Introduction to Financial Modeling
Washington Joint Transportation Committee

September 2011
• A tool that guides and supports decision making
• Evaluates the quantitative benefits and drawbacks of different financing and delivery approaches
• Aids Washington in determining whether it will receive appropriate value
• Helps identify the method of project financing and facility delivery that is most likely to achieve the lowest cost and/or best value
• Key tool used in the Value for Money (VfM) analysis
Value for Money analysis:

- Tool with the purpose of demonstrating whether a P3 solution is better than the chosen method of traditional delivery
- Comparison of the cost of delivery of a project under P3 against the cost under traditional delivery

**Public Sector Comparator (PSC)**
- Retained Risks
- Ancillary Costs
- Financing Costs
- Base Costs

**Shadow Bid**
- Retained Risks
- Ancillary Costs
- Financing Costs
- Base Costs

- Value of P3 RFP Bid
- NPV of P3 costs
Public Sector Comparator (PSC) model:

- Risk adjusted, whole-life costs of a project if the project is procured traditionally
- DBB or DB normally the model used to model traditional delivery
- PSC is used to compare to the cost of P3 delivery
- PSC is stated in Net Present Value terms
  - Estimation of project full cost and revenue under traditional delivery
  - Consideration and quantification of project risks
  - Use of discount rate
Shadow Bid model:

- Cost of delivery of a project under the P3 approach
- Shadow Bid is effectively the hypothetical estimation of what the private sector would bid in response to the P3 RFP
- Beyond the VFM analysis, Shadow Bid models are used to:
  - Assess different scope or commercial terms
  - Analyze financing structure
  - Develop payment mechanisms
Availability payment P3 model:

- Concessionaire designs, builds, finances, operates and maintains the facility over a period of time.
- Receives a periodic payment as compensation. Payment is dependent upon:
  - Availability – facility being available to users
  - Performance – facility performing to standards specified in P3 agreement
- If facility is not available or performing to standards, then the concessionaire receives a deduction to the availability payment.
- The concessionaire may not receive any availability payment if unavailability / non-performance is material.
- Tolls can still be collected on the facility; however, concessionaire is not compensated directly from toll revenue (i.e., public sector retains revenue risk)
Toll concession P3 model:

- Concessionaire designs, builds, finances, operates and maintains the facility over a period of time
- Concessionaire responsible for collecting toll revenue generated by the facility. Toll revenue compensates the concessionaire for costs incurred.
- Performance standards normally included in the P3 agreement
- Inability of concessionaire to meet performance standards can be grounds for termination
- Concessionaire retains revenue risk (both upside and downside)
**Discount rate:**

- A discount rate is needed to convert project cash flows into NPV
- Adjusting discount rate to reflect inherent risk in cash flow can be counter-intuitive for costs – if a high discount rate is applied to high risk cost projections, the result will be a low NPV
- Generally, the values of risks are added/included in the cost projections
- The same discount rate is applied to cost projections of both P3 and PSC
- Choice of the discount rate:
  - Government borrowing rate – Probably most widely used and easiest to explain but often will not accurately reflect inherent risk in cash flows. Discount rate is from government’s perspective.
  - Project level discount rate (Project WACC) – Discount rate is from the project’s perspective reflective of risk inherent in cash flows.
  - Choice of discount rate is a policy decision
The methodology for developing a VfM analysis includes:

- Define procurement model and risk sharing
- **Estimate project costs**
- **Estimate project revenues**
- Identify and analyze project risks
- Assess the uncertainty around the cost estimates to arrive at risk-adjusted values
- **Develop financial model and calculate net present value**
• Built in Microsoft Excel, usually consisting of numerous worksheets

• At its core, it consists of:
  • Inputs
  • Calculations
  • Outputs

• Summary sheet for quick, “desktop” view of project

• Calculations are complex and interaction exists between worksheets

• Includes functionality to facilitate in-depth analysis
Introduction to Financial Modeling
Developing a Financial Model – Core Components

Inputs
- Unit Tolls (Adjust to give target returns and ratios)
- Traffic Forecast
- Government Funding
- Ancillary Revenue
- Operating Cost Assumptions
- Construction and Lifecycle Cost Assumptions
- Financial Cost Assumptions

Calculations
- Project Revenue
- Operating Expenditure
- Capital Expenditure
- Indexation
- Financing

Outputs
- Equity Returns
- Debt Service Coverage Ratios
- NPV of Cash Flows
- Financing Requirements
### Developing a Financial Model – Inputs

<table>
<thead>
<tr>
<th>PSC</th>
<th>Shadow Bid Model</th>
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</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>Baseline projections considering “equity” view</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>Projections using a fixed-price DB model</td>
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<tr>
<td><strong>O&amp;M</strong></td>
<td>Baseline projections for private O&amp;M provider</td>
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<tr>
<td><strong>Lifecycle</strong></td>
<td>Baseline projections with impact of enhanced O&amp;M to reduce lifecycle costs</td>
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</tbody>
</table>
| **Tax** | • Federal, state, and local taxes  
|  | • Depreciation and impact on taxation |
| **Financing** | Private finance terms for:  
|  | • Taxable bank/bond debt  
|  | • Tax-Exempt Private Activity Bonds  
|  | • TIFIA  
|  | • Equity |
| **Inflation** | Inflation rates for revenue, construction, O&M |
| **Tenor of analysis** | • To be determined  
|  | • Generally, for availability payment P3: avg. 30 years  
|  | • Generally, for toll concession P3: avg. 50 years |
Introduction to Financial Modeling

Developing a Financial Model – Outputs

- Long-term cash flow analysis of project inputs
- Funding gap assessment over the project life
- Valuations in both year of expenditure and present dollar terms
- Financial capacity assessments for both taxable and tax exempt debt and private equity scenarios depending on delivery option
Functionality within the model allows a user to analyze:

- Chosen private and public sector delivery options
- Private sector financing and public sector funding and financing solutions, including:
  - PABs, TIFIA, equity, taxable bonds, bank debt and State and Federal grants
- Model can include “breakeven” analysis functionality
- Model can include NPV analysis functionality
• Coordinate with WA JTC to clarify scope of projects and coordinate output of financial model
• Data and input collection, including “gap” analysis
• Sources of data to be confirmed
• Develop a financial model that is aligned with the level of complexity and detail of the inputs
# Financial Model Inputs – Data Sources

## Project: I-405

<table>
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## Project: SR 509

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# Financial Model Inputs – Data Sources

## Project: SR 167

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## Project: I-5 Columbia River Crossing

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## Financial Model Inputs – Data Sources

### Project: Monroe Bypass

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