



**MACQUARIE CAPITAL**  
**PROCUREMENT OPTION PRESENTATION**

**DRAFT**

**December 2013**  
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MACQUARIE

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## PROJECT PARAMETERS

# PURPOSE AND OBJECTIVES

**The purpose of the Project is to implement a transportation solution that improves safety, access and mobility**

## Overview

- The I-70 East corridor is one of the most heavily traveled and congested highway corridors in Colorado.
- The corridor serves a number of critical transportation functions including interstate and intrastate travel and the main route between Downtown Denver and Denver International Airport.
- Additionally, I-70 serves as a main access point to adjacent employment, neighborhood and new development centers.

## Key Issues to Address

- **Increased transportation demand** – the area is experiencing rapid growth and development including new development and redevelopment with substantial residential and business activity.
- **Limited transportation capacity** – the corridor serves a number of users including commuters, tourists, regional trucking and local traffic; the demand from these users is exceeding design capacity of the corridor.
- **Safety concerns** – the corridor experiences higher than average rates of traffic collisions further worsening conditions on the corridor and can be attributed to conditions that do not meet current design standards.
- **Transportation infrastructure deficiencies** – I-70 was originally constructed in the early 1960's and was designed to last 30 years; several structures on the corridor are now past their anticipated lifespan and are classified as either structurally deficient or functionally obsolete and in need of replacement, rehabilitation or repair.

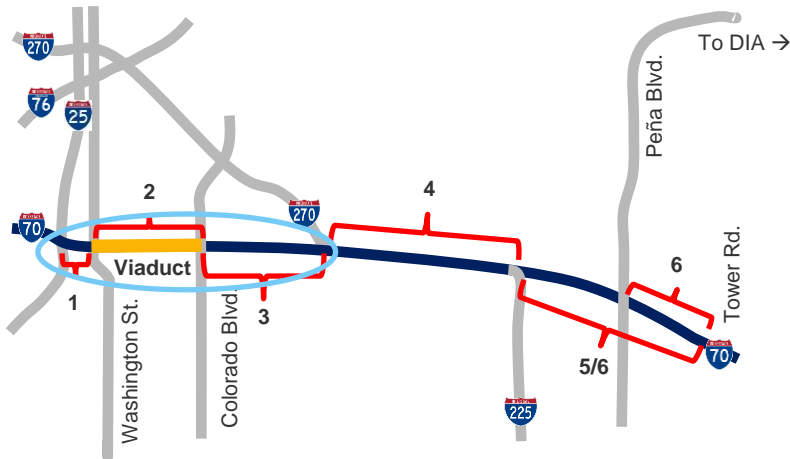
# PROJECT PARAMETERS

Our analysis has been conducted using the latest guidance from CDOT on the intended project scope

## Project Specific

- Construction scope limited to sections 1-3 (previously, from 1-6)
  - I-25 to I-270 (previously, from I-25 to Tower Road)
- Construction period still assumed to be **5 years** despite smaller construction scope
  - Majority of work to be done on section 2 (viaduct), which is still within scope
  - Remains critical path to completing project

## Project Map



## Key Elements

- Add capacity in each direction.
- Lower highway between Colorado Blvd and Brighton Blvd; place a cover over the highway between Columbine Street and Clayton Street with urban landscape on top.
- North-south connectivity via York Street, Josephine Street, Columbine Street, Clayton Street, Steel Street/Vasquez Blvd, and Monroe Street.
- 46th Avenue located adjacent to the highway on each side.
- Add managed lanes in each direction to increase capacity.
- Managed lanes will be separated from general-purpose lanes by a striped buffer.
- Pricing of managed lanes will be adjusted based on real-time demands.



## INTRODUCTION TO VFM

# VfM OBJECTIVES

## **VfM analysis compares the total costs of delivering the I-70 East Corridor Project (the “Project”) using different forms of procurement**

- The VfM objectives are to identify the procurement approach which:
  - 1) Best fits within Colorado Department of Transportation (“CDOT”) and Colorado Bridge Enterprises’ (“CBE”) Affordability Envelope for the Project;
  - 2) Results in the lowest net present value (“NPV”) of payments by CDOT and CBE over the lifecycle of the Project and maximizes availability of CBE revenues to fund additional, bridge replacement, and rehabilitation projects; and
  - 3) Achieves best risk transfer and creates the the least risk to CBE’s AA- credit rating.
- At this stage in project development, the VfM analysis is by necessity based on hypothetical estimates based on the features of the Project and experience drawn from similar projects. Best practice is for the VfM analysis to be used through the procurement process to ensure the details of the selected procurement approach are as efficient as possible.
- CDOT should only choose a PPP delivery method if the capital and/or operating costs of the private sector in delivering the same level of service are lower than those of public sector delivery on a risk adjusted basis.



# PROCUREMENT OPTIONS

**VfM considers the estimated costs to the public sector of delivering a Project using the DB method of procurement, in which total estimated costs are known as the public sector comparator (“PSC”), against a PPP, using the same specifications, which total estimated costs are known as the “Shadow Bid”**

In respect of this VfM, CDOT has selected three procurement options for detailed analysis:

- 1) **Public Sector Comparator (“PSC”)** - a Design-Build (“DB”) procurement financed by TIFIA and CBE bonds issue by CBE at financial close. Under this scenario operations, maintenance and rehabilitation (“OMR”) risks, and tolling revenue risks are borne by CDOT.

Two Public-Private Partnership (“PPP”) procurement options:

- 2) **Design-Build-Finance (“DBF”)** - construction financed by private partner in the form of a short-term bond, which is refinanced following substantial completion through CBE senior bonds and TIFIA financing. Under this scenario, OMR risks and tolling revenue risks would be borne by CDOT.
- 3) **Design-Build-Finance-Operate-Maintain (“DBFOM”)** - project financed through long-term equity, senior debt in the form of PABs and TIFIA financing without recourse to CDOT or the CBE balance sheet except for pre-defined annual availability payments which are subject to deductions for performance failures. OMR risks and tolling revenue risks could be taken by the private sector partner.



## BENEFITS OF DBFOM PROCUREMENT

# KEY BENEFITS OF DBFOM PROCUREMENT

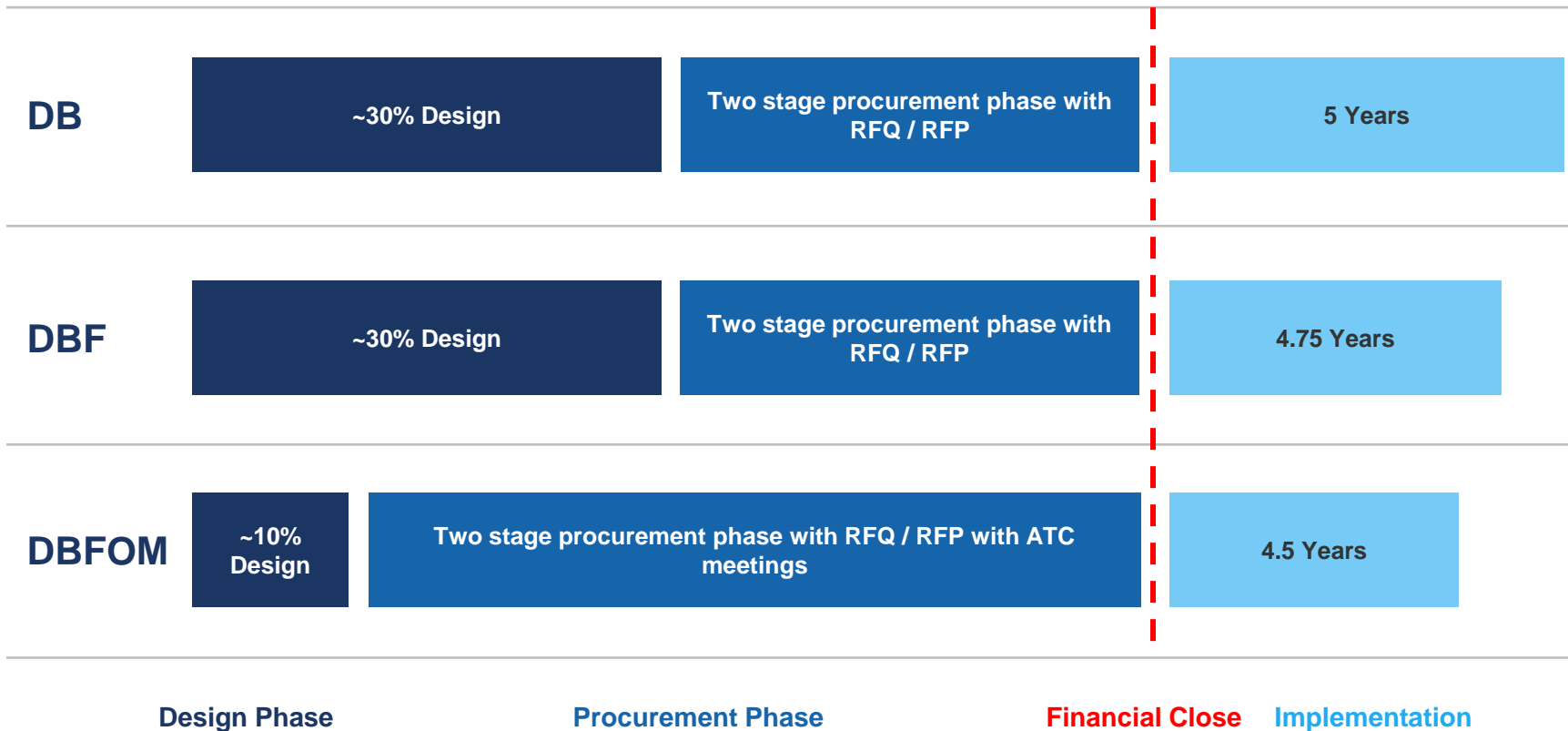
**Key benefits of DBFOM procurement include operations and maintenance certainty, construction cost savings, and higher quality service standards**

<b>1) Schedule &amp; Cost Certainty</b>	<ul style="list-style-type: none"> <li>■ DBFOM delivery allows for schedule and cost certainty. In Macquarie's experience, this is driven largely by the role of private sector financing, and in particular, compounding interest during construction.</li> </ul>
<b>2) Design &amp; Innovation</b>	<ul style="list-style-type: none"> <li>■ In a DBFOM, the public sector interacts with bidders on a one-on-one basis, allowing for the bidders to optimize proposals. Additionally, bidders are encouraged to put forth Alternative Technical Concepts (ATC's), providing an opportunity for project innovation and cost savings not found in a traditional DB procurement.</li> <li>■ As an example, the Denver FasTracks Eagle P3 incorporated 17 ATC's into the project's scope that saved the Regional Transit District ~\$300 million and further reduced overall operations and maintenance expenses.</li> </ul>
<b>3) Construction Cost Savings</b>	<ul style="list-style-type: none"> <li>■ P3 deliver will attract a broader range of design and construction companies, which will enhance competition. P3 projects are currently delivering in excess of 20% cost savings in infrastructure projects globally.</li> </ul>
<b>4) OMR Certainty / Risk Transfer</b>	<ul style="list-style-type: none"> <li>■ O&amp;M certainty is important; public sector delivery often defers maintenance. Further, in terms of OMR risk, DB procurement is a relatively riskier model without transfer of risk.</li> <li>■ In a DBFOM, high quality service standards can be incentivized through performance deductions.</li> <li>■ Overall, integration of design and construction with operations and maintenance typically achieves lifecycle cost savings in excess of 20%.</li> </ul>
<b>5) Protection of CBE's Credit Rating</b>	<ul style="list-style-type: none"> <li>■ A DBFOM procurement would result in substantial risk transfer to the private sector, including for cost-overruns. Due to this transfer of risk, there would be greater certainty that CBE would be able to maintain its required 2.0x coverage ratio, protecting its AA- credit rating.</li> </ul>
<b>6) Higher Tolling Revenue Forecast</b>	<ul style="list-style-type: none"> <li>■ The private sector will typically take a more aggressive view on forecast tolling revenues. In relation to the Project, this would reduce CDOT's need to make OMR Availability Payments throughout the operating term.</li> </ul>

# 1) PROCUREMENT SCHEDULE

While DBFOM requires longer procurement phase in order to achieve full collaboration, innovation and lifecycle efficiency benefits, DB procurement typically requires greater level of design work prior to launch of procurement

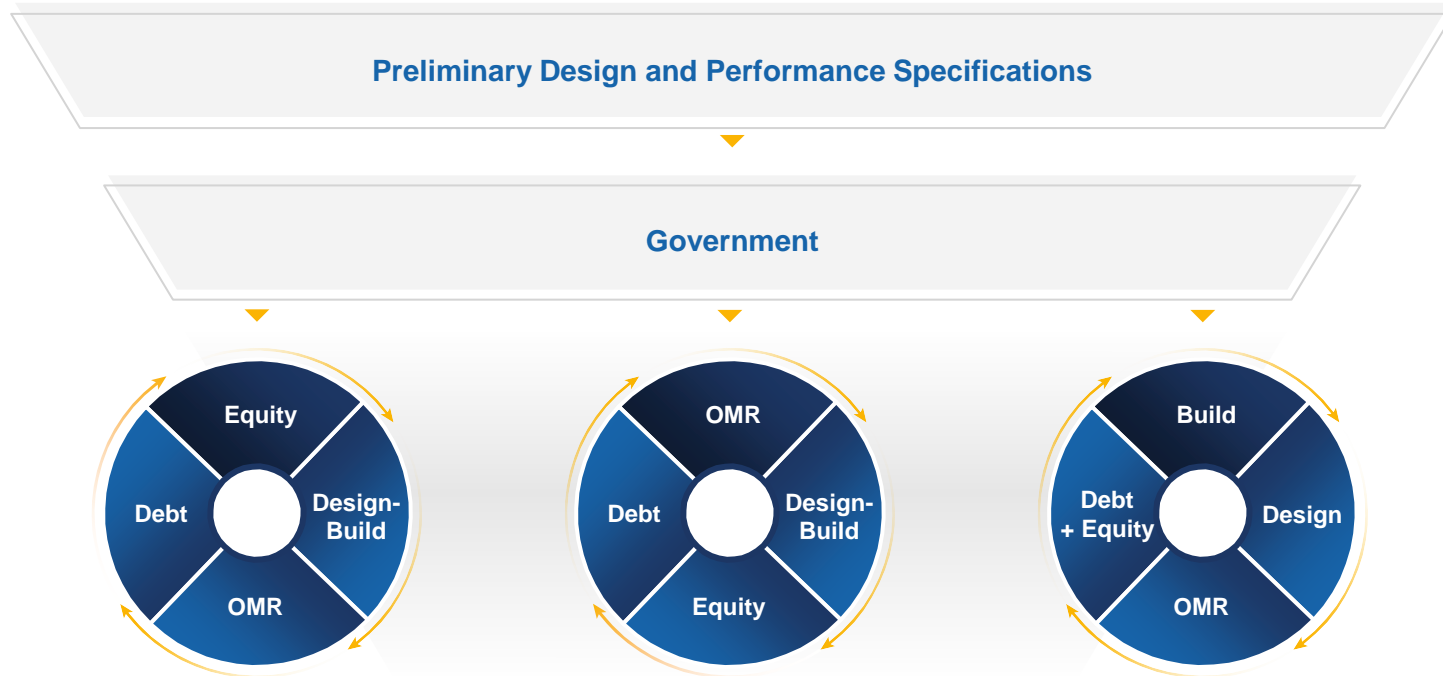
A key benefit of DBFOM delivery is to achieve schedule certainty



## 2) DESIGN AND INNOVATION IN A PPP

### Effect of Competition in a PPP

#### Virtuous Circle: Knowledgeable in Integrated Teams in Competition



- In a DBFOM, the public sector interacts with bidders on a one-on-one basis, allowing for the bidders to optimize proposals. Additionally, bidders are encouraged to put forth Alternative Technical Concepts (ATC's), providing an opportunity for project innovation and cost savings not found in a traditional DB procurement.



# 3) CONSTRUCTION COST SAVINGS

**A DBFOM will typically result in a lower construction cost, without the need for the additional risk contingency required in a DB**

	<b>DB</b>	<b>DBF</b>	<b>DBFOM</b>
<b>Design Costs</b>	High	Some savings likely	Savings due to use of in-house resources
<b>Innovation</b>	Limited by 30% design	Limited by 30% design	Increased due to design flexibility
<b>Contractor Mobilization &amp; Supervision (Indirects)</b>	Higher based on less schedule incentive	Some savings likely	Reduced due to faster schedule and closer design/ constructability integration
<b>Materials</b>	Higher due to payment constraints	Some savings likely	Savings due to better hedging
<b>Construction Oversight</b>	Higher	Some savings due to oversight from private lenders	Savings due to oversight from operator, equity and lenders
<b>CDOT Indirects</b>	No savings	Some savings likely	Savings due to risk transfer to concessionaire
<b>Risk Contingency</b>	Greater than 10% cost overrun likely	Minimum 5% contingency	No contingency required



# EXAMPLES OF CONSTRUCTION COST SAVINGS

**Large differences between winning and losing bidders and high correlation between losing PPP bidder and PSC supports Value for Money**

## Construction Cost Savings Achieved in North American PPP Market

Project	Savings Relative to PSC	Comments
I-595, Florida (Road)	14.3% lower than PSC (\$300m)	ATC's and risk transfer
A30, Quebec (Road + Bridge)	33% lower than PSC	Hybrid toll and availability
Denver Fastracks, Colorado (Transit)	13% lower than PSC	17 ATC's accepted
Southeast Stoney Trail, Alberta (Road)	NPV 63% below PSC	Innovation and market shift
Alberta Road Projects (Average of 5 Projects)	NPV 27% below PSC	2003 - 2012
Windsor Essex Parkway, Ontario (Road)	NPV 15% below PSC	
I-635 (LBJ Freeway), Texas (Road)	NPV 15% below PSC	
Port of Miami Tunnel, Florida (Road / Tunnel)	12.5% lower capital costs than PSC	Based on VfM analysis 2010
Goethels Bridge, New York (Road / Bridge)	13.7% lower than PSC	
Presidio Parkway, California (Road)	20% lower than PSC	Separate DBFOM and DB projects

## 4) OMR CERTAINTY / RISK TRANSFER

### **Operations and Maintenance Certainty and Cost Savings, Higher Quality Service Standards**

- O&M certainty is important; public sector often defers maintenance.
- In terms of OMR risk, Design-Build is a relatively riskier model without transfer of risk.
- Significant cost savings arise from whole of life optimization and financed costs (reserves, performance securities).
- High quality service standards follow effective OMR but can also be individually incentivized through performance deductions.
- Even more effective with transfer of tolling revenue risk to concessionaire.
- Definition and transfer of long term OMR is challenging and does not receive full government attention but is vital to well performing PPPs.



# 5) PROTECTION OF CBE'S CREDIT RATING

## Risk transfer under DBFOM procurement would allow for greater certainty that CBE would be able to protect its AA- credit rating

### Risks to Rating's Downgrade

#### Project Risks

- CBE retains the complete project risk under a DB scenario
- A ratings downgrade could result if the retained project performance requirements eventuated in higher retained risk
- Macquarie's Denver RTD experience suggests that the bond investors see through to project risk

#### Risk of Uncertainty in CBE Revenue Streams

- The CBE revenue streams are generally regarded as very predictable and stable even though the growth rate in revenues cannot be reliably forecast
- Care will have to been taken in structuring the Affordability Envelope to avoid putting so much strain on the coverage that a one-off reduction in vehicle registrations could result in a breach of the minimum coverage requirements

#### Interest Rate Risk

- A significant risk is an increase in interest rates before financial close

#### Cost Overrun Risks

- A cost overrun could result in the requirement to issue additional bonds which would likely breach CBE's required coverage ratio, putting pressure on it's credit rating
- CBE will likely have to carry reasonable contingency to provide confidence that the project can be completed within budget
  - This will be especially critical under the DB scenario given the projects large size relative to CBEs existing revenue streams and CDOT's retention of the entire project risk
  - It is possible that the rating agencies would require CDOT to provide a guarantee of DB cost to CBE or some other form of credit support in the event of a cost overrun

#### Purpose of Required Coverage Ratio

- Minimum coverage required to be able to issue additional indebtedness with recourse to total CBE revenues in addition to the current BAB's which have first-lien pledge on the CBE revenue stream
- Preservation of AA- rating
- Risk of uncertainty in revenue streams
- Project delivery risks



## 6) HIGHER TOLLING REVENUE FORECAST

**The private sector will typically take a more aggressive view on forecast tolling revenues; in our analysis of the procurement alternatives, a range of forecasts have been considered**

- Successful capture of the tolling revenue streams will depend upon the design and construction of the overall Project and the effective operation, maintenance, and rehabilitation of the whole Project.
- Macquarie believes that the risk of future tolling revenues can be transferred to the private sector partner and will significantly reduce the need for availability payments from CDOT for OMR costs.
- In taking tolling revenue risk, the private sector partner will be strongly motivated to operate, maintain, and rehabilitate the Project to the highest standards.
- We believe such volume-risk structure provides significant benefits, however its success is subject to risk appetite by market participants.



RISK TRANSFER  
BENEFITS OF DBFOM  
PROCUREMENT



# RISK TRANSFER IN A PPP

**DBFOM procurement maximizes long-term transfer of risk to the private sector**

Private Sector Risk	DB	DBOM	DBF	DBFOM
	Design-Build	Design-Build-Operate-Maintain	Design-Build-Finance	Design-Build-Finance-Operate-Maintain
Design Risk	✓	✓	✓	✓
Construction Risk	✓	✓	✓	✓
Maintenance Risk	Public	✓	Public	✓
Operations Risk	Public	✓	Public	✓
Finance Risk	Public	Public	✓	✓
Ownership Risk	Public	Public	Public	✓
Demand Risk	Public	Public	Public	Public / Shared

**Increasing transfer of risk from Government to Private Sector**

# RISK TRANSFER BENEFITS FOR THE PROJECT

## Macquarie anticipates that CDOT would benefit significantly from transfer of risk under a DBFOM procurement

<b>Design Risk</b>	<ul style="list-style-type: none"> <li>In a DB, CDOT bears responsibility for ensuring that the design meets the Project requirements, both during construction and throughout the operating period. Further, CDOT does not have the benefit of working with the builder to discuss the design and address any potential issues before the construction actually begins.</li> </ul>
<b>Scope Changes</b>	<ul style="list-style-type: none"> <li>Under a DBFOM, the private sector partner is incentivized to push the design forward to meet the schedule requirements which imposes a level of discipline on the design process that is non-existent under a DB.</li> </ul>
<b>Commitment to Major Lifecycle and Maintenance</b>	<ul style="list-style-type: none"> <li>Government budgets tend to have many high priority items to which they must allocate funding. In a DB, CDOT is not contractually obligated to pay for the project's necessary lifecycle and rehabilitation costs and can defer the expenditures as it sees fit. A lack of regularly scheduled maintenance and rehabilitation will lead to a deteriorating and poor performing asset in the long run.</li> </ul>
<b>Long-Term Asset Performance &amp; Transfer of OMR Risk</b>	<ul style="list-style-type: none"> <li>CDOT retains long-term asset performance risk under a DB and fully transfers this risk under a DBFOM. Over time, this risk can result in a highway that costs significantly more than estimated to operate and maintain and can ultimately lead to a failure in meeting expected long-term performance objectives (i.e. quality of asset, ease of transportation, etc.).</li> <li>Given that the viaduct replacement is the most substantial component of the construction, CDOT would benefit from transferring the OMR to the concessionaire and foregoing the risks associated with ongoing operations, maintenance and rehab on the partial cut-and-cover.</li> </ul>
<b>Force Majeure / Relief Events</b>	<ul style="list-style-type: none"> <li>Under a DB, CDOT would be responsible for the costs and lost revenues associated with a force majeure event. Under a DBFOM, the project agreement will outline provisions for force majeure and relief events between CDOT, the concessionaire and the contractor.</li> </ul>
<b>Tolling Revenue Risk</b>	<ul style="list-style-type: none"> <li>In taking tolling revenue risk, the private sector partner will be strongly motivated to operate, maintain and rehabilitate the Project to the highest standards.</li> </ul>

# RETAINED RISKS AND CONTINGENCIES

## Retained Risks

- CBE will retain certain development and construction risks under both DB and DBFOM.
- Retained risks will be similar, but DBFOM should result in some reduction.
- The major retained risks that have been identified at this stage include:
  - Environmental;
  - Land Acquisition;
  - Changes in Law;
  - Seismic Events;
  - Force Majeure;
  - Unknown Contaminated Material; and
  - Unknown Pre-Existing Site Conditions.

## Shared Risks

- CBE will share certain risks with the contractor under any procurement method.
- However, DBFOM will significantly mitigate likelihood of occurrence.
- The key shared risks include:
  - Geotechnical Conditions;
  - Hazardous Material Removal Risk;
  - Utilities - Unexpected relocation and risks;
  - Existing Asset Conditions;
  - Public Outreach;
  - Inflation Risk;
  - Structural Latent Defects; and
  - O&M During Construction.

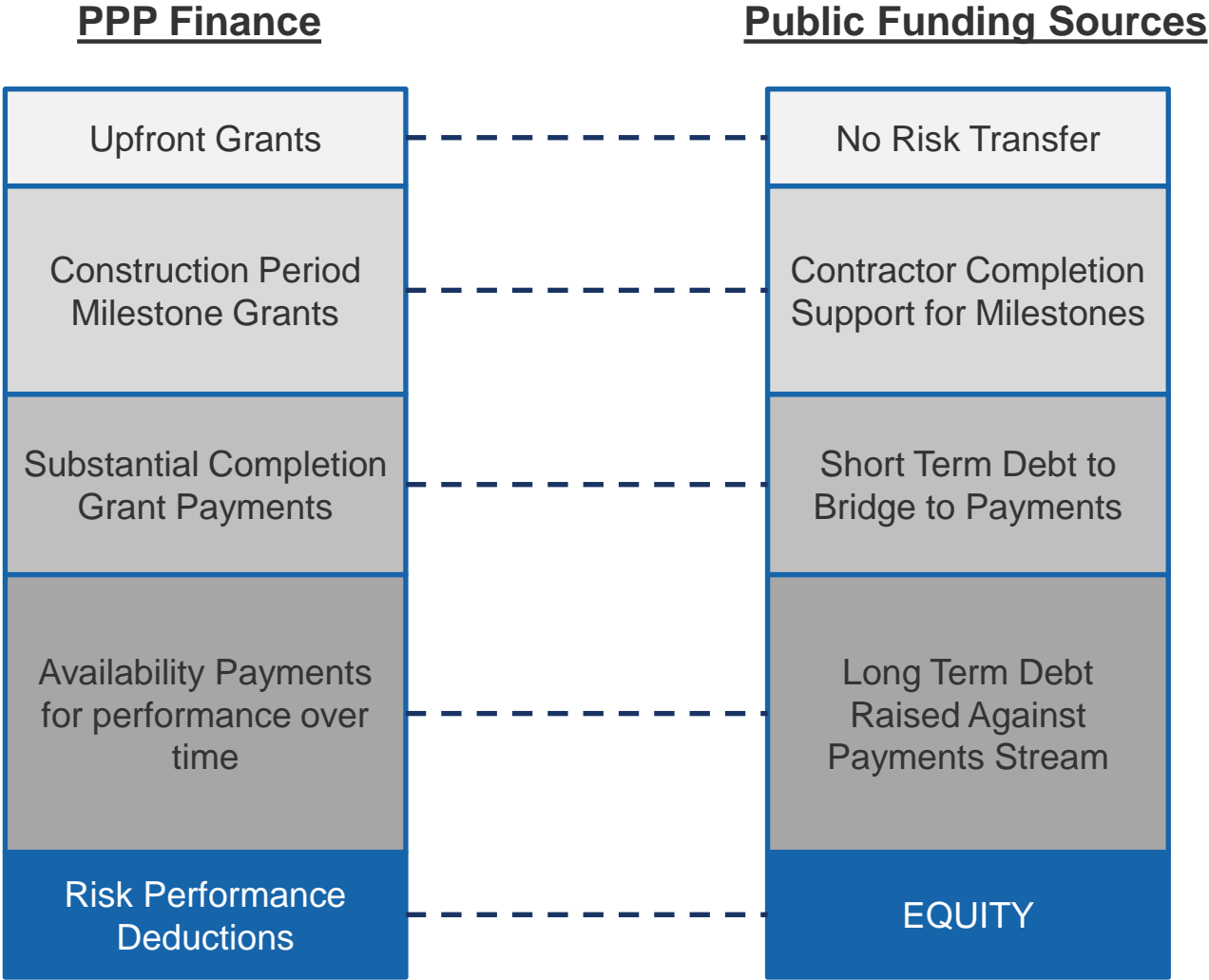
## Cost and Schedule Contingency

- DB will not guarantee a lump sum, date-certain price in the same way as a DBFOM.
- DB will need to carry a specific cost contingency in addition to shared and retained risks.
- CBE should develop a value for schedule achievement including early completion.
- CBE to consider whether risk contingencies should be included within the Affordability Envelope.



# FINANCING CONSIDERATIONS

# PUBLIC FUNDING SOURCES AND EFFECTS ON ELEMENTS OF PPP FINANCE STRUCTURE





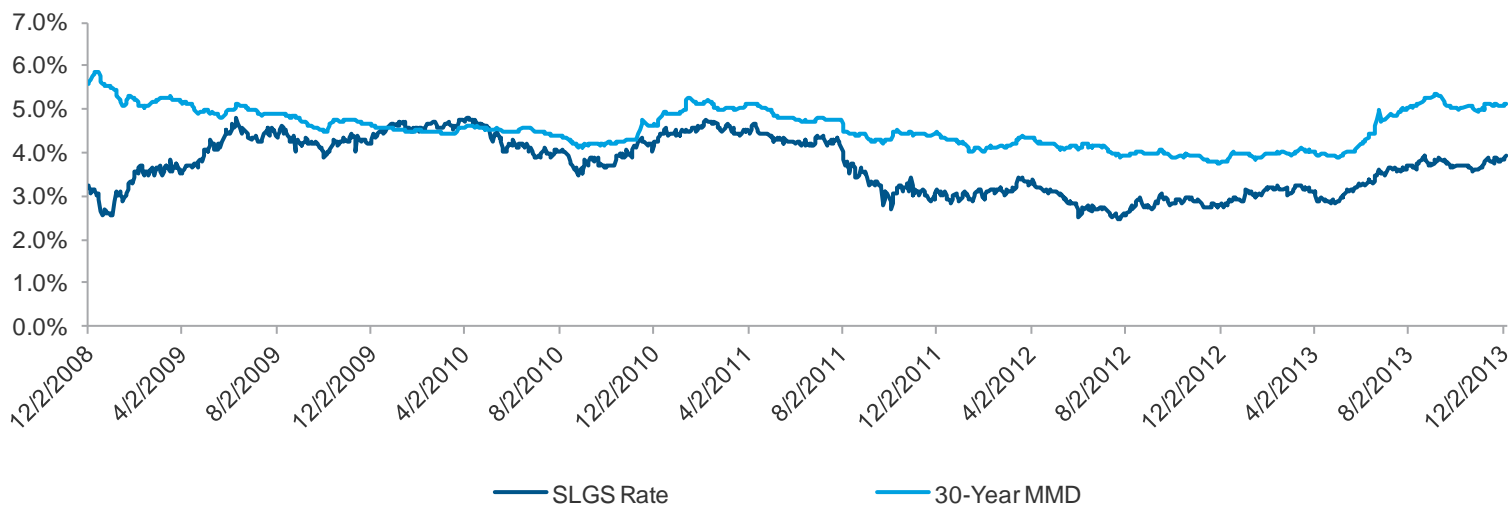


# COST OF CAPITAL CONSIDERATIONS

**The use of TIFIA financing in the DBFOM scenario significantly reduces the cost of capital relative to DB procurement**

- TIFIA has a number of significant advantages:
  - It carries the lowest interest rate of any of the sources of financing;
  - The interest rate is fixed at the date of financial close and there is no commitment fee on undrawn balances;
  - Drawdown can occur as and when required to fund construction costs; and
  - Flexible repayment terms and maturity of 35 years allows for repayment to be significantly backended, including interest only periods.
- These features make it most efficient to draw senior debt first, then utilize upfront funding sources and finally draw TIFIA.
- Due to the lower interest rate, it also makes sense for the repayment of TIFIA to be as backended as possible.

**SLGS Rate (TIFIA) vs. Municipal Rate (AAA)**





# DEVELOPMENT AND TRANSACTION COSTS

Costs associated with development and closing procurement will differ under the DB, DBF and DBFOM scenarios

Cost	DB	DBF	DBFOM	Commentary
Development Costs and Fees	Low	Medium	Medium	In general, the transaction costs, development costs and fees are likely to be higher under a DBFOM procurement
Preliminary Design Costs	High	High	Low	For a DB, CDOT will have to perform a more costly and lengthier design process
Financing and Issuance Costs	Low	Medium	Medium	The cost of financing is higher for a concessionaire under a DBFOM relative to CDOT's cost of debt under a DB
Performance Monitoring and Contract Management Costs	Medium	Medium	Low	A private operator is typically able to perform these functions at a lower cost than the public sector



## CONCLUSION



# COMPARISON OF PROCUREMENT OPTIONS

**Value-for-Money analysis indicates that DBFOM procurement would be the most attractive option**

	<b>DB</b>	<b>DBF</b>	<b>DBFOM</b>
Procurement Costs	Best	Medium	Medium
Procurement Schedule	Medium	Medium	Best
Design Risk Transfer	Worst	Medium	Best
Construction Risk Transfer	Best	Medium	Best
Construction Cost	Worst	Medium	Best
Cost of Capital	Best	Worst	Medium
Rehabilitation Risk Transfer	None	None	Best
Routine O&M Risk Transfer	None	None	Best
Tolling Revenue Transfer	None	None	Best

# PRICE VERSUS SCOPE

## **Macquarie recommends a “best value approach” under which the Project is awarded to the private sector partner who can offer the maximum road improvements possible for a fixed budget in contrast to a traditional low bid approach**

- It is our understanding that CDOT would like to achieve a complete corridor solution for I-70; however, the cost of these improvements exceeds current funding availability making this unattainable without additional resources.
  - Cost estimates produced several years before the tender date will only ever be indicative and actual cost outcomes may vary significantly depending upon the state of the Colorado construction market at the time of tender.
  - Under all procurement options, CDOT has indicated a desire to compete the Project on the basis of the maximum road improvements possible for a fixed budget.
- To maximize the road improvements that CDOT could afford, Macquarie recommends a “best value approach” under which the Project is awarded to the private sector partner who can offer the maximum road improvements possible for a fixed budget in contrast to a traditional low bid approach.
  - This is in contrast to standard procurement which defines what is required to be constructed and then awards the contract to the partner who offers the lowest cost.
- In order to follow this procurement approach, CDOT must:
  - Define minimum mandatory requirements which must be constructed to make the Project effective;
  - Define a scope ladder of additional elements above the mandatory requirements; and
  - Develop as objective as possible a scoring methodology for valuing the additional elements.
- This method of procurement lends itself to DBFOM delivery:
  - Under a DBFOM, there is a close relationship between upfront construction and long-term OMR costs, which are integrated into a single bid proposal under a DBFOM.
  - Under DBFOM, unlike public finance models, there is a close relationship between what is constructed and the financing.
- This approach was used successfully on the Sea-to-Sky Highway Improvement Project, resulting in substantial added value beyond expectations including 20km of additional passing lanes, 16km of additional median barrier, 30km of additional shoulder improvements.

# PRICE VERSUS SCOPE CASE STUDY

## SEA-TO-SKY HIGHWAY IMPROVEMENT PROJECT



### The Sea-to-Sky Highway Improvement Project is regarded as a landmark road PPP transportation project in Canada

#### Sea-to-Sky Highway Improvement Project Overview

- Project consisted of the upgrade of an existing 95km road between Vancouver and Whistler in Canada with a total cost of C\$600 million.
  - Construction was completed prior to 2010 Vancouver Winter Olympics.
- Project was procured as a DBFO, however, instead of evaluating proposals based on lowest price, Ministry of Transportation (MoT) process was reversed so that proposals were evaluated based on additional improvements beyond the baseline requirements (at a set price).
  - Anticipated user benefits from incremental improvements were calculated based on international approach involving estimated travel time savings and safety benefits.
- MoT determined that they would have had to use a series of DB contracts in the event a DBFO did not offer greater value for money.
  - Use of performance based payments under DBFO helped provide incentive to private sector, driving value for money.
- Resulted in substantial added value beyond expectations including 20km of additional passing lanes, 16km of additional median barrier, 30km of additional shoulder improvements.
  - Overall, incremental improvements were in the order of 15-30% above the expected benefits of the baseline improvements.<sup>1</sup>

#### Macquarie Role & Project Awards

- Consortium lead by Macquarie was selected as preferred proponent and reached financial close in June 2005.
- Project was procured as PPP by Partnerships BC and is recognized as one of the most successful PPPs in Canada.
- Awards include:
  - PPP/AFP of the Year (Gold Award) – Canadian Council for PPP/AFP (2005); and
  - Best Global Project to Reach Financial Close – PPP Awards in England (2005).



1. Project Report: Achieving Value for Money, Sea-to-Sky Highway Improvement Project.