Value for Money Analysis: Constructing the Public Sector Comparator and the Shadow Bid

P3-VALUE Webinar – July 11, 2013

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P3 Program Manager
Office of Innovative Program Delivery
**P3-VALUE Webinars**

- **P3-VALUE**: Suite of four integrated analytical tools and supporting documentation to help practitioners understand processes used to quantitatively evaluate P3 options

- This is the third of four webinars on P3-VALUE
  - P3 Evaluation Overview (May 2)
    - Recording available at: [https://connectdot.connectsolutions.com/p552kqd0pxs/](https://connectdot.connectsolutions.com/p552kqd0pxs/)
  - P3 Project Risk Assessment (June 13)
    - Recording available at: [https://connectdot.connectsolutions.com/p37y72rl5je/](https://connectdot.connectsolutions.com/p37y72rl5je/)
  - **Value for Money Analysis** (today)
  - Financial Structuring and Assessment (August 7)
Course Outline

Lesson 1  Introduction to P3s and the P3 Toolkit
Lesson 2  Developing a Public Sector Comparator
Lesson 3  Developing a Shadow Bid
Lesson 4  Comparing Procurement Options
Summary
Course Objectives

After taking this course you should be able to:

- List the various components of the Public Sector Comparator (PSC) and Shadow Bid (SB)
- Describe the methodologies used to estimate the PSC and Shadow Bid
- Explain how the PSC and Shadow Bid are compared using Value for Money (VfM) analysis
- Access the P3-VALUE tools and supporting information
Lesson 1

Introduction to P3s and the P3 Toolkit
What is a P3?

- **Acronym**: Public-private partnership (P3 or PPP)
- **Definition**: Contractual agreement between a public agency and a private entity that covers more than a single phase of a project.
- FHWA’s Office of Innovative Program Delivery focuses on P3s that include financing
Common Types of P3s

P3

Greenfield
Design-Build-Finance
Toll Concession

Brownfield (primarily toll concessions)
Design-Build-Finance-Operate-Maintain*
Availability Payment Concession

*Focus of P3-VALUE tools
Potential Benefits and Drawbacks

Potential Benefits

- Additional Financial Capacity
  - Accelerates project delivery
  - Conserves public sector debt capacity

- Life-Cycle Cost Efficiencies
  - Creates incentives to manage costs over the life of the project
  - Integrates project phases creating efficiencies

- Risk Transfer
  - Budget and cost certainty
  - Improved risk management reduces costs

Potential Drawbacks

- Loss of flexibility of public agency
- Complex procurement process
- *Perceived* higher financial costs (due to incorporation of risk premiums into private sector returns)
FHWA’s P3 Toolkit

- The P3 Toolkit provides educational tools and guidance documents to enhance the capacity of public sector decision-makers to evaluate and implement P3s
- Will address four key phases of P3 implementation:
  1. Legislation and policy
  2. *Planning and evaluation*
  3. Procurement
  4. Monitoring and oversight
P3 Evaluation

- **Value for Money (VfM)**
  - The optimum combination of life cycle costs and quality of a good or service to meet the user’s requirements
  - Generally expressed as the dollar difference or % difference between present value of costs for P3 vs. present value of costs for conventional project delivery

- **VfM Analysis**
  - Quantitative analysis to compare the financial impacts of procurement alternatives for a project
  - Financial analysis
  - Impact on balance sheet of the procuring agency
  - Other benefits (e.g., to users) considered in qualitative assessment
 Agencies typically conduct VfM analyses once they decide to undertake a project and wish to assess delivery options.
Pre-Procurement P3 Evaluation

1. Identify potential procurement options
2. Identify, monetize and allocate project risks (covered in 6/13 webinar)
3. Develop public sector comparator (PSC)
4. Develop P3 option ("shadow bid")
5. Compare PSC to Shadow Bid
6. Consider qualitative factors (e.g., benefits to users from accelerated project delivery)

P3-VALUE Tools

- **Risk Assessment Tool**
  - Helps identify risks, risk allocation, risk response strategies, potential cost and schedule impacts

- **Public Sector Comparator (PSC) Tool**
  - Calculates risk-adjusted life-cycle costs of conventional procurement

- **Shadow Bid (SB) Tool**
  - Calculates costs of P3 procurement, including payments to private partner

- **Financial Assessment Tool**
  - Compares PSC and Shadow Bid costs to calculate value for money

P3-VALUE Tools

1. Risk Assessment Tool

2. Public Sector Comparator (PSC) Tool

3. Shadow Bid Tool

4. Financial Assessment Tool

Project Assumptions

Risk values and allocation

Cost of public delivery

Cost of P3 delivery
True or False:
P3 evaluation may be undertaken using Value for Money analysis prior to procurement as well as later during a project’s life.
Questions?

Submit a question using the chat box
Lesson 2

Developing a Public Sector Comparator
PSC Tool Overview

- **Public Sector Comparator (PSC)**
  - Conventional procurement’s baseline cost against which P3 option will be compared

- **Public Sector Comparator Tool (PSC Tool)**
  - Estimates the risk-adjusted life-cycle costs of a project delivered by the public sector
  - **Prerequisites**
    - Estimates of project delivery schedule, life-cycle costs and revenues
    - Estimates of value of retained and transferrable project risks
    - Basic project finance plan
Developing a PSC

- **Key assumptions:**
  - Project can be completed to the same standards anticipated by P3 delivery
  - Same time frame, e.g., funding or financing issues will not delay conventional procurement
  - Discount rate – all future cash flows are converted to “present value” terms, including:
    - Costs
    - Revenues
    - Financing (e.g., debt and equity receipts and payments)
Example of Present Value Calculation

Present Value of $10M received in Year 2 at 5% discount rate

Present Value of $10M received in Year 4 at 5% discount rate
Discount Rate

- **Discount rate** is a percentage by which a cash flow element in the future is reduced per year, applied exponentially
  
  - It is used to estimate how much money would have to be invested currently, at a rate of return equal to the discount rate, to yield the cash flow in future
  
  - It is also used to estimate how large an investment can be justified at a required rate of return equal to the discount rate on the basis of expected future cash flows
  
  - It may be used to account for uncertainty in future cash flows – one “certain” dollar is worth more than one uncertain dollar
  
  - A “nominal” discount rate accounts for inflation, and is applied to nominal (i.e. inflation-adjusted) future cash flows
  
  - A “real” discount rate is applied to future cash flows that do not incorporate inflation
**Present Value**

- **Present Value**: A metric to determine the time-adjusted (and risk-adjusted) value of future project cash flows:
  - Sum of present values of positive and negative cash flows, including the initial investment, is called Net Present Value (NPV)
  - For a sum that is a net cost, the term Net Present Cost (NPC) may be used
  - Using a high discount rate will favor lower upfront investment with higher recurring costs in the future (since the high discount rate will minimize future costs)
The same annual payment ($25.6 M) appears to be much smaller with a higher discount rate.

PV at 5% discount rate

PV at 7.2% discount rate

- Availability Payments
- PV of Availability Payments
Key Steps in Developing a PSC

- Estimate the hypothetical, risk-adjusted cost of a project delivered through conventional approach:
  1. Base costs (including financing)
  2. Cost impacts of risks
  3. Other project costs such as procurement and oversight costs
  4. Adjustments for any competitive advantages and disadvantages that accrue to the public agency by virtue of its public ownership, a.k.a. “competitive neutrality”
# 1. Base Costs

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Costs</td>
<td>Includes design, right-of-way purchase and construction costs.</td>
</tr>
<tr>
<td>Operations Costs</td>
<td>Day-to-day costs of operating the project.</td>
</tr>
<tr>
<td>Maintenance Costs</td>
<td>Routine and preventive maintenance costs. Items such as pavement overlay, replacement of lighting, and snow and ice removal.</td>
</tr>
<tr>
<td>Reconstruction &amp; Rehabilitation Costs</td>
<td>Costs associated with major structural replacement or upgrades, e.g., bridge or pavement replacement.</td>
</tr>
<tr>
<td>Financing Costs</td>
<td>Costs associated with the interest charged on debt, as well as other costs, such as arrangement fees, commitment fees, and “swap” credit premiums.</td>
</tr>
</tbody>
</table>
## 2. Cost Impacts of Risks

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained Risk Costs</td>
<td>The costs of project risks that a public agency bears. If a retained risk is realized, then the public agency is responsible for the related costs of responding to that risk event.</td>
</tr>
<tr>
<td>Transferrable Risk Costs</td>
<td>Risk costs that may be transferred from the public agency to its contractor, though the public agency may still pay a risk premium through the contractor’s bid price.</td>
</tr>
<tr>
<td>Shared Risk Costs</td>
<td>The public agency and the contractor may share the burden of some risks that cannot be efficiently transferred.</td>
</tr>
</tbody>
</table>

- For a more detailed discussion, see
  - P3 Project Risk Assessment Webinar: [https://connectdot.connectsolutions.com/p37y72rl5je/](https://connectdot.connectsolutions.com/p37y72rl5je/)
### 3. Other Project Costs (Examples)

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement Costs</td>
<td>Transaction costs incurred by the public agency throughout the procurement process for preparing and advertising a bid, receiving and reviewing proposals, etc.</td>
</tr>
<tr>
<td>Monitoring &amp; Oversight Costs</td>
<td>Costs inherent to the public agency as it performs its project oversight and monitoring activities, such as site inspections or Federal-aid reports.</td>
</tr>
<tr>
<td>Right-of-way Costs</td>
<td>Costs associated with land acquisition and right-of-way entitlements. May be included in Base Costs (capital costs).</td>
</tr>
</tbody>
</table>
4. Competitive Neutrality Adjustments (Examples)

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal corporate tax</td>
<td>“Opportunity cost” of Federal corporate taxes that would be paid under a P3. Consideration depends on the procuring agency’s viewpoint</td>
</tr>
<tr>
<td>State corporate tax</td>
<td>“Opportunity cost” of State corporate taxes that would be paid under a P3. Consideration depends on the procuring agency’s viewpoint</td>
</tr>
<tr>
<td>Self-insurance Cost</td>
<td>For example, tort liability limits under public operation favor the public sector</td>
</tr>
<tr>
<td>Costs associated with transparency, accountability and public scrutiny</td>
<td>For example, a public agency may incur higher costs for public involvement with a P3 procurement; on the other hand, greater public involvement may be required in the operations phase with traditional delivery, especially in toll rate setting.</td>
</tr>
</tbody>
</table>
True or False:

Using a *high* discount rate to get the present value of a stream of future cash flows will result in a *lower* present value.
Illustration of PSC Estimation

- We will use hypothetical project data to illustrate how a PSC may be estimated.
- We will first show how the data may be used with a very simple model
  - To illustrate each step of the process
  - Using simple assumptions
- We will then show results produced by P3-VALUE focusing on:
  - How the results differ from our simple calculations
  - Why the results differ
Hypothetical PSC Cost Data

- Design-Bid-Build (or Design-Build)
- Base design/construction costs of $30M in Year 1 and $70M in year 2 – P3-VALUE expects these cost in nominal dollars
- $10 million (real dollars) per year O&M costs over 28 years
- Risk cost estimates for design-build phase:
  - 10% probability (P10) that they will be at or below $10 M
  - 70% probability (P70) that they will be at or below $20 M
  - 90% probability (P90) that they will be at or below $30 M
- Risk cost estimates for operations phase:
  - 10% probability (P10) that they will be at or below $1 M
  - 70% probability (P70) that they will be at or below $2 M
  - 90% probability (P90) that they will be at or below $3 M
  - $10 million (real dollars) per year O&M costs over 28 years, with an inflation rate of 3%
- Other project costs are assumed to be zero for simplicity
Hypothetical PSC Assumptions

- **Financing:**
  - Bond financing for 100% of construction costs, at 5% interest and 30-year maturity
  - $2 M in bond issuance costs are financed as part of the debt
  - For simplicity in this illustration, no reserves are required, but reserve requirements (for debt service and O&M) would normally also be required to be financed

- **Inflation = 3% annually**

- **Discount rate = 5%**
  - This rate is the same as the public sector borrowing rate
  - It assumes that all project risks are accounted for in the cash flows
While nominal costs are $100 M, the present value of those costs are only $92.1 M
Base PSC Operations Costs

PSC Operations Costs

$250.0
$200.0
$150.0
$100.0
$50.0
$

Year 0: $206.3
Year 3: $10.9
Year 4: $11.3
Year 30: $24.3

Nominal Operations Costs
PV of Operations Costs

U.S. Department of Transportation
Federal Highway Administration
PSC D-B Phase Risk Costs (at P70)

PSC Design Build Risk Costs

Year 0: $18.4
Year 1: $6.0
Year 2: $14.0

P70 DB Risk Costs
PV of P70 DB Risk Costs
PSC Operations Risk Costs (at P70)

PSC Operations Risk Costs

Year 0: $41.3
Year 3: $2.2
Year 4: $2.3
Year 30: $4.9

- P70 Ops Risk Costs
- PV of P70 Ops Risk Costs

U.S. Department of Transportation
Federal Highway Administration
Innovative Program Delivery
PSC Net Financing Costs (at P70)

- PV of Debt Service Costs = $122M
- Capital cost in Year 0 = $120M
- Net PV of Debt Costs = $2M

Note: Financing for reserve funds is not included – they can greatly increase costs
## PSC Results from P3-VALUE

<table>
<thead>
<tr>
<th>Nominal Discount Rate</th>
<th>Results - Risk Adjusted Payments ($)</th>
<th>PV of Payments with P10 Risk Adjustment</th>
<th>PV of Payments with P70 Risk Adjustment</th>
<th>PV of Payments with P90 Risk Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.00%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Payment Item</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design and Construction After Subsidy #</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Construction Phase Transferrable Risks #</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Construction Phase Retained Risks #</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Periodic Maintenance</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Operations Phase Retained Risks</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Other Project Costs (ROW etc)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>PSC Adjustments</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Principal Debt Payments</td>
<td>41,890,908</td>
<td>45,768,288</td>
<td>49,645,668</td>
<td></td>
</tr>
<tr>
<td>Interest &amp; Fee Payments</td>
<td>76,377,465</td>
<td>82,473,436</td>
<td>88,569,408</td>
<td></td>
</tr>
<tr>
<td><strong>Total Payments</strong></td>
<td>$341,991,107</td>
<td>$372,302,889</td>
<td>$402,614,671</td>
<td></td>
</tr>
<tr>
<td>Toll and Other Revenue</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Total Payments After Toll and Other Revenue</strong></td>
<td>$341,991,107</td>
<td>$372,302,889</td>
<td>$402,614,671</td>
<td></td>
</tr>
</tbody>
</table>
Comparison of PSC Estimates

- With P3-VALUE, a 6-month payment schedule is used instead of a one-year schedule; also amount invested includes debt service and O&M reserves that must be financed upfront

<table>
<thead>
<tr>
<th>SIMPLE MODEL</th>
<th>P3-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discount rate = 5%</strong></td>
<td><strong>Discount rate = 5%</strong></td>
</tr>
<tr>
<td>Cost ($M)</td>
<td>Cost ($M)</td>
</tr>
<tr>
<td>Base DB costs</td>
<td>Principal</td>
</tr>
<tr>
<td>92.1</td>
<td>45.8</td>
</tr>
<tr>
<td>DB Risks</td>
<td>Interest &amp; Fee</td>
</tr>
<tr>
<td>18.4</td>
<td>82.5</td>
</tr>
<tr>
<td><strong>Total investment</strong></td>
<td><strong>Total investment</strong></td>
</tr>
<tr>
<td>110.5</td>
<td>128.3</td>
</tr>
<tr>
<td>Base O&amp;M costs</td>
<td>Base O&amp;M costs</td>
</tr>
<tr>
<td>206.3</td>
<td>203.4</td>
</tr>
<tr>
<td>O&amp;M risk costs</td>
<td>O&amp;M risk costs</td>
</tr>
<tr>
<td>41.3</td>
<td>40.7</td>
</tr>
<tr>
<td><strong>Total O&amp;M costs</strong></td>
<td><strong>Total O&amp;M costs</strong></td>
</tr>
<tr>
<td>247.6</td>
<td>244.1</td>
</tr>
<tr>
<td>Financing costs</td>
<td>Financing cost (incl. above)</td>
</tr>
<tr>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>Total cost</strong></td>
</tr>
<tr>
<td>360.1</td>
<td>372.3</td>
</tr>
</tbody>
</table>
Test Your Knowledge

True or False:

If the discount rate is equal to the interest rate on the debt, the present value of a stream of debt service payments discounted to the year the loan is made will be equal to the amount borrowed.
Questions?

Submit a question using the chat box
Lesson 3

Developing a Shadow Bid
Shadow Bid Tool Overview

- **Shadow Bid**
  - Cost of P3 option
  - Includes estimated payments to private partner as well as other costs incurred by public sponsor

- **Shadow Bid Tool**
  - Estimates the risk-adjusted, life-cycle costs of a project delivered by the private sector
  - **Prerequisites**
    - Estimates of project delivery schedule, life-cycle costs and revenues
    - Estimates of value of retained and transferrable project risks
    - Basic project finance plan
Developing a Shadow Bid

- Estimate the total costs *to the public agency* for delivering the *same* project as a P3 (instead of conventional delivery)

- Components include:
  - **P3 contract payment**: Amount that would be required by private sector to deliver the project based on its costs and desired rate of return
  - **Retained risks**: Value of risks retained by the public sector in P3 delivery structure
  - **Other project costs**: Costs incurred by the public agency to facilitate project delivery and oversight

- Note that the term “shadow bid” as used in Value for Money analysis includes both the estimated private bid cost *as well as* additional public costs
Estimating the P3 Contract Payment

Payments to Private Partner cover:

1. **Base life-cycle costs borne by private partner**
   - Capital Costs (Design and Construction)
   - Annual Operations and Maintenance Costs
   - Periodic Maintenance Costs (Reconstruction and Rehabilitation)

2. **Costs of transferred risks**

3. **Financing costs:**
   - Interest on debt
   - Equity returns
   - Includes consideration of corporate taxes to be paid by concessionaire
1. Base Life-Cycle Costs of Private Partner

Costs may be reduced (relative to PSC) due to:

- **Cost Efficiency**
  - Lower design-build costs
  - Lower O&M costs

- **Schedule Efficiency**
  - Faster design and construction
2. Costs of Transferred Risks

- Costs may be reduced (relative to PSC) due to risk management:

  - Insurance and Performance Security (Millions)
  - Cost of Construction (10’s of Millions)
  - Cost of Operations (10’s of Millions)

  ![Diagram showing cost reduction](image-url)
3. P3 Financing Costs

P3 financing costs incorporate risk premiums for:

- Identified project risks that are transferred
- Unidentified project risks that are transferred
- Market risks ("systematic" risks)
  - Inflation
  - Economy
  - Interest rates (e.g., when short-term loans have to be refinanced)

Costs may increase (relative to PSC) due to incorporation of project risk premiums that may not be incorporated in PSC financing costs.
Hypothetical Shadow Bid Costs

- DBFOM with “availability payments” made by public agency over a 30-year concession term, contingent on meeting performance standards; no toll revenue
- 10% DB cost reduction relative to PSC
- 5% O&M cost reduction relative to PSC
- Risk management efficiency
  - 50% of design-build phase risk costs are transferred
  - 100% of operations phase risk costs are transferred
  - 25% lower risk costs for all transferred risks
Hypothetical Shadow Bid Assumptions

- **Financing costs**
  - Project funded 80% by debt and 20% by equity
  - Average debt interest rate is 6.0% (vs. 5% for PSC)
  - Required return on equity is 12% ("hurdle" rate)
  - For simplicity in this illustration, we assume no reserves are required; reserve requirements (for debt service and O&M) would normally also be required to be financed
  - No consideration of taxes paid by concessionaire (for simplicity in the illustration)

- **Inflation = 3% annually**

- **Discount rate = 5%**
  - This rate is the same as the public sector borrowing rate
  - It assumes that all project risks are accounted for in the cash flows, e.g., through contingencies and risk premiums in financing costs
Nominal costs are $90 M (10% reduction relative to PSC), and the present value of those costs are only $82.9 M.
Base SB Operations Costs

SB Operations Costs

$196.0

$200.0

$150.0

$100.0

$50.0

$-

Year 0  Year 3  Year 4  Year 30

$10.4  $10.7  $23.1

Nominal Operations Costs  PV of Operations Costs
Nominal costs of DB risks are $7.5 M (25% reduction for the transferred $10M out of total $20M in risks); the present value of those risk costs is $6.9 M
SB Financing Costs (at P70)

**PV of Debt Service Costs** = $86.8M (at 6%)

**PV of Equity Costs** = $35.9 (at 12% return)

**PV of SB Financing Costs** = $122.7

**Total Capital Cost in Year 0** = $97.5

**SB Net Financing Cost** = $126.5 - $97.5 = $25.2
Shadow Bid Costs (from P3-VALUE)

- Note: Procurement costs are not included; they may be higher for a P3 and would be included in “Other Project Costs (for Agency)”

<table>
<thead>
<tr>
<th>Manual Input</th>
<th>Risk Adjusted Payments ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PV of Payments with P10 Risk Adjustment</td>
</tr>
<tr>
<td><strong>Payment Item</strong></td>
<td></td>
</tr>
<tr>
<td>Availability Payments</td>
<td>$332,769,407</td>
</tr>
<tr>
<td>Construction Phase Retained Risks</td>
<td>$4,434,779</td>
</tr>
<tr>
<td>Operations Phase Retained Risks</td>
<td>-</td>
</tr>
<tr>
<td>Other Project Costs (For Agency)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Payments Before Toll Revenue</strong></td>
<td>$337,204,186</td>
</tr>
<tr>
<td>Toll and Other Revenue</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Payments After Toll Revenue</strong></td>
<td>$337,204,186</td>
</tr>
</tbody>
</table>
### Comparison of PV of SB with P3-VALUE Results

<table>
<thead>
<tr>
<th>SIMPLE MODEL</th>
<th>Cost ($M)</th>
<th>P3-VALUE</th>
<th>Cost ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discount rate = 5%</strong></td>
<td></td>
<td><strong>Discount rate = 5%</strong></td>
<td></td>
</tr>
<tr>
<td>Base DB costs</td>
<td>82.9</td>
<td>Availability payments</td>
<td>355.2</td>
</tr>
<tr>
<td>DB Risks</td>
<td>6.9</td>
<td>Retained risks</td>
<td>8.9</td>
</tr>
<tr>
<td>Total investment</td>
<td><strong>89.8</strong></td>
<td>Total cost</td>
<td><strong>364.1</strong></td>
</tr>
<tr>
<td>Financing cost</td>
<td>25.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base O&amp;M costs</td>
<td>196.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O&amp;M risk costs</td>
<td>31.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total O&amp;M costs</td>
<td><strong>227.0</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total concessionaire cost</td>
<td><strong>341.9</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retained risks</td>
<td>9.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>351.2</strong></td>
<td></td>
<td><strong>364.1</strong></td>
</tr>
</tbody>
</table>
PV of concessionaire’s costs:
- Total = $341.9 M

Uniform availability payment over 28 years*:
- Similar to mortgage payment, with $341.9 M “borrowed” and an “interest” rate of 5%**
  = $25.3 M

*Annual availability payments are made by public agency over a 28-year operating period (i.e., 30-year term less 2-year design-build phase), contingent on meeting performance standards

**The PV of total concessionaire costs (i.e., $341.9M) includes the costs for financing with debt and equity, so the 5% discount rate is appropriate in this case
Shadow Bid Availability Payments (P70)

SB Availability Payments

- Year 0: $341.9
- Year 1: $25.3
- Year 2: $25.3
- Year 30: $25.3

Availability Payments (blue) and PV of Availability Payments (red)
With P3-VALUE, the availability payment is inflated over the term of the concession, rather than being uniform throughout – that is why the first year availability payment is lower than we calculated with our simple model.

### Availability Payment

<table>
<thead>
<tr>
<th></th>
<th>P10</th>
<th>P70</th>
<th>P90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Nominal Payment Amount:</td>
<td>16,361,607</td>
<td>17,466,518</td>
<td>18,571,429</td>
</tr>
</tbody>
</table>
Test Your Knowledge

**Multiple answer:**

Which of the following are included in the calculation of *payments to a concessionaire*:

- Base life-cycle costs estimated for the concessionaire
- Costs of risks transferred to the concessionaire
- Costs to the concessionaire for financing the project
- Cost of risks retained by the public sector
Questions?

Submit a question using the chat box
Lesson 4

Comparing PSC and SB
Comparing PSC to Shadow Bid

<table>
<thead>
<tr>
<th>PSC</th>
<th>Shadow Bid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base cost</td>
<td>Base cost</td>
</tr>
<tr>
<td>Other project costs</td>
<td>Other project costs</td>
</tr>
<tr>
<td>Financing</td>
<td>Financing</td>
</tr>
<tr>
<td>Retained risks</td>
<td>Retained risks</td>
</tr>
</tbody>
</table>

Value of P3 Bid (Shadow or actual)

VfM
Comparison of PSC and SB: Simple Model Results

- Difference = $9M or about 1.9%
- With the P3 option, the comparison with hypothetical data indicates that the reductions due to lower investment and O&M costs would exceed the increase in financing costs, so that the P3 would provide marginal value for money.

<table>
<thead>
<tr>
<th></th>
<th>PSC</th>
<th>Shadow Bid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Simple Model</strong></td>
<td><strong>Cost ($M)</strong></td>
<td><strong>Cost ($M)</strong></td>
</tr>
<tr>
<td>Total investment</td>
<td>110.5</td>
<td>89.8</td>
</tr>
<tr>
<td>Total O&amp;M costs</td>
<td>247.6</td>
<td>227.0</td>
</tr>
<tr>
<td>Financing costs</td>
<td>2.0</td>
<td>25.2</td>
</tr>
<tr>
<td>Retained Risks</td>
<td></td>
<td>9.2</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>360.1</strong></td>
<td><strong>351.1</strong></td>
</tr>
</tbody>
</table>
## Comparison of PSC and SB: P3-VALUE Results

- **Difference** = $8.2M or 2.2%
- The P3-VALUE comparison suggests that the P3 option would cost the public agency 2.2% less than the public procurement option.

<table>
<thead>
<tr>
<th></th>
<th>PSC P3-VALUE</th>
<th>Cost ($M)</th>
<th>SHADOW BID P3-VALUE</th>
<th>Cost ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total investment (incl. financing and retained risks)</td>
<td>128.3</td>
<td>Availability payments</td>
<td>355.2</td>
<td></td>
</tr>
<tr>
<td>Total O&amp;M costs</td>
<td>244.1</td>
<td>Retained risks</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td>Total cost</td>
<td><strong>372.3</strong></td>
<td>Total cost</td>
<td><strong>364.1</strong></td>
<td></td>
</tr>
</tbody>
</table>
P3-VALUE Financial Assessment Tool

- Imports results from PSC and SB tools
- Compares the results for four scenarios:
  - Nominal dollars for P70 (i.e., 0% discount rate)
  - Present value terms for P10
    - Present value terms for P70
    - Present value terms for P90
## P3-VALUE Present Value Comparison (P70)

<table>
<thead>
<tr>
<th>Project Payments</th>
<th>PSC</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Construction After Subsidy $</td>
<td>$101,692,152</td>
<td>(1)</td>
</tr>
<tr>
<td>Operations</td>
<td>$101,692,152</td>
<td>(1)</td>
</tr>
<tr>
<td>Routine Maintenance</td>
<td>$101,692,152</td>
<td>(1)</td>
</tr>
<tr>
<td>Periodic Maintenance</td>
<td>$101,692,152</td>
<td>(1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Adjustments</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Transferrable Risk $</td>
<td>$40,676,861</td>
<td>(1)</td>
</tr>
<tr>
<td>Construction Retained Risk $</td>
<td>$8,869,557</td>
<td></td>
</tr>
<tr>
<td>Operations &amp; Maintenance Transferable Risk</td>
<td>$355,241,557</td>
<td></td>
</tr>
<tr>
<td>Operations &amp; Maintenance Retained Risk</td>
<td>$355,241,557</td>
<td></td>
</tr>
</tbody>
</table>

| Availability Payment      | $355,241,557 |          |

<table>
<thead>
<tr>
<th>Payment Type</th>
<th>PSC Adjustments</th>
<th>N\A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal Debt Payments</td>
<td>$45,768,288</td>
<td>(1)</td>
</tr>
<tr>
<td>Interest &amp; Fee Payments</td>
<td>$82,473,436</td>
<td>(1)</td>
</tr>
<tr>
<td>Other Project Costs</td>
<td>$101,692,152</td>
<td>(1)</td>
</tr>
<tr>
<td>Toll + Other Revenues</td>
<td>$101,692,152</td>
<td>(1)</td>
</tr>
</tbody>
</table>

| Total Payments            | $372,302,889 | $364,111,114 |
| Notional Value For Money ($) | $8,191,775  |
| Notional Value For Money (% of PSC) | 2%           |

(1) Included in the Availability Payment
With the higher risk scenario, the difference is larger due to the more efficient risk management assumed in the P3 option. Likewise, difference is lower in the lower risk scenario.

<table>
<thead>
<tr>
<th>PSC Discount Rate: 5%</th>
<th>PV of Payment with P10 Risk Adjustment</th>
<th>PV of Payment with P70 Risk Adjustment</th>
<th>PV of Payment with P90 Risk Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>VfM Discount Rate: 5%</td>
<td>PSC</td>
<td>SB</td>
<td>PSC</td>
</tr>
<tr>
<td>Project Payments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Construction After Subsidy#</td>
<td>$</td>
<td>-</td>
<td>(1)</td>
</tr>
<tr>
<td>Operations</td>
<td>$ 101,692,152</td>
<td>(1)</td>
<td>$ 101,692,152</td>
</tr>
<tr>
<td>Routine Maintenance</td>
<td>$ 101,692,152</td>
<td>(1)</td>
<td>$ 101,692,152</td>
</tr>
<tr>
<td>Periodic Maintenance</td>
<td>$</td>
<td>-</td>
<td>(1)</td>
</tr>
<tr>
<td>Risk Adjustments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Transferrable Risk#</td>
<td>$</td>
<td>-</td>
<td>(1)</td>
</tr>
<tr>
<td>Construction Retained Risk#</td>
<td>$</td>
<td>-</td>
<td>$ 4,434,779</td>
</tr>
<tr>
<td>Operations &amp; Maintenance Transferrable Risk</td>
<td>$ 20,338,430</td>
<td>(1)</td>
<td>$ 40,676,861</td>
</tr>
<tr>
<td>Operations &amp; Maintenance Retained Risk</td>
<td>$</td>
<td>-</td>
<td>$</td>
</tr>
<tr>
<td>Availability Payment</td>
<td>$ 332,769,407</td>
<td></td>
<td>$ 355,241,557</td>
</tr>
</tbody>
</table>

**Payment Type**

<table>
<thead>
<tr>
<th>Adjustments</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PSC Adjustments</td>
<td>$</td>
<td>-</td>
<td>N\A</td>
</tr>
<tr>
<td>Financing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal Debt Payments</td>
<td>$ 41,890,908</td>
<td>(1)</td>
<td>$ 45,768,288</td>
</tr>
<tr>
<td>Interest &amp; Fee Payments</td>
<td>$ 76,377,465</td>
<td>(1)</td>
<td>$ 82,473,436</td>
</tr>
<tr>
<td>Other Project Costs</td>
<td>$</td>
<td>-</td>
<td>$</td>
</tr>
<tr>
<td>Toll + Other Revenues</td>
<td>$</td>
<td>-</td>
<td>$</td>
</tr>
<tr>
<td>Total Payments</td>
<td>$ 341,991,107</td>
<td>$ 337,204,186</td>
<td>$ 372,302,889</td>
</tr>
<tr>
<td>Notional Value For Money ($)</td>
<td>$4,786,921</td>
<td>$8,191,775</td>
<td>$11,596,628</td>
</tr>
</tbody>
</table>

(1) Included in the Availability Payment
Qualitative Assessment

- Key qualitative considerations related to project goals:
  - User benefits from accelerated project delivery
  - Safety
  - Service quality
  - Reliability

- P3 contract-related considerations include:
  - **Viability**: Ability to formulate a sound contract
  - **Performance**: Opportunity for innovation
  - **Achievability**: Public agency’s capabilities and those of the private sector
  - **Flexibility**: Ability of the public agency to coordinate regional network policies
VfM Analysis Limitations

- Analytical process to assess costs and risks is resource-intensive and may require outside expertise.
- Analysis results are entirely dependent on the assumptions, especially regarding risk transfer.
- Choice of discount rate can skew the results – extreme care is needed to ensure risk costs are not double-counted in the discount rate.
- Does not answer the question: “Can the government agency afford the costs of delivering a project as a P3?”
- Does not quantitatively assess non-financial costs and benefits of a project (e.g., benefits of project acceleration).
Course Summary
Course Recap

Lesson 1  Introduction to P3s, Value for Money and the P3 Toolkit
Lesson 2  Developing a Public Sector Comparator
Lesson 3  Developing a Shadow Bid
Lesson 4  Comparing Procurement Options

Summary
Homework Assignment

- Run a Value for Money analysis using the P3-VALUE tools with the hypothetical project data presented in this webinar:
  - Availability payment concession
  - Toll concession (extra credit)

- Technical assistance options:
  - E-mail questions to: P3-VALUE@dot.gov
Resources

IPD’s P3 Website:

P3-VALUE Website:

FHWA Value for Money Assessment Primer:

FHWA Value for Money Analysis Factsheet:

P3-VALUE PSC and Shadow Bid Tools:

P3-VALUE PSC Tool User Manual:

P3-VALUE Shadow Bid Tool User Manual:
I-595 Corridor Value for Money Analysis:

Presidio Parkway Value for Money Analysis:
http://www.presidioparkway.org/project_docs/files/presidio_prkwy_prjct_bsnss_case.pdf

Sea-to-Sky Highway Value for Money Analysis:
http://www.presidioparkway.org/project_docs/files/presidio_prkwy_prjct_bsnss_case.pdf
Upcoming P3-VALUE Training

- Aug. 7: P3 Financial Assessment 201
- Sep. 5: P3 Evaluation Overview
- Sep. 20: P3 Project Risk Assessment 201
- Oct. 3: Public Sector Comparator/Shadow Bid 201
- Oct. 18: P3 Financial Assessment 201

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Questions?

Submit a question using the chat box