplier of 2) or low (multiplier of 1) impact items with respect to relative importance to the Project.

The table below lists the Evaluation Criteria, along with a brief explanation.

Table 5: Qualitative Assessment Criteria

Criteria	Weight	Description
Alignment with Project Alignment with Project, Waterfront Toronto, Partner, and Stakeholder Objectives		
Innovation[1]	High	Innovation measures the relative ability of the procurement option to leverage private sector expertise, resources, products, and technologies in order to incentivize innovation in design and construction.
Sustainability and Environmental Management	High	Sustainability and Environmental Management measures the relative ability of the procurement option to provide solutions that incorporate enhanced sustainability/environmental management features or measures, which can serve as a model for future projects in the designated waterfront area and beyond. Waterfront Toronto will impose high sustainability and environmental management standards on all projects.
Design Excellence	High	Design Excellence measures the relative ability of the procurement option to maximize achievement of design excellence. Design excellence relates to both the functionality and aesthetics of the Project.
Value, Cost, and Schedule Factors		
Competition	Medium	Competition measures the relative ability of the procurement option to maximize private sector engagement and drive competition among proponents to achieve project goals with the best proposal.
Cost Certainty	High	Cost Certainty measures the relative ability of the procurement option to provide a high degree of cost certainty early on.
Schedule Certainty	Medium	Schedule Certainty measures the relative ability of the procurement option to provide a high degree of schedule certainty early on.
Funding Expenditure Timing	Medium	Funding Expenditure Timing measures the relative ability of the procurement option to align required expenditures with timing constraints for government funding.
Time to Deliver Project	Low	Time to Deliver Project measures the relative ability of the procurement option to deliver functional flood protection as early as possible, either through accelerating delivery or accommodating early construction start or some combination.
Risk Transfer/Management	High	Risk Transfer/Management measures the relative ability of the procurement option to appropriately transfer cost/schedule/environmental and other risks from the public to the private sector and to support effective management of residual risk remaining with the public sector.
Project Delivery Factors		

[1] Innovation in this context refers to potential cost efficiencies related to Project scope and requirements.

Criteria	Weight	Description
Interface Coordination and Flexibility	High	Measures the relative flexibility of the procurement option in terms of facilitating coordination/integration with adjacent major projects and accommodating adjustments to scope or functional requirements as may be needed to achieve such integration and/or keep final costs within budget.
Legal Considerations/Precedent Projects	Medium	Measures the relative ability of the procurement option to minimize complexity of required legal agreements and to build on existing market precedent.
Logistics	Medium	Measures the relative ability of the procurement option to facilitate management and control of the project site, so as to achieve efficient construction staging/operations while simultaneously minimizing access/servicing/traffic/business disruptions.
Collaboration	High	Measures the relative ability of the procurement option to focus contracting parties on constructive problem-solving in the best interest of the project and to limit non-productive, adversarial interaction.

5.3 Scoring of procurement options

The qualitative assessment involved scoring each Procurement Option identified, based on its fit with and ability to ensure the criteria agreed. A score between zero (0) and five (5) was allocated to each option, for each criterion accordingly based on the following agreed scoring table:

Table 6: Scoring scale

Score	Description
0	Option fails to meet basic requirement
1	Minimally meets requirement
2	Meets some of the requirement
3	Adequately meets the requirement
4	Provides good solution
5	Provides highly efficient and effective delivery solution

The tables below summarize the scoring allocated to each evaluated Procurement Option, relative to each agreed criterion based on this scoring methodology. This analysis includes summary level rationale for the application of the scoring agreed. These scores represented a consensus of agreement between the parties involved in the qualitative assessment workshop.

5.3.1 Alignment with Project, Waterfront Toronto, Partner, and Stakeholder Objectives

5.3.1.1 Innovation

HIGH	MED	LOW

Innovation measures the relative ability of the procurement option to leverage private sector expertise, resources, products, and technologies in order to incentivize innovation in design and construction.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Separate, sequential contracts for design, construction, and operational/ maintenance phases limit opportunities to innovate. ▶ Prescriptive specifications required in order to obtain comparable, fixed-price bids. ▶ Procurement process does not lend itself to considering innovation pre-award. ▶ Incorporating value management practices/constructability reviews during design can partially offset limitations posed by contracting structure.	1
Design Build (DB)	▶ Combining design and construction responsibilities into a single contract has potential to drive innovation. ▶ Use of performance-based rather than prescriptive specifications can encourage private sector (design-builder) innovation. ▶ Procurement process (proposal evaluation criteria) can be designed to reward innovation.	3
Construction Manager/General Contractor (CM/GC)	▶ Early retention of CM/GC and resultant collaboration with design team has potential to drive innovation. ▶ CM/GC delivery model facilitates application of value management techniques throughout the design phase. ▶ Owner is at the table and can provide feedback as innovation proposals are developed.	3
Build Finance (BF)	▶ Please refer to considerations listed under DBB, as financing add-on alone would not generally increase opportunities for innovation. ▶ Exclusion of design scope limits innovation potential.	2
Design Build Finance (DBF)	▶ Please refer to considerations listed under DB, as the addition of financing alone would not generally drive increased design and construction innovation. ▶ Lender risk tolerance may sometimes inhibit implementation of design and construction innovations perceived as “too high risk” ▶ In Ontario process, commercially confidential meetings intended as forum for discussion of innovation proposals with the Owner.	4

5.3.1.2 Sustainability and Environmental Management

HIGH	MED	LOW

Sustainability and Environmental Management measures the relative ability of the procurement option to provide solutions that incorporate enhanced sustainability/environmental management features or measures, which can serve as a model for future projects in the designated waterfront area and beyond. Waterfront Toronto will impose high sustainability and environmental management standards on all projects.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Requirements must be specified in tender documents. ▶ Approval agencies can be engaged/consulted during development of proposals/designs. ▶ Limited opportunity to incorporate constructability considerations in the development of proposals/designs for enhanced sustainability or environmental management measures.	5
Design Build (DB)	▶ Desired outcomes must be articulated through performance specifications in tender documents.	4
Construction Manager/General Contractor (CM/GC)	▶ Facilitates designer, constructor, and Owner collaboration and allows for constructive engagement of regulators in identifying, designing and implementing sustainable solutions. ▶ Provides opportunity to refine and adjust solutions and for the Owner to make cost trade-offs in support of project goals as design development proceeds.	5
Build Finance (BF)	▶ Please refer to considerations listed under DBB, as financing add-on alone would not generally alter outcomes.	5
Design Build Finance (DBF)	▶ Please refer to considerations listed under DB, as financing add-on alone would not generally alter outcomes.	5

5.3.1.3 Design Excellence

HIGH	MED	LOW

Design Excellence measures the relative ability of the procurement option to maximize achievement of design excellence. Design excellence relates to both the functionality and aesthetics of the Project.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Designers responsible directly to Owner for achieving design excellence. ▶ Prescriptive specifications can incorporate and clearly define desired functional and aesthetic elements.	5
Design Build (DB)	▶ May be difficult to unambiguously define what constitutes “design excellence” via performance specifications. ▶ Owner has limited ability to influence design decisions.	4
Construction Manager/General Contractor (CM/GC)	▶ Allows for independent procurement of best design team and constructor. ▶ Owner retains control over design and project decisions. ▶ Contractor “buy-in” to design more readily achieved in collaborative environment.	5
Build Finance (BF)	▶ Please refer to considerations listed under DBB.	5

Procurement Option	Considerations	Score
Design Build Finance (DBF)	▶ May be difficult to unambiguously define what constitutes "design excellence" via output specifications. ▶ Private sector will focus on meeting the output specifications while achieving lowest cost, which may impact the long term quality and maintainability of the project.	4

5.3.2 Value, Cost and Schedule Factors

5.3.2.1 Competition

HIGH	**MED**	LOW

Competition measures the relative ability of the procurement option to maximize private sector engagement and drive competition among proponents to achieve project goals with the best proposal.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Scale of project would attract interest from numerous regional and national firms. Market sounding participants indicated that interest was not tied to a particular delivery model.	3
Design Build (DB)	▶ Please refer to considerations listed under DBB. ▶ Market sounding found potential private sector partners had strong desire to compete by providing innovative solutions, which can be encouraged via DB procurement. ▶ Market sounding participants recommended early contractor involvement, which is inherent in DB.	4
Construction Manager/General Contractor (CM/GC)	▶ Please refer to considerations listed under DBB. ▶ Market sounding participants recommended early contractor involvement, which is a key feature of the CM/GC process. ▶ Market sounding found potential private sector partners had strong desire to provide innovative solutions, which can be realized in the collaborative environment of the CM/GC delivery model.	3
Build Finance (BF)	▶ Please refer to considerations listed under DBB.	4
Design Build Finance (DBF)	▶ Please refer to considerations listed under DB. ▶ DBF model may also attract international players based on project size and scope.	5

5.3.2.2 Cost Certainty

HIGH	MED	LOW

Cost Certainty measures the relative ability of the procurement option to provide a high degree of cost certainty early on.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Allows the Owner to fully resolve complex design issues in advance of soliciting bids/pricing. ▶ Firm bids may not be obtainable until entire design is complete and tendered. ▶ "Low bid" pressures can tend to drive substantial cost and schedule increases post contract award.	2
Design Build (DB)	▶ Costs are generally known at an earlier stage in the project, as compared to DBB (typically at 30% design completion or less) ▶ Additional risk transfer to private sector may reduce magnitude of contract change orders compared to DBB.	4
Construction Manager/General Contractor (CM/GC)	▶ May allow greater flexibility to design to budget. ▶ GMP could be fixed at earlier stage than DBB pricing, but there is a risk that agreement cannot be reached between the CM/GC and the Owner prior to competitive tendering of sub-contracts ▶ Extensive collaboration with contractor during design stage could reduce potential for certain types of changes/claims during construction (e.g., design errors and omissions).	3
Build Finance (BF)	▶ Please refer to considerations listed under DBB.	2
Design Build Finance (DBF)	▶ Price is typically fixed at an early stage. Price certainty can be tied to the signing of the P3 contract. ▶ Please refer to considerations listed under DB, potential for additional risk transfer may further reduce magnitude of contract change orders, however substantial risk (e.g., environmental and geotechnical) is largely non-transferable.	5

5.3.2.3 Schedule Certainty

HIGH	MED	LOW

Schedule Certainty measures the relative ability of the procurement option to provide a high degree of schedule certainty early on.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Owner typically retains risks and cost impacts related to schedule overruns. ▶ Owner could implement progress payments to manage schedule certainty.	3
Design Build (DB)	▶ Please refer to considerations listed under DBB.	3
Construction Manager/General Contractor (CM/GC)	▶ Please refer to considerations listed under DBB.	3

Procurement Option	Considerations	Score
Build Finance (BF)	▶ Under a P3 model, the contractor has greater incentive to maintain construction schedule, as risks related to schedule certainty are typically transferred to contractor.	4
Design Build Finance (DBF)	▶ Please refer to considerations listed under DB.	5

5.3.2.4 Funding Expenditure Timing

HIGH	**MED**	LOW

Funding Expenditure Timing measures the relative ability of the procurement option to align required expenditures with timing constraints for government funding.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Owner required to make progress payments as work is completed.	2
Design Build (DB)	▶ Please refer to considerations listed under DBB.	2
Construction Manager/General Contractor (CM/GC)	▶ Please refer to considerations listed under DBB/DB.	2
Build Finance (BF)	▶ Finance component allows more or all of the Owner's payments to the private sector to be deferred until substantial completion.	5
Design Build Finance (DBF)	▶ Please refer to considerations listed under BF.	5

5.3.2.5 Time to Deliver Project

HIGH	MED	**LOW**

Time to Deliver Project measures the relative ability of the procurement option to deliver functional flood protection as early as possible, either through accelerating delivery or accommodating early construction start or some combination.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Design and construction must be performed sequentially. ▶ Limited ability to build in effective contractual incentives for on-time completion.	1
Design Build (DB)	▶ Overall project schedules can be compressed through some concurrent design and construction.	2
Construction Manager/General Contractor (CM/GC)	▶ Early contractor involvement helps to achieve schedule goals of the project. Optimal phasing can be considered during the design process and work prioritized accordingly. ▶ Overall project schedules can be compressed through some concurrent design and construction.	4
Build Finance (BF)	▶ Please refer to considerations listed under DBB, but lender oversight may result in additional pressure on constructor to achieve timely completion.	1
Design Build Finance (DBF)	▶ Please refer to considerations listed under DB, but lender oversight may result in additional pressure on designers and constructor to promptly resolve issues and to achieve timely completion.	4

5.3.2.6 Risk Transfer/Management

HIGH	MED	LOW

Risk Transfer/Management measures the relative ability of the procurement option to appropriately transfer cost/schedule/environmental and other risks from the public to the private sector and to support effective management of residual risk remaining with the public sector.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Majority of risks retained by Owner. ▶ Requires that most design-related and third party risks be resolved prior to procurement to avoid costly contractor contingency pricing and magnitude of potential change orders and claims.	1
Design Build (DB)	▶ Greater opportunity for risk transfer possible owing to integration of design and construction responsibilities in a single contract. ▶ Risks allocated to design-builder must be well-defined to minimize contingency pricing of risks.	3
Construction Manager/General Contractor(CM/GC)	▶ Opportunity for parties to discuss, negotiate, allocate, and share risks as the project team collaborates to eliminate or mitigate risk to the extent possible. ▶ Combination of Owner-controlled design and early team formation involving the contractor provides a forum for identifying and minimizing risk, particularly risk associated with innovative and complex design and construction. ▶ May enable risks that are hard to define or quantify up front to be addressed prior to fixing price. Facilitates risk allocation to party best able to manage.	2
Build Finance (BF)	▶ Please refer to considerations listed under DB.	2
Design Build Finance (DBF)	▶ Commercially confidential meetings provide forum to discuss proposed risk allocation with short-listed proponents during the procurement period. ▶ Reliance on lender agreements/oversight to ensure appropriate level of risk management effort on the part of the private sector designers and constructor. ▶ Owner will require sufficient capability/resources within its own team to effect appropriate management of retained risk.	4

5.3.3 Project Delivery Factors

5.3.3.1 Interface Coordination and Flexibility

HIGH	MED	LOW

Measures the relative flexibility of the procurement option in terms of facilitating coordination/integration with adjacent major projects and accommodating adjustments to scope or functional requirements as may be needed to achieve such integration and/or keep final costs within budget.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ As entire design phase is under the control of the Owner, there is a longer period of time available for resolving interface issues and making adjustments to contract documents before scope and price need to be locked down.	3
Design Build (DB)	▶ Integrated team has potential to respond more nimbly to accommodate changed Owner requirements.	2
Construction Manager/General Contractor (CM/GC)	▶ Facilitates designer, constructor, and Owner collaboration and allows for early team engagement with design/delivery teams for adjacent projects for increased likelihood of innovative joint solutions to interface issues. ▶ Increased flexibility to design to budget compared with DBB or DB.	4
Build Finance (BF)	▶ Please refer to considerations listed under DBB. ▶ Need to consider provisions of lender's agreement when negotiating potentially material changes to scope or requirements.	2
Design Build Finance (DBF)	▶ Method designed to minimize changes and predicated on Owner's ability to generate comprehensive performance specifications up front. ▶ Need to consider provisions of lender's agreement when negotiating potentially material changes to scope or requirements	2

5.3.3.2 Legal Considerations/Precedent Projects

HIGH	MED	LOW

Measures the relative ability of the procurement option to minimize complexity of required legal agreements and to build on existing market precedent.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Owner enters into independent contracts for design and construction. Designers and constructors in turn enter into contracts with sub-consultants and sub-contractors. ▶ Well-established and tested forms of contract available. ▶ Prescriptive specifications and reference standards readily available for most components of work.	5
Design Build (DB)	▶ Similar level of complexity to DBB in terms of overall contractual arrangements. ▶ Precedent performance specifications available for some components of work.	2

Procurement Option	Considerations	Score
Construction Manager/General Contractor(CM/GC)	▶ Owner enters into independent contracts for design and construction. Designers and constructors in turn enter into contracts with sub-consultants and sub-contractors. ▶ Could be based on extensive US and some Ontario market precedents for major infrastructure projects.	5
Build Finance (BF)	▶ Established and tested templates available for agreement between Owner and the private sector. ▶ Inclusion of financing adds complexity to agreement between Owner and the private sector (vs. DBB) and to the inter-party agreements within the private sector team.	5
Design Build Finance (DBF)	▶ Established templates available for agreement between Owner and the private sector. Some Ontario precedents, but fewer than BF or DBFM. ▶ Private sector counterparty consists of multiple entities, whose individual interests are not necessarily fully aligned, requiring complex inter-party agreements within the private sector team.	5

5.3.3.3 Logistics

HIGH	**MED**	LOW

Measures the relative ability of the procurement option to facilitate management and control of the project site, so as to achieve efficient construction staging/operations while simultaneously minimizing access/servicing/traffic/business disruptions.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Allows for some ability to transfer risk for maintaining access. ▶ Owner may need to invest greater effort in up front phasing and traffic management planning. Without the benefit of contractor input in this process, a higher risk of inefficiency and lack of contractor flexibility may arise. ▶ Logistics requirements must be very prescriptive.	1
Design Build (DB)	▶ Integration of design and construction responsibilities, and therefore schedules, could result in improved site and access management. Logistics requirements would include a combination of prescriptive and non-prescriptive elements, providing more flexibility as compared to DBB.	2
Construction Manager/General Contractor (CM/GC)	▶ Early coordination of design and construction responsibilities, and therefore schedules, could result in improved site and access management.	3
Build Finance (BF)	▶ Please refer to considerations listed under DBB.	1
Design Build Finance (DBF)	▶ Please refer to considerations listed under DB.	4

5.3.3.4 Collaboration

HIGH	MED	LOW

Measures the relative ability of the procurement option to focus contracting parties on constructive problem-solving in the best interest of the project and to limit non-productive, adversarial interaction.

Procurement Option	Considerations	Score
Design Bid Build (DBB)	▶ Separate contracts with independent designers and constructors coupled with "low-bid" pressures can lead to adversarial working relationships and greater likelihood of disputes.	1
Design Build (DB)	▶ Collaboration between designer and constructor is incentivized, but typically less opportunity for meaningful Owner collaboration. ▶ Owner must assemble technical oversight team that mirrors capabilities of private sector team. ▶ Contract documents can spell out regime for greater collaboration between Owner and private sector (e.g. Nijmigen example).	2
Construction Manager/General Contractor (CM/GC)	▶ Early retention and alignment of team members usually creates a more collaborative, less adversarial work environment. ▶ Facilitates Owner involvement and timely decision-making.	3
Build Finance (BF)	▶ Please refer to considerations listed under DBB.	1
Design Build Finance (DBF)	▶ Typically, the DBF process includes technical and financial commercially confidential meetings ("CCMs") which allow for the bidders and Project Sponsor to discuss, revise and amend (where required) tender and Project documentation.	4

The table below summarizes the applied scoring of the procurement options against the identified Evaluation Criteria.

Table 7: Qualitative Scoring Summary

Criterion	Weight		Design Bid Build (DBB)	Design Build (DB)	Construction Management / General Contractor (CM/GC)	Build Finance (BF)	Design Build Finance (DBF)
Innovation	**High**	3	1	3	3	2	4
Sustainability and Environmental Management	**High**	3	5	4	5	5	5
Design Excellence	**High**	3	5	4	5	5	4
Competition	**Medium**	2	3	4	3	4	5
Cost Certainty	**High**	3	2	4	3	2	5
Schedule Certainty	**Medium**	2	3	3	3	4	5
Funding Expenditure Timing	**Medium**	2	2	2	2	5	5
Time to Deliver Project	**Low**	1	1	2	4	1	4
Risk Transfer / Management	**High**	3	1	3	2	2	4
Interface Coordination and Flexibility	**High**	3	3	2	4	2	2
Legal Considerations / Precedent Projects	**Medium**	2	5	2	5	5	5
Logistics	**Medium**	2	1	2	3	1	4
Collaboration	**High**	3	1	2	3	1	4
Overall Score			**83**	**94**	**111**	**96**	**136**

The table above shows that the DBF model emerges as the highest scoring procurement option. For the purposes of this report, the CM/GC model was carried forward as a second alternative delivery model for analysis to serve as comparative “baseline”/traditional option for current Waterfront Toronto procurement/delivery processes.

6. Quantitative Assessment

The purpose of this section of the Report is to summarize the methodology, analysis and results of the detailed quantitative analysis carried out on the short-listed procurement options brought forward from the qualitative analysis – DBB and DBF.

6.1 Value for Money Methodology

Value-for-money ("**VFM**") is expressed quantitatively as the difference in cost of delivering an infrastructure project using the traditional public sector project procurement model and an alternative delivery model. In the case of the Project, the comparative "traditional" model is assumed to be CM/GC (based on the results of the qualitative analysis and Waterfront Toronto past practice for larger scale municipal infrastructure projects) and the alternative delivery model for consideration is the DBF model.

The VFM analysis involves a detailed quantitative assessment of the two (2) procurement options, CM/GC and DBF, with the objective to assess whether the DBF procurement model is likely to achieve greater VFM to the public as compared to the CM/GC procurement model. The methodology for determining VFM for this Project is based on the Infrastructure Ontario VFM methodology. This involves establishing a period by period cash-flow profile for each of the procurement options based on procuring the Project on a "like for like" basis (i.e., assuming consistent timeline, project scope, etc.)[2]. For this Project, a consolidated comparative financial model was developed. The financial model was used to assess VFM by comparing CM/GC delivery to the DBF delivery option. The DBF Model examines Project costs from the start of construction up to the end of construction. The model excludes the long term operations and maintenance components.

For the DBF Model, nominal construction cash-flows for each delivery option, CM/GC and DBF, are compared at the substantial completion date or construction completion. The total Project cost is calculated as the sum of the nominal costs during the construction phase, including all relevant financing costs and P3 ancillary costs. The VFM analysis also includes an assessment of risk that is retained by the public sector under each delivery model. This quantified retained risk is added to the cost of each procurement option and then the risk adjusted totals are compared to calculate the VFM using the following formula:

$$\textbf{VFM} = \textbf{Nominal Value}_{\textbf{CM/GC}} - \textbf{Nominal Value}_{\textbf{DBF}}$$

6.2 Project Costs

Preliminary base construction costs for the Project's Core Scope (as illustrated in Figure 1) have been estimated by Hanscomb. The construction spend profile was developed by HDR based on loading the project schedule with Hanscomb's component cost estimates. . It should be noted that these estimates exclude contingencies, as a separate probabilistic cost and schedule risk analysis is being undertaken by HDR to support the calculation of an appropriate contingency. Table 8 below summarizes the base case project costs for the core scope of work under the alternative procurement options.

[2] The actual timelines for CM/GC and DBF delivery are expected to differ. The project schedule has been developed by Waterfront Toronto based on CM/GC delivery, however, additional up front work would be needed before financial close and the start of construction could occur under a DBF model.

A 7.5% Innovation Factor[3] adjustment is typically applied to recognize that the base cost under a DBF model is likely to be lower than under a CM/GC model as a result of using output based specifications in DBF projects allowing bidders to optimize the design of the asset and to more effectively integrate design and construction. For the purposes of this analysis, it has been assumed equal net savings due to innovation can be realized when comparing DBF delivery to the CM/GC option. To align the base construction costs of the CM/GC and DBF models, the 7.5% innovation factor was deducted from the base DBF costs.[4]

Table 8: Project Cost Assumptions

	Project Cost Assumptions	
	CM/GC	**DBF**
Project Construction Costs	**$M (Nominal)**	**$M (Nominal)**
Base Construction Costs (excluding contingency)	628.93	628.93
Design & Engineering (8%)	50.31	50.31
Construction Costs (Excl. Innovation Factor)	**679.24**	**679.24**
Innovation Factor (7.5% deducted from DBF Base Costs)	N/A	-50.94
Total Construction Costs	**679.24**	**628.30**
Other Costs		
Transaction Costs (Upfront)	0.50	20.00
Management Costs	22.18	13.68
Total Other Costs	**22.68**	**33.68**

6.3 Risk Assessment

This section sets out the methodology for estimating the approximate value of risks retained by Waterfront Toronto, transferred to a third party or shared between the parties under each of the highest-ranked P3 and conventional public sector procurement options, as short-listed by the qualitative analysis.

6.3.1 Risk Assessment and Quantification

The fundamental principle underlying the VFM analysis is the appropriate allocation of risk between the public and private sectors. The foundation for risk allocation is based on the premise that the party which is able to manage a given risk most efficiently (i.e. at the lowest cost) should assume that risk.

Once the identified risks have been quantified, their value (i.e. the expected cost of these risks) is incorporated into the project cash flows in order to compare the procurement models on a risk-adjusted basis.

The CM/GC and DBF procurement options being considered for the Project each come with their own inherent risks. In order to quantify the value of risk in the Project under the procurement options, a risk workshop was conducted. This section sets out the methodology adopted and the results from the process.

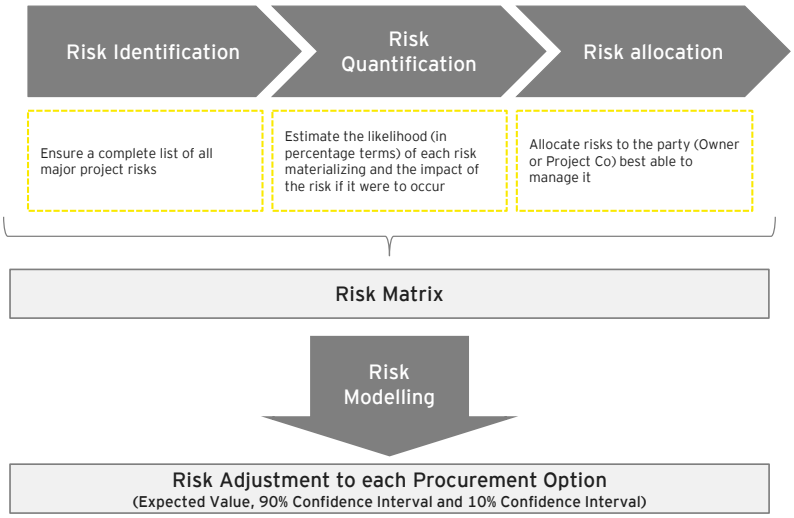
[3] Innovation in this context refers to cost efficiencies or savings resulting from novel approaches or solutions presented by bidders.

[4] The innovation factor is based on the Infrastructure Ontario methodology. An innovation factor of 7.5% is applied to DBF projects, while an innovation factor of 12% is typically applied to DBFM or DBFOM projects.

6.3.1.1 Overview of the Risk Quantification Process

The process to estimate the risks in the Project under the procurement options is summarized in the diagram below:

Figure 2: Risk Quantification Process



6.3.1.2 Risk Identification and Preliminary Risk Assessment

The Project is unique in its size, scope and complexity. For these reasons, there was not an existing "template" risk matrix which could be easily adapted to the needs of the Project. A base risk matrix was developed based on conservative estimates from several standard IO DBF risk matrices as developed by Altus Group Ltd. and MMM Group, along with consideration to Project risks identified by HDR through the risk sessions previously conducted.

- Standard DBF risk matrices represented a spectrum of asset classes from social to civil infrastructure that were refreshed by IO in 2015 following review by the Auditor General;
- Conservative probability and impact figures were drawn for all risks carried over from the standard risk matrices for both DBF and CM/GC models;
- Additional project-specific risks were added to the base risk matrix for consideration based on the HDR Project risks identified. These Project-specific risks were discussed for applicability during the risk workshop.

Base values for risk probabilities and impacts were determined by taking the average of the most conservative estimates (i.e. highest likelihood of occurrence and highest potential impacts) across the comparable project risk matrices.

This base risk matrix was intended to act as starting point for the Project risk assessment and was slightly amended based on Project-specific information through a risk workshop.

6.3.1.3 Risk Quantification

A risk workshop was held on February 25, 2016 for further discussion and amendment to the template risk matrix. For each risk identified for further discussion by risk workshop participants, consensus was to be achieved on the following:

- Probability of the likely occurrence of the risk;
- If the risk was to materialize, a best case, worst case and most likely case of financial impact. The allocation of the risk between the public and private sector under each procurement model (e.g., transferred to the private sector, retained by the public sector, or shared[5] between).

For the purposes of this analysis, the best-case impact would be the financial impact that would be exceeded in 90% of occurrences. The worst-case impact would be exceeded in only 10% of occurrences. In this manner, the three (3) data points for each risk can be used to define a triangular distribution with the best-case impact defining the 10th percentile, the most likely impact defining the mode, and the worst-case impact defining the 90th percentile.

6.3.1.4 Risk Allocation

During the risk workshop, the expected allocation of each risk to either the contracting entity or public sector under each procurement option was also discussed and agreed upon for each option. The table below notes the allocation applied to each of the identified risks under the CM/GC and DBF.

Risk #	Risk Name	Risk Allocation	
		DBF	CM/GC
1.	Policy / Strategy		
1.01	Government Approvals for Project	Retained	Retained
1.02	Government Funding	Retained	Retained
1.03	Project Schedule	Retained	Retained
2.	Transaction and Tender Process		
2.01	Due Diligence (by the owner in preparation of tender in RFP)	Shared	Retained
2.02	Tendering Competition	Retained	Retained
2.03	Delays in Contract Award/Financial Close	Shared	Retained
2.04	Termination prior to Contract Award/Financial Close	Retained	Retained
3.	Project Agreement		
3.01	Ambiguities In Legal Agreements	Shared	Shared
3.02	Termination For Convenience During Construction	Retained	Retained
4.	Design		

[5] For the purposes of the risk quantification exercise, shared risks were assumed to be shared equally (50% of risk retained by public sector, 50% of risk transferred to private sector).

Risk #	Risk Name	Risk Allocation	
		DBF	CM/GC
4.01	Stakeholder Consultation Pre-Financial Close	Retained	Retained
4.02	Stakeholder Consultation - Post Financial Close and Tender	Retained	Retained
4.03	Scope Changes initiated by Owner During Design	Retained	Retained
4.04	Compliance with Codes and Standards - During Design	Transferred	Retained
5.	Site Conditions / Environmental		
5.01	Utility/Services Relocations	Transferred	Shared
5.02	Geotechnical	Transferred	Retained
5.03	Existing Contamination	Shared	Retained
5.04	Archaeological	Shared	Retained
5.05	EA Conditions of Approval	Transferred	Retained
6.	Construction		
6.01	Adverse Weather Conditions	Transferred	Shared
6.02	Construction Management Efficiency / Coordination	Transferred	Shared
6.03	Resource Availability - Labour, Materials, Equipment	Transferred	Shared
6.04	Resource Availability - Fill Materials	Transferred	Retained
6.05	Latent Defects	Retained	Retained
6.06	Default during Construction	Transferred	Retained
6.07	Scope Changes During Construction (directed by owner)	Retained	Retained
6.08	Schedule Adherence	Transferred	Retained
6.09	Quality Management	Transferred	Retained
7.	Permits and Approvals		
7.01	Regulatory Approvals	Shared	Retained
7.02	Implementation Approvals / Permits	Transferred	Shared
7.03	Title / Access / Title Encumbrances	Retained	Retained
8.	Completion / Commissioning		
8.01	Deficiencies	Transferred	Shared

6.3.1.5 High Impact Risks

Participants from Waterfront Toronto, Infrastructure Ontario, TRCA, the City of Toronto and HDR focused the discussion on the high impact risks that had the greatest potential impact on the VFM outcome based on initial cost estimates. The risks discussed in detail during the risk workshops are described further in the table below.

Table 9: High-Impact Risks Discussed in Risk Workshop

Risk #	Risk Name	Risk Definition
1.03	Project Schedule	▶ Risk of a longer baseline construction period, resulting in a higher total budgeted program cost.
2.01	Due Diligence (by the Owner in Preparation of Tender in RFP)	▶ Risk that an insufficient level of due diligence is undertaken and communicated to Bidders resulting in reduced tolerance to risk and higher bid prices.
6.07	Scope Changes During Construction (Directed by Owner)	▶ Risk that the scope of work is changed by the Owner during the construction period.
6.08	Schedule Adherence	▶ Risk associated with incurring schedule delays and either having to rush construction (quality risk) or add resources (cost risk) to achieve schedule completion.
6.09	Quality Management	▶ Risk associated with meeting design standards and codes as they relate to long term asset performance.

Following the risk workshop, EY captured all of the agreed-upon quantification parameters into an updated risk register. Placeholder figures were utilized for the cost base corresponding to each risk, pending completion of the updated cost estimates and schedule under development in parallel. Following completion of HDR's draft Cost Risk Assessment report in mid-June 2016, the required cash flow and cost base data were supplied to EY by Waterfront Toronto. . A percentage factor was applied to each cost base to accommodate the Project scope elements related to specific risks, for example, a 15% factor was applied the design and construction cost base for Risk 5.04 (Archaeological). This 15% factor was applied to account for the fact the scope of this risk was limited to excavation work only. A final risk matrix is found in Appendix C.

6.3.1.6 Risk Modelling

A risk model was created using the information contained in the final agreed risk register. Specific software for risk modeling, @RISK, was used to perform a Monte Carlo simulation[6] with this information. For each risk, the RiskTrigen (a function contained within the @RISK software) distribution was selected into which the values for best, expected and worst outcomes were input.

The RiskTrigen distribution was selected as it provides for a triangular distribution defined by three points — one at the most likely value and two at the specified lower and upper percentiles. Given the level of accuracy associated with the inputs, using a more refined distribution model is considered unwarranted. The best and worst outcomes

[6] A Monte Carlo analysis is a form of stochastic modeling used to evaluate a probability distribution by performing a simulation of the probability distribution over a large number of iterations (in the case of the feasibility analysis, 10,000). In performing the analysis the Monte Carlo simulation takes randomly selected variables across the range of the probability distribution to provide a range of potential values of the risk. The calculation is repeated a large number of times to obtain the distribution of the expected values of the risks. A sample of 10,000 iterations was used in the simulation to ensure that the results were not adversely impacted by any sampling bias.

were set to represent the 10th and 90th percentiles along the RiskTrigen distribution. The objective of the Monte Carlo analysis is to estimate the likely or expected outcome of risks under both procurement models.

6.3.1.7 Risk Analysis Results

Table 10 below presents the expected value of the risk categories for each procurement option. These numbers are carried forward for inclusion in the preliminary VFM analysis within Section 6.4.

Table 10: Expected Value of Risk

Expected Value of Risk	
($M)	**CM/GC**
Risks during Construction	148.89
	DBF
Risks during Construction	76.65

6.4 Value-for-Money Assessment

The results of the DBF procurement option VFM analysis are set out below in addition to sensitivity analysis performed on the results to assess how changes in key variables may affect the VFM achieved by the Project under this delivery option.

6.4.1 Financial Assumptions

The DBF financial model has been prepared as a monthly cash flow model. Cash flows were assumed to occur at the end of the period in which they are incurred. Each financial year was assumed to end on March 31, in line with the Waterfront Toronto's fiscal year.

Table 11 and Table 12 below provide a summary of the timing and financial assumptions that apply to the Project under the DBF procurement option.

Table 11: Timing Assumptions

Timing Assumptions	
	Date
Financial Close Date	01-Apr-17
Design Start Date	01-Apr-17
Construction Start Date	01-Jan-18
Construction period in months	66
Substantial Completion Date	30-Sept-22
Future Value Date	01-Oct-22

Core scope construction period is anticipated to be 57 months (from the January 1, 2018 construction state date). The combined design and construction period (inclusive of the design period beginning in April 2017) is anticipated to total 66 months.

Table 12: Financial Assumptions

Financial Assumptions	
Discount Rate	3.00%
Construction Inflation Rate	2.50%
CM/GC Financing Rate	2.00%
DBF Borrowing Rate	3.50%
DBF Upfront Fees	1.25%
DBF Commitment Fee	1.00%

The discount rate used in the DBF Model represents Waterfront Toronto's short term cost of borrowing. The year-over-year inflation assumption was aligned with the City of Toronto's current assumption and EY provided the short term financing assumptions based on recent projects in the market.

6.4.2 Base Case Results

Summaries of the total cost of each of the procurement options are provided in Table 13 and Table 14.

Table 15 shows a comparative summary of these results and summarizes implications for VFM.

6.4.2.1 CM/GC Option

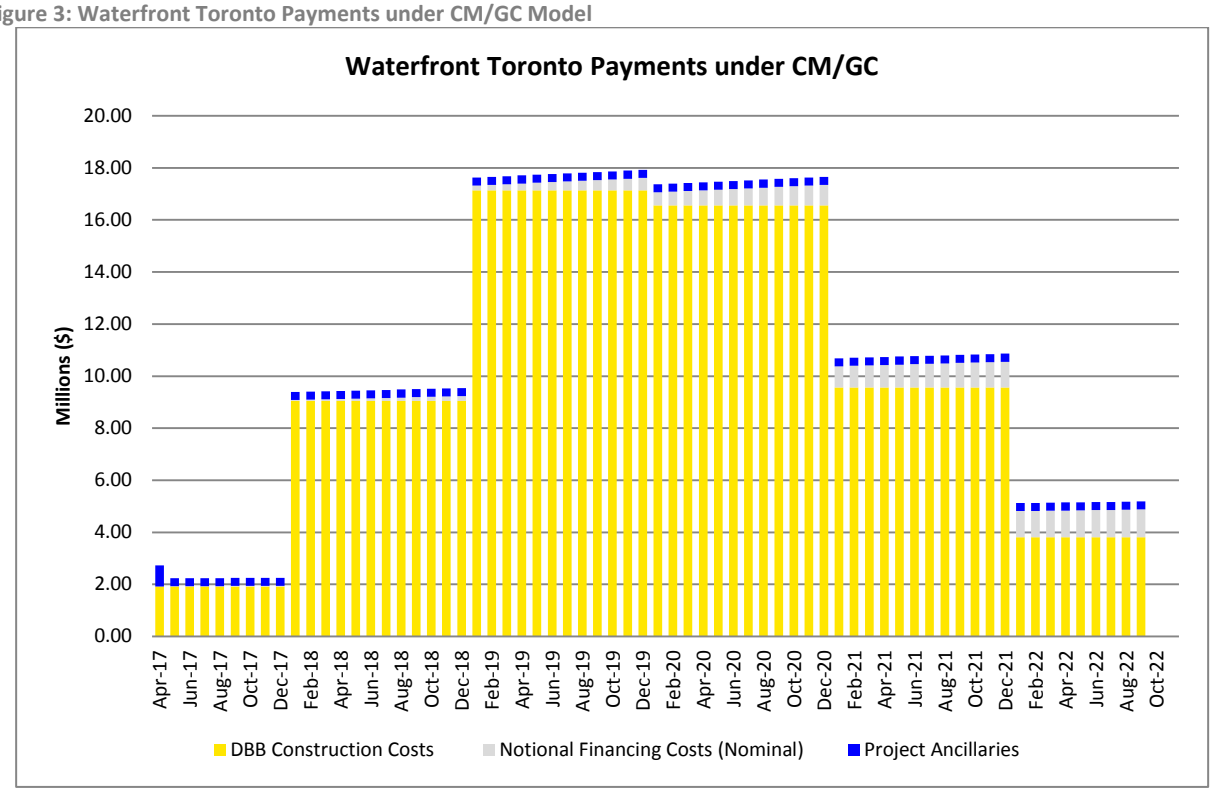
The table below provides a summary of the total cost of the CM/GC procurement option.

Table 13: Base Case CM/GC Results

Base Case CM/GC Results	
	Nominal Cost ($M)
Base Costs	679.24
PSC Financing Cost	30.53
Retained Risks - Traditional Delivery	148.89
Total Project Ancillaries (Future Value)	22.77
Total Cost	**881.43**

Under the CM/GC procurement option Waterfront Toronto will make monthly progress payments to pay for construction costs in addition to the related financing and project ancillary costs. Figure 3 below shows the Waterfront Toronto payments under the CM/GC model on a monthly basis during the construction period.

Figure 3: Waterfront Toronto Payments under CM/GC Model



6.4.2.2 DBF Procurement Option

The table below provides a summary of the total cost of the DBF procurement option broken down by payments made by Waterfront Toronto to the private sector.

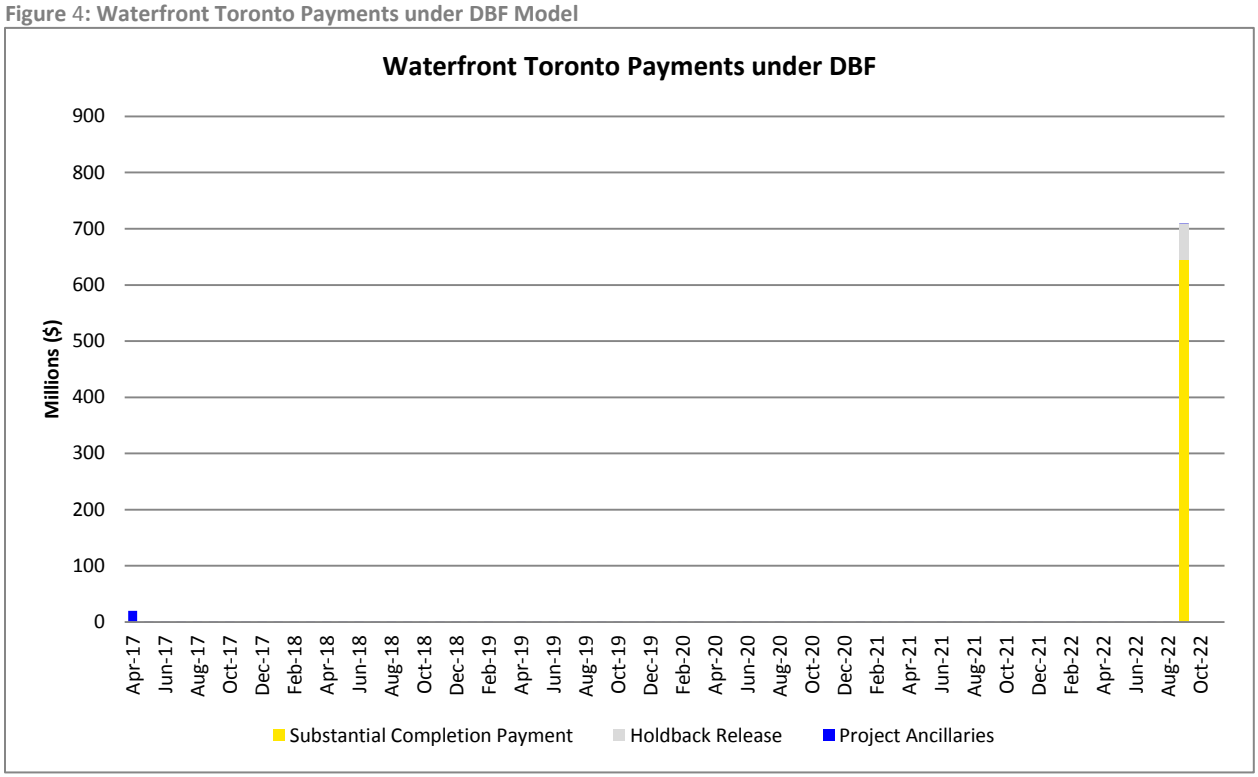
Table 14: Base Case DBF Results

Base Case DBF Results	
	Nominal Cost ($M)
Base Costs	628.30
Private Financing Costs	57.30
Retained Risks - AFP Delivery	76.65
Total Project Ancillaries (Future Value)	37.26
Total Cost	**799.52**

Under the DBF procurement option it is anticipated that Waterfront Toronto will make a lump Substantial Completion Payment ("**SCP**") at construction completion to pay for construction and financing costs. In addition, Waterfront Toronto will incur monthly costs related to project ancillaries.

Figure 4 below shows Waterfront Toronto's payments under the DBF model on a monthly basis during the construction period.

Figure 4: Waterfront Toronto Payments under DBF Model



6.4.2.3 VFM Results Summary

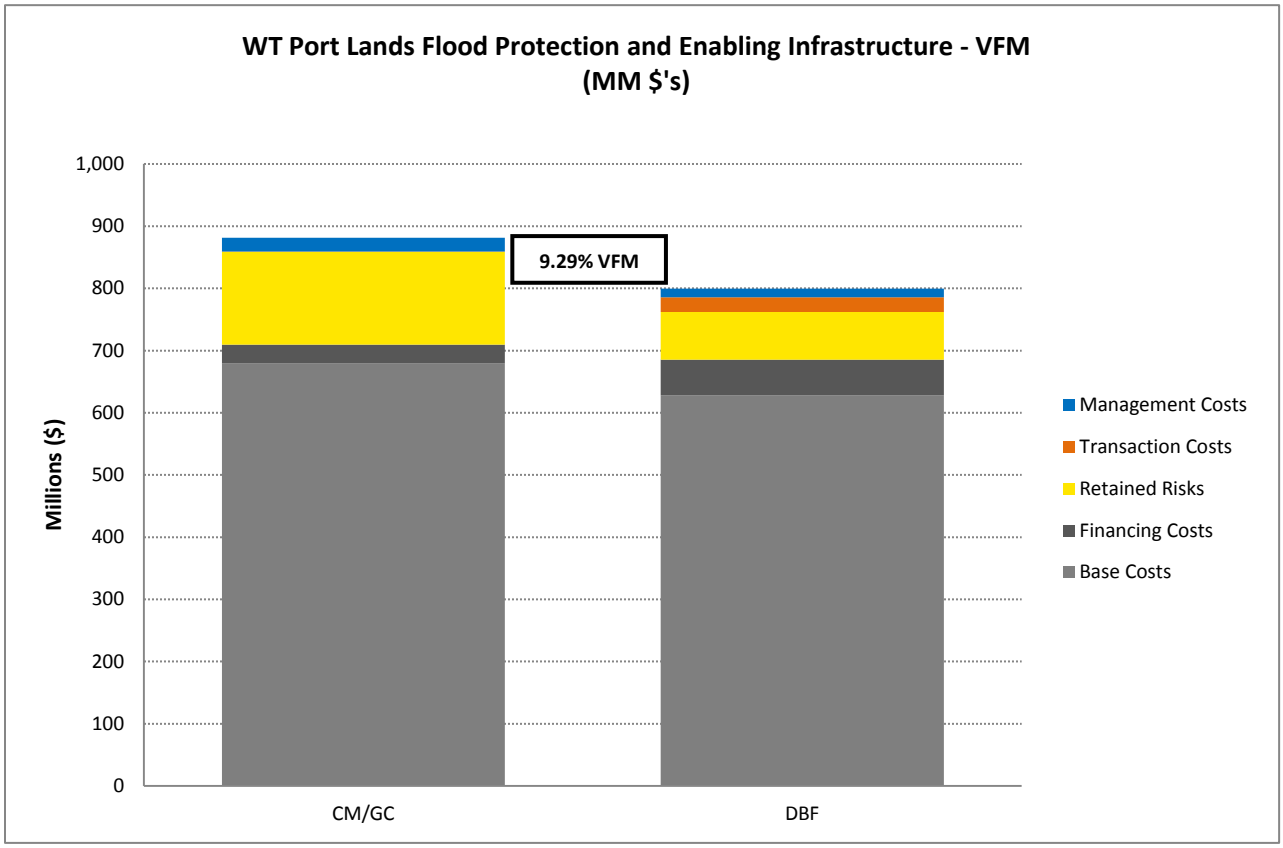
The table below summarizes the VFM results under the base case assumptions for the DBF procurement model.

Table 15: Base Case Comparative Value for Money Results

Base Case Comparative Value for Money Results		
Base Case Value for Money Results ($M)	**CM/GC**	**DBF**
Total Cost	$881.43	$799.52
Estimated Value for Money (cost difference)		**$81.91**
Estimated Value for Money (% difference)		**9.29%**

The underlying cost differences between the CM/GC and DBF procurement options and the VFM results are shown in Figure 5 below.

Figure 5: VFM Analysis



6.4.3 Sensitivity Analysis

A sensitivity analysis of the VFM results was undertaken in order to show how public sector financing would impact the VFM achieved by the Project. The results of the sensitivity analysis are set out below.

6.4.3.1 Sensitivity of VFM to Public Financing

An analysis was conducted to assess the sensitivity of the VFM without public financing, i.e. zero interest on public financing. The table below highlights the VFM results after amending the interest rate for public sector funds from the base case of 2% to 0%.

Table 16: DBF Model - VFM Sensitivity to Public Financing

Sensitivity of VFM to Public Financing		
	DBF	
Rate Sensitivity	**VFM (%)**	**VFM ($M)**
Base Case (2.00%)	9.29%	$81.91
No Public Financing (0.00%)	6.04%	$51.38

As displayed in the table above, the VFM is sensitive to changes in public financing assumptions. VFM changes by $30.5 million, causing a 3.25% deviation in the project VFM.

6.4.4 Quantitative Analysis Conclusion

The analysis above concludes that the DBF model produces VFM as compared to the CM/GC delivery option. However, the existence of Project VFM is only one factor that needs to be considered when determining which delivery option is the appropriate choice for Project procurement. The different Project finance procurement options each have differentiating characteristics such as increased risk transfer or reduced flexibility that can provide Waterfront Toronto with various outcomes that can be beneficial or restrictive. All options considered should be thoroughly tested for VFM, while taking careful consideration of the defining characteristics of the delivery option and Project specific elements.

7. Findings and Considerations

7.1 Summary of Findings

In reviewing the procurement options available to Waterfront Toronto, the qualitative analyses combined with the detailed quantitative analyses carried out on the short-listed procurement options yield integrated findings for the assessment of the optimal Project delivery model(s).

7.1.1 Qualitative Assessment and Market Sounding

The qualitative analysis was applied to the long-list of procurement options to determine which were most aligned with the project-specific criteria. The DBF procurement model yielded the highest comparative score. The CM/GC model, which received the second-highest score, was also carried forward through quantitative analyses and serves as a comparative "baseline"/traditional option for current Waterfront Toronto procurement/delivery processes.

In parallel to the qualitative analysis, feedback from the market sounding exercise showed interest in the Project, regardless of delivery model. It was also noted that maintenance scope would be too small to generate any long-term value, relative to Project capital size. Site related conditions, approvals and due diligence requirements were stressed as extremely important components for the delivery of the Project, regardless of the procurement option selected.

Overall, the Project was considered to be a very attractive opportunity for most market players, regardless of the delivery model selected.

7.1.2 Quantitative Analysis

The shortlisted CM/GC and DBF delivery options were further assessed through risk quantification and financial modelling exercises. These analyses were conducted based on costs and detailed information provided by Waterfront Toronto and its consultants.

The DBF model was compared with the traditional (CM/GC) model. The purpose of the quantitative analysis was to determine which delivery option would provide best value for money.

The DBF Model yielded 9.29% VFM savings as compared to the CM/GC model. While the DBF model emerges as offering the greatest value for money to Waterfront Toronto given the applied timing, cost and other assumptions, additional factors should be further considered by Waterfront Toronto in making a decision on the preferred procurement option for the Project.

Appendix A: Market Sounding Participants

EY contacted seventeen (17) companies to request participation in the market sounding. Thirteen (13) companies participated in the market sounding, covering a wide array of Project roles, including lenders, construction companies, equity providers, technical and waste specialists.

Company	Industry Sector	Participated	Declined	No Response
Cintra / Ferrovial	Developer / Constructor	✓		
ACS Infrastructure Canada Inc. / Dragados Canada	Developer / Constructor	✓		
SNC	Developer	✓		
Borealis	Equity Provider			✓
Macquarie	Equity Provider	✓		
Plenary Group	Equity Provider	✓		
PCL	Constructor		✓	
EllisDon	Constructor	✓		
Carillion	Constructor			✓
Aecon	Constructor	✓		
Dufferin	Constructor	✓		
Scotia Bank	Lender	✓		
BMO	Lender	✓		
CIBC World Markets Inc.	Lender	✓		
Waste Management	Waste Specialist	✓		
GFL Environmental Corp.	Waste Specialist			✓
Sevenson Environmental, Services, Inc.	Environmental Remediation and DredgingSpecialist	✓		

Appendix B: Market Sounding Information Package

Appendix C: Risk Matrix

Appendix D: Risk Definitions

Project ID	Risk	Description
Policy / Strategy		
1.01	Government Approvals for Project	Risk that government approvals on a project level are not received in a timely manner and ultimately delays the issue of tenders. Under traditional procurement involving multiple contracts, there is a risk that project approval may be delayed resulting in an overall higher project cost.
1.02	Government Funding	Risk of government changing funding priorities or methods adversely affecting the project start or asset quality.
1.03	Project Schedule	Risk of a longer baseline construction period, resulting in a higher total budgeted program cost.
Transaction and Tender Process		
2.01	Due Diligence (by the owner in preparation of tender in RFP)	Risk that an insufficient level of due diligence is undertaken and communicated to Bidders resulting in reduced tolerance to risk and higher bid prices.
2.02	Tendering Competition	Risk that sufficient qualified contractors are not available resulting in a smaller than expected number of Bidders which could result in higher bid prices.
2.03	Delays in Contract Award/Financial Close	Risk of additional costs and schedule impacts resulting from a delay in Contract Award / reaching Financial Close.
2.04	Termination prior to Contract Award/Financial Close	Risk of decision to not proceed with project occurring prior to Contract Award or Financial Close
Project Agreement		
3.01	Ambiguities In Legal Agreements	Risk that ambiguities exist in legal agreements that could lead to disagreements at a later stage.
3.02	Termination For Convenience During Construction	Risk that government(s) will terminate the contract, for convenience, prior to Substantial Completion.
Design		
4.01	Stakeholder Consultation Pre-Financial Close	Risks associated with fulfilling stakeholder consultation requirements and achieving sign-off where required.
4.02	Stakeholder Consultation - Post Financial Close and Tender	Risks associated with fulfilling stakeholder consultation requirements and achieving sign-off where required.
4.03	Scope Changes initiated by Owner During Design	Risk that scope of work is changed by the Owner during the Design phase, resulting in additional costs and schedule delays.

Project ID	Risk	Description
4.04	Compliance with Codes and Standards - During Design	Risk that design does not comply with relevant codes and standards.
Site Conditions / Environmental		
5.01	Utility/Services Relocations	Risk associated with inaccurate information provided during bid period or delay by third parties in approving or completing necessary relocations.
5.02	Geotechnical	Risk associated with incomplete / inaccurate information or delays associated with completing necessary investigations.
5.03	Existing Contamination	Risk associated with incomplete / inaccurate information or delays associated with completing necessary investigations and remedial work.
5.04	Archaeological	Risk associated with incomplete / inaccurate information or delay to completing necessary clearances.
5.05	EA Conditions of Approval	Risk associated with satisfying specific EA Conditions of Approval.
Construction		
6.01	Adverse Weather Conditions	Risk that unanticipated adverse weather conditions result in schedule delay or increased costs, including localized flooding.
6.02	Construction Management Efficiency / Coordination	Risk that contractor team does not effectively coordinate / manage construction activities to meet project schedule.
6.03	Resource Availability - Labour, Materials, Equipment	Risk that required resources are not available, resulting in delay and increased costs.
6.04	Resource Availability - Fill Materials	Risk that required fill resources, either existing on-site (targeted 85% reuse) or new fill, are not available, resulting in delay and increased costs.
6.05	Latent Defects	Risk that latent defects result in operational difficulties, additional lifecycle maintenance costs or reduced asset residual value.
6.06	Default during Construction	Risk of Project Co / contractor default, and subsequent replacement. This could result in delays and additional costs.
6.07	Scope Changes During Construction (directed by owner)	Risk that the scope of work is changed by the Owner during the construction period.
6.08	Schedule Adherence	Risk associated with incurring schedule delays and either having to rush construction (quality risk) or add resources (cost risk) to achieve schedule completion.
6.09	Quality Management	Risk associated with meeting design standards and codes as they relate to long term asset performance.
Permits and Approvals		
7.01	Regulatory Approvals	Risk that there is a delay in obtaining relevant Regulatory Approvals by the Owner, resulting in schedule delays and additional costs.

Project ID	Risk	Description
7.02	Implementation Approvals / Permits	Risk that there is a delay in obtaining relevant Permits to the construction contractor, resulting in schedule delays and additional costs.
7.03	Title / Access / Title Encumbrances	Risk that site access is not made available to Contractor within the prescribed timeframe. This may include potential delay and added costs to acquire property from un-willing sellers / pay off leases.
Completion / Commissioning		
8.01	Deficiencies	Risk that there are deficiencies upon substantial completion resulting in additional cost difficulties.

Appendix E: The Guide to the new Building Canada Fund P3 Screen – Suitability Assessment