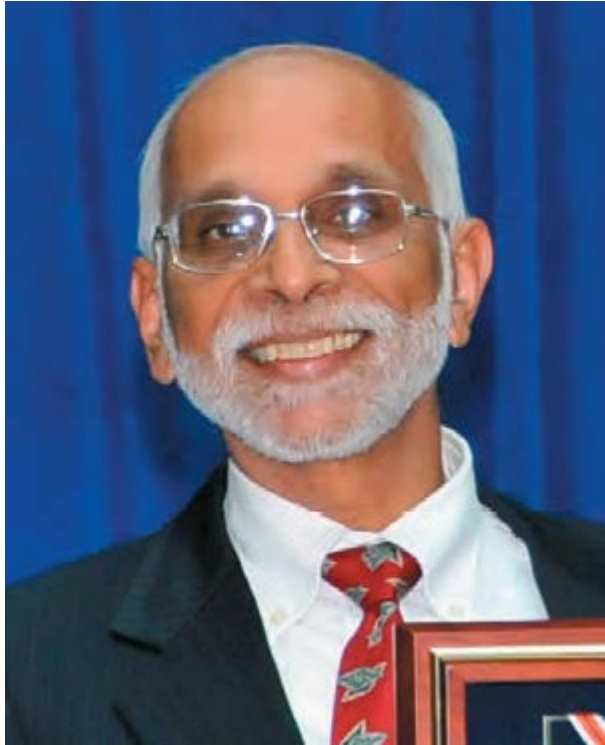




Risk Assessment Exercise Review

P3-VALUE 2.0 Webinar
March 14, 2016

Instructors



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P3-VALUE 2.0 Webinars

- This is one of a series of webinars to introduce P3-VALUE
 - P3 Evaluation Overview (January 25, 2016)
 - Value for Money Analysis (February 8, 2016)
 - Value for Money Exercise Review (February 16, 2016)
 - Project Delivery Benefit-Cost Analysis (Feb 22, 2016)
 - PDBCA Exercise Review (Feb 29, 2016)
 - Risk Assessment (March 7, 2016)
 - **Risk Exercise Review (today)**
 - Financial Viability Assessment (March 21)
 - Financial Viability Exercise Review (March 28)



Exercise Objective

- Learn how to estimate, for use in VfM analysis, the cost impacts of risks, as well as the value of risks retained by the public agency and those transferred to the concessionaire under a P3.
- Learn how to estimate the value of risks for use in benefit-cost analysis.
- Be able to explain the role of financial conditions in developing a market-based estimate of the costs of lifecycle performance risks and revenue uncertainty..



Webinar Outline

Intro

Project Background

Part A

Risk Valuation for use in VfM Analysis

Part B

Risk Valuation for use in BCA Analysis

Part C

Valuation of Lifecycle Performance Risk and Revenue Uncertainty

Recap

Summary of Webinar



Introduction

Project Background



Study Background

A study was done previously by a state DOT to estimate VfM and net social benefits of P3 delivery for a highway project. The various inputs required for the analysis are included in the P3-VALUE 2.0 spreadsheet model.



Project Information

- 20 miles highway expansion
- From 3 lanes to 5 lanes in each direction
 - 3 General Purpose Lanes (GPL)
 - 2 Managed Lanes (ML)
- Costs (excluding risks and financing):
 - Pre-construction & construction: \$425M
 - Routine O&M: \$4M per year
 - Major maintenance: \$10M (every 8 years)
- Preconstruction start: 2015 (2 years)
- Construction start: 2017 (4 years)
- Operations start: 2021 (40 years)

Base Cost Variability

Base variability on pre-construction costs

Base variability on construction costs

Base variability on O&M costs

	PSC
Base variability on pre-construction costs	10.00%
Base variability on construction costs	17.00%
Base variability on O&M costs	10.00%



Construction Phase “Pure” Risks

Risk label

- Design risk
- Engineering & construction risk
- Planning & approval risk
- Environmental risk
- Right of way/utilities risk
- Commercial/procurement risk
- Latent defect
- Force majeure
- Political risk
- Insurance risk
- Public sentiment risk
- Changes in law & policy



Operations Phase “Pure” Risks

Risk label

Latent defect

Operations risk

Maintenance risk

Force majeure

Insurance risk

Changes in law & policy

P3 Financing Conditions

Cost of equity	12.00% % p.a.
Gearing (debt-to-equity ratio)	75.00% %
Debt maturity	30 years
Debt interest rate	6.00% % p.a.
Equity bridge loan interest rate	6.00% % p.a.
	-
Difference between Availability Payment WACC & Toll Concession WACC*	1.60% %



Part A

Risk Valuation for Use in VfM Analysis

PSC Risks

- PSC risks include:
 1. Base variability;
 2. Pure risks;
 3. Lifecycle performance risks; and
 4. Revenue uncertainty.

P3 Option

Differences between P3 and Conventional Delivery that could affect P3 risk values may include:

- P3 differences with regard to risk management, potentially leading to a reduction in risk valuation
- Share of pure risks transferred to the concessionaire



Review of Model Inputs

Please stand by as we open the Excel file



Review of Model Outputs

- Conventional Delivery (PSC)
- P3 Option:
 - Retained risks
 - Transferred risks



Conventional Delivery Risk Values

Item	Risks under Conventional Delivery	
	NPV risk values (\$M, Column G)	Nominal risk values (\$M, Column H)
Total Pure risks (row 28)	69	121
Total Base variability (row 34)	79	112
Lifecycle performance risk premium (row 36)	228	574
Revenue uncertainty adjustment (row 38)	130	377
Total risks under Conventional Delivery (row 45)	505	1,184



P3 Risk Values – Retained Risks

Item	Risk Retained by Agency under P3	
	NPV risk values (\$M, Column J)	Nominal risk values (\$M, Column K)
Pure risks (row 28)	6	11
Base variability (row 34)	7	10
Lifecycle performance risk premium (row 36)	-	-
Revenue uncertainty adjustment (row 38)	-	-
Total risks retained under P3 (row 45)	13	21



P3 Risk Values – Transferred Risks

Item	Risk Transferred to P3 Developer	
	NPV risk values (\$M, Column M)	Nominal risk values (\$M, Column N)
Pure risks (row 28)	40	98
Base variability (row 34)	54	94
Lifecycle performance risk premium (row 36)	93	515
Revenue uncertainty adjustment (row 38)	51	382
Total risks transferred under P3 (row 45)	238	1,089



Nominal Values – PSC vs. P3

Item	Nominal values	
	PSC (\$M, Column H)	P3 (\$M, Column K + Column N)
Pure risks (row 28)	121	109
Base variability (row 34)	112	104
Lifecycle performance risk premium (row 36)	574	515
Revenue uncertainty adjustment (row 38)	377	382
Total risks transferred under P3 (row 45)	1,184	1,110

Benefits from Risk Transfer

- Nominal value of all risks retained by Agency under PSC
= **\$1,184 M**
- Nominal value of all retained + transferred risks under P3
= **\$1,110 M**
- Nominal value of difference
= **\$74 M**

Questions?

Submit a question using the chat box





Part B

Risk Valuation for Use in BCA Analysis

Risks in Project Delivery BCA

- Project Delivery BCA (PDBCA) considers the following risks for the *Delayed* Conventional Delivery, Conventional Delivery and P3 Options:
 1. Base cost variability;
 2. Pure risks;
 3. Lifecycle performance risks

- Discount rate is the social discount rate, assumed to be 3%

P3 Option

Differences between P3 and Conventional Delivery that could affect P3 risk values may include:

- P3 differences with regard to risk management, potentially leading to a reduction in risk valuation



Review of Model Inputs

Please stand by as we open the Excel file



Review of Model Outputs

- Delayed Conventional Delivery
- Conventional Delivery
- P3 Option



Delayed Conventional Delivery vs. PSC

Item	Delayed Conventional Delivery Risk values NPV @ 3.00% (\$M) for PDBCA (Column G)	Conventional Delivery Risk values NPV @ 3.00% (\$M) for PDBCA (Column J)
Pure risks (row 28)	52	62
Base variability (row 34)	63	74
Lifecycle performance risk premium (row 36)	147	185
Total risks (row 38)	262	321



Conventional Delivery (PSC) vs. P3

Item	Conventional Delivery Risk values NPV @ 3.00% (\$M) for PDBCA (Column J)	P3 Risk values NPV @ 3.00% (\$M) for PDBCA (Column M)
Pure risks (row 28)	62	57
Base variability (row 34)	74	71
Lifecycle performance risk premium (row 36)	185	171
Total risks (row 38)	321	299

Questions?

Submit a question using the chat box





Part C

Valuation of Lifecycle Performance Risks and Revenue Uncertainty

Alternative Revenue Scenario

- Due to new information on revenue uncertainty, project financiers perceive much higher revenue risk.
- Financing conditions will change.
 - increase in the cost of equity by 2%
 - Increase in interest rates by 2%.

WACC Changes

- Prior WACC = **8.84%**
- Revised WACC = **10.70%**
- Increase in WACC = **1.86%**

- Use the model to calculate the new value of revenue uncertainty by adding the increase in WACC to the existing revenue uncertainty adjustment input
 - Difference between Availability Payment WACC and Toll Concession WACC:
= 1.6% + Increase in WACC of 1.86%
= **3.46%**



Review of Model Inputs

Please stand by as we open the Excel file



Review of Model Outputs

- VfM risk values



Conventional Delivery Risk Values

Item	Nominal value	
	Base Case (from Part A)	Revised Scenario (\$M, Column H)
Total Pure risks (row 28)	121	121
Total Base variability (row 34)	112	112
Lifecycle performance risk premium (row 36)	574	575
Revenue uncertainty adjustment (row 38)	377	579
Total risks under Conventional Delivery (row 45)	1,184	1,387

P3 Risk Values

Item	Nominal values	
	Base Case (from Part A)	P3 (\$M, Column K + Column N)
Pure risks (row 28)	109	109
Base variability (row 34)	104	104
Lifecycle performance risk premium (row 36)	515	517
Revenue uncertainty adjustment (row 38)	382	586
Total risks transferred under P3 (row 45)	1,110	1,316



Revised Comparison – PSC vs. P3

Item	Nominal values	
	PSC (\$M, Column H)	P3 (\$M, Column K + Column N)
Pure risks (row 28)	121	109
Base variability (row 34)	112	104
Lifecycle performance risk premium (row 36)	575	517
Revenue uncertainty adjustment (row 38)	579	586
Total risks transferred under P3 (row 45)	1,387	1,316



Benefits from Risk Transfer

- Nominal value of all risks retained by Agency under PSC
= **\$1,387 M**
- Nominal value of all retained + transferred risks under P3
= **\$1,316 M**
- Nominal value of difference
= **\$71 M**

Questions?

Submit a question using the chat box





Webinar Summary



Webinar Recap

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Part B

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Part C

Valuation of Lifecycle Performance Risk and Revenue Uncertainty

Tool and References

P3-VALUE 2.0 Excel
Spreadsheet

User Guide

Primers &
Guidebooks



Upcoming P3-VALUE Training

- **March 21** Financial Viability Assessment (2pm)
- **March 28** Exercise Review on Financial Viability Assessment (12:30pm)



Resources

FHWA's Office of Innovative Program Delivery Website:

<http://www.fhwa.dot.gov/ipd/>

P3 Website:

<http://www.fhwa.dot.gov/ipd/p3/>

Questions?

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