



**REGION OF WATERLOO**

**TRANSPORTATION AND ENVIRONMENTAL SERVICES  
Rapid Transit  
FINANCE DEPARTMENT  
Financial Services and Development Financing**

---

**TO:** Chair Jim Wideman and Members of the Planning and Works Committee

**DATE:** May 28, 2013 **FILE CODE:** A02-30

**SUBJECT: STAGE 1 LIGHT RAIL PROJECT – REQUEST FOR PROPOSAL FINANCIAL MATTERS**

---

**RECOMMENDATION:**

THAT the Regional Municipality of Waterloo approve issuing the Request for Proposal for the Stage 1 Light Rail Project to the three short-listed bid teams, generally as described previously in Report E-13-048 dated April 9, 2013 and in Report E-13-074/F-13-049 dated May 28, 2013.

**SUMMARY:**

In February 2012, Regional Council approved the delivery model for Stage 1 of the Light Rail Project as a Design-Build-Finance-Operate-Maintain (DBFOM).

In October 2012, the Region issued the Request for Qualification (RFQ) document and subsequently received submissions from seven teams interested in delivering the project on behalf of the Region.

In February 2013, Council approved GrandLinq, Kitchener Waterloo Cambridge Transit Partners and TriCity Transit System as the three pre-qualified teams selected to submit proposals for the project.

In April 2013, Council approved the Request for Proposal (RFP) Technical Matters report. This first report described the nature of the procurement documentation and the recommended roles and responsibilities between the Region and the successful bidder (Project Co).

As a follow-up, this second report focuses primarily on financial matters, RFP evaluation criteria and other RFP process related issues for the project.

**REPORT:**

**1.0 Introduction**

In June 2011, Council approved the technology, route, stations, staging and funding of Stage 1 of the Region's rapid transit project. Stage 1 includes 19 km of light rail transit (LRT) from Conestoga Mall to Fairview Park Mall and 17 km of adapted bus rapid transit (aBRT) from Fairview Park Mall to the Ainslie Street Terminal. Council also directed staff to complete an evaluation of project procurement and delivery options with the goals of maximizing project innovation and quality, leveraging private sector expertise, and managing risks to the Region of Waterloo.

In February 2012, Council approved DBFOM as the procurement and delivery model with the intent to build on the strengths of the public and private sectors and provide the best value to the Region. Council also directed staff to review options that would allow the Region to take advantage of operations by a private contractor without losing significant flexibility for future system expansion.

In September 2012, Council approved the financial evaluation threshold to pre-qualify respondents to the Request for Qualifications (RFQ) be an amount of long-term private financing equal to approximately 25% of total capital costs, and also indicate in the RFQ an initial term of ten years for the operations component with 2-4 renewal options to be exercised at the discretion of the Region so that the planned integration with future system expansion could be combined under a single operator. Council also directed staff to report back on the final amount of private financing required prior to the issuance of the Request for Proposal (RFP).

## **2.0 Financial Matters**

### **2.1 Long-Term Private Sector Financing**

As described more fully in Report E-12-098/F-12-079 dated September 25, 2012, the Design-Build-Finance-Operate-Maintain (DBFOM) model of procurement offers the following advantages:

- **Cost:** LRT design and construction can proceed at the same time, with significant time savings, better coordination and more efficient construction.
- **Experience:** The private sector has more experience than the Region with designing, construction, operating and maintaining an LRT system.
- **Incentives:** With DBFOM, payments and penalties based on performance would provide incentive for the private sector to complete the project on time and on budget, and also to operate and maintain a high-quality LRT system over the long term. If the private sector does not perform to the standards set in the contract, it does not get paid and risks losing the remaining capital financed in the project.
- **Risks:** With DBFOM, the Region limits its risk by placing responsibility on the private sector. The Region monitors the service and holds back payments if the private sector does not meet the contract performance standards.

A key principle of DBFOM is “Pay for Performance” which results in a portion of the construction costs to be withheld and paid to the private contractor over the length of the operations and maintenance term, necessitating that the private contractor obtain financing to bridge this payment gap.

The private financing must consider the costs of the transferred risk and its cost will be higher than a typical long-term debenture issued by the Region. This deferred payment or private financing acts as insurance, and as with any insurance, the cost will vary depending on the extent of the coverage. As such, it is important to strike the right balance to ensure that the Region has the right amount of coverage at the lowest possible cost.

Staff undertook a preliminary assessment to identify the long-term financing required. Various scenarios were evaluated against key criteria including affordability, risk transfer securing performance, the Region’s up-front share of capital cost and market acceptability. Staff recommended that for the purposes of the RFQ, potential bidders be informed that approximately 25% of the total capitalized costs of construction will be financed by the DBFOM Team following substantial completion, which will be paid over the contract term.

The Region and its advisors have continued to refine the financial analysis based on updated design, costs, and funding agreements to determine a more definite level of private financing that is

required for the LRT project. The DBFOM Team will be required to construct both the LRT system (for which it is responsible for the long-term maintenance and lifecycle renewal costs for a period of 30 years) and other public infrastructure works, such as water main and sewer replacements, road improvements, utility relocations and the King St. grade separation. These public infrastructure works are necessary for the completion of the LRT project; however, the DBFOM Team is not responsible for the long-term maintenance and lifecycle renewal costs, as these infrastructure works will be the responsibility of the Cities and the Region. These other infrastructure projects account for approximately 10% of the overall project costs, and there would be no benefit to the Region to require the DBFOM Team to provide long term financing for these projects, as there is no risk transfer for the maintenance of these capital works. Therefore, to reduce the Region's overall financing costs and to set the final amount of financing at approximately 25% of the capital costs related to the LRT, staff have included in the RFP the provision that the DBFOM team provide an amount of long-term private financing equal to 22.5% of total capital costs. The final amount will be determined through the RFP process.

## **2.1 Value for Money (VFM) Assessment Update**

In 2008, the Region held a risk workshop to assess the key risks inherent in the rapid transit project for various delivery options, the potential impact to the Region, and the role that the private sector could play in assuming and/or mitigating the project risks to the Region.

In Report E-12-011, dated February 7, 2012, a summary of the assessment of the procurement and delivery options was provided with the resulting VFM for the DBFOM (and other) models, resulting in the selection of DBFOM as the preferred model.

The VFM considers the risk-adjusted cost of the DBFOM option in comparison to the "baseline" traditional option of Design-Bid-Build (DBB), with the operations and maintenance performed by the public sector entity. The comparison includes capital, operating and maintenance costs, in net present value form. The analysis considers not only the cash flows under each option, but also the risks retained by the Region, taking into account the probability of the risk occurring and the impact that the risk would have on the Region, and assigning a monetary value to each risk.

The VFM analysis demonstrated that the DBFOM option results in considerable risk transfer from the Region to the private sector and results in significant VFM for the Region. In other words, the DBFOM model results in savings as compared to the traditional approach. With DBFOM, the cost of financing is higher because the cost of private sector financing is higher than public financing costs to account for this risk transfer. However, the Region benefits from transferring design, construction, operating and maintenance risks to the private sector. There are also efficiency benefits from integrating the design, construction, operating and maintenance processes and as a result of the incentives introduced by the private sector having money at risk based on their performance.

The VFM assessment has now been updated based on updated design, cost models and the risk transfer identified in the draft RFP and draft Project Agreement. Deloitte completed this analysis with the participation of Region staff and technical advisors and the VFM report is attached as Appendix A to this report.

The VFM Results (page 12 of Deloitte's report) identify a VFM, that is, the difference between the costs and retained risks under DBB and the costs and retained risks under DBFOM, of approximately 12.3%, which is comparable to the preliminary VFM of 18% reported in February 2012. The difference in VFM is due to revised assumptions on private financing costs and updating and refining the risk matrix to more closely reflect the potential risks specific to the Region's LRT project.

The VFM will be updated once more, at the time of bid submission, to reflect the proposed costs of the preferred DBFOM Team.

**2.2 Financial Model**

Report E-11-072 dated June 15, 2011 provided costing information including capital costs estimated at \$818 million, in 2014 dollars, with funding to be provided by the federal government in the amount of up to \$265 million and by the provincial government in the amount of \$300 million, with the Region’s share of the capital cost being \$253 million.

Council approved the LRT and aBRT projects, together with improvements to conventional transit (GRT) and transit-supportive strategies in Cambridge, with the Region’s share of capital costs and operating and maintenance costs to be funded, area rated to the urban transit service area, through an annual tax rate increase of 1.5% per year (allocated 1.2% to the LRT and aBRT projects and 0.3% to the improvements to conventional transit) for a period of 7 years and reduced by budget reductions resulting from the retirement of debt and uploading of social assistance costs in the average amount of 0.5% per year.

Finance staff created a financial model in 2011 which included all of the original DBB costs identified for all of the projects identified above and the associated tax revenue, government funding and reserve fund (RTMP) to meet those costs. With the approval of DBFOM as the preferred procurement alternative for the LRT, the financial model has been expanded and updated, with the assistance of the Region’s financial advisors, Deloitte, to include the costing required to deliver the project, as follows:

<b>Cost component</b>	<b>Traditional DBB model</b>	<b>DBFOM model</b>
Design & construction of LRT and public infrastructure works	Region contracts for design and construction separately.	Design and construction included in DBFOM Team bid.
Vehicles	Region purchases vehicles.	Region purchases vehicles and provides vehicles to DBFOM Team.
Financing, net of federal and provincial government shares for LRT	Region issues debenture financing for its share of costs.	DBFOM Team has debt/equity for 22.5% of project costs. Region issues debenture financing for the balance of its share of costs.
Financing for public infrastructure works	Region recovers costs from utilities and Cities. Region issues debenture financing for its share of Roads projects.	Region recovers costs from utilities and Cities. Region issues debenture financing for its share of Roads projects.
Operations	Region hires staff to operate LRT.	DBFOM Team provides operations staff.
Maintenance	Region hires staff to maintain LRT.	DBFOM Team provides maintenance staff.
Lifecycle and renewal	Region budgets in future years (over the 30 year term) for lifecycle (major maintenance) and issues debenture financing for its costs.	DBFOM Team bids estimated lifecycle and renewal costs. Region issues debenture financing in future years for bid lifecycle and renewal costs.

The DBFOM Team or "Project Co" will generally be responsible for and their bid for the 30 year term will include:

- Design and construction of the LRT system;
- Design and construction of related public infrastructure works (roads improvements, King St. grade separation, utilities relocation, replacement of watermains and sewers, etc.);
- Maintenance of the LRT system and the LRT vehicles for a period of 30 years;
- Operations of the LRT system for an initial period of 10 years (with potential renewals to a total of 30 years);
- Financing of 22.5% of the capital costs of the project, which is approximately 25% of the capital costs of the LRT system, with the capital costs to be paid over the 30 year maintenance period.

The RFP will include a budget amount for all of these elements, as determined by the Region's financial advisors and Finance staff and the proponents will submit bids which include all these project elements. The RFP award to the successful DBFOM Team will include the amounts for:

- Capital costs for LRT and public infrastructure works, including a breakdown of the capital costs to be paid during construction and the financing costs for the capital to be paid during the 30 year term;
- Operations, for a period of 10 years, with renewal provisions;
- Maintenance of the LRT system and vehicles, for a period of 30 years;
- Lifecycle costs, for a period of 30 years.

All of these amounts will be fixed at the time of RFP award, subject to changes in service levels which will require the approval of Council and allowable cost inflation as determined by contract terms.

The funding model has been updated on a continuous basis as costs (construction, financing, utilities, vehicles, etc.) have been updated by RT staff, technical and financial advisors and compared to the model from 2011. At this time, the capital costs continue to be accommodated within the amount established in 2011, and the operating and maintenance costs are expected to be able to be accommodated within the revenue model (including tax and ridership) which was established in 2011. The bids received during the RFP process will determine the final affordability and will be summarized and reported to Council at that time.

### **3.0 Request for Proposal (RFP) Process**

The RFP is to be issued in June 2013 directly to the three successful pre-qualified Proponents short-listed through the recently completed Request for Qualifications process.

#### **Procurement Document(s)**

The RFP document sets out the terms and conditions of the procurement. In addition to the general governing procurement policies and procedures, the procurement documents set out key performance indicators that the project must achieve, along with the project specific features and requirements. As part of the RFP documentation, the proponents are provided with the draft Project Agreement (PA) including the draft Project Specific Output Specifications (PSOS).

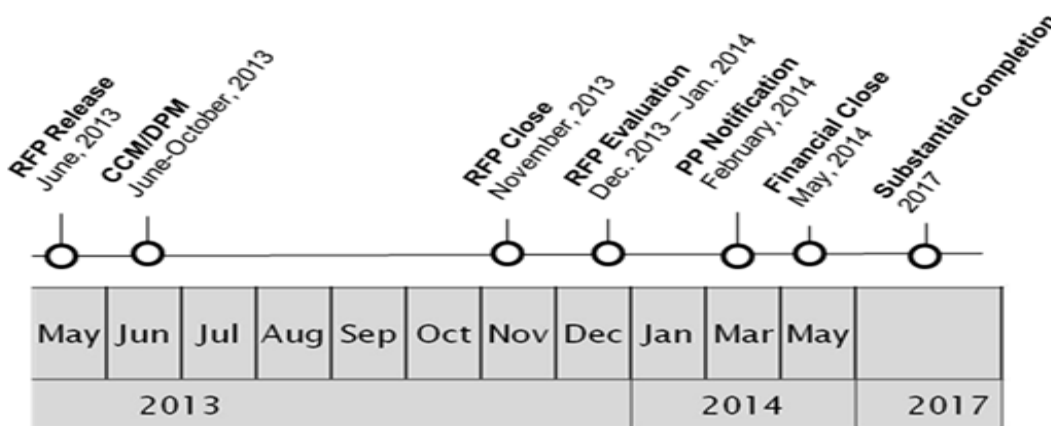
The draft PA is a series of interconnected legal agreements and schedules that provide the commercial terms and form of Contract that will ultimately be executed between the Region and the successful proponent, Project Co. This Agreement articulates the responsibilities, obligations, and risk transfer between the parties. Within the PA, the PSOS provides Proponents with all design, technical quality, operations and maintenance requirements they require for their bid submission.

In addition to defining scope of the LRT project, the PSOS identifies betterments requested by the Cities as well as Region capital projects that intersect with the LRT alignment that must be installed by or coordinated with Project Co. The PSOS acts as the source document for design evaluation and contractual compliance.

The RFP process that the Region is following for the rapid transit project is typically the way Infrastructure Ontario (IO) delivers public infrastructure projects. It is different than the Region’s standard Design-Bid-Build (DBB) process in that the RFP process has the design and construction processes happening concurrently. The successful proponent holds the risk of design errors and subsequent delay and construction claims. The Region’s DBB process would have the Region prepare the design, issue and award a construction tender based on that design, and oversee the construction with its own forces. The Region holds the risk of any design errors and subsequent delays and claims by the contractor. In addition, because the design, bid and build processes happen consecutively the overall process from design to construction completion takes longer than the process outlined in the RFP. The other major difference is that the Region operates and maintains the asset in the DBB process, while the successful proponent will operate and maintain the LRT for the life of the project agreement.

The proposal preparation period will take approximately six months. During this period, the Region will engage the Proponents in a number of separate and individual Commercially Confidential Meetings (CCMs) relating to the RFP, PA and commercial matters, along with Design and Technical Presentation Meetings (DPMs). The CCMs will allow the Proponents the opportunity to provide comments on the PA and RFP, and raise issues that require clarity. The DPMs will allow the Proponents to present their design proposal in its development stage to the Region for feedback on ideas and concepts with respect to their specific design submission. These meetings will allow for a confidential dialogue where the Region will respond to the comments received. To ensure the integrity of the procurement process discussions at the CCMs and DPMs will remain confidential.

A tentative timeline for the next phases of the procurement process is presented below:



#### 4.0 RFP Evaluation

Similar to the Request for Qualifications process, a highly structured and rigorous Evaluation Framework, based on the IO procurement model, is being developed to describe and outline the process to evaluate the RFP submissions from the three short-listed teams and select the Preferred Proponent. The Region will form technical and financial teams to evaluate the proposals submitted. The evaluation methods will be similar to the RFQ evaluation process – individual team member assessment, team discussion and finalization into a consensus score. The evaluation process will involve IO and the Fairness Monitor at every evaluation meeting. The objectives of this Evaluation

Framework are to:

- Safeguard the interests of the Region by ensuring that the evaluation process is fair, applied consistently, free of conflicts of interest, confidential, and transparent.
- Define the authority, decision making process, and reporting structure, while ensuring an appropriate separation of roles and responsibilities related to approvals, conflict of interest determination, fairness oversight, due diligence, overall co-ordination, completeness of RFP submissions, and scoring of rated criteria.
- Provide multiple levels of due diligence to confirm that all material facts have been considered in selecting the Preferred Proponent.
- Ensure that the evaluation process is conducted in a secure environment.
- Ensure that the evaluation process is consistent with best practices and industry expectations.
- Provide evaluation criteria and a process to select the most qualified team.

### Evaluation Categories and Points

The contents of the Proposals will be evaluated against the technical evaluation categories and the financial evaluation categories summarized in the table below.

The evaluation and scoring process will award points in each evaluation category. As few as zero points will be awarded for each evaluation category in which the Proposal does not adequately satisfy the submission requirements.

Evaluation Categories	Maximum Points
A. Proposal Submission Forms and Declarations	Not Scored
B. Technical Submission	500
B1. Project Management	100
B2. Civil Design	75
B3. Systems Design	75
B4. Construction	100
B5. Maintenance and Rehabilitation	75
B6. Operations	75
C. Financial Submission	500
<b>MAXIMUM POINTS AVAILABLE</b>	<b>1000</b>

The Technical Submission will be evaluated based on how well it meets the mandatory requirements outlined in the Output Specifications of the Project Agreement and Technical Submission Requirements of the RFP document.

The Financial Submission will be evaluated based on the Net Present Value (NPV) of the proposal including capital, long-term operations, maintenance and lifecycle costs, as well as the quality of its proposed financing plan. In general, lower NPV proposals will receive higher financial scores.

### Scoring

The Proposals will need to meet a minimum score of at least seventy percent (70%) of available points for the General Technical Submission, the Design Submission and the Construction Submission. For the financial component, a minimum score of at least sixty percent (60%) of available points must be achieved for the quality of proposed financing plan category of the Financial Submission. Failure to achieve the minimum scores noted above may prevent the pre-qualified Proponent from becoming the Preferred Proponent.

In addition, staff will review and perform their own analysis of the financial model and NPV calculation provided by the Proponents. The lowest NPV will be awarded the maximum points available for NPV (450 points) and the Region will deduct thirty (30) points from the maximum points available for NPV (450 points) for every percentage point by which the Proponent's NPV exceeds the lowest NPV.

### **Evaluation Steps**

Based on the Evaluation Framework, the submissions will undergo a completeness review to determine their substantial compliance to the terms and conditions of the RFP prior to being evaluated by the Evaluation Teams. A non-compliant submission will not be evaluated.

The fairness monitor will oversee and attend all evaluation meetings and their attendance will continue throughout the entire RFP process.

Subsequently, evaluation teams established by the Region will evaluate the Technical Package and the Financial Information Package of those submissions that pass the completeness review. Based on this assessment and a thorough review of the submissions, an Evaluation Committee will evaluate and rank each submission to identify a Preferred Proponent, which the Region will enter into negotiations with to achieve Commercial and Financial Close.

The Evaluation Committee will present the recommended Preferred Proponent to the senior management team, the steering committee, the Planning and Works Committee, and ultimately to Regional Council for approval.

### **5.0 Commercial/Financial Close**

Upon identification of the Preferred Proponent, the Region will enter into negotiations leading up to the execution of the PA. These negotiations will:

- Correct minor non-compliance issues, identified during the compliance review;
- Ensure that appropriate project company securities are in place;
- Address outstanding commercial requirements and items required in the PA.

Once all of these requirements have been met, the PA will be executed, achieving Commercial Close. Financial Close will occur immediately following Commercial Close when:

- Final interest rates spreads are set between the Region, Project Co. and the lenders;
- All the Lending Agreements are in place and funding is available to the Project Co. from its lenders.

### **CORPORATE STRATEGIC PLAN:**

This report supports Focus Area 3.1 of Council's Strategic Focus: Implement a light rail transit system in the central transit corridor, fully integrated with an expanded conventional transit system.

### **FINANCIAL IMPLICATIONS:**

In June 2011, Council approved the implementation of the RT project, including LRT and aBRT, with estimated capital costs of \$818 million, in 2014 dollars, with capital funding to be provided by the Province (up to \$300 million), the federal government (one third of eligible project costs to a maximum of \$265 million) and the Region (\$253 million). The RT project and improvements to



conventional transit are financed through an annual tax rate increase of 1.5% for a period of 7 years.

Council approved DBFOM as the preferred alternative to deliver the RT project and the updated VFM comparison of DBFOM to DBB identifies a VFM benefit from this form of procurement and delivery of the project.

**OTHER DEPARTMENT CONSULTATIONS/CONCURRENCE:** Nil

**ATTACHMENTS:**

Appendix A – VFM Report from Deloitte

**PREPARED BY:** *Darshpreet S. Bhatti*, Director, Rapid Transit  
*Calvin Barrett*, Director, Financial Services and Development Financing

**APPROVED BY:** *Thomas Schmidt*, Commissioner, Transportation and Environmental Services  
*Craig Dyer*, Chief Financial Officer



Region of Waterloo  
Light Rail Transit  
Project

Value for Money Report

Final Version  
May 22, 2013

**STRICTLY CONFIDENTIAL**

# Table of contents

Introduction.....	12
Overview of the LRT Project .....	12
Overview of the DBFOM .....	12
Overview of the Value for Money Assessment.....	14
Purpose of this Report.....	14
Purpose of VFM .....	14
VFM Process, Inputs and Assumptions .....	16
Process .....	16
VFM Methodology .....	16
VFM Components .....	17
Key Assumptions.....	20
VFM Results.....	22
Risk Analysis Results .....	22
Pre-RFP VFM Range .....	22
Interpretation of Results .....	23
Conclusions.....	25

# Introduction

## Overview of the LRT Project

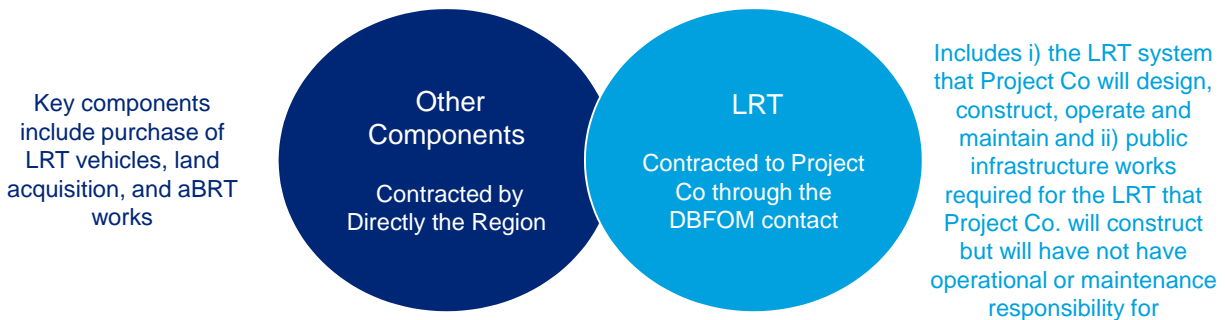
In June of 2011, the Region of Waterloo (the “Region”) approved a 36km Rapid Transit System to improve the connection of Waterloo, Kitchener, and Cambridge. The system is expected to help mitigate urban sprawl, shape efficient transportation choices, re-urbanize/intensity the Region and improve overall environmental conditions.

Included in the project is a 19km Light Rail Transit (“LRT”) from Conestoga Mall to Fairview Park Mall, and a 17-kilometre Adapted Bus Rapid Transit (“aBRT”) south from Fairview Park Mall to the Ainslie Street Terminal. The aBRT technology will include a distinctive and frequent limited-stop service, with transit signal priority and queue jump lanes. In addition, major connections to an expanded bus service will be provided at the LRT Terminals and other station stops along the alignment. Major destination points include the downtown business areas in Waterloo and Kitchener, the planned intermodal facility at King Street and Victoria Street, as well as the University of Waterloo.

As outlined in Figure 1, the project includes two components (collectively “the Project”):

1. The LRT vehicles, aBRT vehicles, acquisitions of land, construction of the aBRT works and overall management of the project (collectively the “Other Components”); and
2. The LRT as delivered using a design-build-finance-operate-maintain (“DBFOM”) contract structure, which is a form of public-private-partnership or, as referred to in Ontario Alternative Finance and Procurement (“AFP”) with a private consortium (“Project Co.”). This contract structure for the LRT was approved by Regional Council in February 2012.

**Figure 1: Project components**



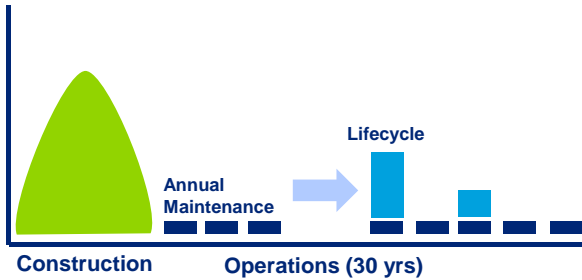
## Overview of the DBFOM

The DBFOM approach is expected to result in overall benefits for the Region over the long term, as it will transfer responsibility for the design, construction, operation, and long-term maintenance of the LRT system to Project Co. for the construction period as well as the 30 year operation period. The primary advantage of the DBFOM approach is that the Region only “pays

for performance” and therefore Project Co.’s invested capital in the project is at risk<sup>1</sup>. This incentivizes Project Co. to provide timely, on-budget performance over the long-term. Since design, construction, operations and maintenance are bundled, a single counterparty, Project Co., is held accountable to the Region. Ownership and control over the project assets remains with the Region at all times. This “risk anchoring” concept is illustrated in Figure 2 below.

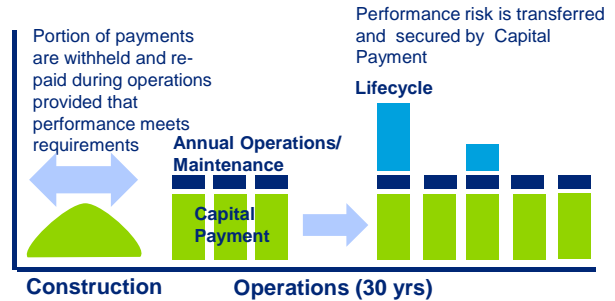
**Figure 2: Risk Anchoring in DBFOM**

**Traditional Public Sector Project**



- Public sector / Region pays for assets / services as they are provided
- Full costs of construction are paid in advance of operational commencement
- Due to limited payment security, most cost overruns also become liabilities for the Region

**DBFOM**



- Payment during construction is linked to performance
- Project Co has lifecycle performance risk and must consider maintenance as part of design/build phase
- Operating risk is mostly assumed by Project Co and secured by Capital Payment
- Ongoing payments reflect amortized capital costs and ongoing operating/maintenance costs
- Performance and asset condition is considered in the development of output based specifications
- Interests of 3<sup>rd</sup> parties (Lenders) are aligned with the Region

<sup>1</sup> Project Co. invests a certain amount during construction before the Region makes any payments and this invested capital is repaid over the operating term only if the performance specifications set by the Region are met.

# Overview of the Value for Money Assessment

## Purpose of this Report

Deloitte has been engaged by the Region to provide financial advice on the Project, which includes the development of a Value for Money (“VFM”) analysis to assess the benefits of the DBFOM. Please note that this report provides a VFM assessment for the LRT only, as the Other Components defined earlier are not part of the DBFOM contract with Project Co.

## Purpose of VFM

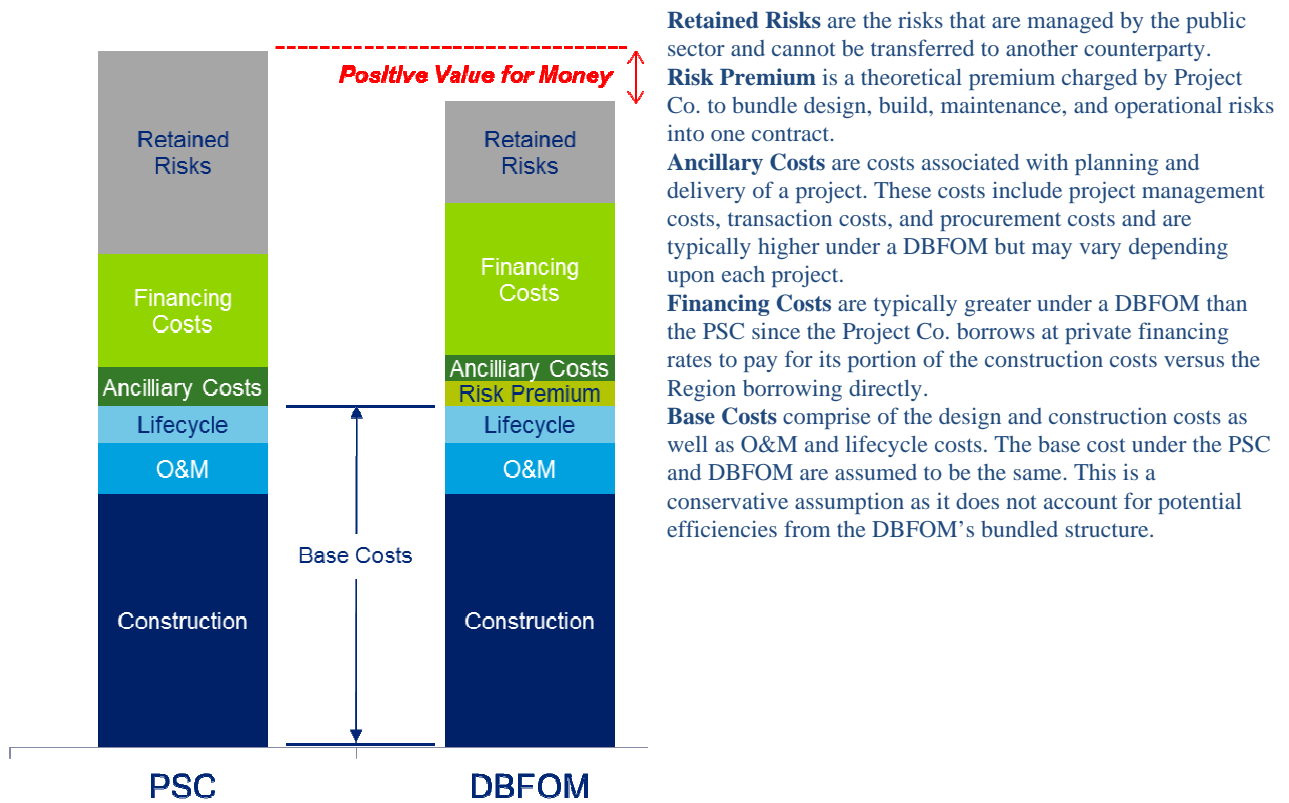
A VFM assessment is a comparison of the costs of delivering an infrastructure project using an AFP (in this case as a DBFOM) to a Public Sector Comparator based on a “traditional” procurement method using a Design-Bid-Build (“DBB”) approach, as follows:

1. **Alternative Finance and Procurement:** These are the total costs to the Region of delivering the LRT based on the DBFOM model. These costs are based on the Region’s future service payments to the private sector partner, including re-payment of the construction costs that are privately financed, and also includes an adjustment for risks retained by the Region under the DBFOM.
2. **A Public Sector Comparator (“PSC”):** The PSC is an estimation of the total costs to the Region of delivering the LRT based on the Region’s traditional DBB method of delivering public infrastructure projects and also includes an adjustment for risks retained by the Region under this model. Under this approach (i.e. the DBB), the Region is assumed to finance the LRT’s capital costs.

The VFM analysis is conducted by comparing the Net Present Value (“NPV”) of the risk-adjusted project costs of the DBFOM against that of the PSC. The premise is that by including the cost of all risks to the Region a fulsome risk-adjusted cost comparison of the DBFOM and the PSC can be completed. It should be noted that a VFM is a comparative assessment and, as such, any quantification of risk should only be viewed within this context and not interpreted on an absolute basis. The impact to the Region of an actual risk event occurring may or may not be similar to the results generated through the VFM risk quantification assessment.

Figure 3 illustrates how the value is demonstrated through the VFM calculation. The cash cost in the DBFOM before adjusting for risk is higher than the cash cost under PSC. However, after adjusting for risks transferred, the DBFOM may present a lower risk adjusted cost. This is because the higher financing costs incurred by the private sector are potentially offset by the risk transfer and mitigation of public sector risks under a DBFOM model.

Figure 3: VFM – Comparison between PSC and DBFOM Delivery Model



# VFM Process, Inputs and Assumptions

## Process

Deloitte carried out the VFM assessment with input provided by the Region and members of the Region's advisory team, including the technical consultants, Parsons Brinckerhoff ("PB"), and transaction advisors, Infrastructure Ontario ("IO"). Among other items, PB was responsible for preparing design, construction, operating, and maintenance costs included in the analysis.

The VFM assessment quantifies risk transfer in dollar terms based on IO's VFM methodology which is considered a best practice in Canadian DBFOM transactions. Some key distinctions of IO's methodology are as follows:

- The risk assessment process is based on an estimate of the probability and cost impact of a range of risks associated with transit projects, in consultation with technical experts and key stakeholders. Estimated risk probability and impact under both the PSC and the DBFOM delivery models are assessed based on historical data for risks associated with transit projects, adjusted for project-specific factors.
- All design, construction, maintenance, and operating cost inputs are equal in both PSC and DBFOM model; no cost efficiencies are assumed for the DBFOM.
- A Risk Premium (refer to Figure 3) is added to the Base Costs for the DBFOM.
- The discount rate for calculating the net present value in the VFM is assumed to be the long-term borrowing rate of the public sector (i.e. the Region).

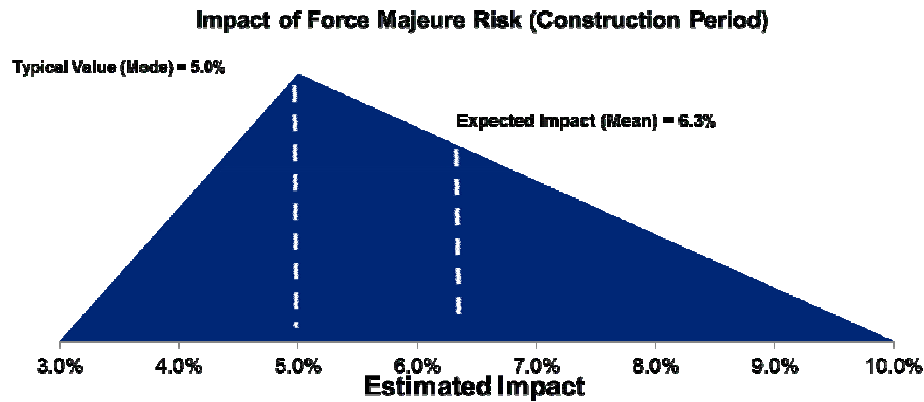
Deloitte facilitated a series of risk workshops with the Region and its advisors, including PB and IO, all of whom contributed based on their respective technical expertise, professional experience and judgment. Prior to the workshops, a draft risk matrix was prepared based on IO methodology and augmented by the team's experiences in the public transit/transportation sector. This risk matrix was refined for Project-specific risks and finalized over the risk workshops.

## VFM Methodology

On completion of the risk matrix Deloitte ran a statistical simulation (a Monte Carlo simulation) in order to calculate the value of risk retained by each party under the PSC and DBFOM models. This simulation yields a distribution of impacts for each risk based on a range of inputs provided in the matrix. The resultant statistical mean is then used as the expected impact for each risk. Most risk impacts have a "triangular" distribution (as illustrated in Figure 4 below), meaning that the range of potential impacts is skewed toward the right. The mode (typical value) often fails to reflect the wider range of worse-than-typical outcomes. Therefore, the mean value is used as the expected impact.



Figure 4: Illustration of Risk Impact Quantification



The statistical simulation provides an expected value for the impact of each risk, under both the DBFOM and the PSC and is calculated as follows:

$$D = A \times B \times C$$

where:

- A** Each risk was assigned a potential cost value in dollars
- B** A probability of occurrence (as a percentage) for each risk was agreed upon through the workshops
- C** A “low” and “high” impact of each risk (as a percentage) was agreed upon through the workshops, with the average generated through the Monte Carlo simulation
- D** The quantified value of the risk is the product of A, B, and C. This value is allocated between the Region and Project Co. based on an assumed risk allocation under the DBFOM and PSC

It should be noted that VFM is a comparative assessment and, as such, the quantification of risk as presented above should only be viewed within this context and not interpreted on an absolute basis. The impact to the Region of an actual risk event occurring may or may not be similar to results generated through the VFM risk quantification assessment.

## VFM Components

During this stage of the VFM assessment, cost inputs have been based on the technical consultant’s cost estimates. Once the procurement process has been completed, VFM will be reassessed utilizing the winning proponent’s construction cost (not including financing) to capture more market reflective construction costs.

### The Public Sector Comparator Costs

The PSC represents the estimated costs to the Region for procuring the design and construction of the LRT using a Traditional or DBB method, financing the project using Region financing, and operating and maintaining the LRT for a period of 30 years.

### DBFOM Costs

The estimated project costs for the DBFOM model are the costs associated with Project Co.

designing, and building the LRT, as well as financing, operating and maintaining the LRT for the 30-year operation period. The costs under a DBFOM are typically higher than under a PSC, as they include additional costs related to private sector financing as well as a risk premium to account for the added risk borne by Project Co. in a DBFOM structure.

**The Risk Matrix**

The structure of a DBFOM transaction allows the Region to transfer and/or mitigate risks associated with designing, constructing, operating and maintaining large infrastructure projects such as the LRT. Some examples of risk transfer and/or mitigation include:

- **Contractual Risk Transfer:** The contractual terms of the DBFOM requires Project Co. to bear most of the risks associated with design deficiencies, construction cost overruns, and maintenance and major capital (lifecycle) repair cost overruns. Typically, a DBB approach requires the Region to assume many of these risks.
- **Co-ordination:** The DBFOM requires a single party, Project Co., to undertake the design, construction, and long-term operations and maintenance of the asset, thereby greatly reducing co-ordination risks.
- **Private Capital Due Diligence:** Financing risk in the DBFOM is borne by private debt and equity investors, who undertake thorough, up-front due diligence and long-term planning, thus reducing both the probability and impact of certain risks.

The risk analysis carried out by the Region’s team examined risks in the categories listed in the Table 1 below.

**Table 1: Risk Categories**

Project Risk Categories	
1. Policy and Strategic Risks	6. Permits and Approvals
2. Project Agreement	7. Completion Commissioning
3. Design & Tender	8. Maintenance Risks
4. Site Conditions / Environmental	9. Operational Risks
5. Construction Risk	

Certain key risks are set out below for summary purposes in Table 2. These are the key risks that have been determined to have a significant impact on the value of risk retained by the Region under each of the delivery models assessed.

**Table 2: Key Project Risks**

Risk	Description
Planning, Process And Allocation Practices	Risks that internal Region approvals are not received in a timely manner and ultimately results in delays in the procurement process.
Changes In Government Funding Policies	The risk that a change in government policy (which includes the Region, the Province and the Federal government) impacts or terminates the Project. There may also be an impact on the Region's reputation and ability to carry out future procurements.
Asset Residual	The risk of the residual value of the asset at the end of the term, i.e. the condition of the facility at the end of the term and the magnitude of any investment required to restore the facility such that it can deliver the service as required.
Incomplete RFP / Tender Documentation	The risk that RFP / Tender documentation (including construction contract or Project Agreement) incompletely or poorly defines Project scope and/or risk allocation, or is poorly coordinated. This results in uncertainty for bidders and may compel them to increase contingencies in their pricing to reflect the fact that the services cannot be priced accurately.
Scope Changes By Owner - During Construction	The risks associated with the Region changing the scope of work during the construction period through issuing change orders. Change orders are not priced under competitive tension and therefore these risks include risks of non-market pricing. This category also includes the risk that the method for pricing change orders is not fully prescribed in the contract resulting in change order costs exceeding estimated amounts. An unclear, incomplete or internally inconsistent specification will increase the probability of scope changes.
Acceleration to Maintain Schedule	The risk associated with the construction contractor having to accelerate the schedule in order to achieve the completion date. Acceleration can result in increased costs to the contractor (such as increased equipment utilization, higher prices for urgent materials); additionally acceleration may also have a quality assurance impact due to sub-trades working longer hours.
Project Integration	Risk that all the design elements of the project, including structures, roadways, tracks, systems, ITS, electrical, facilities and communications have not properly been prescribed and integrated. Risk that individual discipline areas have failed to properly coordinate design and construction in time, space and connectivity to meet final performance requirements, incurring additional costs and delays.
Construction Delays	The risk that the Region's skills, capacity or resources are insufficient which results in delays and quality issues that increase costs. The Region may be required to manage construction (such as under some variants of DBB) or may take a broad oversight role (such as under AFP). DBB option includes certification of progress payments, re-measurement of works to the extent necessary, and managing variations and change orders.
Cost of Labour and Materials	Risk that the cost of labour and materials is greater than predicted. Risk is associated with the extra cost for service contracts, staffing and material suppliers.
Technological Obsolescence And Upgrade	Risk of the contracted services and its method of delivery not keeping pace, from a technological perspective with public or industry expectations of service standards. Risk is the cost associated with the need to upgrade the assets or service delivery over the term of the contract.

Risk	Description
Inflation	Risk that inflation is greater than estimated. Risk is that budgets will be insufficient to address needs and costs will increase.

## Key Assumptions

VFM results will vary over time as financing and timing assumptions evolve between now and Financial Close<sup>2</sup>. Results in this report are preliminary in nature and based on the key inputs and assumptions presented in Table 3 below. The VFM assessment will be updated at critical stages during the procurement process; i.e. prior to naming of the preferred proponent and at financial close, with costing and financing data from the preferred proponent inserted into the VFM model.

---

<sup>2</sup> Financial Close is the date at which Project Co. locks-in its financing rates after which the price for the Project is set.

**Table 3: Key VFM Assumptions**

<b>Assumption Item</b>	<b>Overview</b>
<b>Project Schedule</b>	Based on input from the Region's technical advisor, the construction period has been estimated at approximately 40 months including commissioning. The operating period of the LRT considered in the VFM assessment is 30 years.
<b>Base Date</b>	As costs in a VFM analysis are considered on a NPV basis, they have to be discounted to a specified Base Date (i.e. the date to which all costs in NPV terms are discounted back to). For purposes of the LRT the Base Date has been set as the expected Financial Close date of April 2014.
<b>Region Borrowing Rate</b>	The VFM assessment has assumed an all-in cost of borrowing rate for the Region based on current trends.
<b>Discount Rate</b>	The VFM assessment assumes a discount rate which is equal to the Region's notional borrowing rate.
<b>Ridership revenue</b>	The VFM calculation focuses purely on gross costs and thus does not take into consideration any sources of revenue (e.g. Ridership) that may be available to the Region to cover project costs.
<b>Federal and Provincial funding</b>	Similar to Ridership revenue, the VFM calculation does not reflect sources of funding available to the Region such as Federal or Provincial funding.
<b>Cost Inputs</b>	Cost assumptions for design, construction, operations, maintenance and major capital repairs (lifecycle) have been provided by PB through a detailed costing exercise. With the exception of the Risk Premium (explained below), these cost inputs have been assumed to be the same for both the PSC and DBFOM delivery models.
<b>Risk Premium</b>	An adjustment factor is applied to design and construction costs for VFM purposes to account for the additional risk premium associated with the bundling of design and construction. This premium is only applied to the DBFOM delivery model and not the PSC. The purpose of this standard VFM assumption is to capture the added risk profile that Project Co. takes on in a DBFOM project as compared to a traditional project delivery.
<b>Harmonized Sales Tax (HST)</b>	All cost inputs have been adjusted to include a non-recoverable portion of HST. This assumption has been applied for both the PSC and DBFOM models.
<b>Cost Inflation</b>	To account for inflation during the construction and operational periods of the Project an annual inflation factor has been applied to all costs.
<b>Project Co. Partnership Costs</b>	AFP projects are typically undertaken by special partnerships formed by various team members of the selected proponent. Management fees of such a partnership have been added to the DBFOM delivery model over both the construction and operations period.
<b>Payments to Project Co. during construction (DBFOM)</b>	Project Co. is expected to finance the initial capital costs without receiving any payments from the Region. Subsequently, the Region will be making monthly payments to Project Co. equivalent to 85% of the work completed during the month with the remaining 15% withheld as a holdback. At the end of the construction and commissioning period, the Region will be making a Substantial Completion Payment to Project Co. equal to the total amount of holdbacks withheld during construction leaving the initial capital costs to be repaid to Project Co. throughout the 30-year operational period.
<b>DBFOM Financing Structure</b>	Project Co. is expected to finance initial capital costs through long-term financing. This long-term financing is assumed to be covered through long-term debt (bond structure) and equity. In order to finance the 15% holdback withheld from payments made by the Region during construction, Project Co. is assumed to draw on a short-term debt (bank loan) facility that will be entirely repaid by the Substantial Completion Period.
<b>Private Sector Financing</b>	Long term financing is tied to the long-term Government of Canada bond yield plus a private financing spread based on precedent AFP projects. Similarly, short term financing rates are based on construction period financing facilities observed on precedent AFP projects.
<b>Transaction Costs</b>	Transaction costs consist of the upfront costs required by the Region to deliver the LRT (i.e. take it from the planning phase throughout procurement). These costs are typically higher in AFP projects, relative to the PSC, because of the greater complexity of AFP transactions which require the involvement of external transaction, financial and legal advisors.
<b>Project Management Costs</b>	Project Management costs represent the Region's internal costs required to oversee the LRT until the commencement of operations as well as the cost of retaining a technical advisor. These costs have been assumed to be the same for the PSC and AFP delivery models.

# VFM Results

## Risk Analysis Results

Table 4 below summarizes the risk transfer profile for the LRT, by key categories of risks, based on the mean of the results obtained through the Monte Carlo simulation. Note that each risk category is comprised of a number of more detailed risks, each assessed individually as part of a proprietary model.

**Table 4: Risks Retained by Each Party by Risk Category**

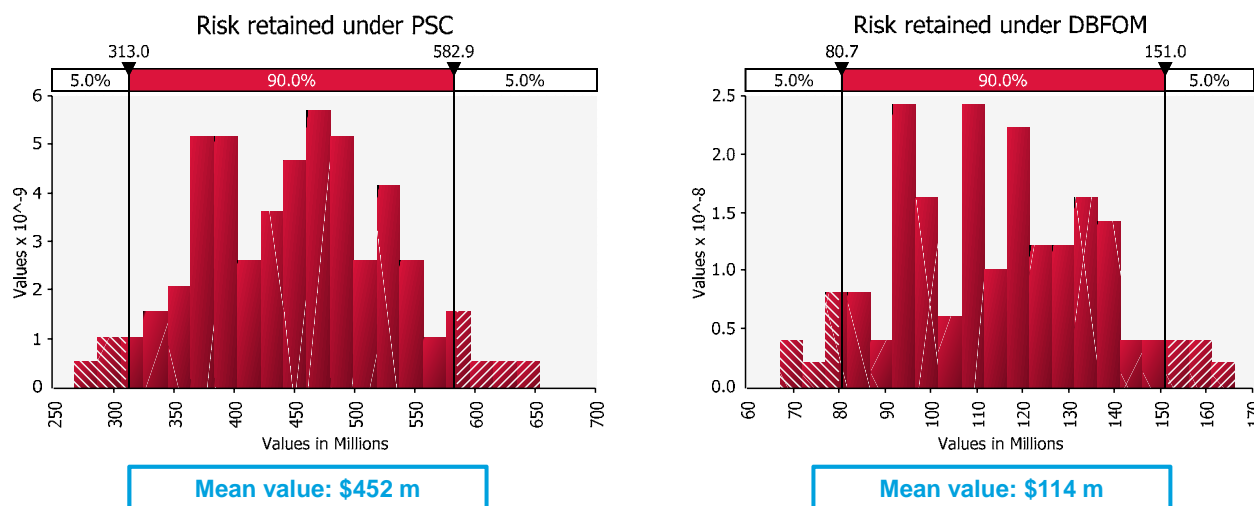
Type of Risk	Estimated Quantified Risk Retained Under Each Option			
	DBFOM		Traditional DBB	
	Region	Private Sector	Region	Private Sector
Policy / Strategic	\$ 40,044,088	\$ -	\$ 166,499,102	\$ -
Project Agreement	\$ 4,963,479	\$ 602,167	\$ 9,376,415	\$ 355,951
Design & Tender	\$ 6,140,157	\$ 12,665,928	\$ 36,959,594	\$ -
Site Conditions/Environmental	\$ 9,492,031	\$ 18,212,834	\$ 24,619,954	\$ 5,932,519
Construction	\$ 18,954,399	\$ 17,649,244	\$ 77,745,663	\$ 14,860,960
Permit and Approvals	\$ 355,951	\$ 949,203	\$ 1,483,130	\$ -
Completion Commissioning	\$ -	\$ 2,076,382	\$ 4,597,702	\$ 4,597,702
Maintenance	\$ 19,644,367	\$ 19,644,367	\$ 77,268,593	\$ 526,725
Operational	\$ 14,618,792	\$ 17,230,881	\$ 53,243,571	\$ 422,980
<b>SUB-TOTAL:</b>	<b>\$ 114,213,264</b>	<b>\$ 89,031,006</b>	<b>\$ 451,793,724</b>	<b>\$ 26,696,839</b>

## Pre-RFP VFM Range

As discussed earlier the value of risk retained by the Region is obtained through a Monte Carlo simulation<sup>3</sup> on the impacts of each risk. The resulting statistical distribution of total risk retained by the Region is presented in Figure 5 below.

<sup>3</sup> Monte Carlo simulation is an estimation method based on a broad class of computational algorithms that rely on repeated random sampling to obtain numerical results i.e. by running simulations many times over in order to calculate probabilities.

**Figure 5: Statistical Distribution of Risk Retained by the Region**



In order to assess the impact of the statistical distribution on VFM, High and Low ranges for risks retained by the Region under the PSC and the DBFOM were obtained using the standard deviation calculated through the Monte Carlo simulation. By using the mean value of risk retained presented in Figure 5 the resulting VFM is approximately 12.3%<sup>4</sup>.

To determine a range of VFM savings, a range of retained risks was calculated by taking one standard deviation from the mean value. This yields High and Low values of risks retained that translated into a range of VFM results that extends from 6.1% to 17.9%<sup>5</sup>. This result compares to the preliminary VFM of 18% reported to Regional Council in February 2012 which was based on generic assumptions from precedent and related projects that were made in advance of development of the Project Agreement. The difference in VFM is primarily due to revised assumptions on private financing costs and refining the risk matrix to make it more specific to this project and provisions of the proposed Project Agreement.

## Interpretation of Results

When reviewing these results, the following considerations should be noted:

- The results illustrate the difference between two vastly different forms of contracts for an infrastructure project the Region has limited experience with. The VFM result is not intended as a criticism of the Region’s typical DBB contracting approach, which is not suited for the LRT project for the following reasons:
  - The Region’s typical construction delivery model is a DBB model using a standard form of construction contract that has been tested and applied against numerous projects that are typically less than \$100m and does not include a long-term operating and maintenance obligation in the scope of the contractor. Current AFP uses the best practice of bundling design-construction-operations and maintenance through the design-life of the infrastructure for new legacy, large scale projects such as the LRT. The VFM illustrates this difference, with the main advantage of the DBFOM being that the same contract counterparty is responsible for all components, thus eliminating any “finger pointing” if the LRT does not perform.

<sup>4</sup> VFM results are typically presented as a percentage calculated by taking the difference between the risk-adjusted cost of the AFP against that of the PSC (please see Figure 3) divided by the risk-adjusted cost of the PSC.

<sup>5</sup> With the range calculated by taking one standard deviation from the mean.

- One of the motivations for the Region to select the DBFOM model was to have Project Co. assume operations and maintenance, since the Region has no expertise in operating LRTs. In other words, the VFM factors in the Region's ability to be an LRT operator as compared to a private partner under the DBFOM whose core business is LRT operations.
- The DBB form of contract is prescriptive as the contractor bids against a 100% level design prepared by the Region, while the DBFOM relies on a performance based set of output specifications that are not prescriptive. The VFM contrasts the difference in the form of compliance, as Project Co. has flexibility to operate the LRT system and therefore must accept consequences if the system does not perform.
- The VFM captures the opportunities that exist under the AFP model to achieve cost synergies through innovations due to: (i) the use of non-prescriptive output-based specifications; and (ii) the integration of design, construction, operations and maintenance enables Project Co to make cost trade-off decisions as it is responsible for long-term asset performance and therefore has incentive to design, construct, and plan based on a "full lifecycle" view of the infrastructure.



# Conclusions

At this pre-RFP stage of the Project and based on refined cost and other input assumptions, the VFM analysis demonstrates that the DBFOM project delivery model continues to achieve value for money savings for the Region when compared to the PSC. In line with best practices, the VFM will be updated prior to commercial and financial close with data from the preferred proponent's bid replacing cost assumptions to ensure that the Region continues to achieve value for money savings using a DBFOM project delivery model.