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Project Number:  
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Date:  
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CITY OF CALGARY

# SOUTHEAST TRANSITWAY

ALTERNATIVE FINANCING AND FUNDING WORKSHOP SUMMARY REPORT



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Dear Mr. MacNaughton:

**Project No: 60309869**

**Regarding: Southeast Transitway Alternative Financing and Funding Workshop**

AECOM is pleased to provide the following FINAL report for the Southeast Transitway Alternative Financing and Funding project for your review and comment.

If you have any questions, please contact the undersigned at 403.254.3323.

Sincerely,  
**AECOM Canada Ltd.**

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Parsons Brinckerhoff  
*Revenue Sources*



# Executive Summary

AECOM was commissioned by the City of Calgary to prepare an Alternative Financing Workshop for the Southeast Transitway. Prior to the workshop, a number of relevant internal and external stakeholders were interviewed. Interview questions were prepared based on a literature review of alternative financing models and funding options. The questions also drew from the documents and publications produced by the City of Calgary on funding and financing transportation infrastructure projects. The literature review covered the City of Calgary reports *Investing in Mobility*, *RouteAhead*, and The City's Public-Private Partnerships Council Policy Framework and Council's 2012-2014 Fiscal Plan. The findings from the literature review, interviews, and workshop feedback have been analyzed for use by the City of Calgary and are documented in this report.

One of the most prominent corridors identified in *RouteAhead* is the Southeast Transitway, which was given a "High" priority rating. The estimated cost of the project is \$642 million. On November 27, 2013, City Council voted to allocate \$52 million of unused provincial education property tax room for 2015 to 2024 to create a dedicated transit fund (the "Green Line Fund") to build the Green Line transitway in both North Central and Southeast Calgary.

The Southeast Transitway is expected to be a multi-stage project that will be built over several decades, providing rapid transit access from downtown to the communities of Inglewood, South Hill, Quarry Park, and Douglas Glen. In addition to this initial cost estimate, future expansion to the Seton Major Activity Centre has been included in the Calgary Transportation Plan, providing access to Prestwick, McKenzie Towne, Auburn Bay, and the new South Calgary Hospital.

## E.1 Terminology

Funding options for any infrastructure project refer to the sources of funds needed to pay for the development and operation of the new facilities. Funding sources can be either public – such as general tax revenues collected by any level of government – or private as in the case of charges paid directly by users, such as public transit fares or tolls for the use of a particular road or bridge.

Financing options involve borrowing funds in order to meet any payment obligations for the development of an infrastructure project. But any financing must eventually be repaid and hence, financing is not a substitute for funding. However, financing an infrastructure project can be justified if the timing of spending obligations for a project does not match availability of funds from the designated sources.

Financing options can be either public or private. Public financing is typically secured by governments issuing general bonds or revenue bonds. General bonds are repaid through tax revenues. Revenue bonds are repayable from specific revenue streams, as in the case of Tax Increment Financing bonds. Private financing means borrowing through the private sector, which can include a range of instruments from bank debt, syndicated private loans or bonds issued by private entities. In the case of public infrastructure projects, private financing of any significant magnitude is typically available only through procurement vehicles known as Public Private Partnerships (P3s). Projects with alternative financing, such as P3s based on availability payments, have in most recent years been based on private financing and public funding (although there has also been a role for private funding sources from toll payments).

## E.2 Alternative Financing and Delivery Options

Given that private financing for public infrastructure projects is usually available only through project delivery options such as P3s, we combine a discussion of alternative financing with alternative delivery options for public infrastructure.

Project delivery options range from traditional options such as Design-Bid-Build, based on public ownership and control of the project, through to the Build-Own-Operate model based on full private ownership and control of the infrastructure project.

For conventional (i.e. Design-Bid-Build) projects, each phase tends to be procured separately through a succession of separate contracts. The contracts are input-based, which means that the owner specifies the exact inputs required, for example, the materials to be used or methods of construction. Contractors are paid monthly during construction usually based on the amount of work completed. Projects are publicly financed and the public sector retains project stewardship. This is the approach followed for most infrastructure projects at The City of Calgary, with exceptions such as the West LRT project.

Alternative private financing for public infrastructure is invariably tied to new procurement methods (i.e. P3s). P3 projects usually integrate two or more project phases, such as the design, construction, operation and maintenance phases. P3 contracts are also output based, where the public sector owner specifies the performance outcomes and allows the private sector to put forward the most efficient methods of achieving those outcomes. There are several P3 models which have been used for public infrastructure across Canada. These models all require a competitive procurement process in order to secure the expected benefits. The P3 models can be described as follows (see main report for detailed description):

### Design-Build (DB)

- Design and construction phases are bundled into one contract
- Contracts are often fixed-price, which transfers some (but not all) of the cost overrun risks during the design and build phase to the private sector; risk of cost overruns during the operations phase is not transferred to the private sector

### Design-Build-finance (DBF)

- Similar to DB, except that the private sector also finances some or all of the capital cost during the design/construction phase
- Ensures more effective risk transfer, because the private sector has capital at risk to guarantee schedule and budget certainty

### Design-Build-Finance-Maintain (DBFM)

- Private partner awarded long-term contract to design and build the facility, provide some financing, and maintain the facility for a 20-30 year period, after which the facility reverts to the public sector
- Compared to the DBF model, this provides whole life-cycle optimization of cost
- Public sector pays the private partner based on performance (e.g. percent of time facility is open and available for service), with payments beginning after facility is commissioned



### Design-Build-Finance-Operate-Maintain (DBFOM)

- Contains all elements of a DBFM model but also includes private sector operation of the facility for the duration of the contract
- The full risks associated with optimization and certainty of whole lifecycle costs transferred to private concessionaire, including operations and maintenance

### Build-Own-Operate-Transfer (BOOT)

- Same as DBFOM, but infrastructure is owned by the private partner
- As a result, the private partner is also responsible for the financing and the full revenue risk

The value proposition for P3s can be summarized by several points from the December workshop presentation on "Structuring Public-Private Partnerships" by Mike Marasco:

- Private financial capital at risk to guarantee on-time and on-budget delivery
- Optimization and certainty of "whole of life" costs
- Ownership of the asset is retained by the Sponsor
- Facility condition guaranteed for the full 25-50 years of operations
- Emphasis on a clear and well-defined risk allocation
- A fully integrated solution that drives design development, construction, equipment and operations

The long term nature of a P3 contract provides a number of benefits relative to the traditional delivery method, particularly in terms of cost and time savings. The ability to allocate risk between the public and private parties, based on the party best able to manage the risks, allows for greater optimization of resources. However, there is also a cost to transferring these risks (known as the "risk premium" associated with transferring the risks), as well as other costs, such as higher financing costs and higher transaction costs. The various benefits and costs are discussed below and outlined in the Figure E.1 below.

| BENEFITS                                                                                                                                                                         | COSTS                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Cost savings<br/>(or quality enhancements)</li> <li>• Time savings</li> <li>• Schedule certainty</li> <li>• Budget certainty</li> </ul> | <ul style="list-style-type: none"> <li>• Transaction costs</li> <li>• Financing costs</li> <li>• Risk premium</li> <li>• Change Constraints</li> </ul> |

**Figure E.1: Potential Benefits and Costs of Alternative Financing / Delivery**

Because the private partner in a P3 contract has a financial stake in the outcomes from the project years after construction, P3 contracts bear many benefits over the traditional project delivery system. The benefits to employing a P3 contract as opposed to the conventional procurement can be measured across all facets of the project delivery based on cost savings, time savings, schedule certainty, budget certainty, and a reduction in lifecycle maintenance costs.

The transfer of risks to the private partner in a P3 project is one of the major benefits of employing an alternative delivery method, but not all risks can be cost-effectively transferred to the private partner. It makes sense to transfer a risk to the private partner if the latter has some control over the relevant **outcomes**. This would lead to a mitigation of the overall risk for the P3 project and in a competitive procurement process the value of this risk mitigation is likely to be at least partly passed onto the public sector sponsor through a lower bid price. This type of optimal risk transfer applies to most construction risks (budget and scheduling), commissioning risks and operations and maintenance risks. It can also apply to some site condition and environmental risks and certain permitting risks, provided that the private partner is in a position to assess the risks beforehand and to manage the risks effectively during the contract term.

The costs of undertaking a P3 delivery model relative to conventional project delivery can be greater or less than the long term benefits, depending on the P3 model selected and how the transaction is structured. In principle, a P3 project delivery should only be undertaken if the benefits outweigh the costs on an appropriate present value basis.

Transaction costs for a P3 contract are significantly greater than under conventional project delivery and include such services as legal, technical, financial, and project management services. P3 financing costs are also greater than public sector financing costs due largely to the variance between public sector bond financing rates and the equivalent yields for bonds issued by private sector entities, including entities with investment-grade credit quality.

### E.2.1 When is a P3 Model Suitable?

An alternative delivery method is not necessarily appropriate for all projects. There are several tools available to provide some guidance as to whether a P3 model would be a good fit for the project being considered. A preliminary approach is to screen potential projects for whether they are suitable to be delivered as a P3. A list of screening criteria is prescribed by PPP Canada in the *P3 Business Case Development Guide* (see text of report for a copy of screening criteria). By screening potential projects against this list of criteria, we can rule out projects which are clearly not suitable for P3 delivery (e.g. small projects under \$50 million which cannot be bundled; or projects which are integrated with a wider network, as can be the case with a BRT service).

A Value for Money (VfM) analysis is used by most Canadian jurisdictions to determine whether a P3 model is in the public interest. The VfM test determines whether there are any cost savings on a net present value basis when comparing one or more P3 models against the traditional Design-Bid Build delivery model, which is often called the Public Sector Comparator (PSC). This is done through a risk-adjusted view of capital and operating and maintenance costs expected to be incurred over the whole lifecycle of the new facility. The test is often used to determine which projects should be pursued as P3s, as well as how a project should be structured (e.g. whether the concession should include the transit vehicles; or operations)

VfM tests are considered an industry standard across Canada and other jurisdictions where P3s are used for the delivery of public infrastructure, as in Europe and Australia. The **Figure E.2** shows a chart of the VfM results for over thirty recent P3 projects across Canada. The chart shows that VfM savings vary between 5% and 20% of total project costs. In other words, the studies showed that P3 delivery methods were expected to deliver significant savings relative to conventional delivery methods.

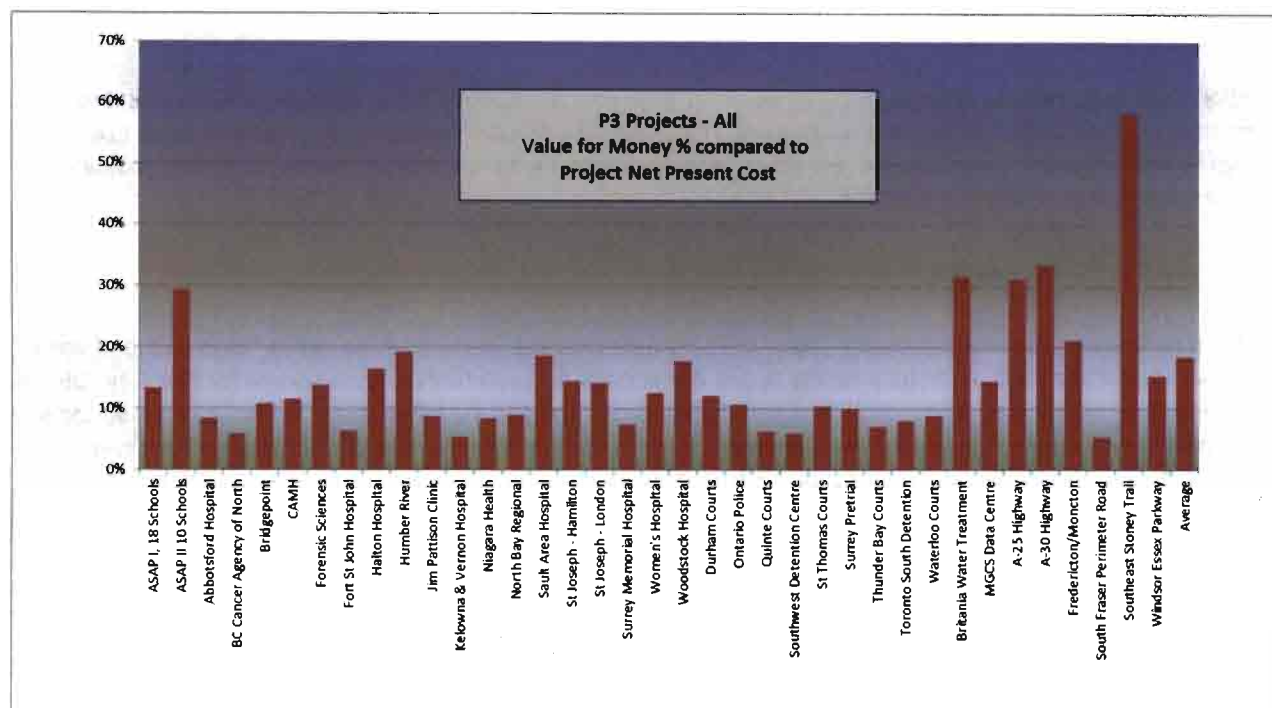


Figure E.2: Value for Money Savings

### E.3 Funding Options and Revenue Tools

Based on the experience of other transit authorities in Canada and abroad, there are a myriad of funding options available to raise revenue for transit projects. The primary objective of revenue tools is to raise funds for transportation infrastructure and to provide a stable and predictable source of funds for future projects. In principle, revenue can be raised in many different ways. However, there is much more than just revenue at stake when analyzing the choice of revenue tools. Some revenue tools tend to reduce the productivity and competitiveness of the affected city-regions – as in the case of most traditional tax-based revenue sources such as income taxes and payroll taxes. Other revenue tools can do the opposite, especially when based on user-charging principles. Some revenue tools have no impact on mobility while others can help mitigate road congestion and thereby generate travel time savings. In addition, there are other relevant considerations in the choice of revenue tools, notably public acceptance. The following is a summary of some of these tools categorized as mobility user charges, traditional tax tools and land-based revenue tools.

#### Mobility User Charges

Mobility user tools refer to charges which mobility users incur when they make travel decisions, such as fuel taxes, cordon charges, highway tolls and transit fares. These charges tend to impact travel decisions, including the time of day and mode choice (e.g. car, bus, walk, etc.). In the long-term, these charges may also affect travellers' residential location decisions and employers' office locations. As a result, mobility charges have the potential to improve mobility and congestion outcomes as users incorporate the price signals in their short-term travel decisions and in their longer-term residence and job location decisions.

## Conventional Tax Tools

Conventional tax tools refer to revenue sources which in large part are already being used by provincial and federal governments, but less so by municipal governments. This category of tools includes income taxes, sales taxes, payroll taxes and corporate income taxes. However, revenues from these tax sources are not currently dedicated to transit or transportation projects in Canada.

## Land-Based Revenue Tools

Land-based revenue tools include property taxes, development charges, parking levies, sales taxes and land value capture. Some of these tools, such as property taxes, are already an important revenue source for The City. Others are potentially new revenue sources, such as a parking space levy or parking sales taxes. Some land-based tools can be applied specifically to the areas which are most likely to benefit from the new the Southeast Transitway transit services, including the transit corridor as a whole or even a certain area around each new station.

## Other Revenue Tools

Other potential revenue tools discussed in the report include drivers' license tax, utility levy, hotel and accommodation levy, monetization of city assets and crowdfunding. Some of these have been used in other jurisdictions, such as a drivers' license tax, while others are relatively new and untested, such as crowdfunding.

Given all these different revenue tools, it is imperative to evaluate which are most relevant and applicable given the local context of the infrastructure the tools are intended to fund. There are five distinct criteria that other jurisdictions have used when evaluating revenue tools:

- Revenue yields and capital and operating costs arising from implementation
- Impact on travel behavior and network performance
- Implementation challenges
- Equity
- Economic Efficiency

From an overall economics and transportation perspective, the preferred revenue tools should be those that maximize the transportation benefits and minimize the inefficiency costs of taxation. On top of these economic considerations, public perception and acceptance represent important considerations. The introduction of a new revenue tool can be controversial and difficult to implement without broad public support. Transparency and the public awareness and support are critical.

We also recognize that some revenue tools can be implemented based on the location of the expected beneficiaries of the new transit services. Revenue tools used to fund the entire *RouteAhead* transit program can be implemented at the city-wide level. On the other hand, some revenue tools can be applied specifically to an area surrounding a new station, such as land value capture. Some revenue tools can be applied specifically to a new transit corridor such as the Southeast Transitway and its catchment area, such as development charges. The rationale for matching revenue tools to specific geographic areas within a region is based on the notion of horizontal equity (i.e. beneficiaries of new services should pay for the project costs).



## E.4 Benefit Case Analyses

Public support for the introduction of revenue tools depends in part on whether the funds generated by the new charges will be used for transit or transportation projects which will significantly improve mobility and mitigate congestion. This is in part dependent on prioritizing the different transit projects in *RouteAhead*, but it also depends on ensuring that each transit project has been carefully analyzed so that the most effective variant of the project is selected, given the future travel needs in the corridor (e.g. BRT in mixed traffic vs BRT with fixed guideway vs LRT).

## E.5 Recommendations

Our recommendations are based on the results of the literature review and the workshop presentation and discussion. The recommendations begin with the benefits case analysis and project justification theme, followed by the funding theme and the project financing and delivery theme. This follows the logic that project funding discussions should be preceded by a benefits case analysis (or a business case) for the project in question. It is also consistent with the view that any proposed public-private partnership should already be fully funded or have reasonable expectations of being fully funded in the near term.

### Benefits Case Analysis

We learned from John Howe's presentation that the Metrolinx process for selecting and advancing the best projects for funding implementation is an evidence-based transparent case-making process and relies on two tools: (1) a Benefits Case Analysis (BCA), which uses a Multiple Account Evaluation (MAE) approach, and (2) a project prioritization approach. The City of Calgary has already undertaken an extensive project prioritization exercise.

- We therefore recommend that The City undertake a BCA for each major project which is in *RouteAhead* but is not already underway, beginning with the Southeast Transitway project. In the case of the Southeast Transitway corridor, the BCA would compare alternative transit solutions for the Southeast Transitway corridor (each with their own mode progression, if appropriate) against a "business as usual" scenario using the MAE approach adopted by Metrolinx and other transit agencies in Canada. It would identify the preferred project alternative over the relevant long-term horizon, based on a combination of the project variant with the highest benefit-cost ratio and the results from the other "accounts", such as the Economic Development Account and the Social Community Account

### "Investing in Mobility" Investment Strategy and Revenue Tools Analysis

Given the funding gap which The City faces in implementing *RouteAhead* and the overall *Investing in Mobility* transportation plan, we recommend that:

- The City should undertake the analysis required to develop an investment strategy on how best to address the funding gap for the Investing in Mobility transportation program

The supporting analysis for the Investment Strategy would consist of an analysis of all potential revenue tools, including potential revenue yields for each tool as well as an estimate of the economic costs and benefits of each tool, where possible (e.g. for every dollar of revenue raised from sales taxes, approx. 15 cents are lost in terms of economic distortions). It would also offer several options of combinations of revenue tools which could be sufficient to meet the *Investing in Mobility* funding gap. It would also identify which revenue tools are best employed in which context, distinguishing between program-wide funding requirements, corridor infrastructure funding requirements and station-specific requirements.

The resulting revenue tool combinations could be used as the basis for a public consultation. Based on the results of the consultation and other strategic considerations (e.g. City Charter discussions with the Province), Council would then recommend one of the revenue tool combinations above, or a modified version thereof.

### Financing and Project Delivery

Public-private partnerships should be considered fully-integrated project delivery solutions that can provide on-time and on-budget outcomes with optimization and certainty regarding whole-life costs. This is achieved through cost-effective risk-transfer, performance-based payments and financial capital at risk. P3s are not a source of additional funding for infrastructure projects. Nor should P3s be viewed as a means for The City to avoid public borrowing constraints (e.g. debt ceilings). Our recommendations in this area are as follows:

- The City should undertake a preliminary screening of all major transit projects which have been identified in *RouteAhead* as a high priority over medium to long term and consider their potential suitability for delivery as a P3 – with delivery options ranging from Design-Build-Finance through to Design-Build-Finance-Operate-Maintain. This should be done for all projects which are already fully funded or are expected to be fully funded over the next few years.
  - The City should consider modifying the boundaries between projects listed in *RouteAhead*, if the modifications make some P3 options feasible or more attractive (e.g. bundling 2 or more projects; or removing a project element from the scope of the P3, such as operations)
  - the preliminary screening should yield a short-list of projects for further consideration as potential P3s
- All P3 delivery options should be considered, ranging from Design-Build-Finance through to Design-Build-Finance-Operate-Maintain. In the current post global financial crisis environment, we do not recommend serious consideration of P3 models which entail transferring the bulk of a project's demand or revenue risk to the private partner such as the BOOT model. Such projects are unlikely to secure private financing in the current environment.
- Projects shortlisted as potential P3s should be subject to a Value for Money (VfM) analysis in order to determine if the P3 delivery option is in the public interest. A VfM analysis would compare the preferred P3 option to the traditional project delivery method (initially based on a shadow-bid methodology) in order to determine if the P3 option can deliver savings for The City.
- A P3 project with potentially positive VFM results should be subject to a professional market sounding in order to gauge the interest of potential bidders.
- We recommend that The City consider relying on the P3 procurement process used by Province of Alberta, since this model is already widely accepted in the P3 marketplace.



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# 1. Introduction

AECOM was commissioned by the City of Calgary to prepare an Alternative Financing Workshop for the Southeast Transitway. In anticipation of this workshop, a number of relevant internal and external stakeholders were identified to be interviewed. Questions were prepared based on a literature review of alternative financing models and funding options. The questions also drew from the documents and publications produced by the City of Calgary on funding and financing transportation infrastructure projects. The literature review covered the City of Calgary reports *Investing in Mobility*, *RouteAhead*, and The City's Public-Private Partnerships Council Policy Framework and Council's 2012-2014 Fiscal Plan. The findings from the literature review, interviews, and workshop feedback have been analyzed for use by the City of Calgary, and are documented in this report.

The workshop was held on December 9, 2013. Funding and financing/project delivery options were addressed with a view to what is feasible within Canada, Alberta and the City of Calgary. The workshop and associated technical documents are not intended to provide a detailed screening of the suitability of any one project delivery or financing method for the Southeast Transitway project. It is intended to set the stage for a series of next steps to explore the most attractive avenues for both funding and project delivery/financing options. The results from this study will also be applicable to a wider range of other infrastructure projects for The City.

## 1.1 Background Information

As part of The City's "Investing in Mobility" report, a number of transit corridors have been identified for development and implementation over the next 10 years. These projects were selected and prioritized based on key directional and policy documents including the Calgary Transportation Plan, *RouteAhead*, and Council's 2012-2014 Fiscal Plan for The City. Due to the \$2 billion funding shortfall expected over the next 10 years, higher priority projects will be targeted for funding, while others are likely to be delayed due to budget constraints.

One of the most prominent corridors identified in the study is the Southeast Transitway, which was given a "High" priority rating. The estimated cost of the project is \$642 million. On November 27, 2013, City Council voted to allocate \$52 million of unused provincial education property tax room for 2015 to 2024 to create a dedicated transit fund (the "Green Line Fund") to build the Green Line transitway in both North Central and Southeast Calgary.

The Southeast Transitway is expected to be a multi-stage project that will be built over several decades, providing rapid transit access from downtown to the communities of Inglewood, South Hill, Quarry Park, and Douglas Glen. In addition to this initial cost estimate, future expansion to the Seton Major Activity Centre has been included in the Calgary Transportation Plan, providing access to Prestwick, McKenzie Towne, Auburn Bay, and the new South Calgary Hospital.

Figure 1.1 shows the Southeast Transitway project map. Transit oriented development is also expected at key stations along the corridor. The construction of this transitway will significantly improve transit service in southeast Calgary, responding to the increasing demand of current residents and future development.

Given the high priority status of this transitway, we propose to explore alternative funding and financing options for the unfunded portion of this project. As many other jurisdictions across North America have already relied on alternative financing and funding methods for infrastructure projects, it is in the interest of The City to explore similar options for this transitway and other transportation infrastructure projects. The objective of the workshop was to provide the basis for a preliminary, but informed, discussion of alternative funding options and project delivery/financing options which may be applicable to the Southeast Transitway and other transportation infrastructure projects.

A key feature of the Southeast Transitway is the option to develop the corridor in stages, with Bus Rapid Transit (BRT) as the initial stage, which would ultimately be converted to Light Rail Transit (LRT). It is expected that the LRT would be implemented approximately 10-15 years after the BRT. This approach presents a new set of challenges in both funding and financing. The City may aspire to accelerate the phasing or implement the program directly from the LRT stage without the intermediate BRT similar to other jurisdictions within Alberta.

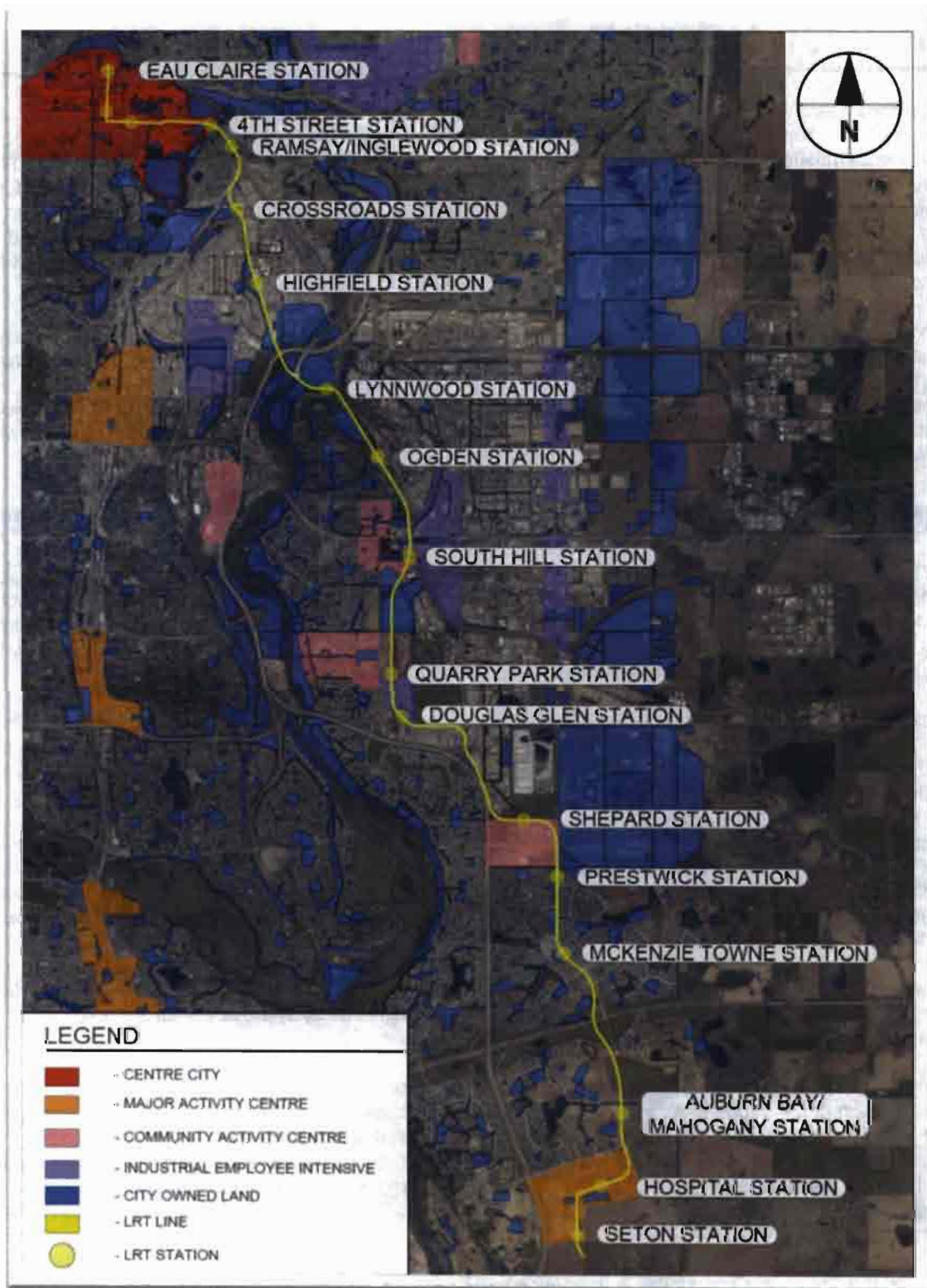


Figure 1.1: Southeast Transitway Project Map



## 1.2 Terminology and Organization of this Report

With the Southeast Transitway as the main topic of conversation during the interviews and the workshop, this study reviews the various funding and financing tools available to the City of Calgary, with emphasis on their applicability in the Calgary setting. By “funding” we refer to potential sources of funding for the transitway and other transportation infrastructure projects. By “financing” we refer to potential ways of borrowing funds.

Section 2 of this report provides a framework for discussing the typical funding and financing options available for public infrastructure projects in the Canadian and wider North American context. It also clarifies the distinctions between public and private forms of financing and funding. Section 3 explores alternative financing and project delivery options. We explore alternative financing alongside project delivery models, because in practice, large-scale private financing of transit infrastructure has only been achieved through project delivery options known as public private partnerships (P3s). P3s represent an alternative way of delivering on projects based on increased participation of the private sector and greater risk transfer to a private sector partner. Section 3 includes an overview of costs and benefits of alternative project delivery models as compared to traditional delivery models. It examines the conditions under which P3s can be an attractive model for major infrastructure projects and describes a screening process for identifying projects which are potentially suited for delivery as P3s. It also describes the Value for Money (VfM) analysis which is required in order to confirm that the delivery of a project through a specific P3 model can generate value for the public sector (i.e. for taxpayers and infrastructure users). The last part of section 3 examines case studies of transit infrastructure projects delivered as P3s both in Canada and elsewhere in the world.

Section 4 of this report examines the funding options and specific revenue tools which can potentially be used to fund the transitway and other transportation infrastructure projects for the City of Calgary. This section introduces a number of funding tools that are used by transit authorities around the world. The same revenue can be generated in a myriad of ways to pay for transit and other infrastructure. The section therefore provides a full appreciation of both the negative and positive impacts of each revenue tool. Section 4 also examines which revenue tools are best employed in which context, distinguishing between program-wide funding requirements, corridor infrastructure funding requirements and station-specific requirements.



Figure 1.2: December 9, 2013 Workshop



## 2. Funding and Financing Options: A Framework for Analysis

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This section is intended to clarify the difference between funding and financing options as a framework for the discussion in the subsequent sections. Funding options for any infrastructure project refer to the sources of funds needed to pay for the development and operation of the new facilities. Funding sources can be either public – such as general tax revenues collected by any level of government – or private as in the case of user charge paid directly by users, such as public transit fares or tolls for the use of a particular road or bridge.

Financing options involve borrowing funds in order to meet any payment obligations for the development of an infrastructure project. But any financing must eventually be repaid and hence, financing is not a substitute for funding. However, financing an infrastructure project can be justified if the timing of spending obligations for a project does not match availability of funds from the designated sources. In fact, economists have often argued that long-term borrowing is justified for public infrastructure projects whose benefits accrue to future city residents, because it enhances both efficiency (i.e. allowing the project to proceed earlier and for the net benefits from the project to accrue to users earlier than if funded through reserves) and fairness (i.e. future beneficiaries of the infrastructure services are responsible for repayment of the debt via property taxes or user fees).<sup>1</sup>

Financing options can be either public or private. Public financing is typically secured by governments issuing general bonds or revenue bonds. General bonds are repaid through tax revenues. Revenue bonds are repayable from specific revenue streams, as in the case of Tax Increment Financing bonds. Public financing can also be secured through bonds issued by senior-level agencies, such as the Alberta Municipal Finance Corporation. Private financing means borrowing through the private sector, which can include a range of instruments from bank debt, syndicated private loans or bonds issued by private entities. In the case of public infrastructure projects, private financing of any significant magnitude is typically available only through procurement vehicles known as Public Private Partnerships (P3s) or Alternative Financing and Procurement (APFs).

Figure 2.1 below shows some examples of how public infrastructure is funded and financed. Hence, public roads which are free at the point of use are publicly funded (i.e. through general tax revenues) and usually publicly financed (i.e. through general government borrowing). Privately-owned road infrastructure, such as the 407 Express Toll Route (ETR), is privately funded (i.e. tolls) and was privately financed (i.e. financing was secured by a private entity). In the case of the A25 and the A30 road projects in Montreal, these are funded partly through tolls and the financing was provided by the private concessionaires. Most of the “second wave” of Canadian P3 projects – defined as the P3 projects beginning with the Sierra Yoyo Desan Resource Road Upgrade in 2004 – were based on public funding and private financing.

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<sup>1</sup> Harry Kitchen *A State of Disrepair: How to Fix the Financing of Municipal Infrastructure in Canada*, C.D. Howe Institute Commentary No. 241, December 2006.

|                 | Public Financing                                                                | Private Financing                                                                          |
|-----------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Public Funding  | Public roads and highways<br>“free” at point of use                             | Most “second-wave”<br>Canadian P3 projects (e.g.<br>Calgary and Edmonton Ring<br>Road P3s) |
| Private Funding | Public transit fares<br>Publicly-Owned<br>Toll Roads<br>Highway Trust Fund (US) | A25, A30 (Montreal)<br>407 ETR (Toronto); Freight<br>Rail Infrastructure                   |

Figure 2.1: Public/Private Funding and Financing Examples

Figure 2.2 shows how selected topics align with the categories of public and private funding and financing just discussed. For example, traditional funding and procurement methods for public infrastructure in Canada have been based on both public funding and financing. Projects with alternative financing, such as P3s based on availability payments, have in most recent years been based on private financing and public funding (although there has also been a role for private funding sources from toll payments). Privately owned infrastructure, such as the 407 ETR or Class 1 railroads, rely on private funding and private financing.<sup>2</sup>

|                 | Public Financing                                          | Private Financing                                                                             |
|-----------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Public Funding  | Traditional funding &<br>procurement methods              | Alternative Financing:<br>Availability-payment P3s                                            |
| Private Funding | User-pay tolls (e.g. farebox<br>revenue, fuel taxes, etc) | Privately owned<br>infrastructure (incl. revenue-<br>risk P3s and user-pay<br>infrastructure) |

Figure 2.2: Public/Private Funding and Financing Workshop Discussion Topics

<sup>2</sup> There are some exceptions to these general rules of thumb. For example, the 407 ETR benefitted from public sector finance guarantees.

### 3. Alternative Financing and Delivery Options

This section provides a discussion of alternative financing and project delivery options. As noted in section 2, private financing for public infrastructure projects is usually available only through project delivery options previously described as P3s. Hence, this section combines a discussion of alternative financing with alternative delivery options for public infrastructure.

Project delivery options range from traditional options such as Design-Bid-Build, based on public ownership and control of the project, through to the Build-Own-Operate model based on full private ownership and control of the infrastructure project. **Figure 3.1** shows the full project delivery model spectrum. In the recent Canadian context, most alternative procurement methods for public infrastructure have been P3s, which have ranged from Build-Finance delivery for selected healthcare projects in Ontario through to the Design-Build-Finance-Operate & Maintain model, which has been used in several provinces. In the latter model, the public sector retains ownership but cedes some degree of control after the agreement is concluded.



\*Source: PPP Canada Business Case Development Guide, p.12

**Figure 3.1: Project Delivery Model Spectrum**

For conventional (i.e. Design-Bid-Build) projects, each phase tends to be procured separately through a succession of contracts. The contracts are input-based, which means that the owner specifies the exact inputs required, for example, the materials to be used or methods of construction. Contractors are paid monthly during construction usually based on the amount of work completed. Projects are publicly financed and the public sector retains project stewardship. This is the approach followed for most infrastructure projects at the City of Calgary, with exceptions such as the West LRT project.

Alternative private financing for public infrastructure is invariably tied to new procurement methods (i.e. P3s). P3 projects usually integrate two or more project phases, such as the design, construction, operation and maintenance phases. P3 contracts are also output-based, where the public sector owner specifies the performance outcomes and allows the private sector to put forward the most efficient methods of achieving those outcomes. There are several P3 models which have been used for public infrastructure across Canada. These models all require a competitive procurement process in order to secure the expected benefits. The P3 models can be described as follows:<sup>3</sup>

<sup>3</sup> The first two models – DB and DBF – are not always considered to be P3 models, even though they are more innovative forms of project delivery than Design-Bid-Build. For example, PPP Canada requires that a P3 model include an operations and/or maintenance phase as part of a long-term contract.



### Design-Build (DB)

- Design and construction phases are bundled into one contract
- Contracts contain performance specifications set by the public sector owner
- Contracts are often fixed-price, which transfers some (but not all) of the cost overrun risks during the design and build phase to the private sector; risk of cost overruns during the operations phase is not transferred to the private sector
- This model precludes optimization of whole life-cycle costs
- Calgary's West LRT project which opened for transit service in December 2012 was undertaken as a Design-Build project. The West LRT project was the largest infrastructure project undertaken by The City at the time and included 8.2 kilometres of track, 6 new LRT stations, major roadway upgrades and a new interchange. Total project cost was approximately \$1.4 billion
- The 96th Avenue N.E. Road Extension and the Airport Trail/Deerfoot Trail Interchange Upgrade was also delivered as a Design-Build

### Design-Build-finance (DBF)

- Similar to DB, except that the private sector also finances some or all of the capital cost during the design/construction phase
  - Ensures more effective risk transfer, because the private sector has capital at risk to guarantee schedule and budget certainty
- Public sector owner is able to defer financing until the end of construction
- As in the DB model, the private sector contractor does not bear the risk of minimizing life-cycle costs

### Design-Build-Finance-Maintain (DBFM)

- Private partner awarded long-term contract to design and build the facility, provide some financing, and maintain the facility for a 20-30 year period, after which the facility reverts to the public sector
- Compared to the DBF model, this provides whole life-cycle optimization of cost
- Public sector pays the private partner based on performance (e.g. percent of time facility is open and available for service), with payments beginning after facility is commissioned
- Infrastructure remains in public ownership
- Risks associated with optimization and certainty of whole lifecycle costs transferred to private concessionaire, at least as far as maintenance is concerned (but not operations)

### Design-Build-Finance-Operate-Maintain (DBFOM)

- Contains all elements of a DBFM model but also includes private sector operation of the facility for the duration of the contract
- The full risks associated with optimization and certainty of whole lifecycle costs can be transferred to private concessionaire, including operations and maintenance

### Build-Own-Operate-Transfer (BOOT)

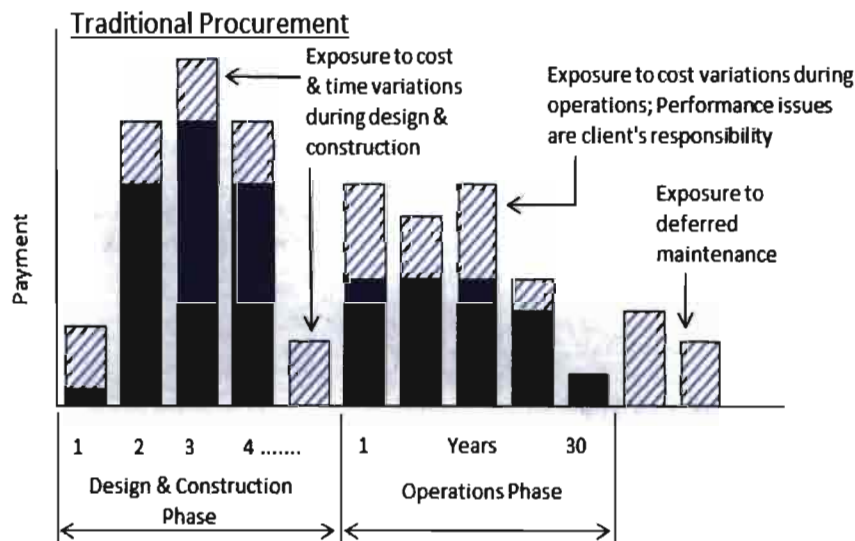
- Same as DBFOM, but infrastructure is owned by the private partner
- As a result, the private partner is also responsible for the financing and the full revenue risk
- Private financing has been very difficult to secure in the post global financial crisis environment, given the strong market aversion to full revenue risk deals



The value proposition for P3s can be summarized by several points from the workshop presentation on "Structuring Public-Private Partnerships" by Mike Marasco:

- Private financial capital at risk to guarantee on-time and on-budget delivery
- Optimization and certainty of "whole of life" costs
- Ownership of the asset is retained by the Sponsor
- Facility condition guaranteed for the full 25-50 years of operations
- Emphasis on a clear and well-defined risk allocation
- A fully integrated solution that drives design development, construction, equipment and operations

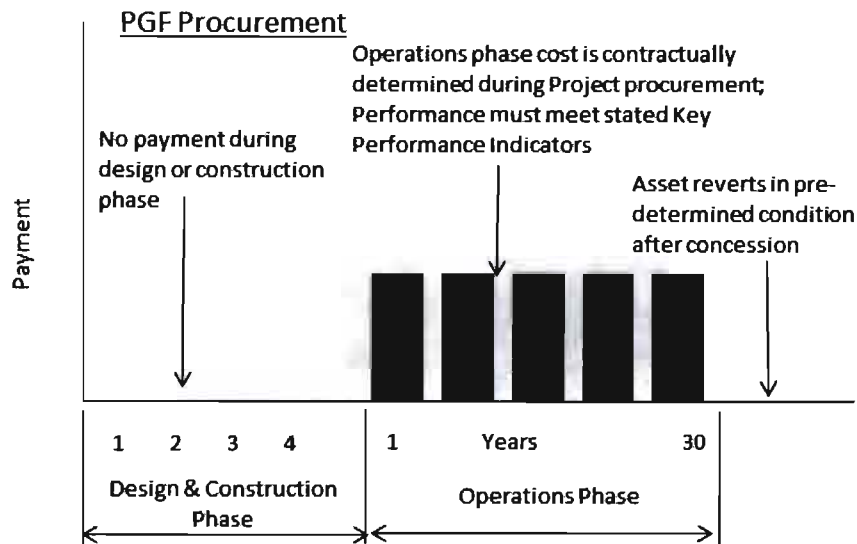
One of the most important features of public private partnerships is securing greater certainty at inception regarding project costs throughout the lifecycle. In the case of a traditional procurement for a facility, **Figure 3.2** below shows a project with the owner's capital and operating expenses during the construction and operations phases, including their exposure to cost overruns and schedule changes.



\*Source: Marasco "Structuring Public-Private Partnerships: Southeast Transitway Workshop, City of Calgary, slide 5

**Figure 3.2: Owner Payments and Risk Exposure for a Traditional Procurement (Common Facility)**

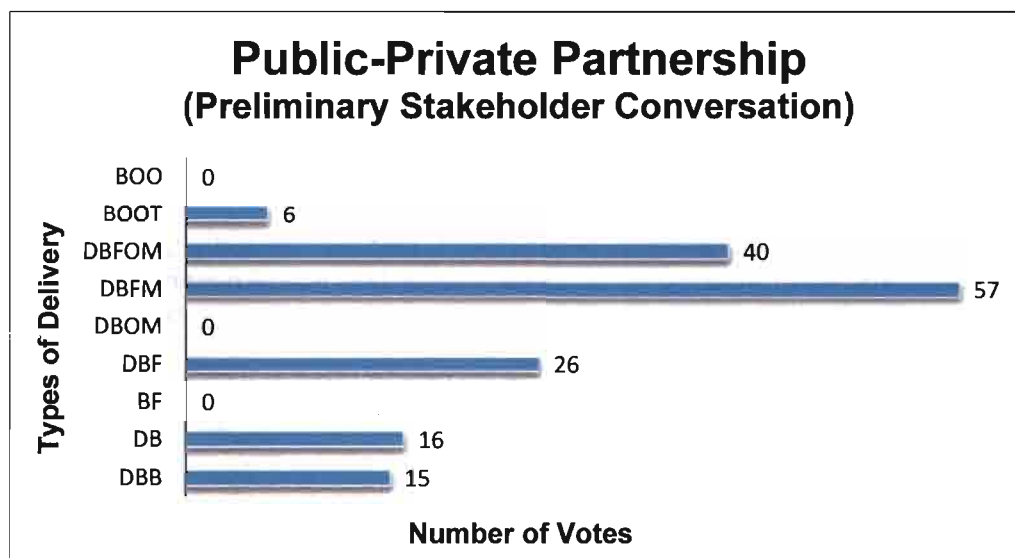
**Figure 3.3** shows the payment profile for a facility under a long-term P3 project. Payments begin after the end of the design and construction phase and are predictable because they are set in the original P3 contract and because the owner's risk exposure to cost and schedule variations is minimized under the P3 contract.



\*Source: Marasco "Structuring Public-Private Partnerships: Southeast Transitway Workshop, City of Calgary, slide 6.

**Figure 3.3: Owner Payments and Risk Exposure for P3 Procurement (Common Facility)**

During the workshop, participants were given a pre-set number of choices to allocate between the various project delivery options listed above in terms of what they felt would be the most feasible and applicable to Calgary and the Southeast Transitway in particular. The results are shown in **Figure 3.4**, with the preferred models being the DBFM model followed by the DBFOM and the DBF models. The remaining votes were distributed between the traditional DB and DBB models.



**Figure 3.4: Results of Preferred Project Delivery Models from Workshop**

### 3.1 Potential Benefits & Costs of Alternative Project Delivery Options

The long term nature of a P3 contract provides a number of benefits relative the traditional delivery method, particularly in terms of cost and time savings. The ability to allocate risk between the public and private parties, based on the party best able to manage the risks, allows for greater optimization of resources. However, there is a price premium associated with transferring the risk, among other costs resulting from financing through a private concessionaire rather than as a public owner (e.g. the municipality). The various benefits and costs are discussed below and outlined in Figure 3.5.

| BENEFITS                                                                                                                                                                         | COSTS                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Cost savings<br/>(or quality enhancements)</li> <li>• Time savings</li> <li>• Schedule certainty</li> <li>• Budget certainty</li> </ul> | <ul style="list-style-type: none"> <li>• Transaction costs</li> <li>• Financing costs</li> <li>• Risk premium</li> <li>• Change Constraints</li> </ul> |

Figure 3.5: Potential Benefits and Costs of Alternative Financing / Delivery

#### Benefits

The main advantages to employing P3 procurements for major projects have to do with cost and schedule. As the contract includes operations and maintenance, the private partner has the flexibility to make design decisions and introduce innovations to optimize the overall lifecycle cost. In fact, the more elements from the post-construction phase that can be included in the P3 contract, the greater the potential savings for the public partner.

Because the private partner in a P3 contract has a financial stake in the outcomes from the project years after construction, P3 contracts have many benefits relative to a traditional project delivery system. The benefits to employing a P3 contract as opposed to the conventional procurement can be measured across all facets of the project delivery based on cost savings, time savings, schedule certainty, budget certainty, and a reduction in lifecycle maintenance costs.

Large public infrastructure projects have historically been subject to cost overruns and schedule delays.<sup>4</sup> Calgary has been no exception in this regard, including the recent 96<sup>th</sup> Avenue N.E. Road Extension and the West LRT projects. In a traditional design-build model, these additional costs are borne by the municipal owner in the form of change orders. In a well-structured P3 project, exposure to these additional costs (as in Figures 3.2 and 3.3 above) can be significantly reduced. The cost savings resulting from the transfer of risk and optimization of lifecycle operations can be compared to the additional costs of a P3 delivery using a VfM analysis.

A major factor to consider when tendering a large scale infrastructure project is budget certainty. In the majority of large infrastructure projects, actual budgets turn out to be greater, often times significantly greater, than the initial budget. An Australian study found that the average cost increase for a project after award was 18 percent amongst standard delivery contracts. In the same study, P3 projects averaged a 4.3 percent increase in project budget after award. P3 projects tend to provide a significantly greater degree of budget stability over the lifetime of the contract due to the higher level of due diligence and risk assessment performed in the early stages of planning and

<sup>4</sup> Flyvberg, Bent et. Al. "Underestimating Costs in Public Infrastructure Projects: Error or Lie? *Journal of the American Planning Association* 68, 3 (Summer 2002): 279-93.

procurement.<sup>5</sup> A properly structured P3 project will likely be subject to less budget and schedule uncertainty than a conventional delivery project. This is also due to the fact that P3 contracts transfer the bulk of cost and schedule risks and they tend to have a prescribed process for handling contract variations.

A significant benefit of P3 contracts over conventional project delivery is the commitment of the private partner to the long term maintenance and performance standards. The use of a payment structure based on performance over a number of years provides motivation to the contractor, from as early as the design stage, to minimize maintenance and operating costs over a predetermined project lifecycle. By motivating the contractor to design around specific long term functional requirements and providing payment over a number of years of use post-commissioning, the final design will tend to minimize total lifecycle costs. The use of long term P3 contracts ensures that the public sector does not incur unexpected maintenance expenditures after final payment has been made to the contractor. Additionally, P3 contracts will often contain a "return conditions" clause for the asset which stipulates the condition the asset must be in at the end of the contract when it reverts back to public control.

Due to the complexity and level of detail required when designing a long term, output-based contract, P3 contracts require significantly greater up front planning and resources during the procurement process. However, once awarded, P3 contracts tend to proceed more quickly because the private partner has much greater project stewardship relative to conventional project delivery. With the knowledge that payments are strictly output-based, the contractor has a financial stake in achieving all the owner's goals and milestones set in the contract, including deadlines for project operation. The combination of private financing and availability payments that begin only after commissioning provide the contractor with powerful incentives for timely completion of both the design and construction phases of the contract.

### Costs

The costs of undertaking a P3 delivery model relative to conventional project delivery can be greater or less than the long term benefits, depending on the P3 model selected and how the transaction is structured. This means that not all projects are suitable for delivery through a P3 model. In principle, a P3 project delivery should only be undertaken if the benefits outweigh the costs on an appropriate present value basis. The typical approach for undertaking this analysis is a VfM study.

Transaction costs for a P3 contract are significantly greater than under conventional project delivery and include such services as legal, technical, financial, and project management services. These higher costs are due primarily to the higher level of due diligence invested into risk identification, management and allocation, as well as the higher private sector financing costs. With a P3, transaction costs are split between the public sector owner and the private sector partner. In a sample of 28 Infrastructure Ontario projects, these additional transaction costs accounted for approximately 1.8% of the total P3 budget.<sup>6</sup>

P3 financing costs are greater than public sector financing costs due largely to the variance between public sector bond financing rates and the equivalent yields for bonds issued by private sector entities, including entities with investment-grade credit quality. Where public sector financing costs are determined by the cost of issuing debt by a municipality, or other public sector owners, private financing costs are dependent on the cost of equity and debt issued for the project and the debt-equity structure of the project.

With the allocation of additional risks to the private partner comes a price premium in the contract. The less predictable the risk, the greater the premium likely charged by the private sector. (The premium also depends on the degree of competition between alternative P3 partners at the procurement stage.) An example of this in the transit industry is passenger demand risk. As the forecast of incremental ridership can vary widely for a new service, this is

<sup>5</sup> Colin Duffield. *National PPP Forum – Benchmarking Study, Phase II: Report of the Performance of PPP Projects in Australia When Compared with a Representative Sample of Traditionally Procured Infrastructure Projects*. Melbourne Engineering Research Institute, December 2008.

<sup>6</sup> Mario Iacobacci *Dispelling the Myths: A Pan-Canadian Assessment of Public-Private Partnerships for Infrastructure Investments*, The Conference Board of Canada, January 2010, pp. 28-29.



considered an important risk, and should it be transferred to the private partner, this may result in a considerable premium.<sup>7</sup> The Canada Line P3 in Vancouver – arguably the first transit P3 in Canada did transfer a small amount of demand risk to the private partner. However, in more recent transit P3s in Canada, demand risks are borne entirely by the public sector.

Finally, given the long-term nature of P3 projects, it is often difficult and costly to make changes to project scope once the contract is in place. Unforeseen changes in project scope which arise for example due to unexpected interfaces with future projects or even due to changes in policy and public preferences can lead to higher transaction costs under P3s relative to conventional delivery. This is particularly the case for major changes in scope, which can be more costly to introduce once the P3 agreement is signed with the private partner.<sup>8</sup> (Minor changes are easily accommodated through formal change order provisions and in the case of changes in services, these changes can allow for market testing against prevailing rates for the same services). Therefore, it is important to invest appropriate resources prior to procurement in order to achieve a well-defined a scope (i.e. anticipating future needs as much as possible). However, unanticipated transaction costs can also be contained by minimizing the cost associated with exercising the voluntary termination provisions in P3 agreements and by excluding from the agreement any part of the asset or service which may be subject to relatively high uncertainty regarding future requirements.

When determining a project delivery method, the public sector client must take a number of factors into consideration. If the client does not have the resources required to undertake a project through the conventional design bid build, or construction management delivery method, a P3 partnership could alleviate some of the upfront challenges. If there is a high likelihood of major, unanticipated changes to the project requirements, such as changes to the functional requirements for the infrastructure or changes in public policy, this could lead to a costly renegotiation of the project agreement.

## 3.2 Risk Allocation

The transfer of risks to the private partner in a P3 project is one of the major benefits of employing an alternative delivery method, but not all risks can be cost-effectively transferred to the private partner. **Table 3.1** below shows a list of common project risks and whether they are typically transferred to the private partner, retained by the public sector sponsor or shared between both parties. It makes sense to transfer a risk to the private partner if the latter has some control over the relevant outcomes. This can lead to a mitigation of the overall risk for the P3 project and in a competitive procurement process the value of any risk mitigation is likely to be at least partly passed onto the public sector sponsor through a lower bid price. This type of optimal risk transfer applies to most construction risks (budget and scheduling), commissioning risks and operations and maintenance risks. It can also apply to some site condition and environmental risks and certain permitting risks, provided that the private partner is in a position to assess the risks beforehand and to manage the risks effectively during the contract term.

However, in some cases, the private partner has little influence or control over the relevant risk outcomes. For example, it may seem convenient to allocate the risk associated with land acquisition for the project to the private partner, but it is actually in the interest of the public sector to retain this risk. This is because the private partner typically has little or no control over land acquisition prices. Moreover, the land acquisition risk can undermine the

<sup>7</sup> It may also result in the inability of the private partner to secure sufficient long-term debt financing for the project, thereby leading to a failed procurement.

<sup>8</sup> One example of large unexpected changes in project scope can be found with the three London Underground P3s concluded in 2002 (Tube Lines) and 2003 (2 Metronet concessions). These 30-year concession agreements covering the maintenance, renewal and upgrade of the London subway network did not incorporate any requirements associated with the construction of the Crossrail project – an east-west underground rail corridor across London – less than a decade later (e.g. cross-passages, service interruptions due to construction, etc). As it turned out, the local government did not face the problem of additional transaction costs for incorporating changes to the P3 agreements, because all three London Underground concessions were terminated before the start of the Crossrail project. However, the local government did bear unforeseen transaction costs in the form of the costs of terminating the agreements prior to the end of their respective terms. See Mario Iacobacci *Steering a Tricky Course: Effective Public-Private Partnerships for the Provision of Transportation and Infrastructure Services*, the Conference Board of Canada, September 2008, pp. 32-34 for a further discussion of this issue.

risk profile of a P3 project and thereby reduce the credit rating of the private concession and increase the cost of capital for the private entity.

Another risk worthy of discussion is operations risk, particularly in the context of a transit P3 project which is part of a pre-existing transit network. One perspective would suggest that operations risk should be transferred to the private partner, because this would ensure that the partner takes into account the impact of all design and construction issues on the future operating costs of the P3 project. This was done in the Canada Line P3 and is also envisaged in the Edmonton Valley Line P3. However, it is not a risk that should necessarily be transferred to the private partner in all transit P3s. In some cases, the operations component of the project is integrated with the rest of the transit network operations and hence, the private partner may not have much control or influence on operational outcomes. Moreover, the transfer of any operations or maintenance staff to the new private entity may create significant labour management challenges. These may be some of the reasons why several other transit P3s have excluded operations (and maintenance) risks from the P3 project, as in the case of the Evergreen Line and the Toronto Air Rail Link to Pearson International Airport.

Another risk that is typically retained by the public sector in transit P3s are the risks related to passenger demand and revenue, including fare-setting policies. The rationale for this risk allocation is partly due to the view that some policy issues should remain in the public domain. It is also related to the limited investor appetite for taking on this type of risk, particularly in the post global financial crisis era. As a result, P3 models which include substantial risk transfer to the private owner, such as the BOOT model or even outright privatization, are not considered feasible in the current environment. There have been no such P3 models in Canada since 2008, because these projects are unable to secure long-term financing at reasonable rates.

**Table 3.1: Typical Allocation of Project Risks in P3 Models**

| PUBLIC SECTOR                                                                                                                                               | PRIVATE PARTNER                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Land acquisition</li> <li>• Environmental assessment risks</li> <li>• Revenue and passenger demand risk</li> </ul> | <ul style="list-style-type: none"> <li>• Construction risks (budget and schedule risks)</li> <li>• Completion and commissioning risks</li> <li>• Operations and maintenance risks</li> <li>• Equipment risks</li> <li>• Financial risks</li> <li>• Lifecycle and residual risks</li> </ul> |
| <div data-bbox="175 1371 383 1430">Shared</div>                                                                                                             | <ul style="list-style-type: none"> <li>• Site conditions and environmental risks</li> <li>• Permitting and approvals risks</li> </ul>                                                                                                                                                      |

### 3.3 Screening Process ("When is a P3 Model Suitable?")

An alternative delivery method is not appropriate for all projects. There are several tools available to provide some guidance as to whether a P3 model is a good fit for the project being considered. A preliminary approach is to screen potential projects for whether they are suitable to be delivered as a P3. The list of screening criteria in **Figure 3.6** below is prescribed by PPP Canada in the *P3 Business Case Development Guide*. By screening potential projects against this list of criteria, we can rule out projects which are clearly not suitable for P3 delivery (e.g. small projects under \$50 million which cannot be bundled; or projects which are integrated with a wider network, as can be the case with a BRT service). The screening process can thereby guide the City toward a shortlist of projects which can be seriously considered for P3 delivery. In essence, this means identifying those projects where cost and/or schedule risks which can be cost-effectively transferred to a private partner. A VfM study is then used to provide a quantitative confirmation that the savings from delivery a project as a specific P3 model outweigh the costs when compared to a traditional delivery method.



Project size is one of the main criteria for a P3 screening process. However, it is not simply a matter of a minimum contract size. Private partners may be more receptive to pursuing a smaller project if they feel the public sponsor has a clear and expedited procurement process with a high degree of certainty around the timing of procurement milestones. Public sector sponsors who rely on a procurement process which is well understood and accepted in the marketplace of contractors and P3 investors – as is the case for Province of Alberta's P3 model – will have greater success in attracting qualified bidders. Public sponsors who lack experience with executing P3 procurements are often advised to adopt a procurement template (i.e. competitive procurement process and draft agreements) that has already been tried and tested by other public agencies and is thereby well known in the marketplace. For example, the Alberta Infrastructure P3 model has already been used successfully in many provincial P3 projects – ranging from the Edmonton and Calgary ring road projects to the bundled schools projects – and is widely understood and accepted in the marketplace. Adoption of any procurement model should be preceded by a professional market sounding process in order to gauge private sector interest and thereby avoid an aborted procurement.

| Screening criterion        | Relevant consideration(s)                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------|
| Project size               | Is the project's size sufficient to support the P3 costs?                                                              |
| Contract bundling          | Is there potential to bundle a number of contracts into a single long term contract?                                   |
| Nature of the project      | Is the project a new build or a refurbishment?                                                                         |
| Project integration        | Is the project separated or integrated with existing assets or networks?                                               |
| Consistency                | Will the performance requirements and use of the project be relatively stable over time?                               |
| Performance Measurement    | Can service performance be easily described and measured?                                                              |
| Asset life                 | Does the asset have an expected useful life greater than 20 years?                                                     |
| Maintenance requirements   | Does the project have significant maintenance requirements?                                                            |
| Refurbishment requirements | Is the refurbishment cycle for the project relatively predictable and stable?                                          |
| Limiting Factors           | Are there stakeholders and/or other factors that influence transferability of the project's maintenance and operations |
| Innovation                 | Is there scope for innovation in design construction or operations?                                                    |
| Revenue                    | Is there scope for the private partner to generate additional ancillary revenues?                                      |

\*Source: PPP Canada Business Case Development Guide, p.12

Figure 3.6: P3 Screening Criteria

### 3.4 Value for Money

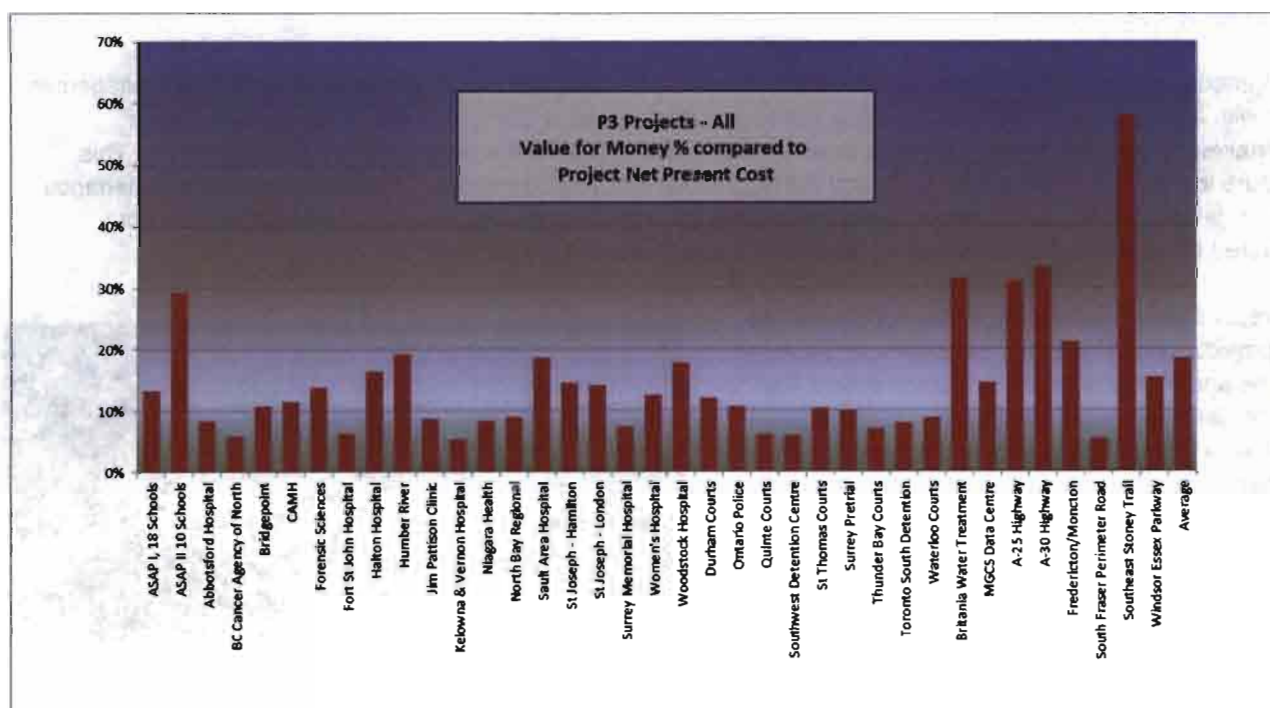
A Value for Money (VfM) analysis is used by most Canadian jurisdictions to determine whether a P3 model is in the public interest. The VfM test determines whether there are any cost savings on a net present value basis when comparing one or more P3 models against the traditional Design-Bid Build delivery model, which is often called the Public Sector Comparator (PSC). This is done through a risk-adjusted view of capital and operating and maintenance costs expected to be incurred over the whole lifecycle of the new facility. The test is often used to determine which projects should be pursued as P3s, as well as how a project should be structured (e.g. whether the concession should include the transit vehicles; or operations).

VfM tests are considered an industry standard across Canada and other jurisdictions where P3s are used for the delivery of public infrastructure, as in Europe and Australia. Figure 3.7 below shows a chart of the VfM results for over thirty recent P3 projects across Canada. The chart shows that VfM savings vary between 5% and 20% of total project costs.

VfM analyses are typically performed on an iterative basis. The first test occurs prior to the issuance of the request for proposal (RFP), at which time the estimated savings from a P3 model are based on a so-called "shadow bid". This first test is used to confirm the procurement decision before engaging the market in a competitive bid process.

The results of the VfM analysis are updated throughout the procurement process. After the financial close of the project, the VfM is revisited one last time and the shadow bid estimate is replaced with the actual price of the winning bid.

Some industry participants think that VfM studies underestimate the true benefits of undertaking a project delivery as a P3. This is because the VfM methodology does not value the benefits of greater certainty regarding project budget and schedule. Nor does it fully value the benefits of a more rigorous upfront planning process that optimizes whole lifecycle costs. Depending on the specific VfM methodology used – these tend to vary across provincial infrastructure agencies – this concern may well be valid. However, this should not exempt any public sector sponsors from undertaking a VfM analysis of their proposed P3 project. P3s involve long-term contracts which bind future generations in terms of payments to the private partner and in terms of the infrastructure services provided in return. It is therefore essential to ensure that the project delivery option generates value for taxpayers and users. The VfM test is the tool of choice for this assessment. It represents the public interest test for adopting a P3 model and provides the transparency necessary for such a public sector decision which commits The City's taxpayers long into the future.



\*Source: Mike Marasco "Structuring Public Private Partnerships: Southeast Transitway Workshop for City of Calgary", slide 16.

Figure 3.7: Value for Money Savings

### 3.5 Case Studies

In analyzing the real-life application of alternative delivery models for transit and other asset classes and their effectiveness in Canada, several case studies were presented during the workshop and discussed. A summary of the projects are provided in the following sections, along with details on the size, structure, and outcomes of the contract.



## A Tale of Two Projects

According to Mike Marasco's presentation at the December workshop, "Structuring Public Private Partnerships", the Abbotsford Hospital and the Vancouver Convention Centre were two projects that were very similar in size and scope. They both had MCM as the architect and PCL as the construction lead; they both started in 2004 and were located in the same approximate region.

The Abbotsford Hospital was delivered as a DBFOM model, with performance-based specifications as is typical of P3 projects. There was strong political commitment throughout the lifespan of the project, and a good partnership between the public and private partners. The public sector had solid P3 knowledge and strong project management to help guide the project, and they were able to apply lessons learned.



The Vancouver Convention Centre was initiated with a P3 structure, but was changed to Construction Management (CM) with a robust governance model using the same principles as a DBFOM. It was a large scale project undertaken by the public sector, working together with external project managers within a CM framework. This structure focused on initial capital costs and did not include lifecycle operations. The operations and maintenance risks remained with the public sector, which meant the contractors and external project managers were not motivated to deliver performance-based results for those phases of the project.

The results were dramatically different between the two projects. The Abbotsford Hospital was delivered on time and on budget with no change orders – a first for Canadian public healthcare capital projects at the time. The private sector is still handling the maintenance of the facility, as dictated by the contract. In contrast, the Vancouver Convention Centre increased from the original \$565 million budget to over \$880 million, representing a budget overrun of 55%. The project delivery was also delayed by 6 months.



## The Canada Line

In September 2000, the Government of Canada, the Province of British Columbia, the Vancouver International Airport Authority (VIAA), TransLink and the Cities of Vancouver and Richmond began to evaluate options for rapid transit in the north/south corridor connecting downtown Vancouver, the suburb of Richmond and the Vancouver International Airport. This line would be 19.5 km. An automated light metro system was chosen, with 16 stations and three water crossings (two bridges and a tunnel); approximately half of the line is in a tunnel and half is elevated. Other project details are listed in Figure 3.8.



A DBFMO model was chosen because it was expected to:

- achieve the best transit solution for the corridor at the most competitive price;
- leverage government funding with private sector investment;
- optimize risk transfer away from the public sector; and while ensuring long-term public sector oversight and ownership.

The result was the first major transit P3 with private sector financing in Canada, delivered on time and on budget. The VfM report was reviewed by the Auditor General of British Columbia, and it found that the chosen method of procurement produced a savings of \$92 million, representing 5.3% of the PSC.

The public sector owner considered raising revenue from land value capture during the development of the project, but had little success in implementing this strategy. Anecdotal evidence suggests that after the Canada Line started operations, property values increased significantly along the Canada Line transit corridor. However, these increases may have been due as much to investments at Vancouver International Airport, which increased the value of proximity to the airport, as to the Canada Line investment.<sup>9</sup>

A copy of the VfM project report can be found at:

[http://www.partnershipsbcc.ca/files-4/documents/Canada-Line-Final-Project-Report\\_12April2006.pdf](http://www.partnershipsbcc.ca/files-4/documents/Canada-Line-Final-Project-Report_12April2006.pdf)

|                                                          |
|----------------------------------------------------------|
| • RFEI Issue: 30 Nov 2002                                |
| • Shortlist: 30 Apr 2003                                 |
| • Preferred proponent selection: 19 Nov 2004             |
| • Financial close: 29 Jul 2005                           |
| • Construction complete: 17 Aug 2009                     |
| • Contract expiry: 29 Jul 2040                           |
| Procurement time: 2 years 8 mo.                          |
| Preferred proponent to financial close: 8 mo and 11 days |
| Construction time: 4 yrs 20 days                         |

**Figure 3.8: Canada Line Project Info**

## Gold Coast LRT

The Gold Coast is Australia's largest non-capital city, with a population of 600,000 people. This number is expected to grow to 800,000 by 2030. Among this sizeable population, only 4% of trips are made by public transport. The Gold Coast Rapid Transit (GCRT) was introduced as a "city-changing" project to address the projected population growth and encourage transit ridership.

A feasibility study was conducted in 2004, with preference for light rail chosen in 2008. By 2009, funding from various government sources was committed and an Expression of Interest for an Operator Franchisee was released. This contract was awarded as a P3 with a total cost of \$1.0 billion. In addition to design and construction, the private partner was to provide the core services of operating the infrastructure.

Through this P3 structure, the public partner was able to set the performance criteria for the project. The private partner operating the LRT was committed to a high level of customer service and public engagement. The corridor was located within a high-density urban environment, and so the facilities had to keep the flow of people moving through the area, while accommodating for special events in the community. The concession period was 15 years, which was a shorter time frame than the typical P3 project.



<sup>9</sup> Jeffrey Cohen and Mike Brown "Impact of Vancouver Airport on Commercial Property Values", December 2013, presented at the American Economic Association 2014 annual meeting.

The risk factors were appropriately divided between the private and public partners. As the government had previously committed to completing the early works, this risk resided with the public partners. Beyond that, budget and scheduling for the remainder of the works were risks allocated to the private entity. This meant a 3 year program with minimal disruptions during construction. Once complete, the government paid an availability based payment, with abatement for low reliability or quality. Revenue from fares was retained by the public sector, and they also retained control over fare setting.

In this procurement model, the private partner was able to introduce innovation to optimize the design of the facilities, including the layout of the main terminal. A dedicated project team led the procurement process, with emphasis on the significance of this facility to the surrounding community. Both the public and private parties were able to meet the procurement deadlines, with 18 months between the EOI being released to the financial closing of the deal.



## 4. Funding Options and Revenue Tools

Based on the experience of other transit authorities in Canada and abroad, there are a myriad of funding options available to raise revenue. The primary objective of revenue tools is to raise funds for transportation infrastructure and to provide a stable and predictable source of funds for future projects. In principle, revenue can be raised in many different ways. However, there is much more than just revenue at stake when analyzing the choice of revenue tools. Some revenue tools tend to reduce the productivity and competitiveness of the affected city-regions – as in the case of most traditional tax-based revenue sources such as income taxes and payroll taxes. Other revenue tools can do the opposite, especially when based on user-charging principles. Some revenue tools have no impact on mobility while others can help mitigate road congestion and thereby generate travel time savings. Hence, from an overall economics and transportation perspective, the preferred revenue tools should be those that maximize the transportation benefits and minimize the inefficiency costs arising from taxation. In addition, there are other relevant considerations in the choice of revenue tools, notably public acceptance.

Figure 4.1 shows the sources of funding used by 3 major transit agencies and the associated municipal authorities. It should be noted that both parking sales taxes and fuel taxes are used by TransLink and AMT/Montreal. The shading of the box implies that 100% of that revenue source is dedicated to transit development.

Figure 4.2 shows the funding tools employed by major transit authorities and other transportation authorities around the world. The shading of the box implies that 100% of that revenue source is dedicated to transit development.

| Revenue Tool             | Metrolinx / Toronto | AMT / Montreal | TransLink / Vancouver |
|--------------------------|---------------------|----------------|-----------------------|
| Transit Fare Increases   | ✓                   | ✓              | ✓                     |
| Fuel Tax                 |                     | ✓              | ✓                     |
| Parking Sales Tax        |                     | ✓              | ✓                     |
| Property Tax             |                     | ✓              | ✓                     |
| Road Pricing / Tolls     |                     |                | ✓                     |
| Utility Levy             |                     |                | ✓                     |
| Vehicle Registration Tax |                     | ✓              |                       |

Figure 4.1: Revenue Tools Used by Major Canadian Transit Authorities



| Revenue Tool             | MTA / New York | Virginia DoT | Portland (TriMet) | California (CTC) | RATP / Paris | Transport for London |
|--------------------------|----------------|--------------|-------------------|------------------|--------------|----------------------|
| Transit Fares            | ✓              | ✓            | ✓                 | ✓                | ✓            | ✓                    |
| Corporate Income Tax     | ✓              |              |                   |                  |              |                      |
| Driver's License Tax     | ✓              |              |                   | ✓                |              |                      |
| Employer Payroll Tax     |                |              | ✓                 |                  | ✓            |                      |
| Fuel Tax                 | ✓              |              |                   |                  |              |                      |
| HOT Lanes                |                | ✓            |                   | ✓                |              |                      |
| Land Value Capture       |                | ✓            | ✓                 |                  | ✓            |                      |
| Road Pricing / Tolls     | ✓              | ✓            |                   | ✓                |              | ✓                    |
| Sales Tax                | ✓              |              |                   | ✓                |              |                      |
| Vehicle Registration Tax | ✓              |              |                   |                  |              |                      |

Figure 4.2: Revenue Tools Used Worldwide

#### 4.1 Revenue Tools

A large number of revenue tools have been considered for funding transit projects around the world. The following is a summary of some of these tools categorized as mobility user charges, traditional tax tools and land-based revenue tools. **Figure 4.3** shows the number of votes given by workshop participants as separated by these categories. This reflects the workshop participants' reception of the various tools as they apply to Calgary transit projects.

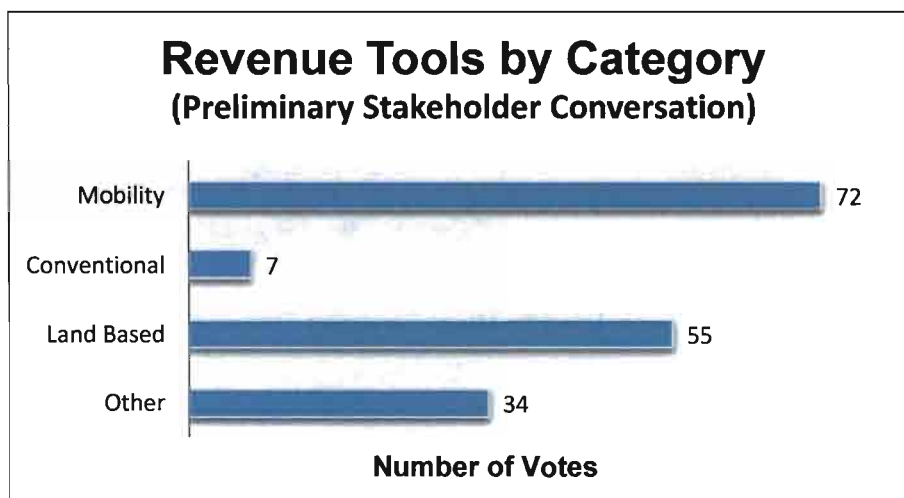


Figure 4.3: Revenue Tools by Category – Results from Workshop

### 4.1.1 Mobility User Charges

Mobility user tools refer to charges which mobility users incur when they make travel decisions. These charges tend to impact travel decisions, including the time of day and mode choice (e.g. car, bus, walk, etc.). In the long-term, these charges may also affect travellers' residential location decisions and employers' office locations. As a result, mobility charges have the potential to improve mobility and congestion outcomes as users incorporate the price signals in their short-term travel decisions and in their longer-term residence and job location decisions. **Figure 4.4** shows the number of votes given by participants to each mobility user charge tool during the workshop as an expression of which tools would be the most attractive and preferred funding options for the Southeast Transitway. A notable feature of the results is the preference for fuel taxes and high occupancy toll lanes.

#### (1) Car Rental Levy

An additional tax or fee charged daily for car rentals. Other such fees already exist on car rentals and an additional one could be implemented almost immediately after approval.

#### (2) Cordon Charging

Drivers are charged a toll when entering or exiting a well-defined zone or cordon area. This option would require significant new infrastructure for vehicle monitoring and processing transactions. The high cost of parking in the Calgary downtown core combined with the fact that most trips to the area are not through-trips suggests that downtown Calgary may already have in place a virtual cordon charge as a result of an explicit policy to limit the supply of commercial parking spaces in the area.

#### (3) High Occupancy Tolls

Commuters pay a toll for the use of a designated highway lane used jointly with high occupancy vehicles with the expectation of reduced commute times. This may require the planning and construction of new infrastructure to accommodate additional lanes and the monitoring and transaction processing associated with them. However, even without the construction of new lanes, this charging tool can provide significant congestion relief relative to HOV lanes for trips which users consider "high-value" trips.

#### (4) Highway Tolls

Highway tolls are paid either per kilometer travelled or for access to designated roads, bridges or sections of road that require the planning and building of infrastructure for vehicle monitoring and transaction processing on a large scale.

#### (5) Municipal / Provincial Gasoline Tax

A tax levied on the sale of transportation fuels. This tax can be a flat rate of a predetermined dollar value per litre, or taxed at a percentage of the total purchase price. It can be applied either within city boundaries or across the entire province in order to limit changes in travel patterns designed to avoid the tax. However, only the revenue collected within the city boundary would go to the designated transit or transportation project. Part of the economic logic of introducing a fuel tax is to ensure that road users bear the full cost of building and maintaining the road infrastructure, particularly the road infrastructure which is municipally owned and currently funded out of City property tax revenues. This could make available some of the existing municipal tax revenues for funding for transit and other infrastructure projects. A number of local and state jurisdictions in the US already collect fuel taxes (over and above the federal gasoline tax), the revenues for which are dedicated to specific transportation projects,

including transit projects. In addition, federal government's Gas Tax Fund distributes \$2 billion in revenue to provincial and territorial governments, which is in turn distributed to municipalities.<sup>10</sup>

#### (6) Transit Fare Increase

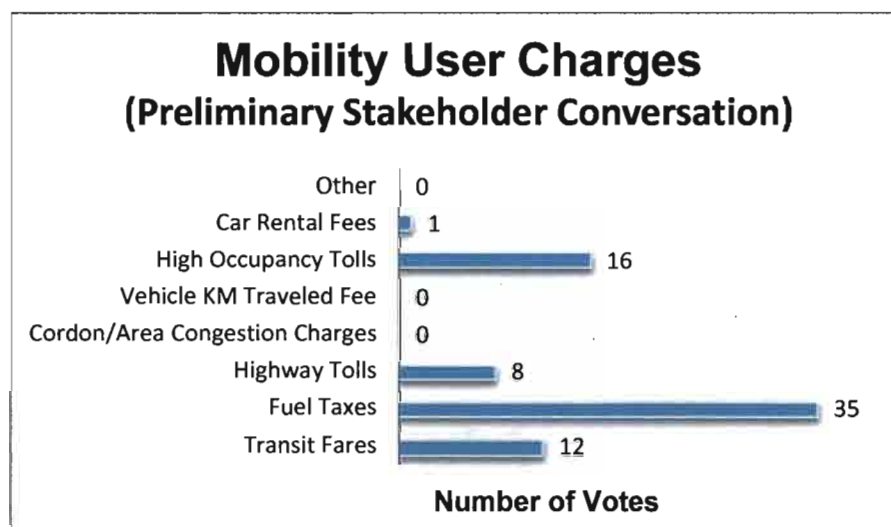
An increase in transit fares is the most direct form of user charge for public transit and is easy to implement, but it is likely to dampen the demand for transit services, which can be deemed counterproductive. Since Calgary Transit already recovers about 50% of its operating and maintenance costs through farebox revenues, any additional fare revenues would likely go toward funding the operating deficit for the Southeast Transitway and/or other parts of the transit network.

#### (7) Transit Fare Restructuring

Restructuring the transit fares through the introduction of distance-based fares and peak/off-peak fare differentials can increase the revenue generation potential of transit fares while limiting the adverse impact on transit demand. For example, higher peak fares are less likely to generate an adverse impact on transit demand, because users have much more limited congestion-free travel options during peak times. This type of value-based pricing can be implemented with relative ease using available smart-card technology.

#### (8) Vehicle Kilometres Travelled Charge (VKT)

With VKT charges, drivers pay a fee for every kilometre that they travel within a designated area. A driver's VKT is tracked through odometer readings, overhead gantries or GPS tracking and would require major infrastructure upgrades to accommodate for tracking and administration. Oregon Department of Transportation has had a pilot project exploring this option and is performing field tests.



**Figure 4.4: Mobility User Charges – Results from Workshop**

<sup>1010</sup> The funds are distributed based on population and not based on the fuel tax revenues collected from the federal fuel excise tax in each jurisdiction. For FY 2014-15, Alberta's share is set at \$209 million. For further information on the Gas Tax Fund, see <http://www.infrastructure.gc.ca/prog/qtf-fte-eng.html>.



## 4.1.2 Conventional Tax Tools

Conventional tax tools refer to revenue sources which in large part are already being used by provincial and federal governments, but less so by municipal governments. However, revenues from these tax sources are not currently dedicated to transit or transportation projects in Canada. The results from the workshop suggest that few believe any of these revenue tools can be or should be used to fund the Southeast Transitway, as shown in Figure 4.5.

### (9) Corporate income tax

A tax applied on corporate income and administered through the Alberta provincial government.

### (10) Sales Tax

This would involve the introduction of a municipal or a provincial sales tax modelled as a value-added tax like the GST. Sales taxes are a popular form of dedicated funding for transit projects in the US. In Alberta, the absence of any provincial sales tax may make this revenue tool a non-starter. However, a number of public finance experts have advocated the introduction of a provincial sales tax in Alberta in a revenue-neutral manner (i.e. accompanied by reductions in income taxes) as a way on improving the overall economic efficiency of the Alberta tax regime.

### (11) Employer or Employee Payroll Tax

Employee payroll taxes are a tax remitted by employers and/or employees based on the size of the payroll. Exemptions can be made for smaller firms and deductions can be capped much like CPP and EI premiums.

### (12) Income Tax

A transportation dedicated addition to personal income tax would apply primarily to employment income, capital income from investments and income from small businesses.

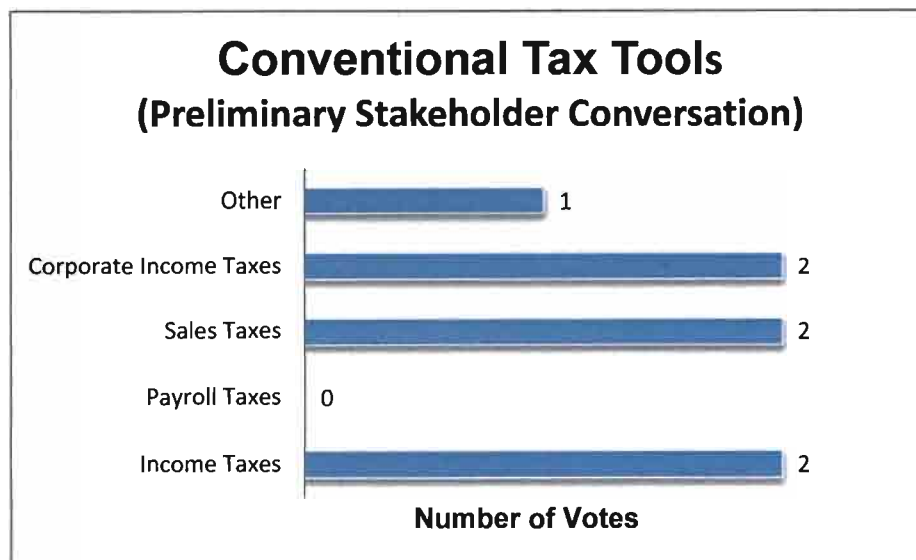


Figure 4.5: Conventional Tax Tools – Results from Workshop

### 4.1.3 Land-Based Taxes

Some land-based revenue tools, such as property taxes, are already an important revenue source for The City. Others are potentially new revenue sources, such as a parking space levy or parking sales taxes. Some land-based tools can be applied specifically to the areas which are most likely to benefit from the new the Southeast Transitway transit services, including the transit corridor as a whole or even a certain area around each new station. For the City of Calgary, a number of maps have been prepared to demonstrate the areas where these tools can potentially be applied, and they can be found in **Appendix G**. The revenue impact of these tools can be much more difficult to predict than some other tools, and can vary greatly depending on the site and the land use. The results from the workshop are presented in **Figure 4.6**, which show considerable interest in development charges.

#### (13) Land Value Capture (LVC)

Land value capture is an attempt to capture a portion of the increase in property values resulting from improvements in transit services and other public infrastructure in the vicinity of a new station or transit corridor. Implementation can be challenging unless The City already owns the designated lands and can sell them once the transit project is well underway. Research on potential revenue tools for Metrolinx in Toronto estimated that land value capture would only be able to contribute 1% of the required funding, approximately \$20 million/year out of the required \$2 billion/year.

As regards the LVC tool in relation to the Southeast Transitway corridor, this may be relevant only for land parcels which are already owned by The City. According to one of our interviewees, The City would have to pay a premium for any land that it does not already own along the Southeast Transitway corridor, because the Southeast Transitway LRT plans are well-known in the community.

#### (14) Tax Increment Financing (TIF)

TIFs work by leveraging future increases in tax revenue to finance current infrastructure projects through the dedication of the incremental tax revenue between the assessed value of designated areas ("TIF zones") prior to the development and its assessed value after the developments are completed. TIFs work best for brownfield, underdeveloped areas which are close to the city core. A local example of this is the Rivers District Community Revitalization Levy (CRL), which is expected to generate property tax revenues between \$735 million and \$1.1 billion over the 20-year TIF.

The Calgary Municipal Land Corporation (CMLC) has a mandate to revitalize the Rivers District. It has also been asked to examine other potential CRL projects. We learned that the CMLC had a preliminary look at the Southeast Transitway corridor and did not think that the corridor is well-suited to a CRL. However, it did not exclude the potential for site-specific development opportunities (as opposed to a corridor-wide opportunity).

#### (15) Parking Space Levy

A parking levy would be a per-day charge on owners of all non-residential off-street parking spaces in the city and implemented on an area basis rather than a per stall basis in order mitigate tax avoidance.

#### (16) Parking Sales Tax

A parking sales tax is a percentage-based tax that is levied on the purchase price of paid-parking across the city and may be feasible with low administration costs.

### (17) Property Tax

Property taxes are typically a percentage based tax levied on the assessed value of real property owned by individuals and businesses in a given region. In November 2013, Calgary City Council voted to allocate \$52 million of unused provincial education property tax room for 2015 to 2024 to create a dedicated transit fund (the "Green Line Fund") to build the Green Line transitway in both North Central and Southeast Calgary.

### (18) Development Charges

Development charges are a one-time charge levied on new developments that are typically determined through a formulaic process and used to pay for associated infrastructure.

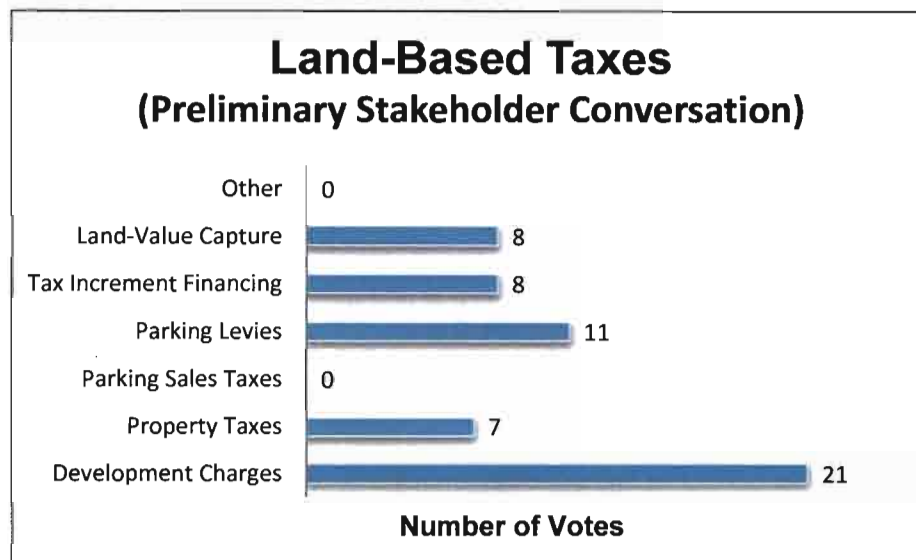


Figure 4.6: Land-Based Taxes – Results from Workshop

## 4.1.4 Other Revenue Tools

Listed below are other potential revenue tools, some of which have been used in other jurisdictions, such as a drivers' license tax, while others are relatively new and untested, such as crowdfunding. The workshop voting results for these alternative tools are presented in Figure 4.7.

### (19) Monetization of City Assets

One option that arose from the discussion during the workshop was the possibility of selling city-owned assets, particularly city assets which may not be considered core to City's operations and responsibilities, such as Enmax. This has been done by Chicago, which monetized their parking assets several years ago.

### (20) Crowdfunding

Crowdfunding is the raising of funds through the collection of small contributions from the general public (known as the crowd) using the Internet and social media. Crowdfunding is used to raise money to fund the development of a well-defined project. There are several different types of crowdfunding:



- The donation and/or reward-based models are the most common form of crowdfunding
- Lending-based crowdfunding is similar to micro-lending in developing countries
- Equity-based crowdfunding, where small contributions from a large number of investors are pooled in exchange for securities.

The first type of crowdfunding above is legal in Canada, but the last two are not. However, financial regulators are expected to issue regulations covering these types of financial activities in 2014. Crowdfunding also has a unique dual function of providing both funding and generating publicity and attention for a project. (source: <http://ncfacanada.org/crowdfunding/>)

#### (21) New Vehicle Sales Tax

A new vehicle sales tax would be similar to a vehicle registration fee in that it is a fee paid by owners of new vehicles at the time of first registration. This fee could be structured as a flat fee or an ad valorem tax and should be applied to all vehicle purchases, both new and used, in order to minimize economic distortions such as discouraging the purchase of new, more fuel-efficient vehicles.

#### (22) Drivers License Tax

A drivers' license tax is a fee charged to drivers upon issuance or renewal of their driver's license. Additional charges can be added to fees paid when renewing a driver's license.

#### (23) Hotel and Accommodation Levy

Dedicated hotel taxes can provide funding for transportation investments needed to improve accessibility and mobility in areas with high tourism and/or business activity. Additional hotel levies would be relatively easy to implement as various fees and taxes are already charged daily at hotels in certain cities.

#### (24) Auto Insurance Tax

This is an additional fee paid by the consumer through auto insurance purchases and dedicated to transportation initiatives. This could be structured as a flat fee or an ad valorem tax.

#### (25) Vehicle Registration Fee

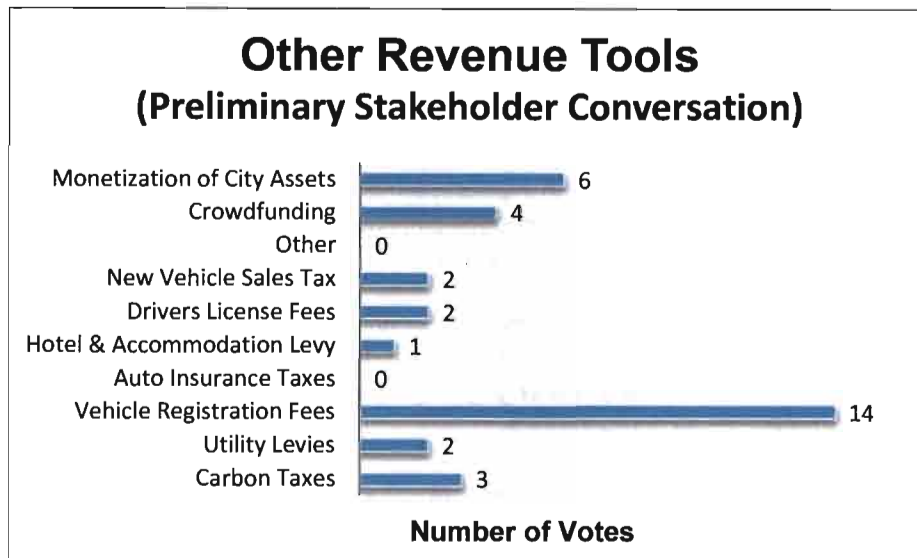
An additional fee dedicated to transit would be applied to vehicle owners upon registering a new vehicle and renewing that registration. General administration would leverage existing systems currently in place for standard vehicle registration procedures.

#### (26) Utility Levy

A utility levy is a monthly fee that is collected from residences and businesses within a region to help fund transportation initiatives, as in the case of TransLink. This can be implemented as a fixed dollar amount and collected through The City's standard utility bill.

#### (27) Carbon Tax

A tax on CO2 emissions priced per tonne and levied on the full range of fuels for used for transportation and other uses at the consumption stage.



**Figure 4.7: Other Revenue Tools – Results from Workshop**

## 4.2 Matching Funding and Transportation Infrastructure Requirements

Some revenue tools can also be implemented based on the location of the expected beneficiaries of the new transit services. Revenue tools used to fund the entire *RouteAhead* transit program can be implemented at the city-wide level. On the other hand, some revenue tools can be applied specifically to an area surrounding a new station, such as land value capture. Some revenue tools can be applied specifically to a new transit corridor such as the Southeast Transitway and its catchment area, such as development charges. The rationale for matching revenue tools to specific geographic areas within a region is based on the notion of horizontal equity (i.e. beneficiaries of new services should pay for the project costs). However, the application of these revenue tools should be done in such a way as to avoid or minimize economic distortions. Economic distortions arise when taxes or user charges result in changes in consumer behaviour, savings behaviour and/or the location of economic activity which do not improve economic outcomes for the people affected but are designed solely to reduce impact of or altogether avoid paying the tax or charge. For example, if higher property taxes or development charges in one area of the city leads to a shift in economic activity to other parts of the city, this would be considered an economic distortion (also called inefficiency cost). Economic distortions reduce the productivity and competitiveness of the affected area or jurisdiction.

## 4.3 Evaluation of Revenue Tools

Given all these different revenue tools, it is imperative to evaluate which are most relevant and applicable given the local context of the infrastructure the tools are intended to fund. There are five distinct criteria that other jurisdictions have used when evaluating revenue tools:

- Revenue yields and capital and operating costs arising from implementation
- Impact on travel behavior and network performance
- Implementation challenges
- Equity
- Economic Efficiency

Not all revenue tools are equal in their revenue generation, and it is important to recognize how much each can generate and their associated administrative costs. Certain sources may not be sustainable in the mid or long term, while others may not generate significant revenues in the short term.

Impact on network performance includes the ability to relieve congestion. Examples of this would be the cordon charge and the high occupancy toll lanes. In addition to reducing traffic, there could also be travel time savings across all modes. These tools may not have as much impact in terms of revenue generation, but they serve alternative purposes that may be valued by the transportation planning authority. They can also have a number of peripheral benefits such as reducing fuel consumption, traffic collisions, and air pollution.

Equity can be examined in two parts: horizontal and vertical. Horizontal equity has to do with the users targeted by the tool and whether they will benefit from the results of the funding. Vertical equity considers how the tool will affect different income groups. This can be particularly challenging to gauge but it is necessary to understand how a tool can affect the entire community across all demographics.

Finally, the economic efficiency criterion considers whether a revenue tool improves the productivity and competitiveness of the region where it is applied by leading to more sustainable travel patterns or whether it reduces productivity and competitiveness by encouraging tax avoidance behaviour and changes in the location of economic activity.

From an overall economics and transportation perspective, the preferred revenue tools should be those that maximize the transportation benefits and minimize the inefficiency costs of taxation. On top of these economic considerations, public perception and acceptance represent important considerations. The introduction of a new revenue tool can be controversial and difficult to implement without broad public support. Transparency and the public awareness and support are critical.

In **Table 4.1**, the list of revenue tools mentioned above are examined in terms of their applicability (i.e. to fund the entire program or just a specific corridor or station), potential travel impacts and potential efficiency impacts.



Table 4.1: Mobility Tools

| Revenue Tool                                                                           | Applicability             | Travel Impact        | Efficiency Impact                                                            |
|----------------------------------------------------------------------------------------|---------------------------|----------------------|------------------------------------------------------------------------------|
| <b>Mobility Charges - Tools Affecting the Decision to Drive</b>                        |                           |                      |                                                                              |
| Auto Insurance Tax                                                                     | Program Wide              | no effect            | negative                                                                     |
| Car Rental Fee                                                                         | Program Wide              | marginal impact      | negative                                                                     |
| Drivers License Tax                                                                    | Program Wide              | no effect            | marginally negative                                                          |
| New Vehicle Sales Tax                                                                  | Program Wide              | no effect            | negative                                                                     |
| Vehicle Registration Fee                                                               | Program Wide              | no effect            | marginally negative                                                          |
| <b>Mobility Charges - Tools Affecting Where, When, and How Much to Drive</b>           |                           |                      |                                                                              |
| Cordon Charge                                                                          | Corridor/Station Specific | potentially positive | positive                                                                     |
| Fuel Tax                                                                               | Program Wide              | marginal impact      | some efficiency costs                                                        |
| Highway Tolls                                                                          | Corridor Wide             | significant positive | positive                                                                     |
| HOT Lanes                                                                              | Corridor Wide             | positive             | positive                                                                     |
| Parking Sales Tax                                                                      | Corridor/Station Specific | potentially positive | potentially positive                                                         |
| VKT Charge                                                                             | Program Wide              | significant positive | potentially positive                                                         |
| <b>Mobility Charges - Transit Based Tools</b>                                          |                           |                      |                                                                              |
| Fare Increases                                                                         | Program Wide              | dampen transit use   | Negative (but not necessarily if implemented under restructured fare policy) |
| Fare Restructuring                                                                     | Program Wide              | potentially positive | potentially positive                                                         |
| <b>Land Based Tools</b>                                                                |                           |                      |                                                                              |
| Development Charges                                                                    | Station Specific          | no effect            | possibly neutral (if done on cost-recovery basis)                            |
| Land Transfer Tax                                                                      | Corridor Wide             | no effect            | efficiency costs                                                             |
| Land Value Capture                                                                     | Station Specific          | no effect            | neutral (if properly implemented)                                            |
| Parking Levy                                                                           | Station Specific          | unclear              | efficiency costs                                                             |
| Property Tax                                                                           | Corridor Wide             | no effect            | efficiency costs                                                             |
| Tax Increment Financing                                                                | Station Specific          | no effect            | efficiency costs                                                             |
| <b>General/Excise Taxes - Tools Currently Contributing to Governments Revenues</b>     |                           |                      |                                                                              |
| Corporate Income Tax                                                                   | Program Wide              | no effect            | high efficiency costs                                                        |
| Employer Payroll Tax                                                                   | Corridor Wide             | no effect            | high efficiency costs                                                        |
| Personal Income Tax                                                                    | Corridor Wide             | no effect            | high efficiency costs                                                        |
| Sales Tax                                                                              | Program Wide              | no effect            | low efficiency costs                                                         |
| Utility Levy                                                                           | Corridor Wide             | no effect            | marginally negative                                                          |
| <b>General/Excise Taxes - Tools Not Currently Contributing to Governments Revenues</b> |                           |                      |                                                                              |
| Carbon Tax                                                                             | Program Wide              | low/mid              | efficiency costs                                                             |
| Hotel & Accommodation Tax                                                              | Program Wide              | no effect            | efficiency costs                                                             |

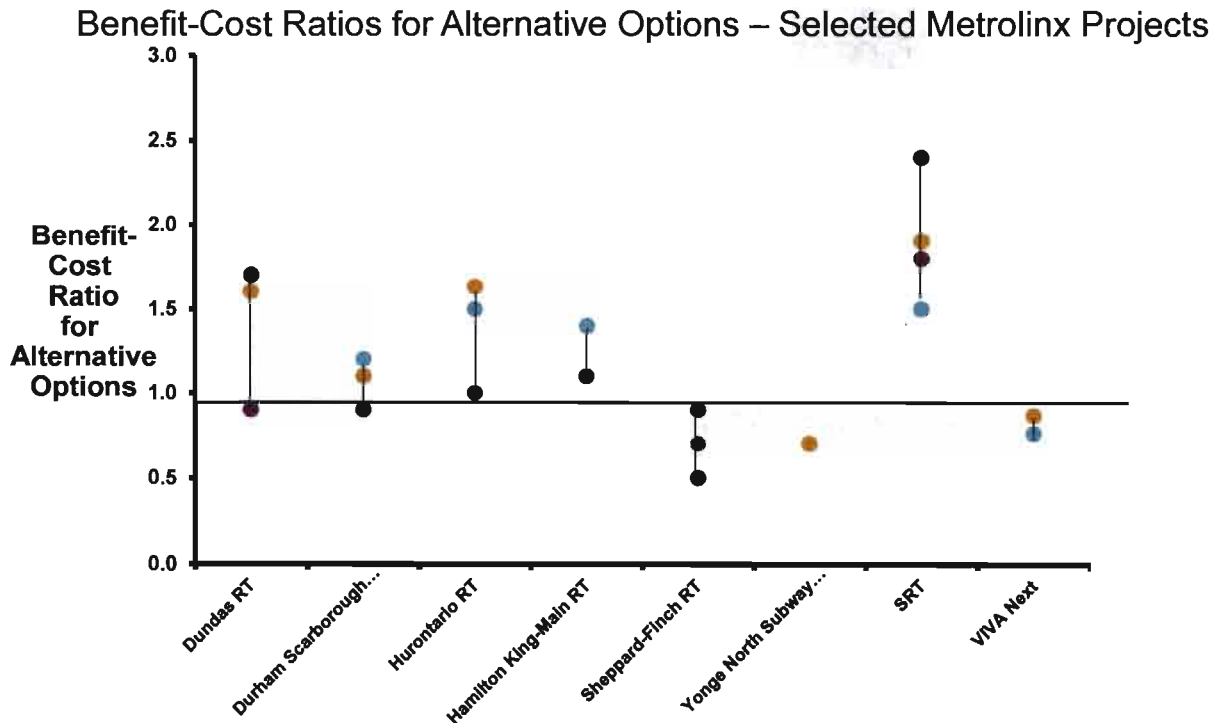


#### 4.4 Benefit Case Analysis (BCA): Advancing the best projects for funding implementation

Public support for the introduction of revenue tools which affect them directly depends on whether they believe the funds generated by the new charges will be used for transit or transportation projects which will significantly improve mobility and mitigate congestion. In other words, it is not unreasonable to think that the level of public support for revenue tools depends on delivering material mobility benefits in return. This is in part dependent on prioritizing the different transit projects in *RouteAhead*, but it also depends on ensuring that each transit project has been carefully analyzed so that the most effective variant of the project is selected, given the future travel needs in the corridor (e.g. BRT in mixed traffic vs BRT with fixed guideway vs LRT).

Shortly after issuing its regional transportation plan known as The Big Move in 2006, Metrolinx introduced a requirement for a Benefits Case Analysis (BCA) for each major project in its plan. The purpose of the BCA is to compare technology, route alignment and phasing options for each project. The objective was to ensure that the best possible option is advanced for each project based on a methodology that goes beyond the traditional cost-benefit analysis. This methodology is known as the Multiple Account Evaluation (MAE) approach and is described in greater detail in the next subsection below.

Figure 4.8 below shows the cost-benefit ratios for alternative options evaluated for a selection of Metrolinx projects which have had BCAs completed. The horizontal axis shows the transit projects, which each project have 2 or more alternatives which have been evaluated. For some projects, the best performing alternative can have a benefit-cost ratio that is 50% higher than the lowest performing alternative. These analyses have assisted Metrolinx decision-makers select the most appropriate alternative for each project, taking into account information from the MAE analysis as well (i.e. not only the benefit cost ratios).



1 Source: Metrolinx, AECOM analysis

**Figure 4.8: Metrolinx Benefit-Cost Ratios**

In addition, the BCA documents have served as public-facing documents to explain to stakeholders and the wider public why certain options were preferred to others. The BCA is also used by other major transit agencies in Canada, including TransLink and AMT.

Table 4.2 below shows all the impacts that are typically evaluated in Metrolinx benefit case analyses; whether or not these are quantified and monetized; and whether or not each of these can be considered incremental in the sense discussed earlier.

**Table 4.2: Impacts Typically Evaluated in Metrolinx Benefit Case Analyses**

| ACCOUNTS <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | IMPACTS                                                                                                                                                                         | MONETIZED         | INCREMENTAL       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|
| Transportation User Benefits Account                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>Travel time savings</li> <li>Automobile operating cost savings</li> <li>Safety benefits</li> </ul>                                       | Yes<br>Yes<br>Yes | Yes<br>Yes<br>Yes |
| Financial Account                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>Ridership revenues</li> <li>Capital and operating costs</li> </ul>                                                                       | Yes<br>Yes        | (1)<br>Yes        |
| Environmental Account                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Greenhouse gas emissions</li> <li>Local air quality impacts, incl. public health impacts</li> <li>Noise and vibration impacts</li> </ul> | Yes<br>No<br>No   | Yes<br>Yes<br>Yes |
| Economic Development Account                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>Standard economic impacts (construction and operations phases)</li> <li>Land value impacts</li> </ul>                                    | Yes<br>Yes        | No<br>No          |
| Social Community Account                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>Land use shaping</li> <li>Health and accessibility</li> </ul>                                                                            | No<br>No          | (2)<br>(2)        |
| <b>Notes:</b><br>(1) Ridership revenues are usually not incremental because the value is already captured in the transportation user benefits account. Fare revenues reflect the willingness to pay for transportation improvements.<br>(2) The incrementality of social and community benefits can be difficult to evaluate and should be done only on a case-by-case basis.<br>The five accounts in this column correspond to those of the Metrolinx Benefit-Cost Analysis template, which is based on a multiple account evaluation approach.<br>Source: AECOM analysis based on Metrolinx benefit case assessments completed to date. |                                                                                                                                                                                 |                   |                   |

All of the above impacts in the first three accounts are considered incremental, with the first two belonging to the transportation user benefits account; and the third belonging to the environmental account. Impacts in the other two accounts are not treated as incremental in BCA analyses.

## 5. Recommendations

Our recommendations from results of the literature review and workshop begin with the benefits case analysis and project justification theme, followed by the funding theme and the project financing and delivery theme. This follows the logic that project funding discussions should be preceded by a benefits case analysis (or a business case) for the project in question. It is also consistent with the view that any proposed public-private partnership should already be fully funded or have reasonable expectations of being fully funded in the near term.

### 5.1 Benefits Case Analysis (BCA), Project Selection and Justification

We learned from John Howe's presentation that the Metrolinx process for selecting and advancing the best projects for funding implementation is an evidence-based transparent case-making process and relies on two tools:

(1) a Benefits Case Analysis (BCA), which uses a Multiple Account Evaluation (MAE) approach, and (2) a project prioritization approach. The City of Calgary has already undertaken an extensive project prioritization exercise.

- We therefore recommend that The City undertake a BCA for each major project which is in *RouteAhead* but is not already underway, beginning with the Southeast Transitway project. In the case of the Southeast Transitway corridor, the BCA would compare alternative transit solutions for the Southeast Transitway corridor (each with their own mode progression, if appropriate) against a "business as usual" scenario using the MAE approach adopted by Metrolinx and other transit agencies in Canada. It would identify the preferred project alternative over the relevant long-term horizon, based on a combination of the project variant with the highest benefit-cost ratio and the results from the other "accounts", such as the Economic Development Account and the Social Community Account

The business case will support the City Council's decision on which version of the project to approve and proceed with. Council would also take into account other strategic considerations in its decision on which project variant to approve. The business case will also serve as the public-facing document to explain and justify the decision to proceed with the particular project variant in question.

During the stakeholder interviews, we learned from the City of Edmonton's project director for the Valley Line P3 that this project was not subject to an explicit business case or BCA analysis, which has resulted in some friction with certain stakeholder groups which were unconvinced that an LRT solution was the best solution for the corridor in question. The project director suggested that the City of Calgary would be well-advised to undertake a BCA in order to ensure a transparent case for the particular project variant of the Southeast Transitway which is selected.

### 5.2 "Investing in Mobility" Investment Strategy and Revenue Tools Analysis

Given the funding gap which The City faces in implementing *RouteAhead* and the overall Investing in Mobility transportation plan, we recommend that:

- The City should undertake the analysis required to develop an investment strategy on how best to address the funding gap for the *Investing in Mobility* transportation program

The supporting analysis for this investment strategy would consist of an analysis of all potential revenue tools, including potential revenue yields for each tool as well as an estimate of the economic costs and benefits of each tool, where possible (e.g. for every dollar of revenue raised from sales taxes, approximately 15 cents are lost in terms of economic distortions). It would also offer several options of combinations of revenue tools which could be sufficient to meet the *Investing in Mobility* funding gap. It would also identify which revenue tools are best employed



in which context, distinguishing between program-wide funding requirements, corridor infrastructure funding requirements and station-specific requirements.

The resulting revenue tool combinations could be used as the basis for a public consultation. Based on the results of the consultation and other strategic considerations (e.g. City Charter discussions with the Province), Council would then recommend one of the revenue tool combinations above, or a modified version thereof.

### 5.3 Financing and Project Delivery

Public-private partnerships should be considered fully-integrated project delivery solutions that can provide on-time and on-budget outcomes with optimization and certainty regarding whole-life costs. This is achieved through cost-effective risk-transfer, performance-based payments and financial capital at risk. P3s are not a source of additional funding for infrastructure projects. Nor should P3s be viewed as a means for The City to avoid public borrowing constraints (e.g. debt ceilings)

- The City should undertake a preliminary screening of all major transit projects which have been identified in *RouteAhead* as a high priority over medium to long term and consider their potential suitability for delivery as a P3 – with delivery options ranging from Design-Build-Finance through to Design-Build-Finance-Operate-Maintain. This should be done for all projects which are already fully funded or are expected to be fully funded over the next few years.
  - The City should consider modifying the boundaries between projects listed in *RouteAhead*, if the modifications make some P3 options feasible or more attractive (e.g. bundling 2 or more projects<sup>11</sup>; or removing a project element from the scope of the P3, such as operations)
  - the preliminary screening should yield a short-list of projects for further consideration as potential P3
- All P3 delivery options should be considered, ranging from Design-Build-Finance through to Design-Build-Finance-Operate-Maintain. In the current post global financial crisis environment, we do not recommend serious consideration of P3 models which entail transferring the bulk of a project's demand or revenue risk to the private partner such as the BOOT model. Such projects are unlikely to secure private financing in the current environment.
- Projects shortlisted as potential P3s should be subject to a Value for Money (VfM) analysis in order to determine if the P3 delivery option is in the public interest. A VfM analysis would compare the preferred P3 option to the traditional project delivery method (initially based on a shadow-bid methodology) in order to determine if the P3 option can deliver savings for The City.
- A P3 project with potentially positive VfM results should be subject to a professional market sounding in order to gauge the interest of potential bidders
- We recommend that The City consider relying on the P3 procurement process used by Province of Alberta, since this model is already widely accepted in the P3 marketplace.

<sup>11</sup> The bundled projects do not necessarily need to be physically contiguous or proximate projects. However, the project bundling rationale should be based on the presence of economies of scale in project delivery costs, including transaction costs.



# **Appendix A**

## **Stakeholder Interview Guide**



AECOM Canada Ltd. is working with The City of Calgary to explore various funding and financing/project delivery options for major transit infrastructure projects. The purpose of this interview is to obtain your input on key issues and provide the basis for a preliminary, but informed, report on innovative options which may be feasible within The City.

Specifically, the Southeast Transitway (SETWAY) project is a primary focus for this study. SETWAY is projected to be a \$642 million project. We anticipate that the results from this study will also be applicable to a wider range of other infrastructure projects for The City.

Please answer the following questions and ignore those not relevant to your organization or experience.

#### Questions – SETWAY Context

**Question 1** – What is your role in the SETWAY project?

**Question 2** – What are the objectives of the SETWAY project? What is the SETWAY project intended to achieve? How will you measure success?

**Question 3** – What do or don't you want to see regarding the funding or financing of SETWAY? Are there specific examples from projects in the past (or projects in other cities) that you would like to replicate or avoid on SETWAY?

**Question 4** – How does SETWAY differ from previous transit-related projects and does it warrant a unique delivery method for design, construction, maintenance, and funding? Why?

#### Questions – Innovative Financing/Delivery Options

Public infrastructure projects can tap into private financing when the projects are delivered through innovative procurement approaches – often called public-private partnerships (P3s) – which integrate design, construction, operations and maintenance.

**Question 5** – What is your organization's involvement, role, and responsibility with current and past P3s in Canada?

**Question 6** – What is your organization's experience with P3s or conventional transit capital projects in Canada?

**Question 7** – In your view, does the procurement of transit infrastructure through a P3 provide any efficiencies or net benefits for the public sector owner as compared to more traditional procurement models (eg.: DBB, DB, or CM)? If so, discuss under any of the issues below:

- Cost savings – capital

- Time savings (procurement and construction phase)
- Budget certainty
- Schedule certainty
- Ensuring timely maintenance (avoiding deferred maintenance)
- Ensuring consistent service quality
- Private sector stewardship of design and construction?
- Other benefits?

**Question 8** In your view, does the procurement of major transit capital projects through P3 models entail costs or drawbacks? If so, please discuss

- Higher transaction costs (legal, procurement, advisory services)
- Higher financing costs

Other drawbacks?

**Question 9** – Are there specific circumstances in which it is preferable to use a P3 model for procurement instead of a DBB (Or vice-versa)? If so, please describe what these circumstances are and provide examples if possible.

**Question 10** – What are the implications of choosing a P3 procurement model for workers' pay and working conditions, given that the private sector is responsible for the hiring and management of staff?

**Question 11** – What are some of the more notable risks or challenges associated with P3s, particularly with the long-term contract aspect? Are there any risks that are specific to transit projects?

**Question 12** If the SETWAY project (or another major transit capital project) were to proceed as a P3, do you have a view about which project elements or risks should (or should not) be transferred to the P3 partner? Why? Please discuss with reference to categories such as those

below.

- Operations
- Service / network planning
- Ticketing
- Fare policy
- Vehicle and facilities maintenance

**Question 13** – How much information is disclosed to the public during the competitive phase of a P3 procurement? How does this differ from conventional procurements?

**Question 14** – Public consultation tends to play a major role in transit-related projects. How much engagement and feedback does a P3 delivery require, and does this differ from conventional procurements?

**Question 15** – It's generally accepted that a project should undergo a screening process to determine if it is appropriate to use P3 procurement. Please describe what some of the criteria should be included in the screening. Are there any additional criteria that should be considered for transit-related projects?

**Question 16** – Are there characteristics that would deem a project unsuitable for P3? Please explain what these features may be.

**Question 17** – There are a number of models that can be included within the P3 framework, all of which are some combination of design, build, financing, operations, and management. Is there a specific combination – DBFOM, DBFM, DBF – that may be more applicable than the rest for SETWAY or transit projects in general?

**Questions – Potential Revenue Sources**

Grant funding is expected to decline significantly as provincial and federal funding programs come to an end. Securing alternative sources of revenue will be necessary to fund the major transportation projects that have been listed as high priority.

**Question 18** – In your view what are the more feasible options to raise revenue to fund transit-related projects? Please choose from the following four categories:

- a. Conventional tax tools – e.g. income, payroll, sales taxes, corporate income taxes
- b. Mobility user charges – e.g. transit fares, fuel taxes, highway tolls, cordon/area congestion charges
- c. Land-based taxes– e.g. development charges, property taxes, parking sales taxes, parking levies, TIFs, land-value capture
- d. Other revenue tools used in Canada and the US – e.g. carbon taxes, utility levies, vehicle registration fees

**Question 19** – Which revenue sources does The City have authority to introduce? Which require Provincial or Federal authority?

**Question 20** – How does the timing of the above revenue sources differ from the timing of spending requirements? (e.g. land-value capture)

**Question 21** – Would SETWAY impact land use and the above revenue sources in any material way?

**Question 22** – Are there any tools affecting development and land use that have been effective in past projects (eg. Community Revitalization Levy for East Village) that may be applicable to SETWAY?



# **Appendix B**

**December 9 Southeast  
Transitway Workshop Agenda**

# Agenda

Monday, December 9, 2013 | The Glenmore Inn & Convention Centre, Glenmore Centre Room

**8:00 - 8:30** Registration & Breakfast  
**8:30 - 9:00** Welcome & Opening Remarks



**Gian-Carlo Carra**  
City Councillor Ward 9



**Mac Logan**  
Transportation General Manager  
City of Calgary



**Shane Keating**  
City Councillor Ward 12



**Dan Bolger**  
Facilitator  
AECOM



**9:00 - 9:15** SETWAY Program / Route Ahead  
**Chris Jordan**  
Calgary Transit  
Manager Strategic Planning



**9:15 - 9:30** Q/A & Discussion  
**9:30 - 10:00** Morning Networking Break

## MORNING SESSION: Innovative Financing/Delivery Option

### Keynote Presentation

**10:00 - 10:45**



**Mike Marasco**  
Plenary Group

With his 26 years of public sector experience (including being one of the founders of Partnerships BC) and 6+ years as CEO of Plenary Concessions in the private sector, Mike has a solid understanding of the value proposition that the private sector brings to the development of public infrastructure in North America.

**10:45 - 11:45** Q/A & Discussion  
**11:45 - 13:00** Lunch

## AFTERNOON SESSION: Potential Revenue Sources

### Keynote Presentation

**13:00 - 13:45**



**John Howe**  
Parsons Brinckerhoff  
Vice President, Strategic  
Consulting-Canada

John Howe is the former Vice President, Investment Strategy and Project Evaluation of Metrolinx (Transportation Authority for the Greater Toronto and Hamilton area). He is on the board of directors of the Greater Toronto Marketing Alliance, an executive-in-residence with the University of Western Ontario's Ivey School of Business, and a project selection advisor to the Canada Foundation for Innovation.

**13:45 - 14:45** Q/A & Discussion  
**14:45 - 15:00** Stakeholder Feedback  
**15:00 - 15:30** Review of Key Findings from the day



**Mario Iacobacci, Ph.D.**  
AECOM  
Director, Economics

**AECOM**

# Appendix C

December 9  
Workshop Attendee List

## Southeast Transitway Alternative Funding & Financing Workshop - Attendee List

### ATTENDEE

### STAKEHOLDER AGENCY OR COMPANY

| CITY OF CALGARY COUNCIL                            |                                                       |
|----------------------------------------------------|-------------------------------------------------------|
| Councillor Carra                                   | Councillor Ward 9                                     |
| Councillor Keating                                 | Councillor Ward 12                                    |
| Scott Deederly                                     | City of Calgary Mayor's Office                        |
| Lindsay Luhnau                                     | Ward 9 Constituent Assistant                          |
| Dustin Rogers                                      | Ward 12 Constituent Assistant                         |
| FEDERAL & PROVINCIAL GOVERNMENT                    |                                                       |
| Peggy Anderson                                     | Office of the MP for Calgary Southeast                |
| Neill McQuay                                       | Province of Alberta, Ministry of Infrastructure       |
| Tom Loo                                            | Province of Alberta, Ministry of Infrastructure       |
| Ryan Reichl                                        | Province of Alberta, Ministry of Infrastructure       |
| KEYNOTE SPEAKERS                                   |                                                       |
| Mike Marasco                                       | Plenary Group                                         |
| John Howe                                          | Parsons Brinckerhoff                                  |
| CITY OF CALGARY ADMINISTRATION                     |                                                       |
| Mac Logan                                          | City of Calgary, Transportation General Manager       |
| Doug Morgan                                        | City of Calgary, Calgary Transit                      |
| Chris Jordan                                       | City of Calgary, Calgary Transit                      |
| Craig Harper                                       | City of Calgary, Transit                              |
| Anne Cataford                                      | City of Calgary, Transportation Infrastructure        |
| Fabiola MacIntyre                                  | City of Calgary, Transportation Infrastructure        |
| Don Mulligan                                       | City of Calgary, Transportation Planning              |
| Chris Blaschuk                                     | City of Calgary, Transportation Planning              |
| Calvin Wong                                        | City of Calgary, Transportation Planning              |
| Eric MacNaughton                                   | City of Calgary, Transportation Planning              |
| Rick Masters                                       | City of Calgary, Finance                              |
| Roland Mueller                                     | City of Calgary, Finance                              |
| Thom Mahler                                        | City of Calgary, Land Use Planning & Policy           |
| Sue Jose                                           | City of Calgary, Intergovernmental Affairs            |
| Fred Young                                         | City of Calgary, Office of Land Servicing and Housing |
| DEVELOPMENT, LANDOWNER and CONSULTING STAKEHOLDERS |                                                       |
| Kondwani Bwanali                                   | CMLC (Calgary Municipal Land Corporation)             |
| Josh Pender                                        | CP Rail                                               |
| Gillian Lawrence                                   | Remington Development Corporation                     |
| Glen Furtado                                       | Consulting Engineers of Alberta (CEA)                 |
| Jodie Parmar                                       | Strategic & Financial Advisory                        |
| Craig Nixon                                        | Imperial Oil                                          |
| Trevor Sawatzky                                    | Shepard Developments                                  |
| Ryan Riddell                                       | Shepard Developments                                  |
| Eileen Stan                                        | M2i Development Corporation                           |
| Iain McCorkindale                                  | M2i Development Corporation                           |
| Alec McDougall                                     | Ecco Waste Systems Group                              |
| WORKSHOP CONSULTANTS / FACILITATORS                |                                                       |
| Alana Somers                                       | AECOM Canada Ltd.                                     |
| Dan Bolger                                         | AECOM Canada Ltd.                                     |
| Mario Iacobacci                                    | AECOM Canada Ltd.                                     |
| Angela Iannuzziello                                | AECOM Canada Ltd.                                     |
| Vivian Yu                                          | AECOM Canada Ltd.                                     |



## **Appendix D**

**Council Approved Notice of  
Motion for Southeast Transitway  
Workshop**

## **NOTICE OF MOTION, NM2013-08**

### **Re: Funding Options for the SETWAY (as approved by Council on 2013 March 04)**

WHEREAS RouteAhead has been completed and identified SETWAY as a priority;

AND WHEREAS the Municipal Sustainability Initiative (MSI) and GreenTRIP funding are fully allocated for the foreseeable future;

AND WHEREAS the Provincial Government is projecting a deficit budget;

AND WHEREAS to construct major transportation infrastructure there is a requirement for all three levels of Government to cooperate and explore various financing methods;

AND WHEREAS Community Revitalization Levies (CRL) has been used successfully to finance new infrastructure in Calgary's East Village;

AND WHEREAS there is significant Transit Oriented Development (TOD) potential along the length of the planned SETWAY that can only be realized with the SETWAY project moving forward;

AND WHEREAS a CRL/Options financing model could be broadened to be utilized on any section or extension of the current or future LRT lines;

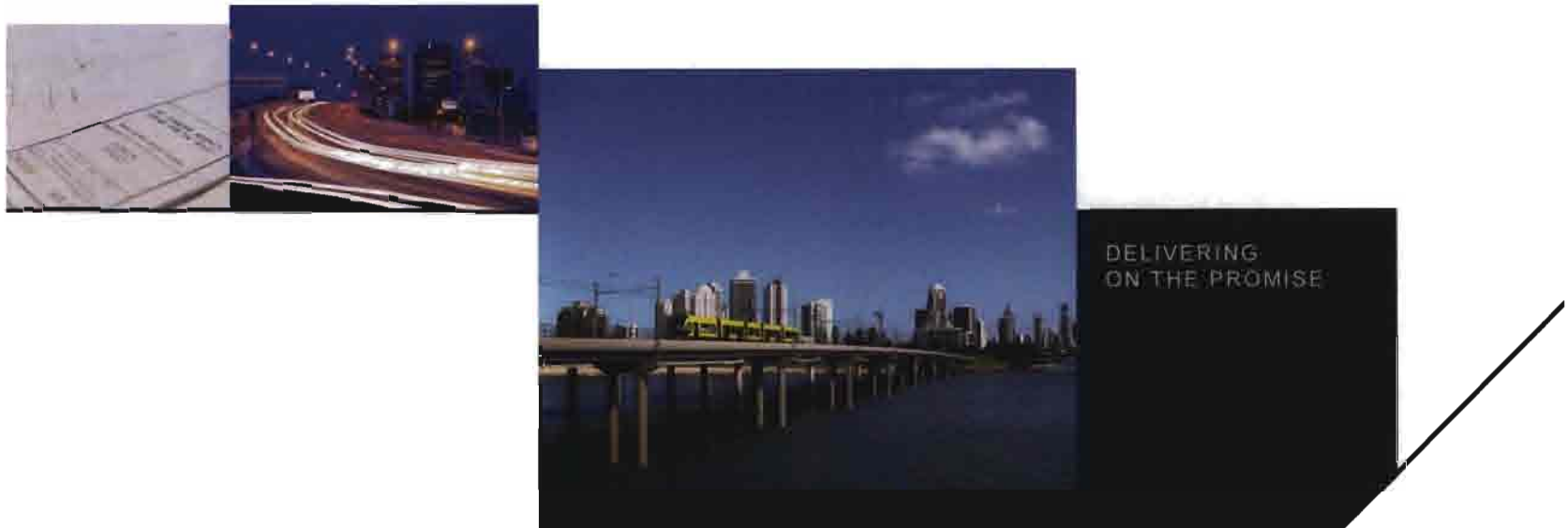
AND WHEREAS with establishing a new line there could be new P3 and BOOT (Build Own Operate Transfer) possibilities that can be explored;

NOW THEREFORE BE IT RESOLVED Council direct Administration to conduct a workshop outlining various options for funding the SETWAY and exploring pros and cons, returning to Council no later than 2014 January.

AND BE IT FURTHER RESOLVED that Administration engage stakeholders along the SETWAY for input.

# **Appendix E**

**Structuring Public Private  
Partnerships Presentation  
By Mike Marasco**



# Structuring Public Private Partnerships

## SETWAY Workshop City of Calgary

December 2013



# Agenda

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- The Case for Public Private Partnerships
- Facts About Financing PPP
- What do we mean by PPP?
  - What are they?
  - How are they structured?
- Case Studies
- Plenary Group Overview

# Value Proposition - PPP

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## Public Private Partnerships (PPP)

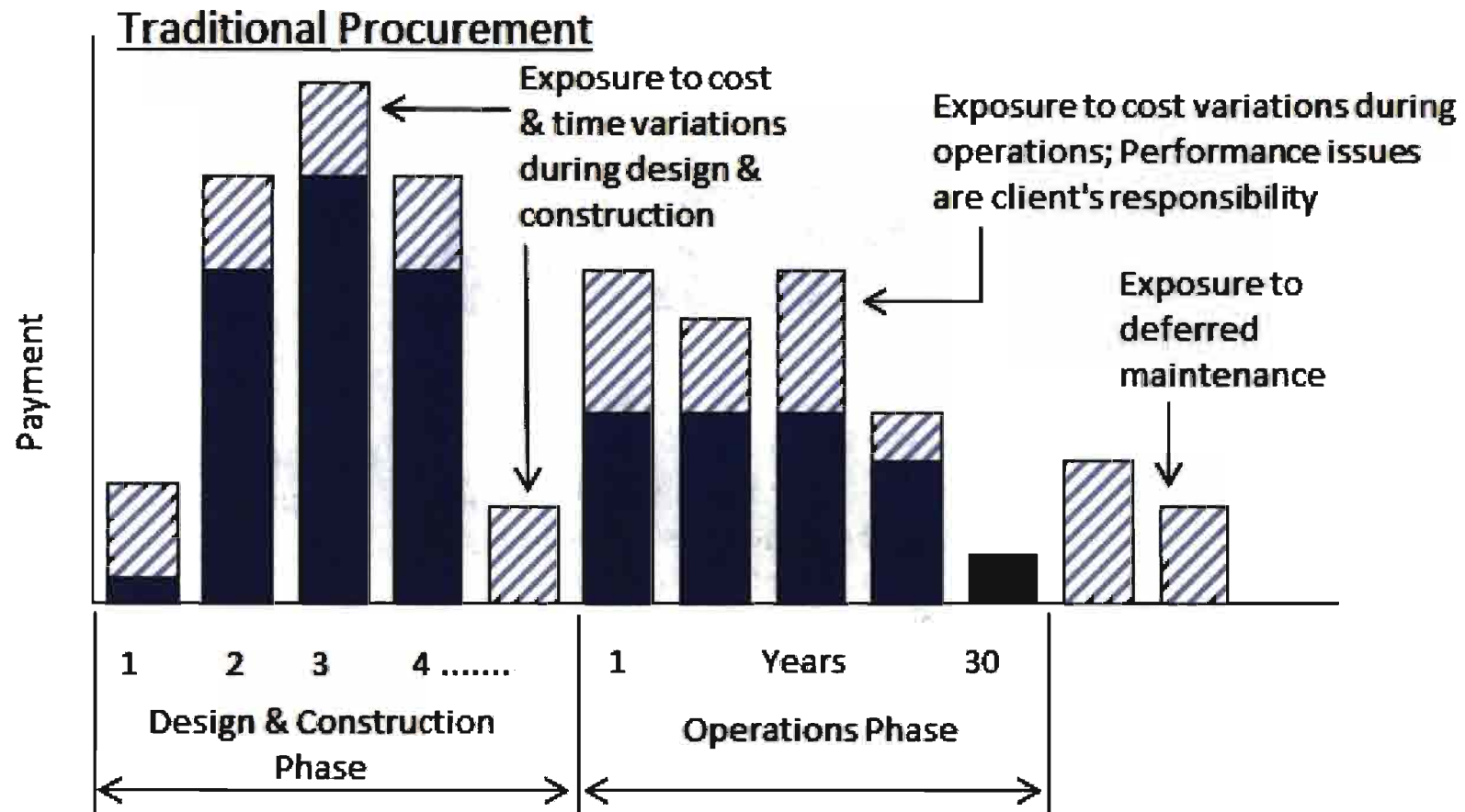
- Financial capital at risk to guarantee on-time and on-budget delivery
- Optimization and certainty of “whole of life” costs
- Ownership of the asset is retained by the Sponsor
- Facility condition guaranteed for the full 25-50 years of operations
- Emphasis on a clear and well-defined risk allocation
- A fully integrated solution that drives design development, construction, equipment and operations
- Offers flexibility to facilitate inevitable change

# Facts About Financing for PPP

- The financing premium paid for PPP is more than offset by:
  - Optimization of “whole of life costs”
  - Significant risk transfer
  - Payments are performance / availability based
- To mitigate the financing cost premium:
  - Vend Sponsor debt into the model
  - Leave enough equity to hold proponent accountable for performance
- The financing in the PPP / DBFMO model is the catalyst for effective risk transfer and optimization of “whole of life” costs:
  - It shifts the focus to what the monthly costs are going to be over the long term, instead of a focus on first-in capital costs, which often leads to poor long-term outcomes

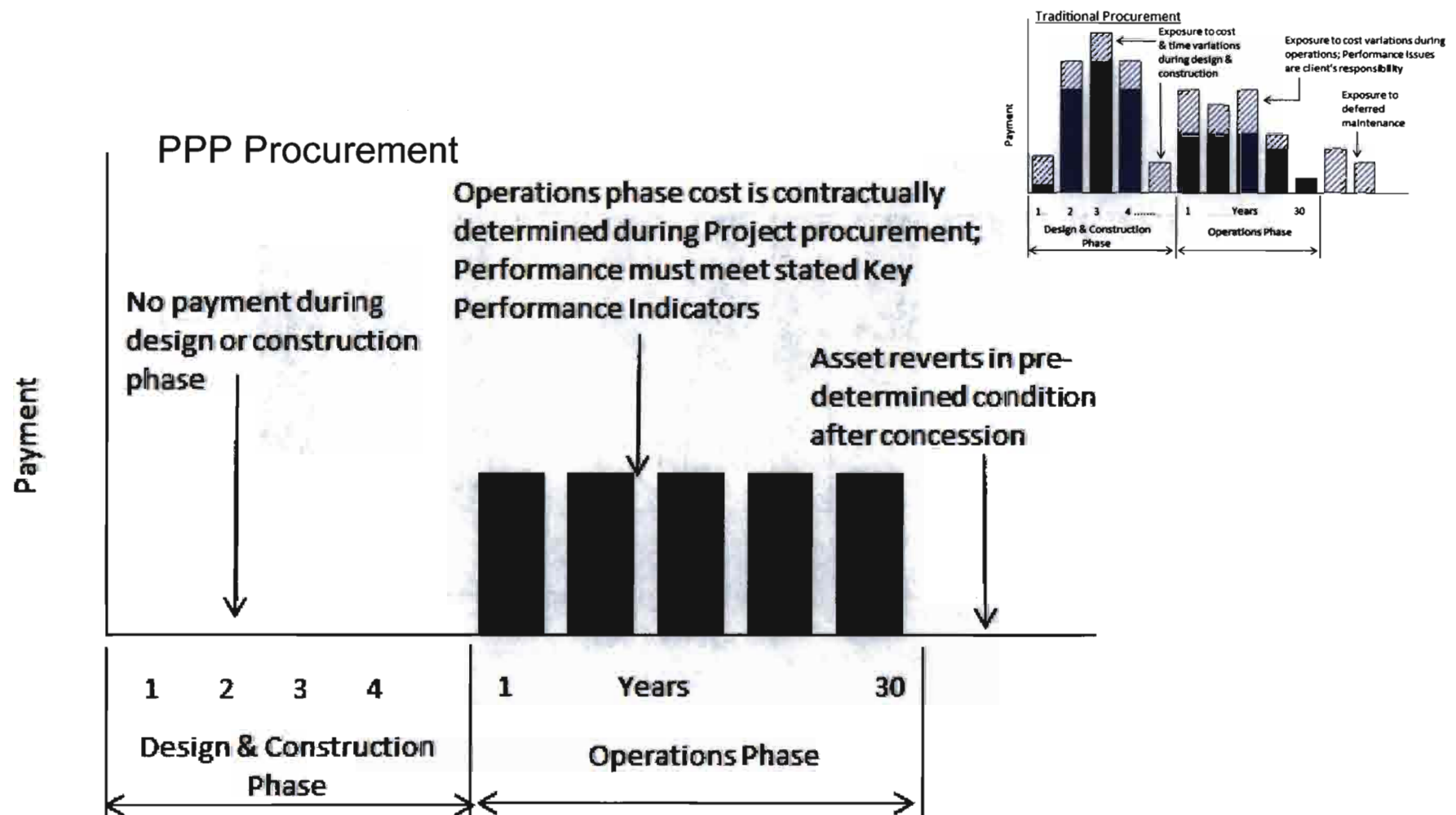


## Common Facility-Related Risk Exposure

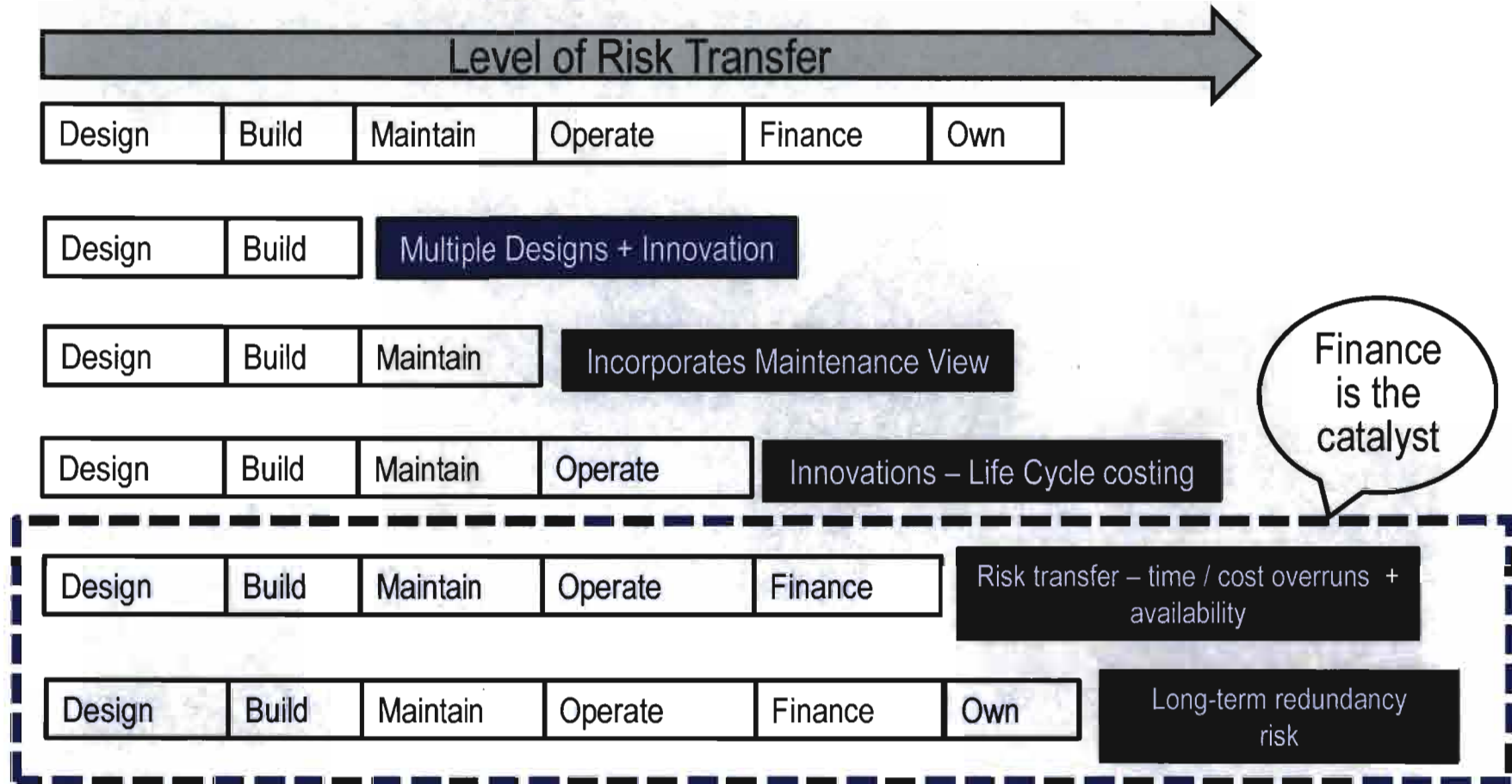




# Significant Risk Transfer – PPP Model

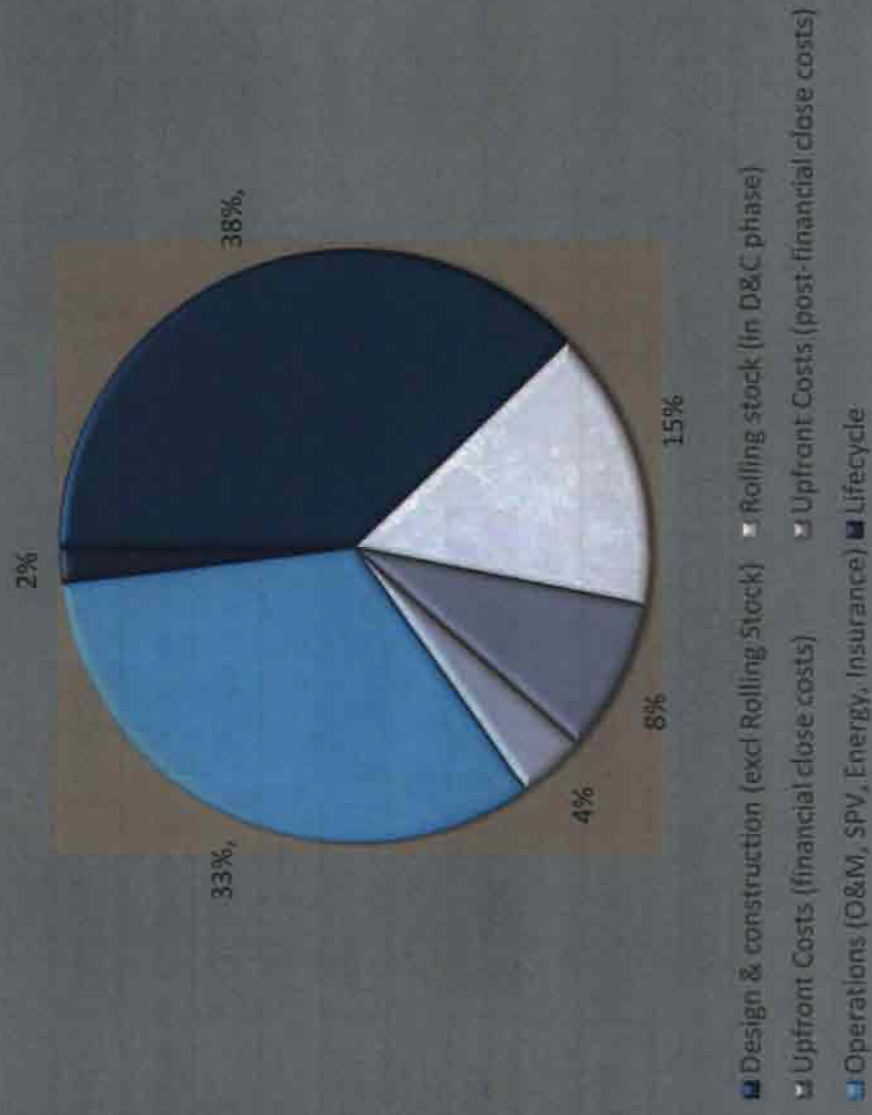


# PGF Comparative Advantages

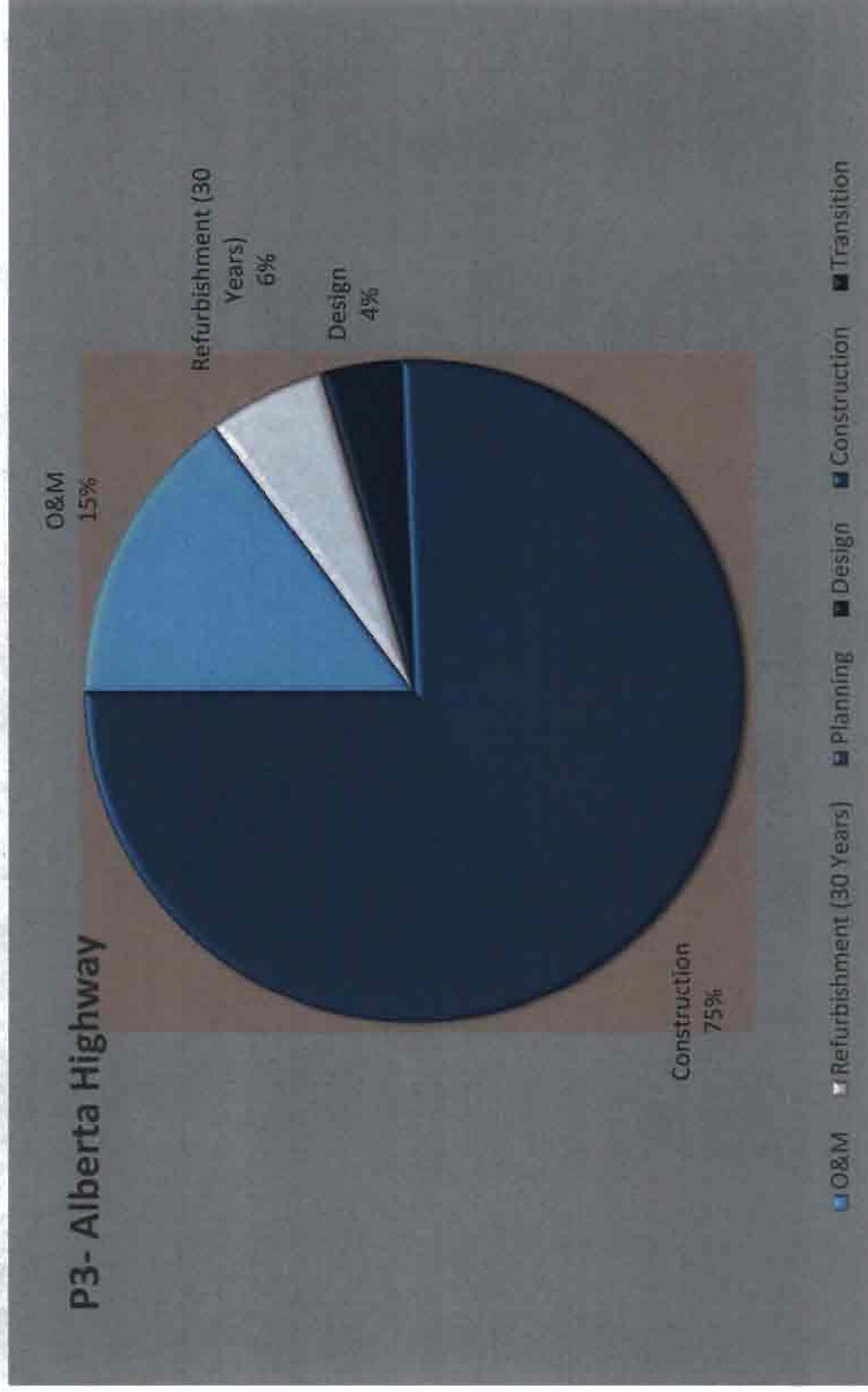


## Beyond “First in” Costs.....LRT

### Gold Coast Light Rail - Project Cost Summary



## Beyond "First in" Costs.....Road





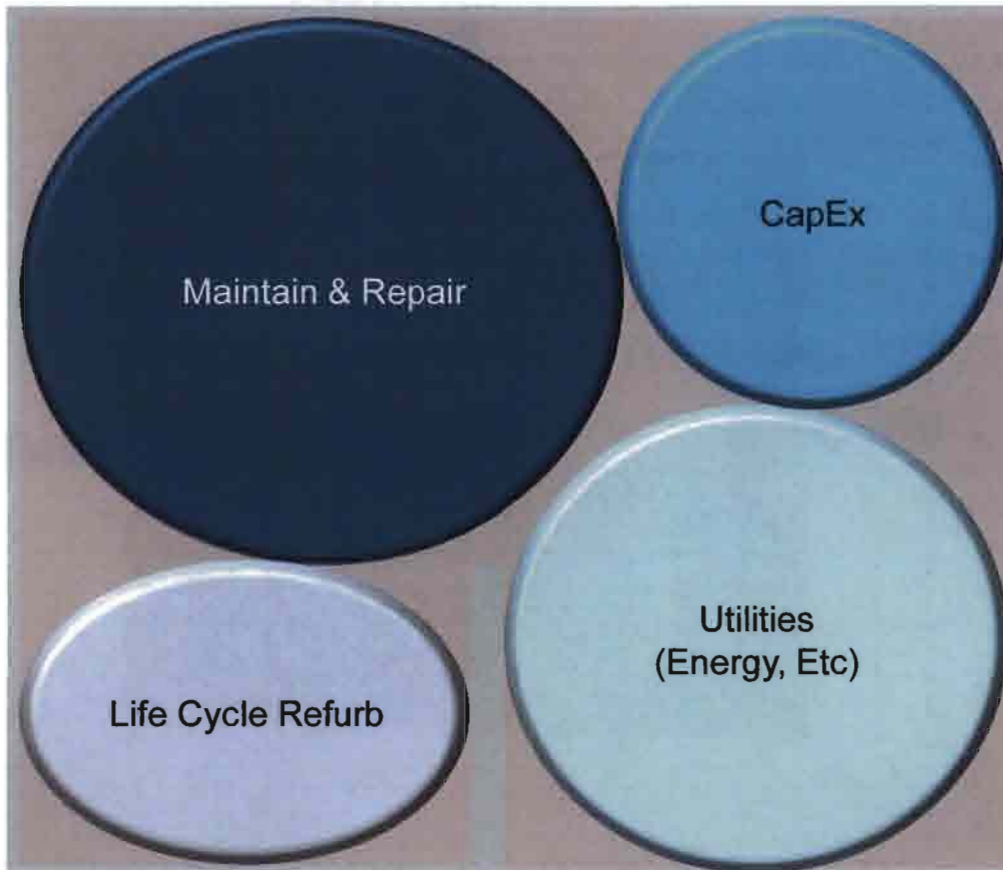
## Beyond “First in” Costs.....Hospital



Note 1: From July 2010 Healthcare BIM Consortium, An Organization consisting of Department of Defense Military Health System (DoD MHS), Department of Veterans Affairs (DVA), Kaiser Permanente (KP), and Sutter Health, representing \$26B of Healthcare construction

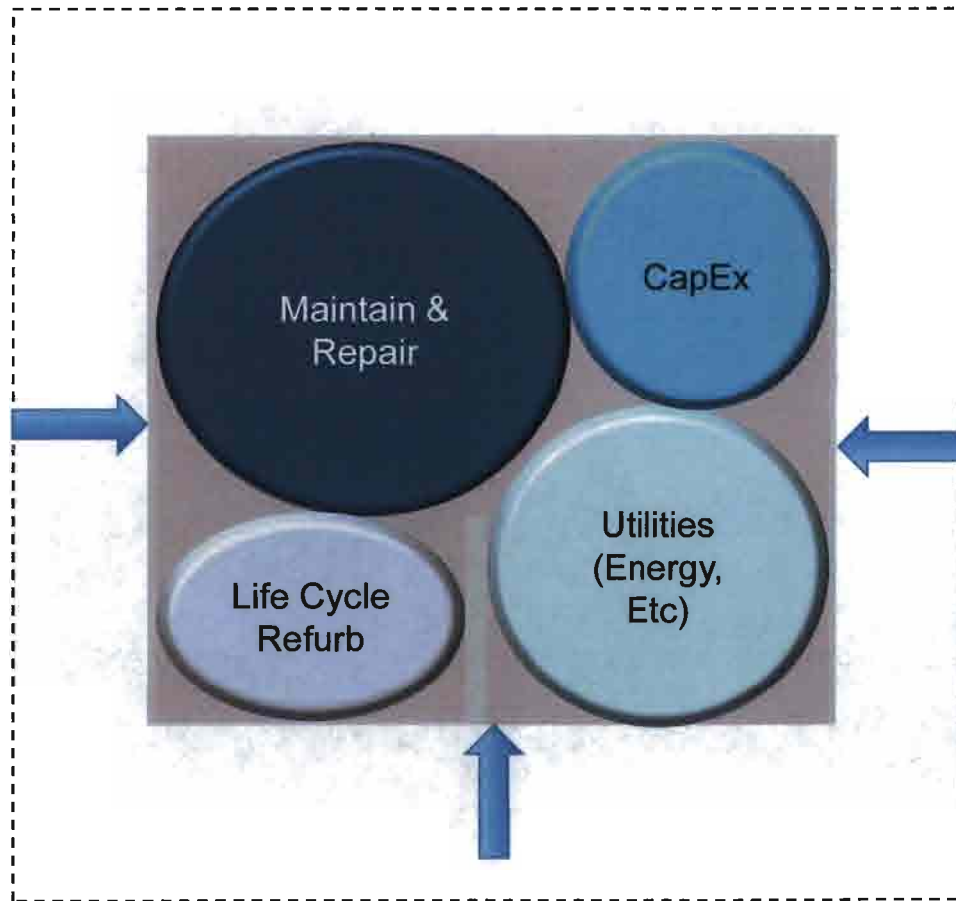
## Value Proposition – “Value for Money”

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- All aspects of Facility costs should be considered
- Decisions in one cost category will impact the others
- Driving down construction costs can have an adverse impact on long term costs

# Value Proposition - PPP



- Long term “Whole of Life” costs instead of first cost construction
- Good decisions during design process consider Value for Money and best investment approach
- Results in lower whole-of-life facility cost (the “box” is smaller)
- Provides outcomes that are guaranteed
- Financing returns are vehicle for Sponsor to enforce the guarantees

## Value for Money

The Real Story

Plenary



# Canada Line – Project Overview

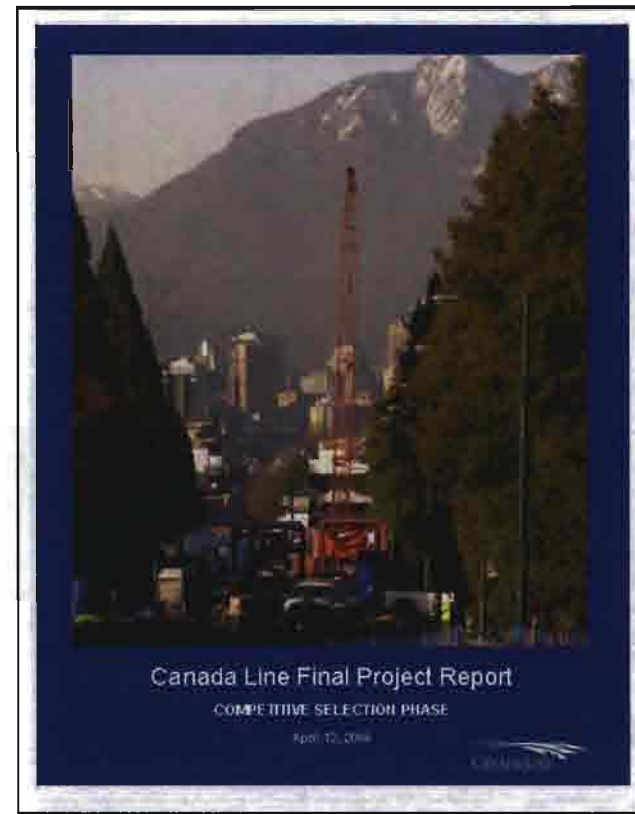
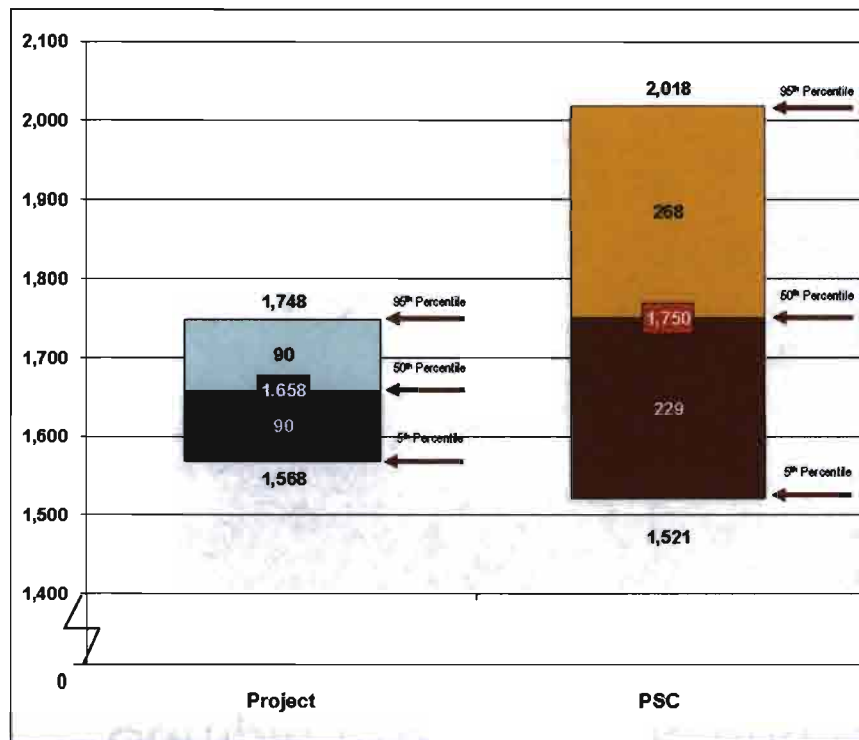
---

- 19km rapid transit system connecting downtown Vancouver with YVR
- 16 Stations
- 2 Bridges
- 9 kms of tunnel
- Funding:
  - \$1.331 million – public sector
  - \$720 million – private Partner
- 35 year concession
- DBFMO structure



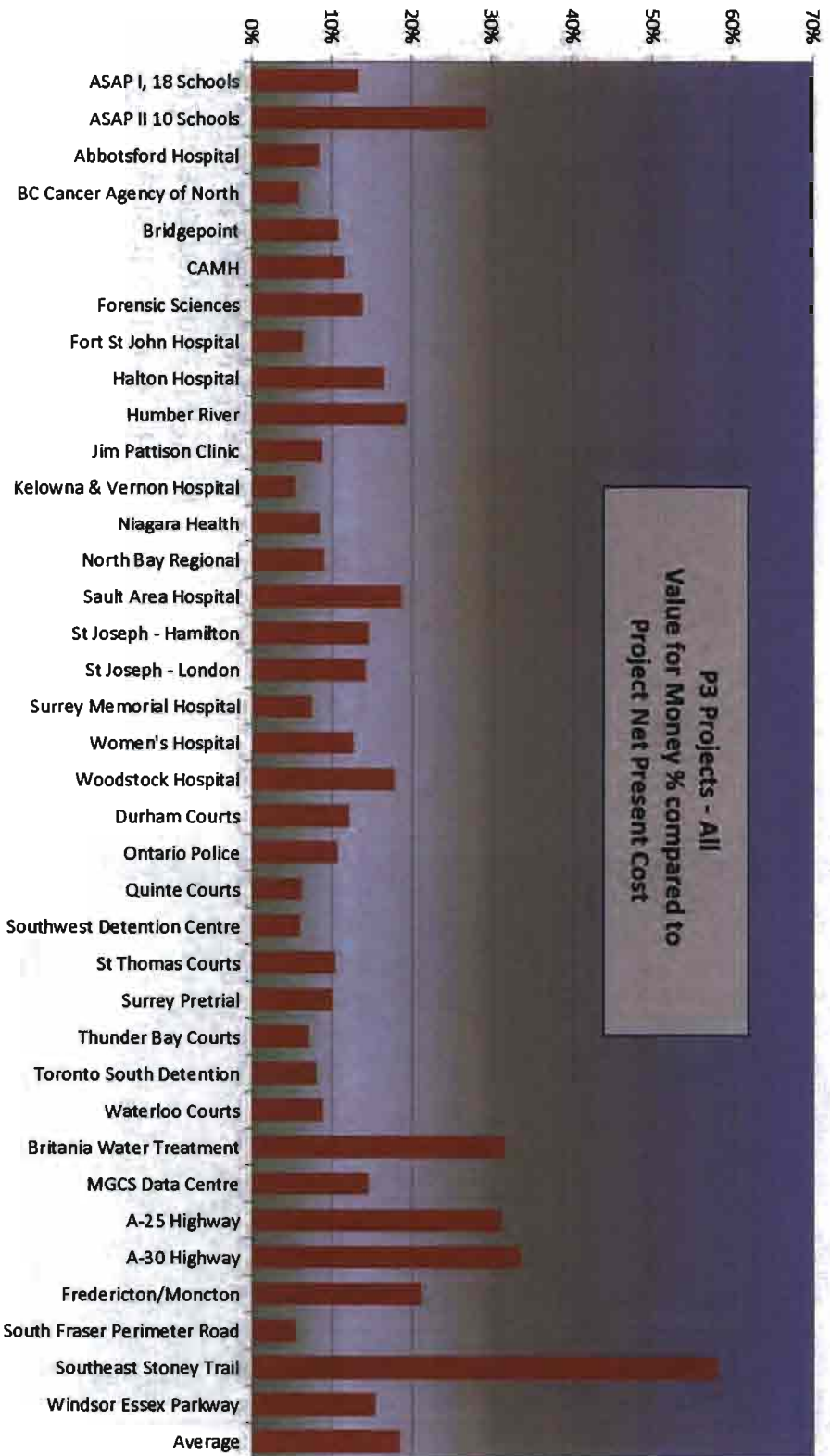
# Canada Line – Value for Money Report Summary

- Reviewed and agreed by the BC Auditor General
- NPC benefit of the PPP - \$92m and revenue NPV of \$148m at financial close



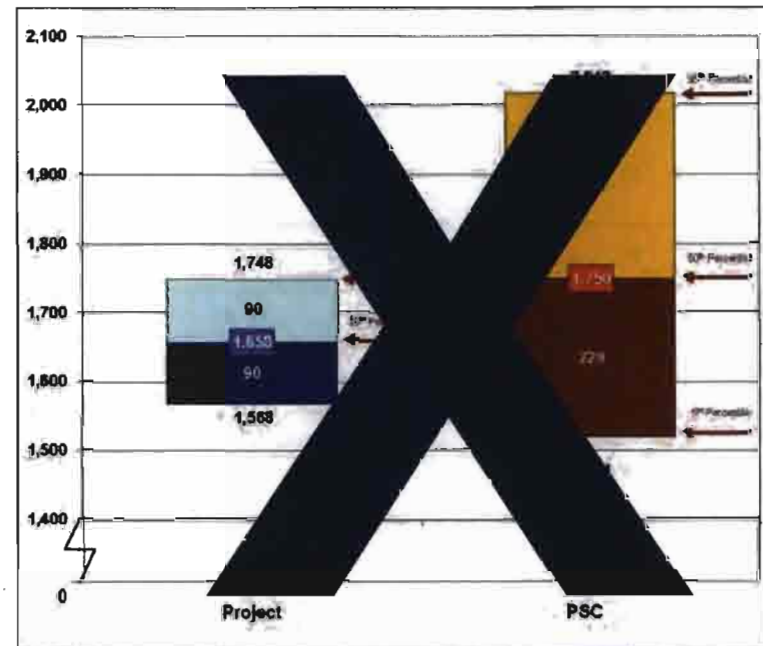
[http://www.partnershipsbcc.ca/files-4/documents/Canada-Line-Final-Project-Report\\_12April2006.pdf](http://www.partnershipsbcc.ca/files-4/documents/Canada-Line-Final-Project-Report_12April2006.pdf)

# Sample Project Costs and Savings (%)



## Real Determinants of Value

- This type of VFM analysis only tells part of the story
  - PSC is a hypothetical model
  - Doesn't assess programmatic impact
- Real value comes from:
  - Actual risk transfer during the construction and operating period;
  - Optimization of “whole of life costs”; and
  - Optimization of program costs
  - PPP process discipline brings certainty of delivery



## Tale of Two Projects

---

Same Time

Same Location

Similar Markets

P3 vs Traditional Procurement



# Abbotsford P3 Hospital - DBFMO



Size: 650,000 ft<sup>2</sup>

Services Available:

- » 300 Bed Acute Care hospital and ambulatory care facility
- » Regional cancer centre

Project Value: \$450 m

|                   |                                                 |
|-------------------|-------------------------------------------------|
| <b>Client</b>     | Fraser Health / BC Cancer Agency                |
| <b>Consortium</b> | ABN Amro, PCL, Johnson Controls                 |
| <b>Completion</b> | May 2008                                        |
| <b>Structure</b>  | Design, Build, Finance, Operate, Maintain (PGF) |
| <b>Status</b>     | Operations                                      |



# Abbotsford PGF Hospital

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## Key project successes:

- » \$ 0 change orders – first for Canadian public healthcare capital projects
- » On time – May 7, 2008

- » No preconceived design; Performance-based specifications
- » Partnership attitude
- » Strong political commitment
- » Health Co P3 knowledge & strong project management
- » Learned from others

# Vancouver Convention Centre



- » Large scale project undertaken by public sector with external project managers and construction management contract
- » Started as P3, but changed approach to Construction Management with a robust governance model using PGF principles

## Results:

- » Increase in price to over \$880m – up from original \$565m
- » Late by 6 months
- » Focus on “first costs” at the expense of lifecycle optimization
- » Even if completed on-budget, all risk with facility performance is still with VCC

## Comparison – ARHCC / VCC



### **Abbotsford Hospital & Cancer Centre**

|                           |                   |
|---------------------------|-------------------|
| <b>Architect</b>          | MCM               |
| <b>Constructor</b>        | PCL               |
| <b>Construction Start</b> | 2004              |
| <b>Procurement</b>        | DBFM – P3 (PGF)   |
| <b>Result</b>             | On / Under Budget |
| <b>Operations Start</b>   | On Time           |

### **Vancouver Convention Centre**

|                           |                         |
|---------------------------|-------------------------|
| <b>Architect</b>          | MCM                     |
| <b>Constructor</b>        | PCL                     |
| <b>Construction Start</b> | 2004                    |
| <b>Procurement</b>        | Construction Management |
| <b>Result</b>             | Over Budget (55% over)  |
| <b>Operations Start</b>   | 6 Months Late           |

# Public Private Partnerships

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## Overview & Structure



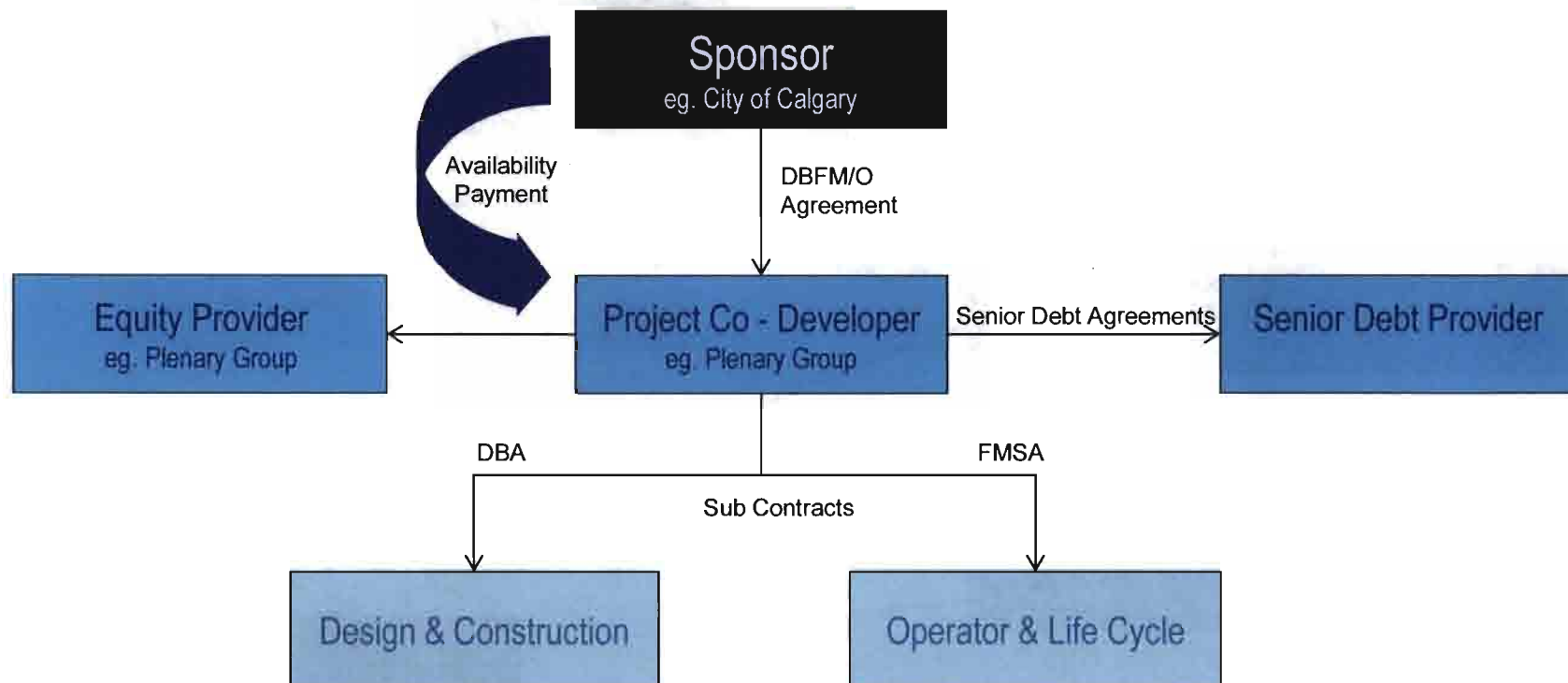
# What is a Public Private Partnership?

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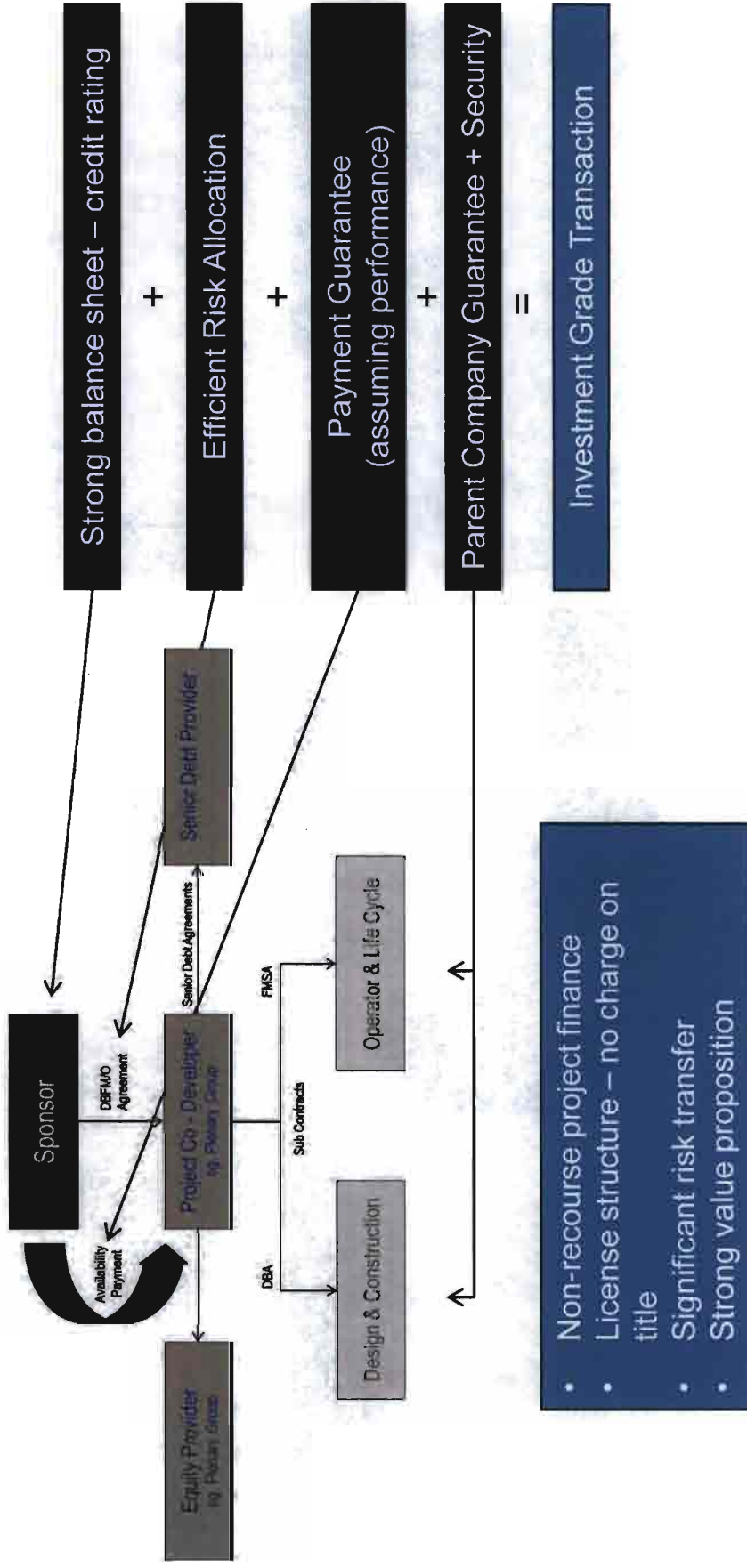
It goes by many names PPP, P3 PFI, but all are essentially it is:

- A Long term partnership where;
- Single entity (“Project Company”) accepts responsibility to Design, Build, Finance, Maintain and in some cases Operate infrastructure (greenfield or renovations and expansions)
- Asset management over a long term concession period (25 – 35 years) with pre-defined hand back conditions
- Single entity (“Project Company”) contracts with a Sponsor entity and in turn contracts with consortium partners
- Performance based contracting arrangements
  - Payment from Sponsor only begins upon completion of construction
  - On-going payments are subject to deduction for failures in service delivery
- Firm price for term of the concession

# Partnership Structure



# Ideal Structure Attributes



# Revenue Risk / Value Capture

---

- Very difficult to finance on a “green field” route
- Issues to consider:
  - Fare box revenues will only cover a small portion of the cost of these systems
  - Fare rates pricing are best kept by the public sector – politics and integration with existing transit system
- Canada line put 10% of payment to InTransit BC at risk for ridership revenues to incentivize private sector promotion and performance – it worked!
- Efforts should be made to “capture value” from TOD and the uptick in property values along the line, HOWEVER not as part of the base procurement for the system

# Extent of the Equipment & Services Bundle

---

## Equipment

- At a minimum all equipment would be procured in a way that ensures that it is commissioned and ready for operations at substantial completion
- Options include:
  - In contract
  - Cash allowance with procure and install
- Rolling stock:
  - If Sponsor has a preferred vendor and technology, do not include in the concession – depth of market

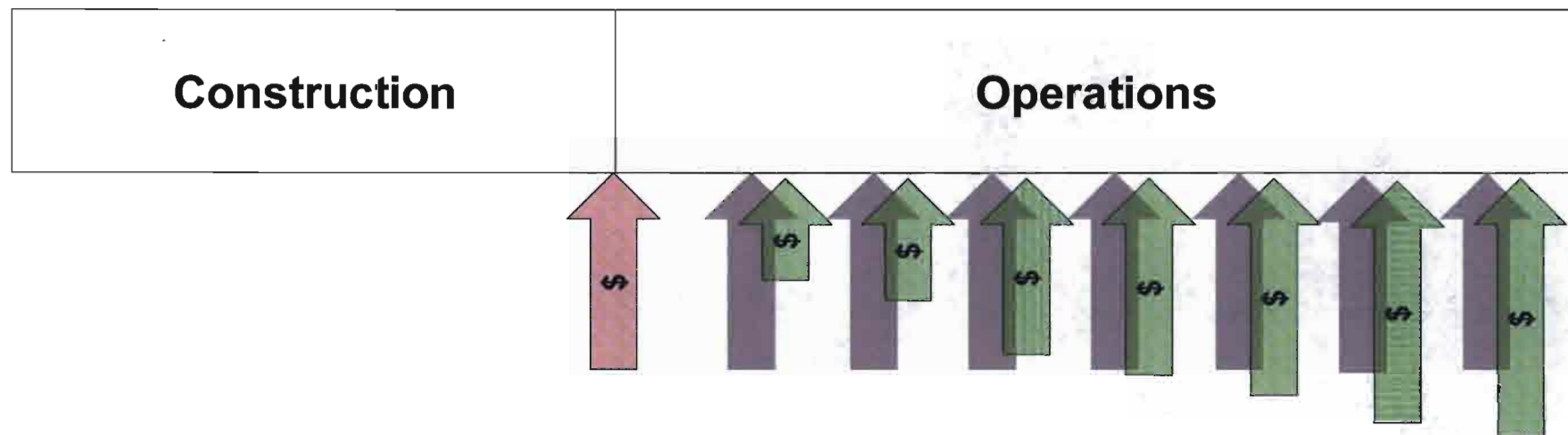
## Services

- At a minimum would need to include all maintenance and major and rehabilitation (hard FM)
- Options include:
  - Full operations included in the concession results in greater risk transfer
  - Need to consider integration with other transit systems



# Payment by the Sponsor

Availability-based PPP's are performance based contracting arrangements



Payment from Sponsor entity only begins upon completion of construction

Initial payment can include Sponsor contribution to lower long term financing costs

Ongoing payments remain subject to deductions for performance failures in service delivery

Payments can reflect projected revenue increases

# Case Study Example

## Gold Coast Rapid Transit



# Project Background

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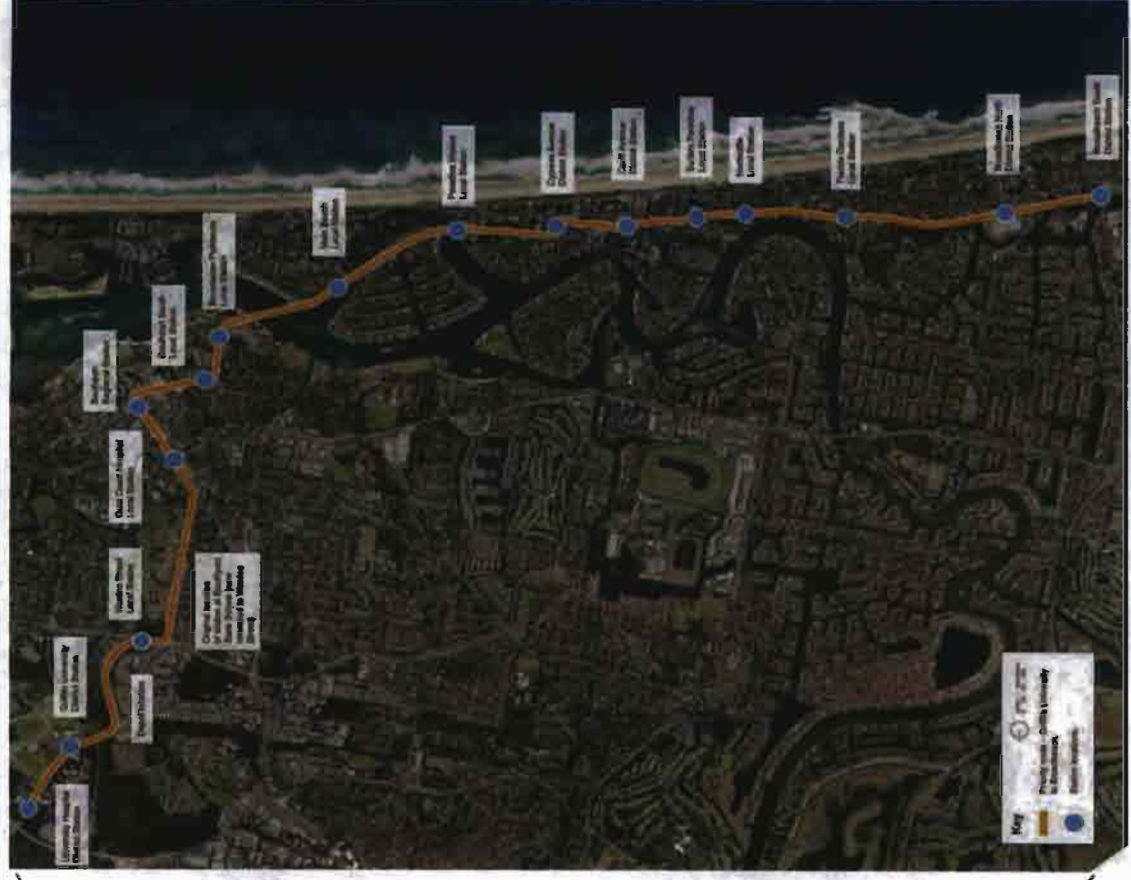
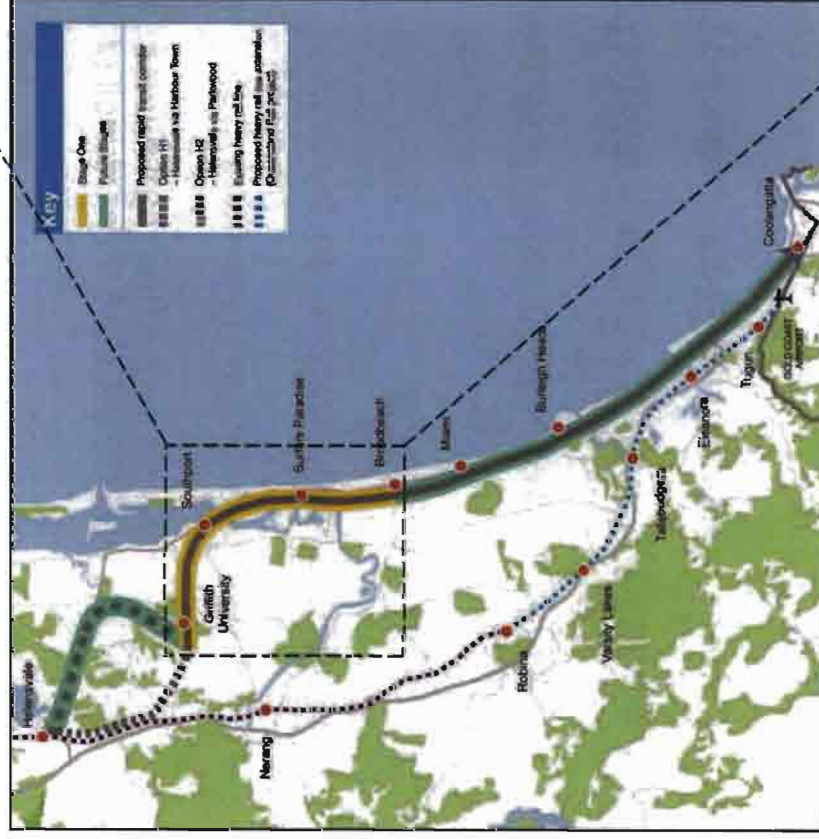
The Gold Coast is Australia's largest non-capital city

- Current population of 600,000, projected to be 800,000 by 2030
- But has one of the lowest usage rates of public transport, at 4% of trips
- GCRT is a 'city-changing' project, addressing population growth and public transport needs

Development Process:

- GCRT feasibility study conducted in 2004
- Preference for light rail (v bus) confirmed in 2008
- By 2009, funding committed from Queensland Government (\$464M), the Commonwealth (\$365M), and Gold Coast City Council (\$120M)
- In December 2009, the State of Queensland called for Expressions of Interest for a Operator Franchisee to deliver and operate the GCRT system, under a PPP framework
  - Total cost of \$1 billion
  - Government funded c.\$140M of Early and Enabling Works

# Route





# Project Specifications

---

## Stations and access

|                      |                                                                                     |
|----------------------|-------------------------------------------------------------------------------------|
| Stations             | 16 stations                                                                         |
| Terminus             | Gold Coast University Hospital / Griffith University (north) and Broadbeach (south) |
| Key bus interchanges | Griffith University, Southport, and Broadbeach                                      |

## Service

|                      |                                                                         |
|----------------------|-------------------------------------------------------------------------|
| Daily Service        | 200-280 services / day (weekday), 220-270 services / day (weekend)      |
| Maximum peak headway | 7.5 minutes                                                             |
| Hours of operation   | 5AM to Midnight (weekday), 24 hours per day (weekend)                   |
| Ticketing            | TransLink Transit Authority's integrated ticketing and zone fare system |

## Infrastructure

|          |                                                                                             |
|----------|---------------------------------------------------------------------------------------------|
| Corridor | 13-kilometre dedicated, at grade, standard gauge, generally centre running in road corridor |
| Depot    | Existing government site, near Southport                                                    |

## Rolling Stock

|                      |                                                                                                     |
|----------------------|-----------------------------------------------------------------------------------------------------|
| Vehicles             | 2.65-metre wide, 70% low floor light rail                                                           |
| Power supply         | 750 volt DC, overhead catenary                                                                      |
| Maximum Design Speed | 70km/h                                                                                              |
| Capacity             | 200 per LRV in AW2 loading (4 passengers / m <sup>2</sup> , 1/3 <sup>rd</sup> of passengers seated) |

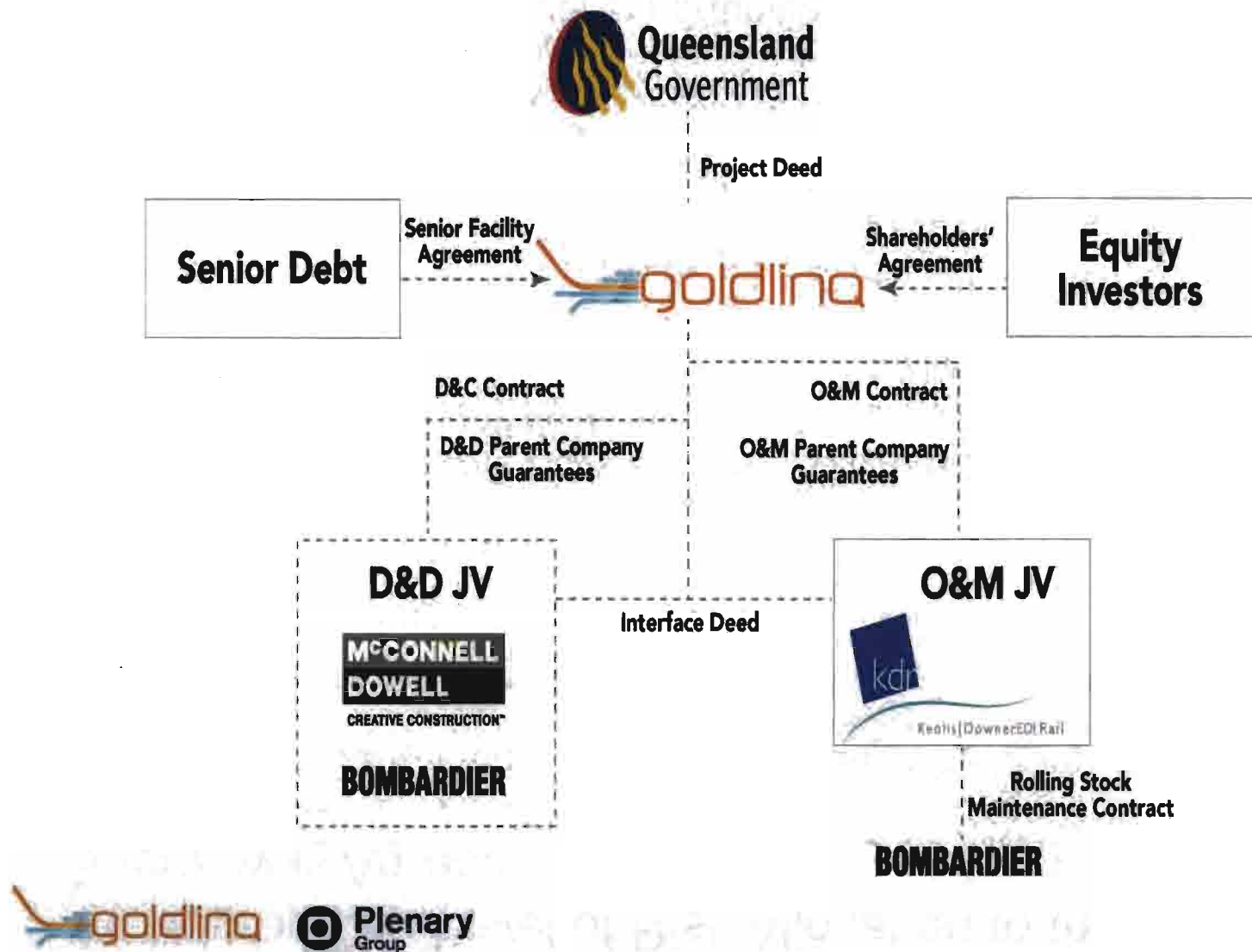


## As a transport P3 on the Gold Coast, the GCRT Project had unique challenges

---

- GoldLinQ, not the State, provides the Core Service
- High levels of customer service and community engagement are a must
- A 13km open 'site' through a high density urban environment
  - Need to 'keep city moving'
  - Fit around Special Events such as V8 SuperCars and Schoolies
- Difficult Depot site
  - Landfill site next to an existing council depot
- Design and construction capability in both Civil Works and Systems not within any single organization
- Testing and commissioning process (required for Completion) is reliant on the Operator running services
- 15 year concession

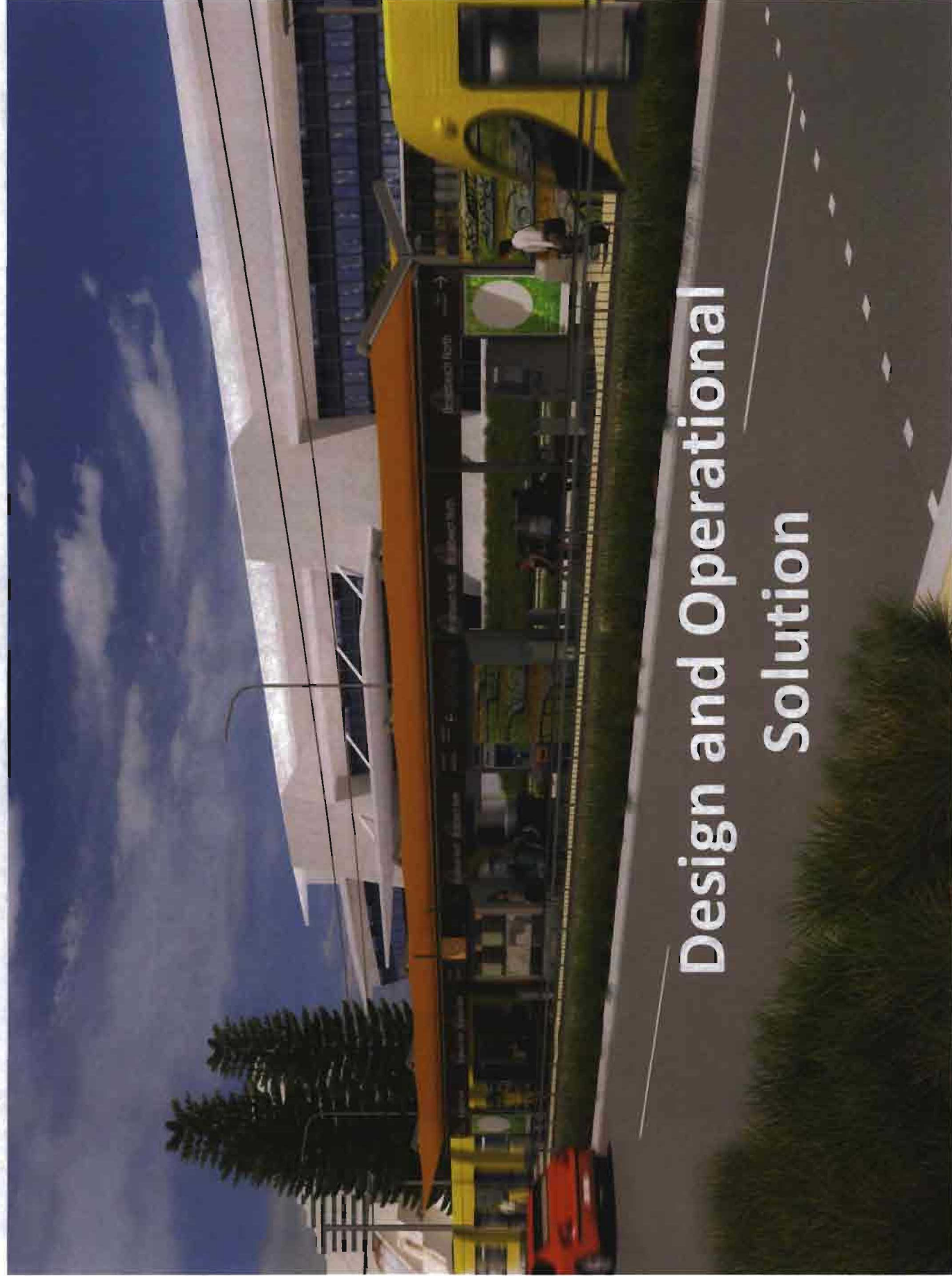
# GoldLinQ Structured to Deliver Appropriate Risk Transfer



# An Appropriate Level of Risk Allocation to the Private Sector was Agreed

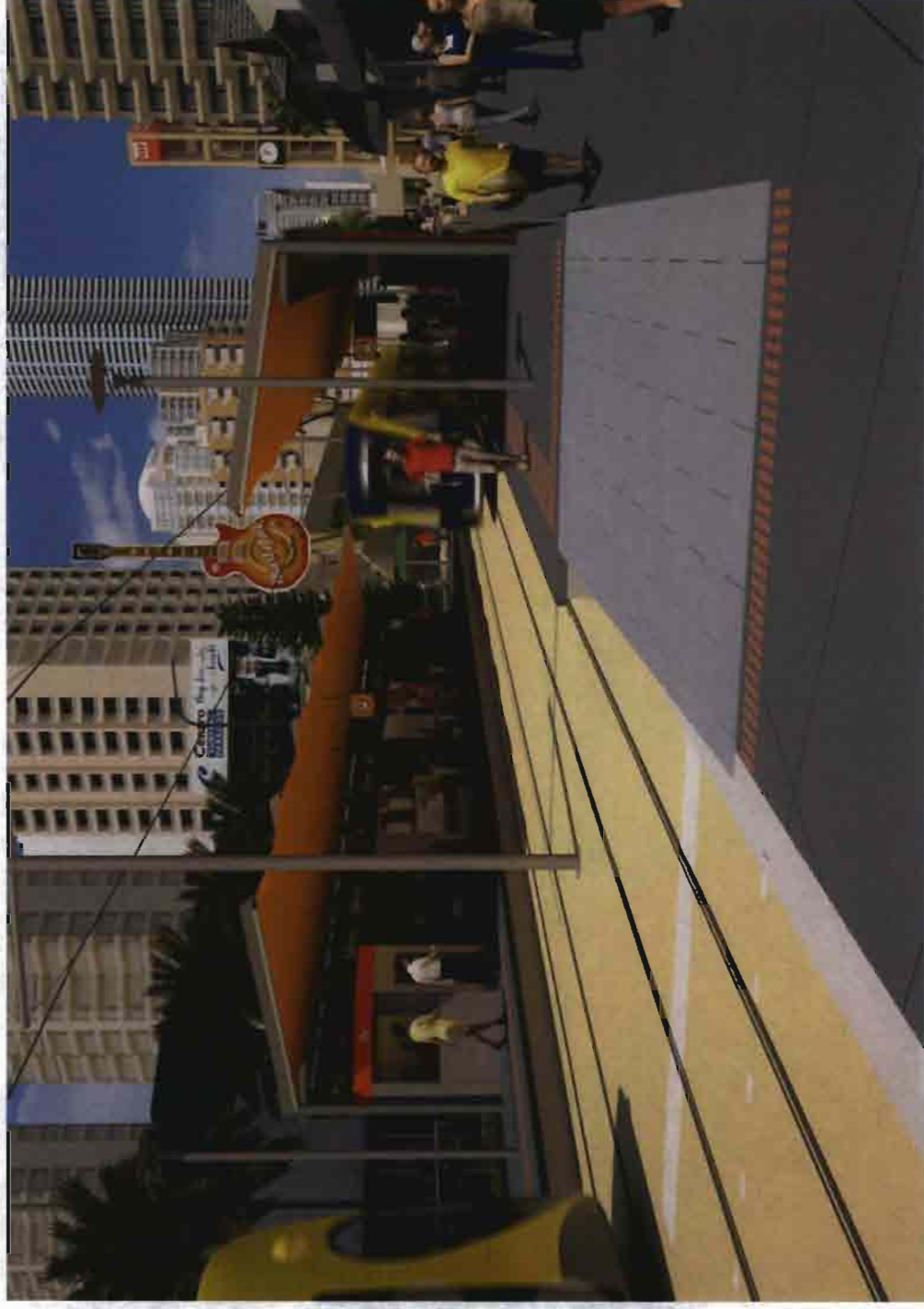
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- Delivery of Early Works on time guaranteed by State
- Otherwise, delivery on time and budget is responsibility of private sector
  - 3 Year construction programme that minimises disruption and recognises Special Events
- Once complete, State pays an Availability based payment, with abatement for low reliability or quality
  - Nil profit to private sector until Completion had occurred
  - Fare revenue retained by State
  - Ensured ready availability of private sector finance
  - State able to retain fare setting within the overall Translink system
  - Private sector took full third party / event risk on abatement
- No Refinancing / Market Disruption / Right to Break risk to State
- Only ancillary commercial opportunities within PPP



# Design and Operational Solution

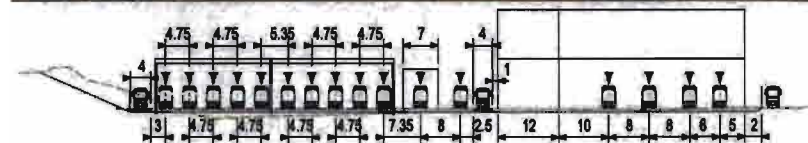
## Sensitive Delivery of a New System Through the Heart of the Gold Coast





# An Innovative Depot Solution Saved Millions Relative to the State Reference Scheme

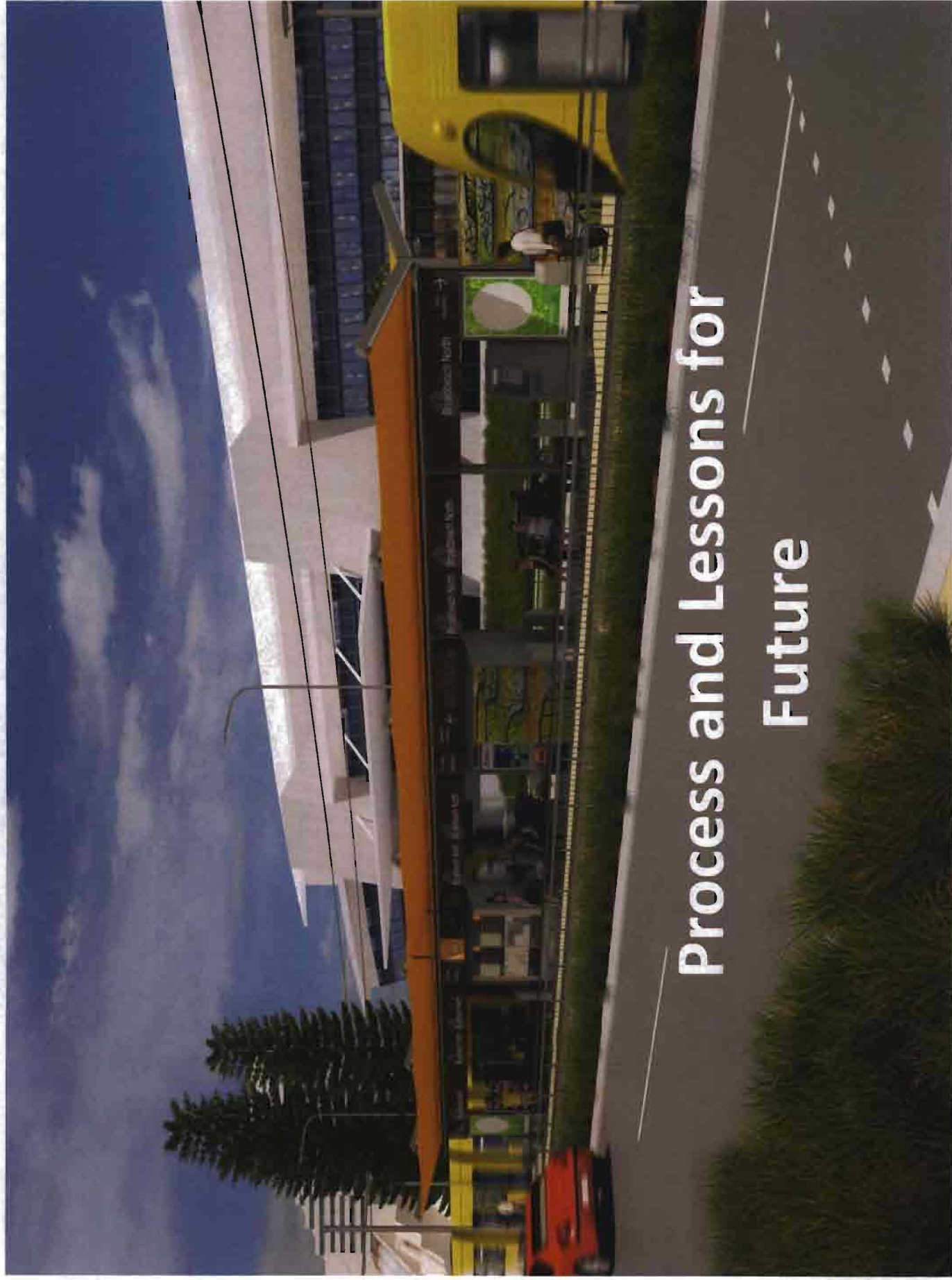
- Avoided landfill site to west, lowering risk
- Minimised need for council depot land to east
- Expandable to west and east
- Cross-over tracks allow depot entry from both directions, and maximum manoeuvrability within depot



# GoldLinQ

---

- A fully-resourced SPV
  - 10 staff, including CEO and four Directors (Rail Safety, Technical, Stakeholder, Finance / Commercial)
  - Recognises importance of community consultation
  - Holds Rail Safety Accreditation and associated duties
- Retained Risks
  - 'Macro' Events (e.g.: natural disasters)
  - Civil Works Defects
  - Counterparty risk on D&C and O&M
  - Financing
  - Tax



# Process and Lessons for Future

# An Efficient Procurement Process

---

- Dedicated Project Team
  - Headed by Department of Transport and Main Roads personnel
  - Presented to private sector as team (not individual consultants)
  - Recognised city-changing nature (and disruption) via a focus on community engagement
- 18 month timeline from EoI to Financial Close:
  - December 2009: Invitation for Expressions of Interest
  - March 2010: Submission of Expressions of Interest by 6 consortia
  - May 2010: Shortlist of 3 announced
  - July 2010: Request for Proposals Issued
  - November 2010: Proposals Submitted
  - March 2011: Exclusive Negotiations commence with GoldLinQ
  - May 2011: Contractual Close
  - June 2011: Financial Close
- Actual Dates matched the timeline set out in the EoI document
  - Both State and Private Sector met the procurement deadlines



# Key Lessons for State on Future Public Transport PPP Procurement

---

- An empowered State Project Team that is able to make decisions and keep to timelines is essential
- Achieving buy-in from three levels of Government
- The decision by the State to go directly from 3 proponents to exclusive negotiations vindicated by outcome
  - Complexity means you need to negotiate final solution 1 on 1
  - PSC was bettered, while achieving innovation
  - Financial Close achieved on time
- State Capital Contribution provided VFM, while maintaining appropriate risk transfer
- Availability based public transport PPPs are readily deliverable with an appropriate level of risk transfer



# Key Lessons for State on Future Public Transport PPPs

---

- Early Works packages accelerate delivery, but cost overruns and completion criteria need to be managed by Government
- PUP is a big risk issue for both Government and private sector
- Catenary free should be considered (if appropriate) – technology much more advanced since GCRT
- Government can obtain long term value for money on a multi-stage network at tender stage:
  - Pre-priced options rather than Modifications
  - But there is a limit to items that can be discretely priced

# Key Lessons for the Private Sector on Future Public Transport PPPs

---

- Successful integration of SPV, D&C JV and O&M JV is essential to ensure best possible outcome for the ultimate customers (passengers)
  - Operator input into design is a must
  - Risk allocations within and between JVs needs to be appropriate
- Prior experience in finance parties is particularly beneficial for transport PPPs
- Take the responsibility that comes with the State passing core service performance to the private sector seriously



## Plenary Group Overview

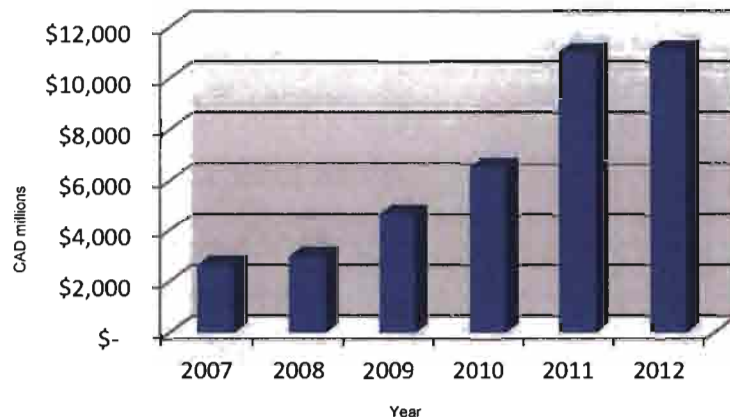
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# Plenary Group Corporate

## Key statistics

- Established 2004
- Projects completed 22
- Total project value over \$11bn
- Offices 10
- Employees 110+

Cumulative Project Capitalization (Plenary Globally)



## History

- Executives active in Canadian market since 2002, initially with ABN AMRO Bank (with 40+ projects completed since 1990's)
- 30% owned by Deutsche Bank Australia
- Operations in 2 Continents: Australia and North America
- International infrastructure business with a focus on long-term availability-based concessions
- Healthcare providers look to Plenary as a trusted and authoritative voice on the best manner to deliver infrastructure facilities that will meet future needs
- The development of Plenary's approach to sustainability:
  - Economic: sustaining our business and the broader P3 market
  - Environmental: the impact our projects have on the environment
  - Social: the contribution we make as a business to the community

# Plenary Group in North America

## Key Statistics

|                     |        |
|---------------------|--------|
| Established         | 2005   |
| Projects completed  | 13     |
| Total project value | \$6 bn |
| Offices             | 6      |
| Employees           | 60+    |

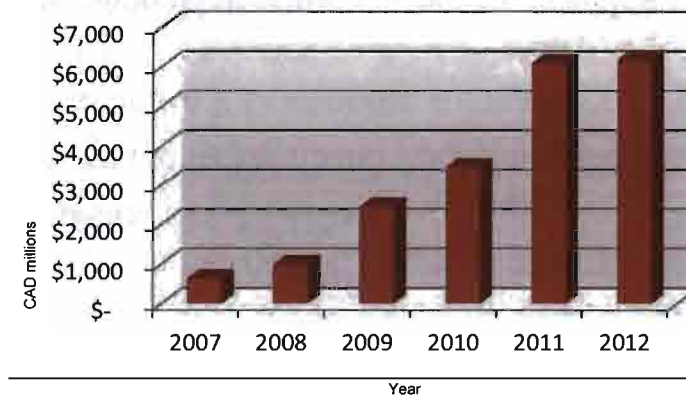
## Profile

- Project lead, developer and equity investor – provides oversight of design, construction and operations – aligns with client interests
- Financial advice and structuring
- Holistic approach and long term investor
- One of North America's largest dedicated P3 developer teams

## Office Locations

- Los Angeles CA
- Denver CO
- Vancouver BC
- Winnipeg MB
- Toronto ON
- Ottawa ON

## Cumulative Project Capitalization (North America only)





# North American Portfolio



**North Bay Regional Health Centre**  
North Bay, Ontario



**Archives of Ontario (York University)**  
Toronto, Ontario



**MGS New Data Centre**  
Guelph, Ontario



**Bridgepoint Hospital**  
Toronto, Ontario



**Disraeli Bridges Project**  
Winnipeg, Manitoba



**St. Joseph's Healthcare Hamilton**  
Hamilton, Ontario



**NHS Health-Care Complex**  
St.Catharines, Ontario



**BCCA**  
Prince George, British Columbia



**Thunder Bay Consolidated Courthouse**  
Thunder Bay, Ontario



**US 36 Concession**  
Denver, Colorado



**CSEC**  
Ottawa, Ontario



**Humber River Regional Hospital**  
Toronto, Ontario



**Interior Heart & Surgical Centre**  
Kelowna, British Columbia

# Australian Portfolio

---



**Melbourne Convention Center**  
Melbourne, Australia



**Gold Coast Rapid Transit**  
Gold Coast, Australia



**Victoria Comprehensive Cancer Centre**  
Melbourne, Victoria, Australia



**Biosciences Research Center**  
Melbourne, Australia



**Casey Hospital**  
Melbourne, Australia



**Barwon Water Biosolids**  
Geelong, Victoria, Australia



**South Australian Police & Courts**  
Regional South Australia



**Australian Defence LEAP 2**  
All Mainland States & Territories



**Australian Defence LEAP 1**  
New South Wales, Australia

# Globally Recognized Leadership

- ✓ 1st – Global Sponsors (Social Infrastructure PPP Transactions)
- ✓ 2nd – Global Sponsors (All PPP Transactions)
- ✓ 6th – Global Sponsors (All Infrastructure Transactions)
- ✓ 10<sup>th</sup> – Global Sponsors (All Project Finance Transactions)
- ✓ WFM – Best Project Sponsor North America (2013)
- ✓ WFM – Best Hospital Project North America (2013)
- ✓ WFM – Global Sponsor of the Year (2013)
- ✓ North American Developer of the Year (2010)
- ✓ North American PPP Deal of the Year (2011/2009)

| Global Sponsor of PPP / P3 transactions (Infrastructure Journal) |                                    |                |              |                  |
|------------------------------------------------------------------|------------------------------------|----------------|--------------|------------------|
| RANK                                                             | COMPANY                            | TOTAL (US \$M) | TRANSACTIONS | MARKET SHARE (%) |
| 1                                                                | Eiffage                            | 4,657          | 3            | 8.39             |
| 2                                                                | Plenary Group                      | 4,273          | 5            | 7.70             |
| 3                                                                | Larsen & Toubro                    | 3,635          | 1            | 6.55             |
| 4                                                                | Vinci                              | 2,622          | 9            | 4.72             |
| 5                                                                | Caisse des Depots et Consignations | 2,058          | 4            | 3.71             |
| 6                                                                | Barclays Infrastructure Funds      | 1,860          | 6            | 3.35             |
| 7                                                                | Reliance Infrastructure            | 1,843          | 1            | 3.32             |
| 8                                                                | Meridiam                           | 1,764          | 3            | 3.18             |
| 9                                                                | Obrascon Huarte Lain (OHL)         | 1,200          | 2            | 2.16             |
| 10                                                               | AXA Private Equity                 | 1,149          | 1            | 2.07             |

| Sponsor of Global Project Finance Deals- Full Year 2011 (Dealog) |                   |                |              |                  |
|------------------------------------------------------------------|-------------------|----------------|--------------|------------------|
| RANK                                                             | SPONSOR           | VALUE (US \$M) | TRANSACTIONS | MARKET SHARE (%) |
| 1                                                                | Adani Group       | 6,829          | 10           | 1.7              |
| 2                                                                | Vedanta Resources | 6,060          | 2            | 1.5              |
| 3                                                                | Larsen & Toubro   | 5,901          | 3            | 1.5              |
| 4                                                                | Exxon Mobil Corp  | 5,246          | 2            | 1.3              |
| 5                                                                | Ecopetrol         | 5,002          | 1            | 1.2              |
| 6                                                                | Qatar Petroleum   | 4,921          | 1            | 1.2              |
| 7                                                                | NextEra Energy    | 4,395          | 6            | 1.1              |
| 8                                                                | Turkmen gaz       | 4,100          | 1            | 1.0              |
| 9                                                                | Gazprom           | 4,007          | 4            | 1.0              |
| 10                                                               | Plenary Group     | 3,840          | 6            | 1.0              |

| Global Sponsor of All Infrastructure transactions (Infrastructure Journal) |                 |                |              |                  |
|----------------------------------------------------------------------------|-----------------|----------------|--------------|------------------|
| RANK                                                                       | COMPANY         | TOTAL (US \$M) | TRANSACTIONS | MARKET SHARE (%) |
| 1                                                                          | Qatar Petroleum | 9,634          | 1            | 3.93             |
| 2                                                                          | Masaden         | 8,513          | 4            | 3.47             |
| 3                                                                          | Ecopetrol       | 5,002          | 1            | 2.04             |
| 4                                                                          | Eiffage         | 4,657          | 3            | 1.90             |
| 5                                                                          | Nextera Energy  | 4,339          | 7            | 1.77             |
| 6                                                                          | Plenary Group   | 4,273          | 5            | 1.74             |
| 7                                                                          | Larsen & Toubro | 3,635          | 1            | 1.48             |
| 8                                                                          | Origin Energy   | 3,302          | 1            | 1.35             |
| 9                                                                          | Acciona         | 2,888          | 9            | 1.19             |
| 10                                                                         | Alcoa           | 2,875          | 4            | 1.17             |



## Questions?

Mike Marasco  
CEO Plenary Concessions  
Phone: (416) 309-2226  
Mobile: (604) 897-6963  
[mike.marasco@plenarygroup.com](mailto:mike.marasco@plenarygroup.com)



# Appendix F

**Revenue Sources Presentation  
By John Howe**



# Potential revenue sources

## The Greater Toronto/ Metrolinx experience

John Howe for

SETWAY Innovative Funding  
and Financing Workshop

Calgary, December 9, 2013



Yonge and Dundas, Toronto  
[www.thestar.com](http://www.thestar.com)

# Presentation outline

- Metrolinx and the GTHA
- The challenge: Relentless growth
- Congestion, the burning platform
- The solution: The Big Move, a \$50 billion plan
- Project prioritization
- How will we pay? Proposed revenue tools
- Evaluating the tools
- A call for leadership
- What next?



Highway 401, Mississauga  
[www.wikimedia.org](http://www.wikimedia.org)

# What is Metrolinx?

- The regional transportation authority for the Greater Toronto and Hamilton Area (GTHA)
- Created by provincial legislation in 2007, reporting to the Minister of Transportation
- Mandated to:
  - Coordinate transportation planning, projects and services in the Greater Toronto and Hamilton Area
  - Recommend an Investment Strategy, including new revenue tools to fund transit expansion – by 2013



Bay Street, Toronto  
nationalpost.com



# Evolution

- |             |                                                                                                                                                                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2007</b> | Inaugural Metrolinx Board meeting                                                                                                                                                                                                                                                             |
| <b>2008</b> | Metrolinx completes <i>The Big Move</i> regional transportation plan <ul style="list-style-type: none"><li>• A bold 25-year, \$50 million blueprint</li></ul>                                                                                                                                 |
| <b>2009</b> | Province of Ontario: <ul style="list-style-type: none"><li>• Commits \$9 billion to fund the first wave of <i>Big Move</i> projects</li><li>• Replaces Metrolinx Board with private-sector appointees</li><li>• Transfers ownership of GO Transit and PRESTO fare card to Metrolinx</li></ul> |
| <b>2010</b> | First construction groundbreaking: <ul style="list-style-type: none"><li>• Metrolinx assumes 100% ownership and control of major new transit projects from municipalities</li></ul>                                                                                                           |
| <b>2013</b> | Metrolinx completes the Investment Strategy, including proposed revenue tools to build the next wave of <i>Big Move</i> projects                                                                                                                                                              |
| <b>2014</b> | Province responds to Investment Strategy recommendations                                                                                                                                                                                                                                      |

Planning agency

Implementation agency

Empowered agency TBD

# The GTHA

## Ontario's "Golden Horseshoe"

- 8,400 square km
- 30 municipalities
- Mix of upper- and lower-tier municipalities
- Nine transit service providers
- Metrolinx: The only public agency with a pan-regional mandate area





# The challenge

## Relentless growth

- One of North America's largest and fastest-growing urban regions
- From 6.6 million to 9 million people in 25 years
- 1.5 million more cars

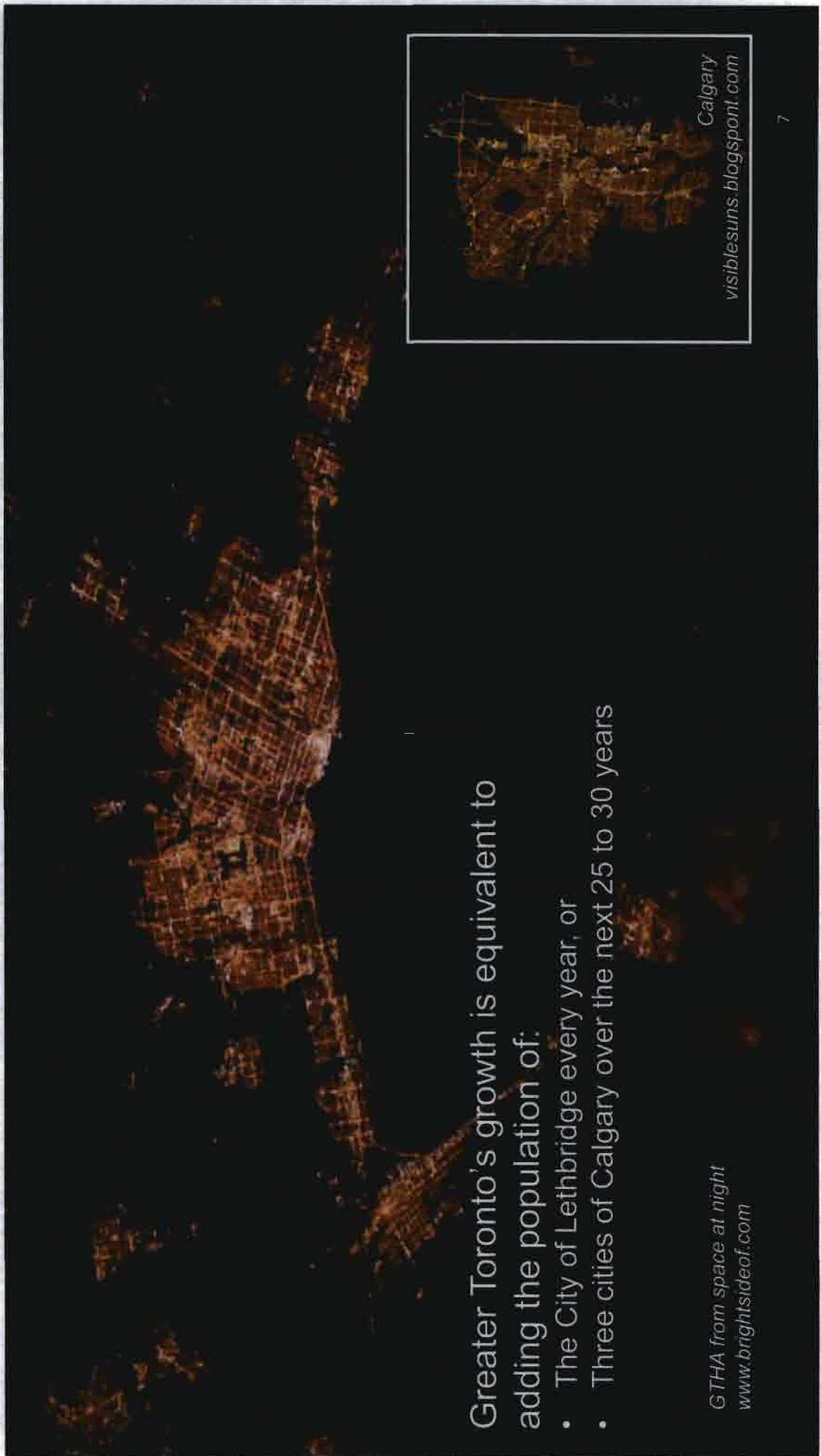
Toronto's skyline today ...



In 10 years



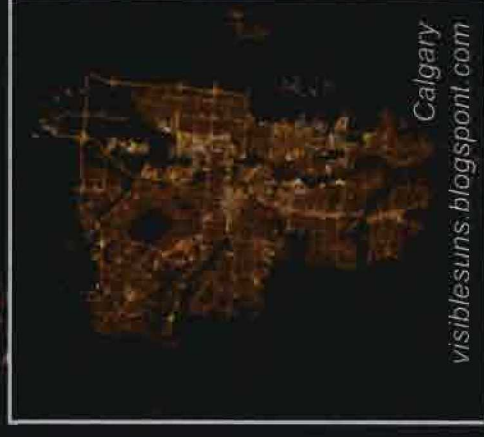
Renderings by Scott Dickson  
[www.urbantorontoca](http://www.urbantorontoca)



Greater Toronto's growth is equivalent to adding the population of:

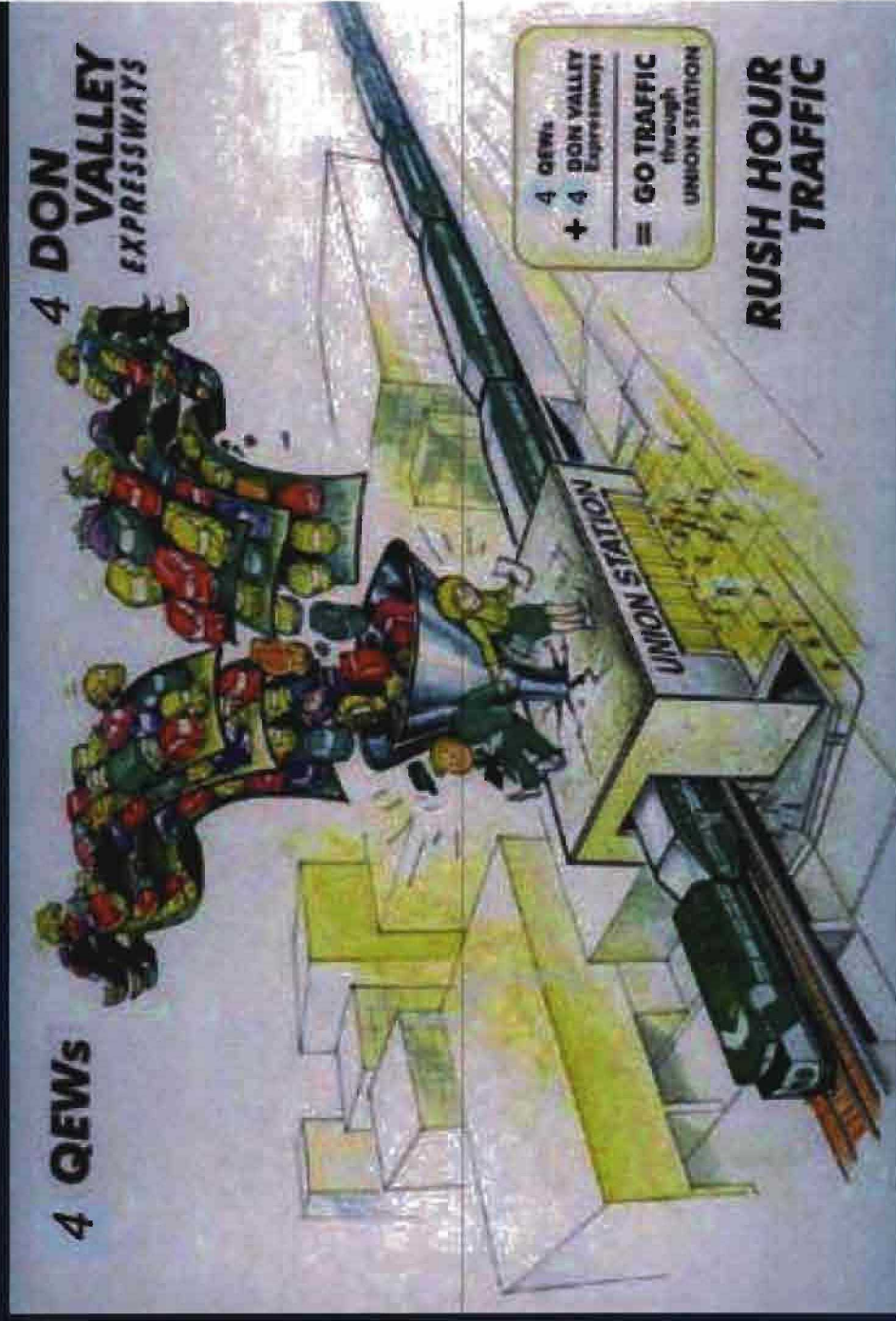
- The City of Lethbridge every year, or
- Three cities of Calgary over the next 25 to 30 years

GTHA from space at night  
[www.brightsideof.com](http://www.brightsideof.com)



Calgary  
[visibleuns.blogspot.com](http://visibleuns.blogspot.com)

The GTHA  
can't pave  
the way to  
growth and  
prosperity  
with more  
expressways

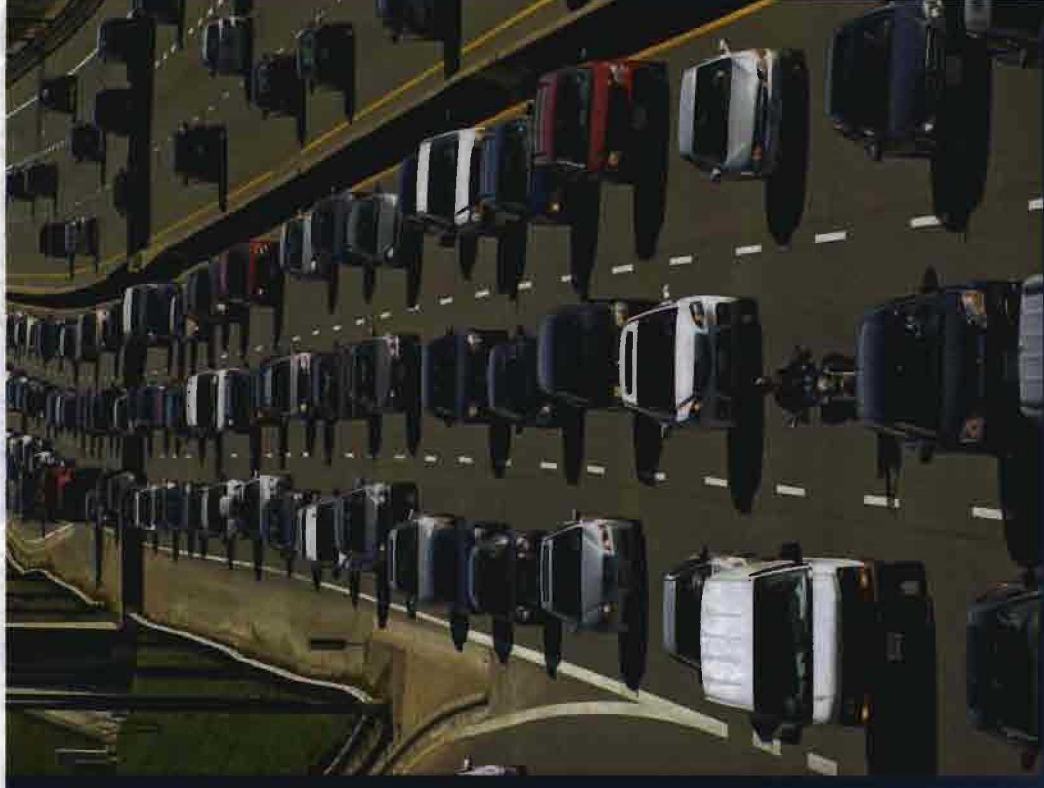




# The “burning platform”

## Congestion: The consequence of success

- Annual cost of congestion in the GTHA
  - \$3.3 billion** per year in lost personal time
  - \$2.7 billion** per year in lost GDP
  - 26,000 jobs** lost per year
- Growing cost of inaction: **\$15 billion** per year in 25 years



Don Valley Parkway at Bayview-Bloor  
[torontocitylife.com](http://torontocitylife.com)

# The costs are personal

- Average daily commute: **82 minutes** per day increasing to **109 minutes** per day in 25 years
- Average cost of car ownership: \$10,000 per year per vehicle
- Families spend more money on transportation than food or clothing





# Public enemy number one

- Transportation is the most important local issue for **48%** of Greater Toronto residents
- More important than crime, development, economy, government and taxes
- Commuting is stressful or very stressful for **55%** of residents

Source: Environics, Focus GTA, Spring 2013



Union Station evening rush  
[www.thestar.com](http://www.thestar.com)

# Crisis in confidence

Keeping pace with growth and making up for decades of under investment

- **82%** say congestion is getting worse
- **50%** say the Gardiner Expressway is unsafe

Source: Environics, Focus GTA, Spring 2013 and Forum Research, December 2012



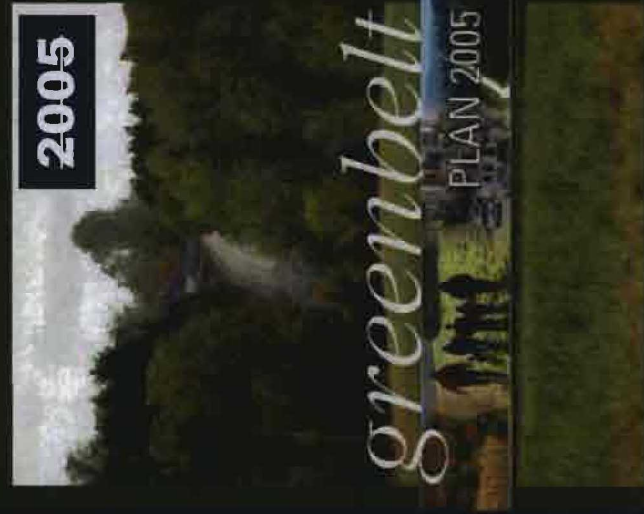
Lakeshore Blvd, Toronto  
[chfi.com](http://chfi.com)



[www.torontolife.com](http://www.torontolife.com)

# The solution... a long time in the making

- Ontario's "policy trifecta"
- The missing link: long-term sustainable transit funding





# Policy and planning symmetry and flow



Greenbelt Plan



Growth Plan



Regional Transportation Plan





# Results and benefits for \$2 billion per year

- Expand rapid transit network to **1,500 km** up from 500 km today
- Bring rapid transit to within 2 km of **80%** of the region's population up from 40% today
- Increase transit modal share to **30%** up from 17% today
- "Manage down" average daily commute to **77 minutes** down from 82 minutes today or 109 minutes in 25 years



Union Station platforms today  
[blogto.com](http://blogto.com)

In 2015-16  
[toronto.ca](http://toronto.ca)

# Big Move projects underway: \$16 billion

## One of North America's largest transit expansion programs

- Funded by traditional direct government capital grants
- 75% from Ontario and Metrolinx
- Most projects completed over the next two to 10 years
- A strong "downpayment" – but the region cannot afford to stop here
- New revenue tools required to complete the full Big Move vision



Eglinton Crosstown LRT  
Finch West LRT  
Mississauga BRT  
Scarborough subway  
Sheppard East LRT  
Union-Pearson Express rail  
Union Station hub expansion  
York Region BRT  
York University-Vaughan subway



Delivering projects on time and on budget is key

- To win public confidence in governments' ability to collaborate and make progress
- To gain support for new revenue tools – to complete the “Next Wave” of investment, results and benefits

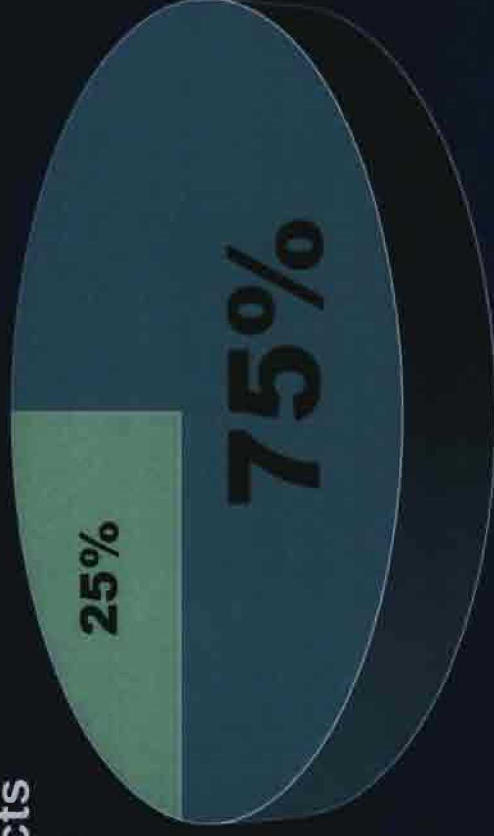


Union Pearson Express rail station under construction, Pearson International Airport  
[transit.toronto.on.ca](http://transit.toronto.on.ca)

# Proposed Big Move “Next Wave”

## “Final mile” projects

- Cycling and walking
- Fare integration
- High-Occupancy Vehicle lanes
- Intelligent Transportation Systems
- Local roads
- Local transit



## New rapid transit projects

- Brampton BRT
- Downtown Relief subway
- Dundas BRT
- Durham BRT
- GO all-day two-way rail
- GO rail electrification
- Hamilton LRT
- Hurontario LRT
- Union-Pearson electrification
- Yonge North subway

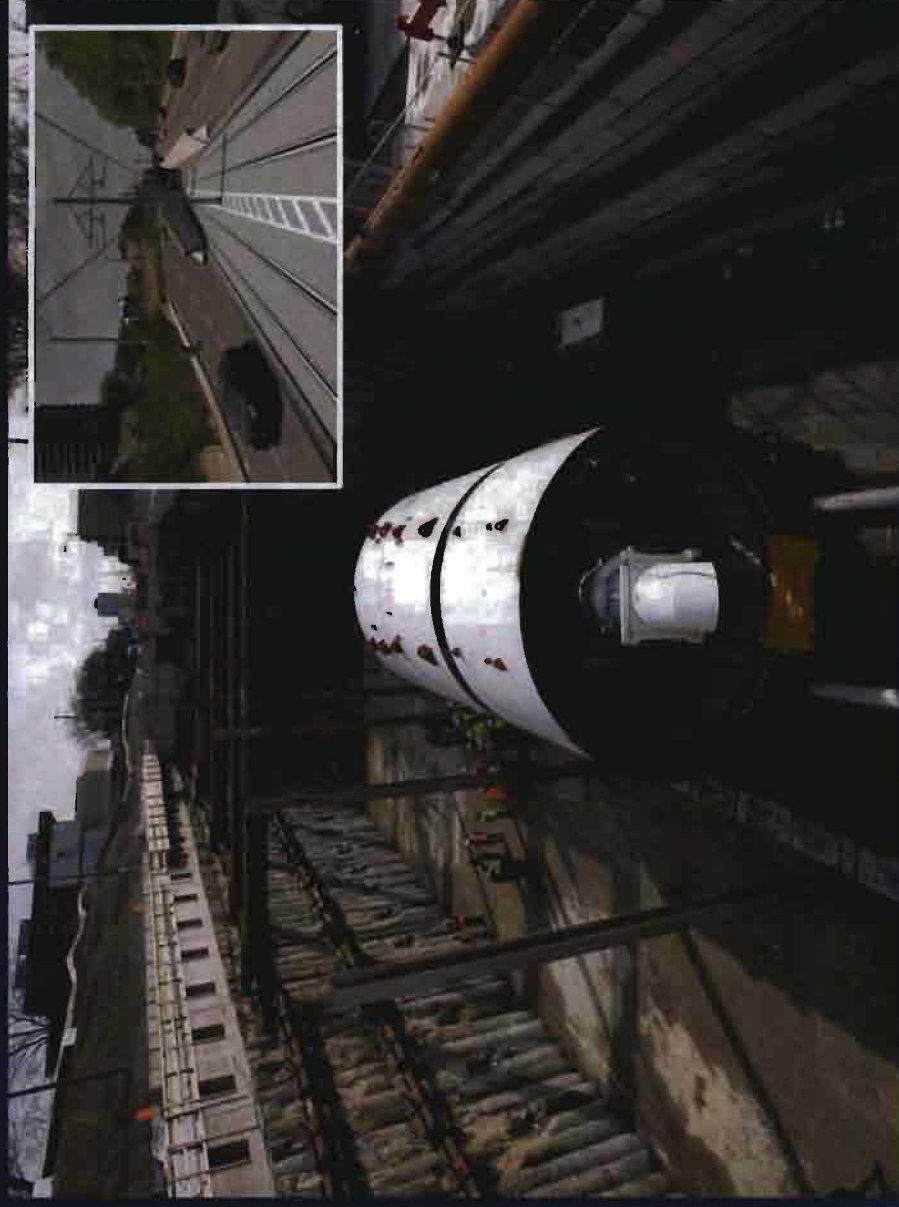
**Total investment: \$2 billion per year from new revenue tools**



# Selecting and advancing the best projects for funding implementation

## Evidenced-based transparent case making

- Benefits Case Analysis (BCA)
- Project Prioritization



Eglinton LRT under construction, Toronto  
[nationalpost.com](http://nationalpost.com)

# BCA

- Compare technology, route alignment and phasing options for every project
- Beyond traditional cost-benefit analysis – to “multiple account” analysis
- Every project should show more benefit than cost

Capital construction and financing

Life-cycle operating, maintenance and replacement



**Costs**



**Benefits**

## Wider economic

- Agglomeration and clustering
- Improved service reliability
- Improved travel comfort

## Community

- Improved access to opportunities
- Improved public health

## Environmental

- Emission cost savings

## Economic

- Jobs and GDP growth
- Land development and uplift

## User

- Travel time savings – transit and autos
- Vehicle cost savings
- Accident cost savings

## Financial

- Operating revenue

# Prioritization process

1

*Metrolinx staff performs technical analysis and project scorecard*

**High quality of life**

- Building communities: population and employment density
- Social need: youth and seniors in transit catchment area
- Regional connectivity: hubs and key destinations served

**Sustainable environment**

- Greenhouse gas emission reduction
- Auto-to-transit modal shift

**Strong economy**

- Benefit-cost ratio
- Economic impact: direct and indirect job creation and GDP growth
- Capital and operating cost per new rider
- Travel time savings
- Operating cost recovery

3

*Metrolinx Board determines "strategic fit"*

**Leveraging other investments**

- Does the project support private sector and other government investments in the corridor?

**Project readiness**

- How advanced is pre-construction work, including design, engineering, environmental approvals and land acquisition?

**Funding**

- Is funding available from the private sector and other levels of government?

**Network completion**

- How does the project advance completion of the full *Big Move* network?

2

Staff submits project priority groupings to Metrolinx Board

4

Board recommends project priorities to Minister



# Starting point: The world

How do great world cities fund transportation? What best practices can we learn from them?

- Access to multiple dedicated revenue sources
- Permanent funding by senior governments
- Private-sector leadership for project and service delivery
- Effective regional transportation coordination and governance
- Inspirational and intelligent municipal leadership
- "If at first you don't succeed, try and try again"

*London, Los Angeles, New York City and Vancouver*





# How will we pay?

From global experience, 24 potential revenue tools to fund transportation

- Auto insurance tax
- Car rental fee
- Carbon tax
- Corporate income tax
- Development charges
- Driver's license tax
- Employer payroll tax
- Fare increases
- Fuel tax
- High occupancy toll lanes
- Highway tolls
- Hotel and accommodation tax

- Land transfer tax
- Land value capture
- New vehicle sales tax
- Parking sales tax
- Parking space levy
- Personal income tax
- Property tax
- Sales tax
- Tax increment financing
- Utility levy
- Vehicle-km travelled fee
- Vehicle registration fee

# 11 potential tools shortlisted by Metrolinx

For further evaluation and public engagement

|                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Auto insurance tax</li><li>• Car rental fee</li><li>• Carbon tax</li><li>• Corporate income tax</li><li>• <b>Development charges</b></li><li>• Driver's license tax</li><li>• <b>Employer payroll tax</b></li><li>• <b>Fare increases</b></li><li>• <b>Fuel tax</b></li><li>• <b>High occupancy toll lanes</b></li><li>• <b>Highway tolls</b></li><li>• Hotel and accommodation tax</li></ul> | <ul style="list-style-type: none"><li>• Land transfer tax</li><li>• <b>Land value capture</b></li><li>• New vehicle sales tax</li><li>• Parking sales tax</li><li>• <b>Parking space levy</b></li><li>• Personal income tax</li><li>• <b>Property tax</b></li><li>• <b>Sales tax</b></li><li>• Tax increment financing</li><li>• Utility levy</li><li>• <b>Vehicle-km travelled fee</b></li></ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# Proposed four revenue tools

1 percentage point

**HST**

**\$1.3 billion**



5 cents per day

**Fuel tax**

**\$330 million**



Average 25 cents  
per non-residential  
space per day

**Parking**

**space levy**

**\$350 million**



15% increase

**Development**

**charge**

**\$100 million**



**GTHA total revenues: \$2 billion per year**



# Evaluating and shortlisting the tools

## Two major inputs

| Technical evaluation criteria                                                                                                                                                                                                                                                                           | Key recurring principles emerging from public and stakeholder input                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>▪ Strong, predictable and durable revenues</li><li>▪ Reasonable cost and ease of implementation</li><li>▪ Price signals to encourage efficient travel choices</li><li>▪ Promotes economic competitiveness</li><li>▪ Promotes social fairness and equity</li></ul> | <ol style="list-style-type: none"><li>1. Dedication, dedication, dedication</li><li>2. Trust and accountability</li><li>3. Social fairness</li><li>4. Regional equity</li></ol> |



## Other tools considered, rejected for now

| Tools not considered at this time | Rationale                                                                                                                                                                                                                                                                                   |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Employer payroll tax              | <ul style="list-style-type: none"><li>• Negative impact on economic growth and productivity</li></ul>                                                                                                                                                                                       |
| Fare increases                    | <ul style="list-style-type: none"><li>• Discourages transit use and increases road congestion</li><li>• Unfair burden on low-income households</li></ul>                                                                                                                                    |
| Higher fuel tax increases         | <ul style="list-style-type: none"><li>• Declining fuel consumption and fuel tax revenues over time</li></ul>                                                                                                                                                                                |
| Highway tolls                     | <ul style="list-style-type: none"><li>• High cost of installing and maintaining toll collection infrastructure</li><li>• Lower cost, reliable GPS toll collection technology still under development</li><li>• Viable transit alternatives are unavailable beyond central Toronto</li></ul> |
| Property tax                      | <ul style="list-style-type: none"><li>• Significant cost impact on property owners</li><li>• Impact on municipalities' ability to fund local infrastructure and services</li></ul>                                                                                                          |
| Vehicle-km travelled fee          | <ul style="list-style-type: none"><li>• High implementation cost and unresolved technology issues</li><li>• Privacy concerns</li><li>• No transit alternatives for most GTHA alternatives</li></ul>                                                                                         |

# Reasonable per capita cost



**\$117**  
per  
student



**\$140**  
per  
senior



**\$477**  
per  
average  
household

**\$1,619**  
per  
average  
household



Cost of proposed four new revenue tools

**vs.**

Cost of congestion

# Principle 1: Dedication, trust, accountability

## Recommendations to build public trust and confidence

- A dedicated GTHA Transportation Trust Fund managed by professionals
- Revenues dedicated to specified transportation improvements
- Stronger public reporting and engagement on progress and results
- Municipal nominations to the Metrolinx Board: A new governance model
- 10-year review and 20-year reauthorization of the revenue tools



Toronto Portlands  
[torontopearson.com](http://torontopearson.com)



# Principle 2: Social fairness

All segments of the economy and society paying a fair share for transportation improvements

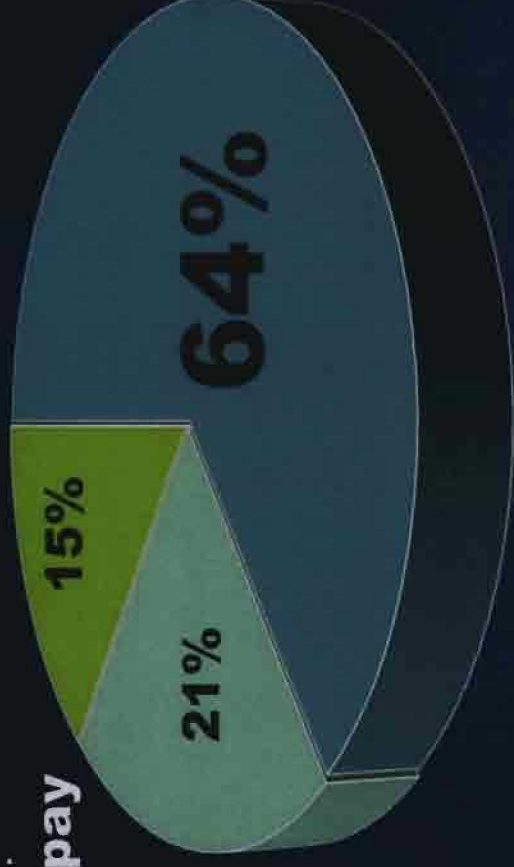
Fuel tax:

**Users pay**

Development charges and

Parking space levy:

**Business pays**



HST:

**Everyone pays**

Includes mobility tax credit for low-income households



## Principle 3: Regional fairness

**41%** of new revenues generated  
in City of Toronto "416" area

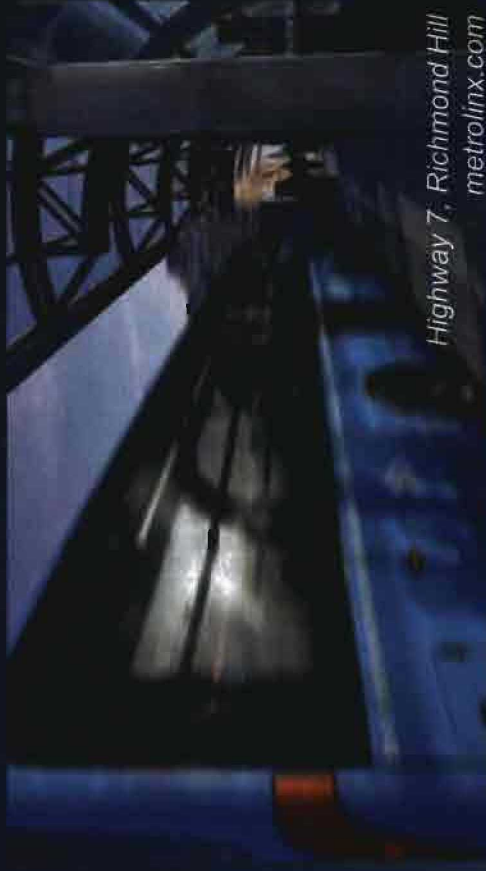
**42%** of Next Wave investments made  
in City of Toronto "416" area



Spadina Avenue, Toronto  
kiss92.com

**59%** of new revenues generated  
in rest-of-GTHA "905" area

**58%** of Next Wave investments made in  
rest-of-GTHA "905" area



Highway 7, Richmond Hill  
metrolinx.com

# Most people in the GTHA

- Want improved transportation – but are unwilling to pay more for it
- Oppose the proposed revenue tools
- Believe transportation improvements can be funded by eliminating government inefficiency and waste



cagle.com



pbs.twimg.com



# A call to leadership

- Who are the political champions for sustainable mobility and investment for the 21<sup>st</sup> century?
- Where is the political courage to lead the case for transformative change in how we fund transportation?
- Meanwhile we continue to benefit from the foresight, plans and investments of previous generations

Highway 401, North York in 1958...  
*losttoronto2.worldpress.com*



Today  
*flickr.com*



# We need community champions

- As a public agency, Metrolinx is a conflicted advocate
- Few political leaders are ready to campaign for new taxes and fees
- People trust academics, business leaders and celebrities more than bureaucrats and politicians

*Metrolinx supported the Civic Action and Toronto Board of Trade campaigns for dedicated revenue tools*





# Transit Investment Strategy Advisory Panel

**Appointed by the Premier to review Metrolinx's proposed revenue tools**

Potential recommendations could include:

- A more "affordable" \$400M per year investment plan
- Re-prioritization of Big Move projects
- Two instead of four proposed tools: Corporate income tax, and fuel tax
- Integrated "value creation" approach to land use-transit planning, development and investment
- Renewed call for permanent federal funding



Transit panel chair Anne  
Golden  
680news.com

# What next?

## A potential scenario

- Transit Panel releases report and recommendations: December 12-13, 2013
- Provincial government announces implementation plan: Spring 2014 budget
- Provincial election, with transit funding the dominant issue in Greater Toronto: Fall 2014
- Potential variable: A minority government coalition holds through 2014, and the next election is deferred to 2015

# 2014

| JANUARY                                                                                                          | FEBRUARY                                                                                                            | MARCH                                                                                                               |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
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| APRIL                                                                                                            | MAY                                                                                                                 | JUNE                                                                                                                |
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| JULY                                                                                                             | AUGUST                                                                                                              | SEPTEMBER                                                                                                           |
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| OCTOBER                                                                                                          | NOVEMBER                                                                                                            | DECEMBER                                                                                                            |
| S M T W T F S<br>1 2 3 4<br>5 6 7 8 9 10 11<br>12 13 14 15 16 17 18<br>19 20 21 22 23 24 25<br>26 27 28 29 30 31 | S M T W T F S<br>1<br>2 3 4 5 6 7 8<br>9 10 11 12 13 14 15<br>16 17 18 19 20 21 22<br>23 24 25 26 27 28 29<br>30    | S M T W T F S<br>1 2 3 4 5 6<br>7 8 9 10 11 12 13<br>14 15 16 17 18 19 20<br>21 22 23 24 25 26 27<br>28 29 30 31    |

# "Journey to a better place"

## Contact John Howe

Effective December 2013

- Vice-President, Strategic Consulting, Parsons Brinckerhoff
- [jhowe@pbworld.com](mailto:jhowe@pbworld.com) or 416-640-1544

## Formerly

- Vice-President, Investment Strategy and Project Evaluation, Metrolinx
- Director, Federal-Provincial Infrastructure Strategy, Ontario Ministry of Public Infrastructure
- Director, Toronto Waterfront Revitalization Secretariat
- Manager, Provincial Transportation Capital, Ontario Ministry of Finance
- Senior Advisor, Infrastructure Strategy, Ontario Jobs and Investment Board
- Project Manager, Highway 407 Safety Review, Ontario Ministry of Transportation
- Senior Policy Advisor, Freight Policy Branch, Ontario Ministry of Transportation

## More resources

- [www.move.ca](http://www.move.ca) and [www.transitpanel.ca](http://www.transitpanel.ca)





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