

P3-Value: Public Sector Comparator Tool User Manual

April 19, 2013

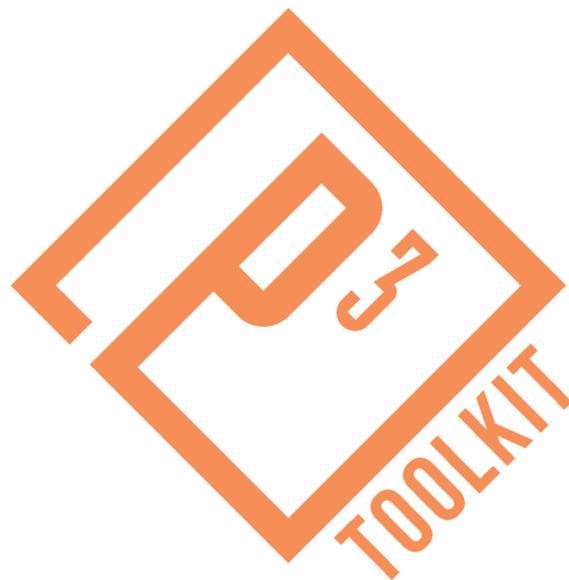


Table of Contents

1	Overview	1-1
	Purpose of P3-VALUE.....	1-1
	Structure of P3-VALUE.....	1-2
	Accompanying Evaluation Resources.....	1-3
	Public Sector Comparator Tool	1-4
	System Requirements	1-4
2	Quick-Start Guide	2-1
3	PSC Development Overview	3-1
	Timing & Prerequisites	3-1
	Structuring the PSC	3-3
4	Assumption and Examples	4-1
	Traffic Scenarios.....	4-1
	Project Delivery Structure.....	4-1
	Timing.....	4-3
	Entering Cost Assumptions	4-3
	Other Project Costs.....	4-3
	Construction Costs.....	4-4
	Operating & Maintenance (O&M) Costs	4-4
	Toll & Other Revenue.....	4-5
	Funding.....	4-6
	Financing.....	4-6
	Inflation	4-7
	Risk Allocation & Risk Values.....	4-7
	Discount Rate	4-8
	Selecting the Discount Rate.....	4-8
	PSC Adjustments	4-9
5	Cash Flow Sheets	5-1
6	Outputs.....	6-1
	Net Present Cost (NPC) Results.....	6-1
	Sensitivity Analysis.....	6-3
	Scenario Analysis.....	6-4
	Integrating Outputs with other Evaluation Tools.....	6-4
7	Summary and Tool Limitation.....	7-1
	P3-VALUE Limitations	7-1

Appendix A: Glossary

Appendix B: References



Tables

TABLE 1: SELECTING PROJECT DELIVERY STRUCTURE 4-2
TABLE 2: INTEGRATING RISK ASSESSMENT OUTPUTS WITH THE PSC TOOL4-10

Figures

FIGURE 1: P3-VALUE OVERVIEW 1-3
FIGURE 2: KEY COMPONENTS OF THE PSC TOOL..... 3-2
FIGURE 3: NPC RESULTS CHART..... 6-2
FIGURE 4: NPC RESULTS BAR GRAPH 6-3
FIGURE 5: SENSITIVITY ANALYSIS OUTPUT..... 6-3
FIGURE 6: SCENARIO ANALYSIS..... 6-4

1 Overview

The Federal Highway Administration's (FHWA) Office of Innovative Program Delivery (OIPD) is producing a P3 Toolkit comprising tools and guidance documents to assist in educating public sector policymakers, legislative and executive staff and transportation professionals. The P3 Toolkit forms the base of a broader P3 capacity-building program which includes a curriculum of P3 courses and webinars. The P3 Toolkit will address Federal requirements related to P3s and four key phases in P3 implementation: (1) Legislation and Policy; (2) Planning and Evaluation; (3) Procurement; and (4) Monitoring and Oversight.

The target audiences for the P3 Toolkit resources are decisionmakers and technical staff in public sector agencies such as:

- ▶ State Executive and Legislative Offices;
- ▶ State Departments of Transportation (DOT);
- ▶ Metropolitan Planning Organizations (MPOs);
- ▶ Regional Planning Agencies;
- ▶ Tolling Authorities;
- ▶ Local jurisdictions; and
- ▶ FHWA Division Offices.

Purpose of P3-VALUE

P3-VALUE (Public-Private Partnership Value-for-Money Analysis for Learning and Understanding Evaluation) is a key component of FHWA's P3 Toolkit. It is a suite of educational tools that introduces users to public-private partnerships (P3s) and the methods used in P3 evaluation, discusses limitations, and explains how public agencies may evaluate different procurement options for a particular project. P3-VALUE can help users understand the processes and considerations that go into a rigorous quantitative analysis of P3 procurement options for transportation projects. P3-VALUE is based on the experience of the U.S. P3 market and therefore reflects the terminology and methodology practiced in the United States. The focus of FHWA's Office of Innovative Program Delivery and its P3-VALUE tools is on long-term P3 contracts that involve designing, operating, constructing, operating and maintaining new highway facilities, also known as greenfield projects.

P3-VALUE is based in Microsoft Excel, and is supported by primers, user guides and other guidebooks, some of which are under development. Practitioners can use P3-VALUE to better understand the concepts, inputs, assumptions and outputs from evaluations of risk, financial feasibility and "value for money" analyses, which are used to evaluate the potential of P3s to



generate value in comparison with conventional methods of project delivery. Users are cautioned that P3-VALUE has been designed for educational purposes only and is not intended to guide decisions on actual projects. The complexity of the analyses for specific projects requires that they be performed by experts using more detailed modeling; however, P3-VALUE provides hands-on instruction in how such detailed modeling analyses are conducted and can help government officials understand the importance of the inputs and assumptions used by modeling experts and the extent to which key assumptions can affect the analysis results.

Structure of P3-VALUE

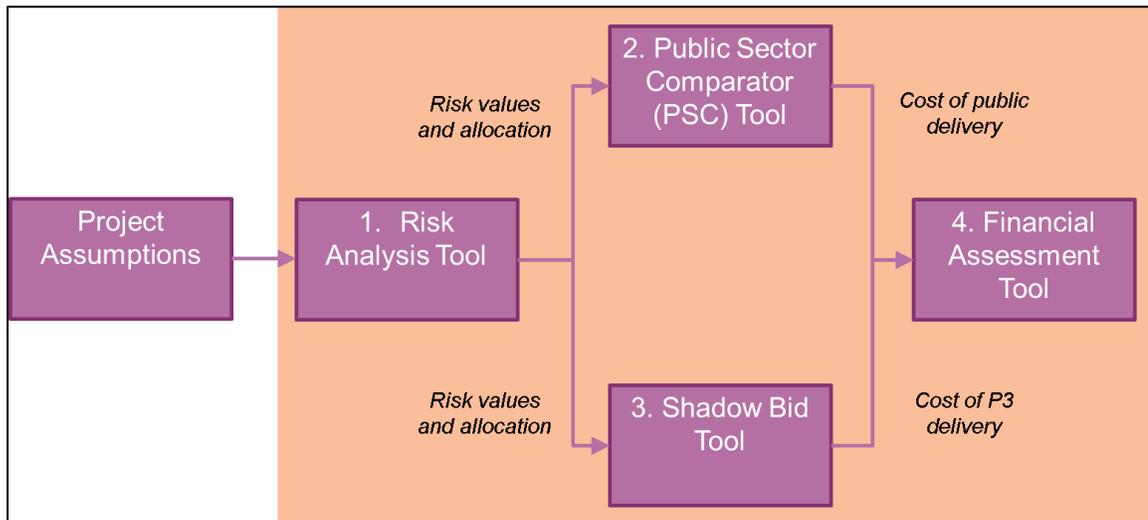
Under a public-private partnership (P3) for a highway project, a private partner may participate in some combination of design, construction, financing, operations and maintenance, including collection of toll revenues. Value for Money (VfM) analysis is a process used to compare the financial impacts of a P3 project against those for the traditional public delivery alternative. The methodology for carrying out a VfM analysis that is incorporated in P3-VALUE involves:

- ▶ Creating a Public Sector Comparator which estimates the risk-adjusted whole-life cost of carrying out the project through a traditional approach;
- ▶ Estimating the risk-adjusted whole-life cost of the P3 alternative (either as proposed by a private bidder, or a hypothetical “shadow bid” at the pre-procurement stage); and
- ▶ Completing an “apples-to-apples” comparison of the present values of costs under the two approaches.

As depicted in Figure 1, P3-VALUE is comprised of four interactive, integrated spreadsheet-based analytical tools that allow users to explore different components of Value for Money Analysis (VfM) including:

- ▶ **Risk Assessment Tool** – This tool allows users to document project risks and risk management strategies and to estimate the costs of risks under different procurement structures.
- ▶ **Public Sector Comparator (PSC) Tool** – This tool allows users to calculate the risk-adjusted costs for a project that is designed, financed, constructed, maintained and operated under a traditional public sector delivery model.
- ▶ **Shadow Bid Tool** – This tool allows users to calculate the costs of payments to a private partner for delivering a project as a P3 concession.
- ▶ **Financial Assessment Tool** – This tool allows users to compare the PSC and Shadow Bid costs for procuring a project and to assess the financial subsidies required using different procurement methods.

Figure 1: P3-VALUE Overview



Accompanying Evaluation Resources

P3-VALUE is supported by several other tools and guides, including:

- ▶ An *Orientation Guide* that summarizes the issues and factors that are evaluated when considering a P3 as a financing and procurement mechanism;
- ▶ Three Primers, one each on *Risk Assessment* (reference for Risk Assessment Tool), *Value for Money Analysis* (reference for Public Sector Comparator and Shadow Bid tools) and *Financial Structuring and Assessment* (reference for Financial Assessment Tool);
- ▶ *User guides* for each analytical tool in the P3-VALUE suite that explain how to use the tools;
- ▶ *Frequently Asked Questions* and a *Troubleshooting Guide* that provide technical advice in support of the P3-VALUE tools;
- ▶ *Evaluation Guidebooks* (under development) for practitioners seeking a deeper understanding of evaluation processes and data sources as well as the concepts, assumptions, inputs and outputs involved in the above analyses; and
- ▶ *P3-SCREEN*, an Excel-based project screening tool along with a supporting user guide to assist practitioners seeking to perform a preliminary screening evaluation of the suitability of a P3 for high-cost highway projects.

P3-VALUE and its accompanying evaluation resources serve as a reference for decisionmakers and practitioners seeking to understand P3s as a financing alternative for major capital projects. Practitioners can use P3-VALUE and its accompanying resources to familiarize themselves with the process of evaluating procurement decisions, the data required to conduct quantitative assessments



of procurement options and the impact that various assumptions can have on the desirability and feasibility of different procurement structures.

Public Sector Comparator Tool

This User Manual, the *Public Sector Comparator Tool User Manual* (User Manual), corresponds to the *Public Sector Comparator Tool* (PSC Tool) and both are part of FHWA's P3-VALUE tool suite. FHWA designed the PSC Tool and User Manual as educational materials to demonstrate how a public sponsor might develop a PSC as part of a VfM analysis. Although the PSC Tool is interactive, FHWA does *not* intend for users to conduct a VfM analysis for a “real-world” project using the tool. FHWA expects that appropriate experts will perform such analyses for a project sponsor. Project data assumptions and requirements vary by project, thereby necessitating project-specific VfM evaluation procedures.

FHWA's *Primer on Value for Money Assessment for Public-Private Partnerships* (Primer) provides an overview of basic PSC and VfM concepts and its *Primer on Financial Structuring and Assessment* provides an overview of basic financing concepts. Both Primers are accessible at www.fhwa.dot.gov/ipd/p3/toolkit/guidance_documents/vfm_for_ppps/toc.htm. The *Guidebook for Value for Money Analysis for Public-Private Partnerships*, which is currently under development, will build upon the Primer to provide an advanced understanding of the practical applications and challenges in conducting a Value for Money Analysis.

System Requirements

The P3-VALUE tools are Microsoft Excel spreadsheets that are best viewed in Microsoft Excel 2007 or later editions. Users may not be able to access the tools when using an earlier version of Excel or when using a different operating system, such as Macintosh.

2 Quick-Start Guide

While the User Manual provides detailed guidance on the PSC Tool, users may also refer to the “Quick-Start” version below for step-by-step instructions.

ACCESSING THE PSC TOOL

1. OPEN THE PSC TOOL.
2. CLICK “ENABLE EDITING” AND/OR “ENABLE CONTENT” ON THE YELLOW BAR ACROSS TOP OF SCREEN.
3. READ THE DISCLAIMER AND CLICK “I ACCEPT.”

MANAGING INPUT FIELDS

1. NAVIGATE TO THE “ASSUMPTIONS” SHEET.

This sheet contains project data that provides the basis for constructing a PSC.

INPUT DATA IN THE LIGHT BLUE CELLS.

- a. Define the project.
 - i. Select a scenario from the “Traffic Scenario” drop-down menu.
Note: See the blue sheets, including “Simple Toll Example” and “Variable Toll Example” for pre-populated toll rate and traffic volume assumptions and “Toll Scenario Template” for a blank toll calculation sheet.
 - ii. Check all the applicable boxes under “Project Delivery Structure” to reflect the project/scenario.
Note: Depending on what boxes are selected, irrelevant inputs cells may turn from light blue to black.
 - iii. Complete the “Timing” table with appropriate dates in ‘YYYY’ format or in number of years.
- b. Estimate project costs.
Note: Enter costs in base year dollars (*not* current or year of expenditure dollars), consistent with the base year defined in step a) above.
 - i. Input planning and development costs into the “Project Costs” table as dollars (in Column E) and include start and end dates (in ‘YYYY’ format) for when those costs are incurred.
 - ii. Itemize “Design & Construction Costs” by asset in the relevant table. Input the “Asset Type” (in Column D), cost in dollars (in Column E), and a breakdown of the expenditure across the design and construction phase (up to 10 years) as a percentage.
Note: The “Year” columns will turn from light gray to blue as values are input. The “Check Sum” value (Column P) should equal 100 percent once the costs are allocated to year of expenditure.
 - iii. Input operations and maintenance costs in the “Operating Costs” table as either a percentage of construction costs (in column E) or as a dollar figure (in column F).
Note: If a user chooses to input O&M costs as dollar values, the adjacent cells in column E black out so that the inputs are only either dollar values or percentages.



- c. Estimate project funding, financing, and revenue.
 - i. If applicable, enter assumptions regarding toll revenue leakage (percentage), length of toll revenue ramp-up period (number of months), and value of additional revenues (in dollars) in the “Toll & Other Revenue” table.
 - ii. Enter funding resources as either a percent of construction cost (Column E) or dollar value (Column F) and allocate across the spending period (up to 10 years) in the “Funding” table.

Note: The “Check Sum” value (Column Q) should equal 100 percent.
 - iii. Input the percent of project to be financed after taking into account other funding.
 - iv. Enter additional financing information in the “Financing” table. The types and values of inputs include:
 - 1. Start date, which reflects the construction start date
 - 2. Maturity, entered as the number of years
 - 3. Grace period, entered as the number of cash flow periods, based on the payment schedule entered in item 5 below.
 - 4. Issuance Fee and Interest Rate, entered as percentages
 - 5. Select payment schedule (semi-annual or annual)
 - 6. Select debt type (bond or “draw”, i.e., bank loan)
 - 7. Annual Debt Service Coverage Ratio (DSCR), entered as a number
- d. Apply appropriate adjustments.
 - i. Input inflation assumptions as percentages in the “Inflation” table.
 - ii. Use outputs from the Risk Assessment Tool to input the risk allocations and values of cost and schedule impacts in the “Risk Allocation” and “Risk Values” tables.

Note: Refer to the FHWA Risk Assessment Tool and corresponding *Risk Assessment Tool User Manual* for information on obtaining appropriate outputs.
 - iii. Input the discount rate as a percentage.

Note: Unless users assume no inflation, the discount rate reflected should be nominal, not real.
 - iv. Enter appropriate dollar values in the “PSC Adjustments” table to remove any differences between the public and private delivery options to ensure “competitive neutrality” (see *Primer*).

OUTPUTS

1. NAVIGATE TO THE “PSC DISCLAIMER” SHEET.
2. READ THE DISCLAIMER AND CLICK “I ACCEPT.”
3. NAVIGATE TO THE “PSC OUTPUTS” SHEET.

This sheet displays the PSC results in tabular and graphic formats as well as a sensitivity analysis and scenario analysis.

4. REVIEW THE RESULTS IN THE “PSC RESULTS” TABLE.

Note the value in the 'Total Payments after Toll & Other Revenue' line. This value represents the cost to the procuring agency to deliver this project after subtracting funding subsidies which could come from other public agencies, or could be financed by the procuring agency from a revenue stream not obtained from the project, such as taxes.

5. SELECT A PERCENTILE AND VALUE (\$ OR %) FOR THE SENSITIVITY ANALYSIS AND CLICK “RUN SENSITIVITY.”
6. ADJUST ASSUMPTIONS IN THE “SCENARIO ANALYSIS” TABLE USING THE ARROWS.

3 PSC Development Overview

Agencies considering P3 procurement options for a highway project may find it useful to conduct a VfM analysis to compare the potential of different project delivery structures to provide value for money. As part of a VfM analysis, the PSC represents a baseline projection of the costs for public sector delivery that serves as a benchmark against which an agency may consider the costs of P3 procurement. The specific steps for completing a VfM analysis are:

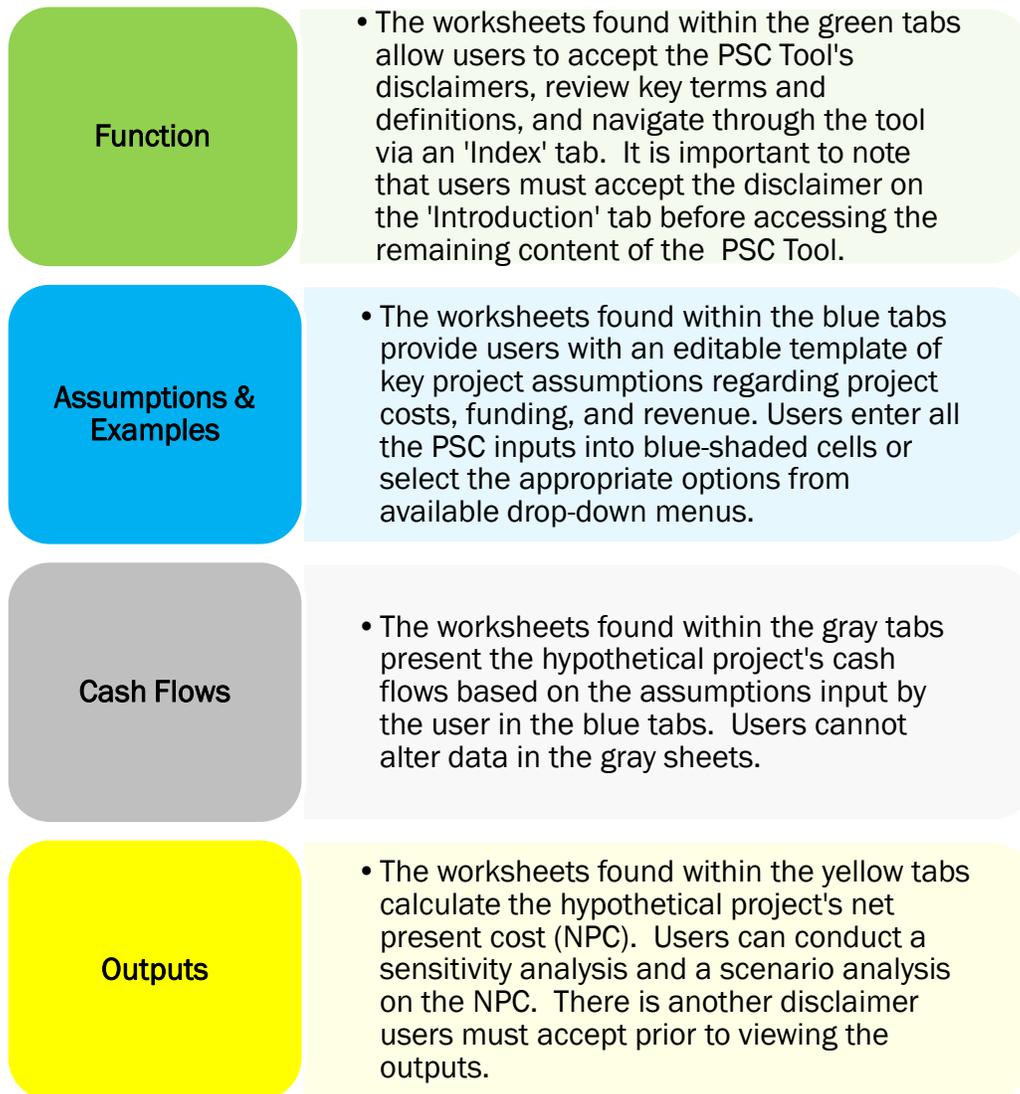
1. **Conduct a risk assessment** to identify, quantify, and allocate risks between the public and private partners.
2. **Develop a PSC estimate** that indicates the potential cost of public delivery.
3. **Develop a P3 estimate** (or “shadow bid”) that indicates the potential cost of P3 delivery.
4. **Conduct a VfM analysis** that compares the public and P3 delivery costs to assess which option provides greater VfM for the public.

The PSC Tool and User Manual utilize a hypothetical highway project as an example to demonstrate how certain assumptions affect the PSC’s results and how those outputs inform the VfM analysis. As outlined in Figure 2, the PSC Tool contains four major classes of worksheets that are color-coded by purpose.

Timing & Prerequisites

Once a public agency has made the decision to move forward with a project, it may consider the options available for the project's delivery structure. If an agency is considering P3 procurement, it may conduct a VfM analysis to inform the selection of the preferred delivery structure. In developing a VfM analysis, public agencies rely on the outcomes of several other tasks conducted in a project's development (e.g., traffic and revenue forecasts and risk assessment) to inform the assumptions made in the analysis.

Agencies typically conduct a VfM analysis after completing the above tasks. An agency may consider qualitative factors earlier in the project development process to assess the potential procurement options that will be evaluated quantitatively in the VfM analysis.

**Figure 2: Key Components of the PSC Tool**

Structuring the PSC

The PSC considered should be the most likely project delivery alternative to a P3. The PSC may be structured as a traditional design-bid-build alternative or it may be structured as design-build or even design-build-finance procurement if these are reasonable alternative delivery structures for the project's public sponsor.

There are a number of qualitative factors, such as those listed below, that agencies should consider when developing the PSC. Agencies should consider qualitative factors first to decide on the project delivery structure and requirements of the PSC and ultimately to decide which project delivery structure best achieves the project objectives.

1. What would be the most efficient and realistic project delivery structure if the project is not delivered as a P3?
2. What are the agency's objectives for the project? How do different project delivery structures help to achieve those objectives?
3. Are there statutory, regulatory, or legal restrictions that limit the project delivery structures available to the public sponsor?
4. Is the project affordable to the public sector under different project delivery structures?
5. Does the agency have sufficient staff resources and capabilities to manage the procurement process and to deliver the project to the service standards and operational requirements contemplated under the PSC?
6. Is there sufficient information of reasonable quality on public sector project delivery costs to develop a representative PSC?
7. How will different project delivery options accelerate or delay project delivery?
8. Will the project delivery options considered allow for more or less transparency and accountability?
9. Will the project delivery options considered have inequitable impacts on certain populations?
10. Are there other advantages or disadvantages associated with the project delivery options considered that are difficult to quantify, such as vulnerability costs or deferral costs?

Chapter 8 of the *Primer* provides additional guidance on qualitative VfM assessments.

4 Assumption and Examples

As shown below, developing the PSC estimate is the second step in conducting a VfM analysis (the first step is to develop a risk assessment). The following section details what inputs users should enter in the “Assumptions” sheet of the PSC Tool.

To develop a PSC, an agency should first compile the necessary data to utilize as assumptions in populating the model. As described earlier, agencies typically derive these assumptions from estimates, analyses, and decisions earlier in the project development process, such as:

- ▶ Project schedule;
- ▶ Cost estimates for design, construction, operations, and maintenance;
- ▶ Cost estimates for other project costs such as land/ROW;
- ▶ Tolling analysis and Traffic and revenue analysis;
- ▶ Public policy decisions regarding the project objectives and tolling;
- ▶ Funding analysis (estimates of grants or subsidies available for the project);
- ▶ Financial analysis and a detailed financial plan;
- ▶ Inflation analysis; and
- ▶ Outcomes of the risk assessment.

Traffic Scenarios

The pre-populated Example Scenario within the PSC Tool demonstrates the range of assumptions when preparing a PSC. Users can select a variety of tolling examples to include in the scenario. The “Variable Tolling Example,” the “Simple Tolling Example,” or the “Toll Scenario Template” can be selected from the “Traffic Scenarios” drop-down menu. If the “Toll Scenario Template” is selected, users can navigate to the “Toll Scenario Template” sheet and enter data in this sheet. The template accommodates variations in toll rates and vehicle classifications similar to the “Variable Tolling Example” and the “Simple Tolling Example” scenarios.

The traffic scenarios provided in the PSC Tool are for demonstration purposes only. If an agency conducts a VfM analysis for a specific project, the actual components and assumptions used in constructing the PSC, such as the project cost estimate and traffic and revenue assumptions, must reflect the specific project being analyzed.

Project Delivery Structure

Users can alter the delivery structure of the Example Scenario through the “Project Delivery Structure” check boxes. The project delivery structure options in the PSC Tool are:



- ▶ **Design Build:** The design aspect refers to completing plans for the project, which includes producing engineering drawings and selecting construction materials and the construction site. Build refers to constructing the facility, which includes reviewing conditions at the building site, providing construction staff and materials, selecting equipment, and, when necessary, amending the design to address problems discovered during the construction phase. Design Build is generally carried out by the private sector in P3 delivery structures.
- ▶ **Finance:** Financing includes providing capital for the project, which may include issuing debt such as project revenue bonds. Users may select “finance” to account for project-based financing (i.e., not financing based on the public sector’s full faith and credit).
- ▶ **Operations:** Operations includes facilitating the performance and availability of the highway, which includes removing debris and snow. It may also include the cost of collecting traffic data. Users may select “operations” if the private sector would undertake operations as part of the project delivery structure (such as in a DBFOM).
- ▶ **Maintenance:** Maintenance includes keeping the project in a state of good repair, which includes filling potholes, repaving or rebuilding roadways, and ensuring the integrity of bridges and highways. Users may select “maintenance” if the private sector would undertake maintenance as part of the project delivery structure (such as in a DBFOM).
- ▶ **Toll Collection:** Toll collection includes the installation and operation of toll collection facilities if the project includes tolling to provide a revenue stream for repaying debt.

The project delivery structure assumptions are essential for facilitating a like-for-like comparison between the PSC and P3 option. Users should create a PSC that reflects the same structure that the private sector would use to deliver the project as a P3. Thus, if users wish to compare a design-build PSC to a design-build-finance P3, then they must check the “Design Build” and “Finance” boxes in the delivery structure. Users should refer to the table below in determining the appropriate selections:

Table 1: Selecting Project Delivery Structure

Public Delivery	P3 Delivery	Project Delivery Structure Options				
		Design-Build	Finance	Operations	Maintenance	Toll Collection
DB/DBB	DBF	X	X			
DB/DBB	DBFOM (availability payment)	X	X	X	X	
DB/DBB	DBFOM (real toll)	X	X	X	X	X

Timing

The “Timing” assumptions define when specific costs, revenues, and inflation factors apply to a project. The project delivery structure selected in the PSC Tool determines which timing assumptions are necessary. For example, if the project delivery structure does not include tolling, then users do not have to input values for the “Tolling Period,” “Tolling Start,” and “Tolling End Dates.” Users can input data for the following “Timing” assumptions:

- ▶ Base Date (date – format YYYY)
- ▶ Construction Period (number of years from 1 to 10)
- ▶ Construction Start (date – format YYYY)
- ▶ Operations Period (number of years from 1 to 75)
- ▶ Operations Start (date – format YYYY)

Based on the inputs to these “Timing” assumptions, the following fields will be calculated:

- ▶ **Concession Period (no. years)** – Sum of the construction period and the operations period
- ▶ **Construction End (date)** – Adds the construction period to the construction start
- ▶ **Operations End (date)** – Adds the operations period to the operations start
- ▶ **Tolling Period (no. years)** – Equals the operations period
- ▶ **Tolling Start (date)** – Equals the operations start date
- ▶ **Tolling End (date)** – Adds the tolling period to the tolling start

The “Timing” assumptions are used to support the project delivery structure selected in the PSC Tool. For example, a Design-Build-Finance delivery structure can be shown by selecting the Design Build and Finance check boxes. The “Timing” assumptions and other assumption fields that relate to this structure, such as Concession Period, Construction Start, and Financing, are then visible and can be completed.

Entering Cost Assumptions

Users should input their cost assumptions in base year dollars (*not* current or year of expenditure dollars) consistent with the base date defined in the “Timing” assumptions table. All costs are inflated based on the user’s assumptions entered in the “Inflation” table.

Other Project Costs

“Other Project Costs” assumptions represent the project costs that the agency incurs in its capacity as the project owner. The types of costs incurred may include right-of-way (ROW) costs, procurement costs, or transaction costs. Based on cost estimates, users input the total dollar value for the identified project costs, and select the timing assumptions that apply to each cost.



Users can input the “Total Cost” for each of the “Other Project Cost” assumptions. Additionally, users can select the “Start Date” and “End Date” from corresponding drop-down menus that contain the following selections: Base Date, Construction Start, Construction End, Operations Start, and Operations End. The “Start Date (Year)” and “End Date (Year)” fields are automatically calculated based on the selection.

Construction Costs

The “Construction Costs” reflect the costs associated with the project's design and construction phase. Specific costs may include the cost of the design-build contract or the sum of the separate costs of the design contract and construction contract (under a design-bid-build structure, with the bid costs reflected under “Other Project Costs”). These costs are provided in the “Asset Type” column. Based on estimated costs, users may input the total dollar value of each cost in the “Cost (\$)” field and then determine the allocation of each cost across the design and construction phase as percentages of the total cost. The cost profile for each “Asset Type” spreads the cost of the asset over the construction period.

Operating & Maintenance (O&M) Costs

Because agencies consider the life cycle costs of a project in the PSC, it is important to include “Operating Costs” and “Maintenance Costs” in the “Assumptions” sheet unless the P3 option being considered is Design-Build-Finance (i.e., it does not include operations and maintenance). Typically, maintenance costs include:

- ▶ **Routine maintenance** that is planned and performed on a routine basis to maintain and preserve the condition of the highway system; and
- ▶ **Periodic or preventive maintenance** that includes resealing, re-gravelling, or new line markings at regular intervals during operations.

In the PSC Tool, the operations and routine maintenance costs are provided as annual values and can be entered as either a percentage of construction (Column E), or as a dollar value (Column F).

The assumptions required for “Periodic Maintenance Costs” are the same; however, users can enter a number in the “Years Per Period” field to indicate how often the periodic maintenance is completed. For example, if the value of the “Years Per Period” field is “8”, then the “Periodic Maintenance Costs” will occur every eight years during the operations phase. Note that if users choose to input O&M costs as dollar values, the adjacent cells in column E black out so that the inputs are only either dollar values or percentages. The PSC Tool will prompt users to first “zero out” the percentage if switching to dollar values, or vice versa.

Toll & Other Revenue

If a project delivery structure includes toll collection, then a project's traffic and revenue study would provide a basis for the "Toll & Other Revenue" assumptions in a PSC. Other revenues from non-road pricing strategies, such as utility right-of-way lease payments, may generate value relevant for the PSC. The PSC Tool accounts for tolling assumptions such as:

- ▶ A "Simple Toll Example" and "Variable Toll Example" that can be loaded into the PSC Tool using the "Traffic Scenario" drop-down menu. A blank "Toll Scenario Template" is also provided for users interested in entering their own tolling assumptions. The "Toll Scenario Template" requires the same level of detail regarding toll rates and volumes as the other tolling examples.
- ▶ The "Toll Revenue Leakage" assumption reflects a set percentage of revenue that is not collected each year (i.e., due to unpaid toll violations). "Toll Revenue Leakage" is expressed as a percentage deducted from annual gross revenues and is entered as a negative value in the PSC Tool.
- ▶ The "Toll Revenue Ramp Up" period reflects the period after the road opens where initial traffic volumes increase to a steady state. The ramp-up period may be up to six years long in the PSC Tool. Users can enter a negative percentage value per year to be subtracted from the period's gross toll revenue. It is important to review the traffic assumptions to be used in the PSC Tool to assess if the ramp-up period has already been factored into the traffic volumes. If so, leaving the ramp-up period assumptions out will avoid double-counting the impact of the ramp-up period. Similarly, if toll revenue values are inputs to the PSC Tool, it is important to consider whether toll leakage has already been accounted for in these values prior to including this assumption in the PSC.
- ▶ "Annual Non-Road Pricing Revenue" covers a wide landscape of strategies that may be employed to generate value from the project and may be relevant in constructing the PSC. Depending on the project, non-road pricing strategies may involve the sharing of costs, revenues or financial risk between public and private partners, or may impose fees or taxes on defined groups expected to benefit from the project.¹ (*Note: all references are located at the end of this manual*). For example, value capture strategies can be applied to roads to take advantage of the increased property values and other economic benefits produced by such improvements as in the case of the San Joaquin Toll Road in California and E-470 in Colorado. Non-road pricing strategies can be accounted for as project revenues under a PSC.

¹ FHWA, Innovative Program Delivery, http://www.fhwa.dot.gov/ipd/revenue/non_pricing/defined/



Funding

The “Funding” assumptions reflect the amount of any grant or subsidy that the agency may receive for a project, or that it may finance from non-project revenue streams such as taxes. The assumption can be provided as an amount of total funding or it can be set as a percentage of the construction costs.

Financing

If “Finance” has been checked as part of the project delivery structure, it indicates that *project-based* financing is included in the PSC. (Any financing based on the public sector’s full faith and credit would be included in the “Funding” line item above)

If a project involves financing, users can specify the level of project-based finance taking into consideration what can be supported by project revenues and what is needed based on the funding gap. Users can input a percentage in the “% Of Project Financed” field, indicating the amount of the funding gap or net costs after funding amounts included in the “Funding” line item above. If financing based on project revenues is proposed to be used to address the entire gap, then users can enter “100%” as the assumption for this field. If some of the gap in funding will be provided by some other project source and not financed, users may input an amount less than 100%—but this will not normally be the case for a new highway project, so the user should input 100%. Users can then input the following assumptions that typically come from a project’s finance plan:

- ▶ **Facility Start Date** – The construction start date in the PSC Tool (the debt is issued at the start of construction).
- ▶ **Maturity (years)** – Indicates the debt period.
- ▶ **Issuance Fee** – The issuance fee and interest rate determine the financing costs in the PSC Tool. The issuance fee is a one-time fee incurred when the debt is initially drawn and is applied to the total borrowed amount.
- ▶ **Interest Rate** –The interest rate is applied per period to the current loan balance.
- ▶ **Annual Debt Service Cover Ratio (DSCR)** – The minimum required DSCR (see *Primers*) for each cash flow period. The DSCR is calculated after construction completion to ensure that it meets the minimum required DSCR.
- ▶ **Payment Schedule** – Either semi-annual or annual debt payments can be selected from a drop-down menu in the PSC Tool.
- ▶ **Debt Facility** – The P3-VALUE tools provide for bond- and draw-type (i.e., bank loan) facilities. The bond facility is based on the borrower raising debt in the year construction commences, with interest payments throughout the construction phase followed by principal and interest payments during operations until the debt matures. The draw facility is based on the borrower drawing down the debt throughout the construction phase with principal and

interest payments occurring during operations until maturity (i.e., the interest during the construction phase is assumed to be “capitalized.”).

- ▶ **Grace Period (years)** – Applies to the debt principal payments that commence after construction completion.

The PSC Tool includes a debt reserve as part of its notional financing structure. The debt service requirement for each period is based on the debt payments calculated for the two future cash flow periods and the DSCR assumption. For example, if the minimum required DSCR assumption is 1.5, the requirement equals 1.5 times the sum of the debt payments in two future cash flow periods. The PSC Tool calculates whether the cash flow available for debt service is sufficient to meet this requirement. If it is insufficient, additional funds are borrowed in the debt reserve account notionally presented on the “Financing” sheet of the PSC Tool to increase the funds available for debt service. Any borrowed funds are held in the reserve until they are no longer required to meet the DSCR requirement.

Inflation

There are four Inflation Factors that may be provided as Assumptions in the PSC Tool. Users may input inflation assumptions as percentages for the following indices:

- ▶ Consumer Price Index (CPI) – Applies to all costs during the operations period as well as any non-road pricing revenue.
- ▶ An index for construction phase costs – Applies to construction costs if the field has a value greater than zero.
- ▶ An index for operations phase costs – Applies to operations period costs if the field is greater than zero. (If the value is zero, the CPI will be used).
- ▶ An index for toll rates (if the project delivery structure includes toll collection) – Applies to toll revenue.

Risk Allocation & Risk Values

Conducting a risk assessment is a prerequisite for developing a PSC. For general guidance on the risk assessment process, see FHWA’s *Primer on Risk Assessment for Public-Private Partnerships* and for step-by-step instructions for conducting a risk assessment, see the *Risk Assessment Tool User Manual* in conjunction with FHWA’s Risk Assessment Tool.

The “Risk Allocation” and “Risk Values” inputs are outcomes of the risk assessment process and may include:

- ▶ An allocation of project cost and schedule risks between the public and private sectors.



- ▶ The cost and schedule delays for the project's construction and operations phases in real dollars, including the 10th percentile, 70th percentile, and 90th percentile values for cost and schedule delays.

Table 2 below specifies the Risk Assessment Tool outputs that users should carry over into the PSC Tool after completing the risk register from the public sector perspective.

Discount Rate

Users may manually enter the discount rate in the PSC Tool as a percentage value in the “Rate” field. The discount rate is the factor applied to the cash flows to generate the project's Net Present Value (NPV) or Net Present Cost (NPC). With a discounted cash flow analysis, all cash flows are discounted to their present value using the discount rate established by the public agency. The discount rate is the rate at which the cash flows occurring at different times in the future are brought to a base period. Discounting allows project cash flows that have different timing assumptions to be discounted back to a base date, enabling a like-for-like comparison of the cost of each delivery structure.²

A discounted cash flow analysis may utilize either a real or a nominal discount rate. The selection of a nominal or real discount rate should be consistent with the use of nominal or real project cash flows. The pre-populated “Example Scenario” in the PSC Tool includes inflation assumptions that are applied to the project cash flows. The Example Scenario’s nominal discount rate accounts for the effect of inflation and is therefore consistent with the cash flows being discounted. If users wish to apply a real discount rate, then they should assume no inflation factors.

Selecting the Discount Rate

Selection of the discount rate is a critical decision in conducting a VfM analysis because the discount rate affects all cash flows and has a significant influence on the relative NPV. The same discount rate may be used to calculate the NPV in the PSC and P3 Estimate to provide consistency across the present value calculations. A higher rate will typically favor the P3 Estimate over the PSC and a lower rate will favor the PSC over the P3 Estimate.³ This may occur if a larger portion of PSC payments are made in earlier years relative to the P3 Estimate. If payment profiles are similar between the PSC and the P3 option, the discount rate should not affect the relative comparison (i.e., the per cent difference), although the actual values of the PSC and P3 Estimate will change.

There is no universal approach for selecting the discount rates for VfM analyses, though users are encouraged to refer to the “Discount Rate” section of Chapter 4 of the Shadow Bid Tool User

² Partnerships British Columbia, *Methodology for Quantitative Procurement Options Analysis Discussion Paper*

³ Treasury Board of Canada Secretariat, *Guideline to Implementing Budget 2011 Direction on Public-Private Partnerships*

Manual. Users may also refer to Chapter 3 of the *Primer* and the *Guidebook for Value for Money Analysis for Public-Private Partnerships* (under development) for additional information on selecting an appropriate discount rate.

PSC Adjustments

To facilitate a like-for-like comparison between public and P3 delivery options, users may input “PSC Adjustments” (as dollar amounts incurred during construction or operations) to remove any differences between the delivery options. Such adjustments are discussed below.

- ▶ **Competitive Neutrality** removes any net competitive advantages that would be inherently available to the procuring agency and includes equivalent costs that would otherwise be incurred. Competitive advantages of public delivery may include property taxes, for example, that are only levied on private enterprises. Competitive disadvantages may include heightened public scrutiny and reporting requirements not faced by private entities.⁴ Taxes such as sales tax are generally reflected in the project cost assumptions in the PSC and the P3 Estimate. However if a public agency considers it appropriate, a PSC adjustment may be included in the PSC to account for any benefit attributable to the tax-exempt status of the agency. The P3 Estimate may also be prepared with no or reduced corporate taxation obligations for the private entity if the agency considers its tax-exempt status to be a distinguishing factor between the PSC and the P3 Estimate.
- ▶ **Deferral costs** reflect the costs to the agency of not proceeding with the public sector option on the same schedule as would be possible under the P3 option and should reflect the additional costs arising from elements such as congestion, accidents, vehicle operating costs, ROW, opportunity costs, and agency maintenance costs, if applicable.⁵ Note that the deferred investment costs will also need to be discounted and subtracted to get the net deferral costs.
- ▶ **Vulnerability costs** reflect the risk-adjusted cost of a loss of service or catastrophic failure of a vital facility, which may be applicable in the case of certain aging assets that are structurally deficient or prone to flooding, for example.⁶
- ▶ **Optimism Bias** accounts for the tendency of project appraisers to be optimistic and less objective regarding certain risks, rendering estimates and projections inaccurate. Adjustment factors may be developed using data from pre- and post-contract signature documents to account for overstated benefits, understated project schedules, and understated capital/operating costs.
- ▶ **Toll revenue risk:** A key issue is how to account for the financial impacts toll revenue risk (a.k.a. demand risk). Toll revenue risk is accounted for in the financing costs of toll concessions

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.



through the higher rates of return demanded by investors. However, toll revenue risk is the same for all types of procurement, conventional or P3, regardless of the way concessionaires may be compensated. When the procuring agency retains toll revenue risk through conventional procurement or an availability payment concession, the cost of toll revenue risk does not disappear. While the financial impact may not appear on the procuring agency's balance sheet, taxpayers in effect bear the risk, but cannot demand compensation for those "risk-bearing services." Therefore, it may be appropriate to account for the cost of the toll revenue risk retained, through a competitive neutrality adjustment.

Table 2: Integrating Risk Assessment Outputs with the PSC Tool

OUTPUTS			INPUTS		
Risk Assessment Tool			Public Sector Comparator Tool		
Worksheet	Field	Cell	Worksheet	Field	Cell
Table 5 – Cost Impact Outputs	Public % of Cost Risk (DB)	G16	Assumption	DB Phase % Public Cost Allocation	E80
Table 5 – Cost Impact Outputs	Private % of Cost Risk (DB)	H16	Assumption	DB Phase % Private Cost Allocation	E81
Table 5 – Cost Impact Outputs	Public % of Cost Risk (Oper.)	G17	Assumption	Oper. Phase % Public Cost Allocation	E82
Table 5 – Cost Impact Outputs	Private % of Cost Risk (Oper.)	H17	Assumption	Oper. Phase % Private Cost Allocation	E83
Table 5 – Cost Impact Outputs	P10 DB Subtotal	F26	Assumption	P10 DB Cost Impact	E86
Table 5 – Cost Impact Outputs	P70 DB Subtotal	G26	Assumption	P70 DB Cost Impact	F86
Table 5 – Cost Impact Outputs	P90 DB Subtotal	H26	Assumption	P90 DB Cost Impact	G86
Table 5 – Cost Impact Outputs	P10 Oper. Subtotal	F27	Assumption	P10 Oper. Cost Impact	E87
Table 5 – Cost Impact Outputs	P70 Oper. Subtotal	G27	Assumption	P70 Oper. Cost Impact	F87
Table 5 – Cost Impact Outputs	P90 Oper. Subtotal	H27	Assumption	P90 Oper. Cost Impact	G87
Table 7 – Schedule Impact Output	Public % of Schedule Risk (DB)	G18	Assumption	DB Phase % Public Schedule Allocation	F80
Table 7 – Schedule Impact Output	Private % of Schedule Risk (DB)	H18	Assumption	DB Phase % Private Schedule Allocation	F81
Table 7 – Schedule Impact Output	Public % of Schedule Risk (Oper.)	G19	Assumption	Oper. Phase % Public Schedule Allocation	F82
Table 7 – Schedule Impact Output	Private % of Schedule Risk (Oper.)	H19	Assumption	Oper. Phase % Private Schedule Allocation	F83
Table 7 – Schedule Impact Output	P10 DB Subtotal	F38	Assumption	P10 DB Schedule Impact	E88
Table 7 – Schedule Impact Output	P70 DB Subtotal	G38	Assumption	P70 DB Schedule Impact	F88

OUTPUTS			INPUTS		
Risk Assessment Tool			Public Sector Comparator Tool		
<i>Worksheet</i>	<i>Field</i>	<i>Cell</i>	<i>Worksheet</i>	<i>Field</i>	<i>Cell</i>
Table 7-Schedule Impact Output	P90 DB Subtotal	H38	Assumption	P90 DB Schedule Impact	G88
Table 7-Schedule Impact Output	P10 Oper. Subtotal	F39	Assumption	P10 Oper. Schedule Impact	E89
Table 7-Schedule Impact Output	P70 Oper. Subtotal	G39	Assumption	P70 Oper. Schedule Impact	F89
Table 7-Schedule Impact Output	P90 Oper. Subtotal	H39	Assumption	P90 Oper. Schedule Impact	G89

5 Cash Flow Sheets

Inputs in the “Assumptions” sheet generate sample cash flow sheets that are available to users for educational/informational purposes. The cash flow sheets are not editable, but display nominal or real cash flows based on specific project assumptions as well as a summary of total project cash flows. The list below includes nominal cash flows (i.e., inflation is incorporated). The cash flow sheets include:

- ▶ **Project Cash Flows** – Includes factors based on the timing and inflation assumptions that are needed to generate the project cash flows (assuming inflation is to be incorporated).
- ▶ **Construction** – Construction phase cash flows.
- ▶ **Operations and Maintenance** – Operations and maintenance nominal cash flows.
- ▶ **Project costs** – Nominal cash flows for other project costs.
- ▶ **Risk** – Calculates the total risk values for cost and schedule delays and the allocation between transferrable and retained risks.
- ▶ **Traffic Scenario** – If tolling is included in the project, this sheet reflects the raw traffic and toll rates based on the traffic scenario selected in the “Assumptions” sheet.
- ▶ **Revenue** – Provides the gross annual revenues per vehicle classification.
- ▶ **Toll and Other Revenue** – Applies any revenue leakage and ramp-up assumptions to the gross toll revenues and calculates any non-toll revenues.
- ▶ **PSC Adjustments** – Nominal cash flows for the PSC adjustments.
- ▶ **Funding** – Cash flow for any funding provided to the project.
- ▶ **Financing** – Generates the required draw-downs based on the project's cost profile and calculates the associated cost of finance based on the financing assumptions provided.
- ▶ **Transferrable Risk** – In a public procurement method, some design and construction risks that would be retained by the procuring agency but would be transferrable to the private contractor under a P3. This sheet allocates the equivalent value of transferrable risk to cash flows, with dollar amounts representing the expected cost consequences of a risk event occurring. Note that these transferrable risks would actually be retained by the procuring agency under a public procurement, and are therefore included in the PSC costs. They are accounted for separately for convenience in making comparisons to the P3 Estimate’s transferrable risk costs.
- ▶ **Retained Risk** – Considers any financing required by the agency to manage these risks.
- ▶ **Cash Flow Summary** – Summarizes the project's cash flows.

6 Outputs

As with the “Introduction” sheet, users must accept the disclaimer on the “PSC Disclaimer” sheet to access the PSC Tool’s output sheets. The PSC Tool is structured to provide an illustration of the net present value results for the assumptions contained in the PSC Tool.

Net Present Cost (NPC) Results

The adjusted NPC Results displayed on the PSC “Output” sheet are based on a discounted cash flow (DCF) analysis of the net project costs. A DCF analysis involves forecasting all revenue and cost cash streams (including capital expenditures) for a project into the future. The stream of free cash flow, or net operating cash flow, is discounted to estimate the value of the project in today’s dollars. The discount rate assumption in the PSC Tool is converted into a discount factor for each cash flow period and is applied to the following cash flows throughout the concession period:

- ▶ Construction phase costs, including other project costs, construction costs, and construction risk costs;
- ▶ Operations phase costs, including operations, routine maintenance, periodic maintenance costs and operations phase risks;
- ▶ Funding, financing costs (debt payments, interest, and fees) and PSC adjustments; and
- ▶ Toll and other revenue, which are subtracted from the costs to provide the net cost of delivery.

The present values of these cash flows are contained in the “NPC Results” table, which provides the total NPC to the agency of delivering the project. Note that the table only includes project-based financing. Funds or financed amounts that are not based on project revenues (e.g., taxes) are not included in the table. The results are presented as a table (see Figure 3) and as a bar graph (see Figure 4). The table of results groups the project costs in the first section of the table to calculate the cash outflows. The first three line items do not have values because all construction phase costs (after subsidies) and risk costs are assumed to be financed and appear as cash outflows in the line items on “Principal Debt Payments” and “Interest & Fee Payments” at the bottom of the list in the first section. The second section of the table includes toll and other revenues. The last line of the table presents the adjusted project NPC based on the difference between the NPV of the cash outflows and cash inflows. This amount represents the “shortfall” or the additional funding that the procuring agency will need to provide in order to make the project financially feasible. The NPC is provided for:

- ▶ The initial project costs, or ‘Raw PSC,’ which excludes the risk adjustments provided from the risk assessment process; and



- ▶ The risk-adjusted NPV at the 10th percentile, 70th percentile, and 90th percentile values. It is important to understand the results as a range of numbers rather than as a single, absolute figure.

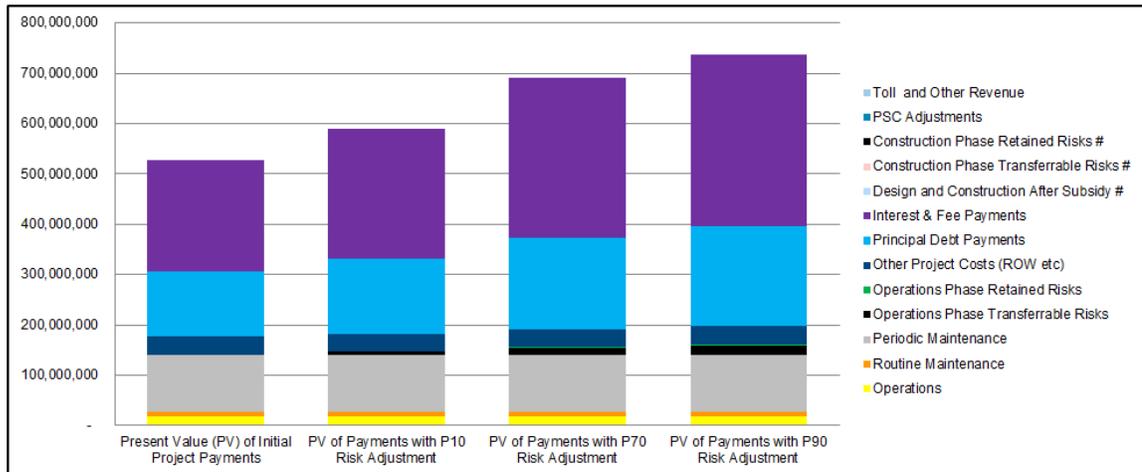
The NPC Results are notional examples provided for educational purposes only. When constructing a PSC for a specific project, the output requirements will reflect the needs of the agency and the project being analyzed.

Figure 3: NPC Results Chart

Nominal Discount Rate	Results - Initial Project Payment (\$)		Results - Risk Adjusted Payments (\$)		
	Nominal Value of Initial Project Payments	Present Value (PV) of Initial Project Payments	PV of Payments with P10 Risk Adjustment	PV of Payments with P70 Risk Adjustment	PV of Payments with P90 Risk Adjustment
5.00%					
Payment Item					
Design and Construction After Subsidy #	-	-	-	-	-
Construction Phase Transferrable Risks #	-	-	-	-	-
Construction Phase Retained Risks #	-	-	-	-	-
Operations	58,287,937	17,821,845	17,821,845	17,821,845	17,821,845
Routine Maintenance	29,143,969	8,910,922	8,910,922	8,910,922	8,910,922
Periodic Maintenance	414,056,238	114,274,912	114,274,912	114,274,912	114,274,912
Operations Phase Transferrable Risks	-	-	5,261,424	13,179,264	18,100,717
Operations Phase Retained Risks	-	-	729,908	1,814,656	2,440,225
Other Project Costs (ROW etc)	40,000,000	35,770,085	35,770,085	35,770,085	35,770,085
PSC Adjustments	-	-	-	-	-
Principal Debt Payments	400,000,000	128,557,037	149,034,792	182,331,958	197,677,645
Interest & Fee Payments	457,462,329	222,415,670	257,971,344	315,785,455	342,430,282
Total Payments	\$ 1,398,950,473	\$ 527,750,470	\$ 589,775,231	\$ 689,889,097	\$ 737,426,632
Toll and Other Revenue	-	-	-	-	-
Total Payments After Toll and Other Revenue	\$ 1,398,950,473	\$ 527,750,470	\$ 589,775,231	\$ 689,889,097	\$ 737,426,632

The value of each cost or revenue in the table is also depicted in a bar graph, as shown in Figure 4. The bar graph presents the cash outflows as a cost to the project and as greater than zero; if the project were to include toll and other revenue, then those, cash inflows would be shown as negative values:

Figure 4: NPC Results Bar Graph



The bar graph can be updated to reflect the values shown in NPC results table by pressing the “Refresh Graph” button to the right of the graph.

Sensitivity Analysis

A sensitivity analysis is essential for assessing how different values of one assumption can impact the overall NPC of the PSC. The PSC Tool includes a sensitivity analysis to illustrate the sensitivity of the results to changes of 10 percent, 20 percent and 30 percent to key assumptions for costs (construction, operating and maintenance) and toll revenues. To run the sensitivity analysis, users may select the risk percentile from the drop-down menu in column C. Users may also select whether to display the results either as percentage changes or dollar values from the drop-down menu in column D. Once users click the “Run Sensitivity” button in the top-right corner, the results will display. Figure 5 is a sample sensitivity analysis from the PSC Tool.

Figure 5: Sensitivity Analysis Output

Sensitivity Analysis Of Results					
Select the Risk Percentile and the Result Type from the Drop Down Menus	P70	\$			
Multiplier	Construction Costs	Operating Costs	Routine & Periodic Maintenance Costs	Toll Revenue	
-30%	\$ 442,670,196	\$ 602,378,711	\$ 570,915,978	\$ 608,018,193	
-20%	\$ 497,786,195	\$ 604,258,538	\$ 583,283,383	\$ 608,018,193	
-10%	\$ 552,902,194	\$ 606,138,366	\$ 595,650,788	\$ 608,018,193	
0%	\$ 608,018,193	\$ 608,018,193	\$ 608,018,193	\$ 608,018,193	
10%	\$ 663,134,192	\$ 609,898,020	\$ 620,385,598	\$ 608,018,193	
20%	\$ 718,250,191	\$ 611,777,848	\$ 632,753,003	\$ 608,018,193	
30%	\$ 773,366,190	\$ 613,657,675	\$ 645,120,407	\$ 608,018,193	



Scenario Analysis

A scenario analysis enables users to assess the impact that individual assumptions have on the NPC results by changing key assumptions within the “PSC Output” sheet. The scenario analysis displays key project assumptions, their current values based on inputs in the “Assumptions” sheet, and arrows to adjust the value of the current assumption. As users change the key assumptions, they can observe resulting changes in the “NPC Results” table. Under the pre-populated Example Scenario, the lower half of the table should automatically be blacked out, as should the “Toll Inflation” row because the Example Scenario’s Project Delivery Structure does not include toll collection. Figure 6 displays the Scenario Analysis table as if toll collection was selected, however, to demonstrate the full functionality of the table.

Figure 6: Scenario Analysis

Scenario Analysis of Results					
<i>Press F9 to Update PSC Results</i>					
Factor	Current Value	Units			
Concession Length	40	Years			
Construction Length	5	Years			
Construction Cost	500,000,000	\$m			
Annual Operating Cost	1,000,000	\$m			
Periodic Maintenance Cost	60,000,000	\$m			
Periodic Maintenance Period	8	Years			
Project Bond	5.00%	%			
CPI	2.00%	%			
Toll Inflation	0.00%	%			
Construction Phase PSC Adjustment (annual)	-	\$			
Operating Phase PSC Adjustment (annual)	-	\$			
Other Construction Phase PSC Adjustment (total)	-	\$			
Debt Financing	100%	%			
Discount Rate	5.00%	%			
Toll Scenario (Select from Drop Down Menu)	Variable Toll Example				
Starting Toll Rates	Motorcycle	2 axle vehicles	3 axle vehicles	4 + axle vehicles	
Toll Section 1 - Weekday - Peak	\$0.10	\$0.20	\$0.30	\$0.40	
Toll Section 2 - Weekday - Peak	\$0.20	\$0.30	\$0.40	\$0.50	
Toll Section 3 - Weekday - Peak	\$0.10	\$0.20	\$0.30	\$0.40	
Toll Section 4 - Weekday - Peak	\$0.00	\$0.00	\$0.00	\$0.00	
Toll Section 1 - Weekday - Off-Peak	\$0.05	\$0.15	\$0.25	\$0.35	
Toll Section 2 - Weekday - Off-Peak	\$0.10	\$0.20	\$0.30	\$0.40	
Toll Section 3 - Weekday - Off-Peak	\$0.05	\$0.15	\$0.25	\$0.35	
Toll Section 4 - Weekday - Off-Peak	\$0.00	\$0.00	\$0.00	\$0.00	
Toll Section 1 - Weekend	\$0.05	\$0.15	\$0.25	\$0.35	
Toll Section 2 - Weekend	\$0.10	\$0.20	\$0.30	\$0.40	
Toll Section 3 - Weekend	\$0.05	\$0.15	\$0.25	\$0.35	
Toll Section 4 - Weekend	\$0.00	\$0.00	\$0.00	\$0.00	

Integrating Outputs with other Evaluation Tools

The outputs of the PSC Tool are key components in the VfM analysis, as the PSC represents the cost of the agency delivering a project. The PSC outputs define the benchmark against which the P3 estimate for a private delivery option is compared to determine which model presents a lower cost



or greater value to the agency. The Financial Assessment Tool provided as part of the P3-VALUE suite uses the cash flow and NPC results from the PSC Tool and the Shadow Bid Tool to complete the VfM analysis process.

7 Summary and Tool Limitation

The *Public Sector Comparator Tool User Manual* is an educational resource and is part of FHWA's P3-VALUE suite. This User Manual corresponds to the FHWA Public Sector Comparator Tool, providing an overview of the Value for Money process and instructions for utilizing the PSC Tool for developing a PSC. Together, these educational resources provide users with a better understanding of the process for evaluating the costs of P3 procurement against the costs of traditional procurement methods.

The information and examples outlined in the User Manual do not encompass all issues and options for constructing a PSC for a highway project. The FHWA P3 Toolkit contains additional information and Appendix B of the User Manual provides references and resources from domestic and international jurisdictions for further guidance.

The PSC Tool has been designed for use in FHWA-sponsored training. FHWA anticipates that at the conclusion of the PSC/VfM training, users will have a greater understanding and appreciation of VfM analysis and of several key considerations when developing a PSC. FHWA encourages users to engage appropriate experts (either in-house or external) to develop their own tools and processes for evaluating potential P3 projects. The level of knowledge gained from this training should help in such an effort.

P3-VALUE Limitations

P3-VALUE provides a notional example of a functioning and interactive VfM Toolkit. A number of assumptions and formulas are included in the PSC Tool that relate to the pre-populated "Example Scenario" and may not be suitable for all potential scenarios. Additionally, a financial tool used to model a PSC for a real-world project is highly customized to reflect the unique project structure, and to optimize the financing needed to deliver the project for the lowest cost.

The P3-VALUE suite has been constructed with minimal 'black box' formulas, so users are able to view each step in the VfM analysis process. While this provides greater clarity to users in how each tool produces outputs, it also limits the flexibility of P3-VALUE to produce the most efficient results. For example, the financing structure presents only one debt facility, which is not optimized to make most efficient use of financing throughout the construction phase. Functions such as this would typically be seen in financial models employed when conducting a VfM analysis for a real-world project.

Appendix A: Glossary

Term	Description
Base Date	The Base Date is commonly referred to as the estimated date of financial/contract close for a project
Concession Period	Concession Period (Total construction and operating periods).
Concessionaire	Private entity that assumes ownership and/or operations of a given public asset (i.e., train station, bus operation) under the terms of a contract with the public sector
Construction Delay Day Cost	Construction delay per day.
Construction End	End date of construction period.
Construction Engineering Costs	The allowable costs for environmental evaluation and documentation, permits, or approvals.
Construction Period	Number of years in construction period.
Construction Phase	The Construction phase involves the actual construction of the physical asset. This phase is often the most sensitive to risks which could result in change orders, schedule delays, and contract disputes. By identifying potential risks before the start of construction phase, it may be possible for the project team to better anticipate and manage construction risks before they occur.
Construction Start	Start date of construction period.
Construction Year Index	Count for construction periods
Contingency	An allowance included in the estimated cost of a project to cover unforeseen circumstances.
Cost Impact	Cost impact is defined as the additional cost of labor, equipment and materials that are incurred when the risk event occurs and whoever is responsible for that risk has to carry out additional works as a direct result of the event. Indirect costs, such as the cost of site offices, utilities and additional resources for engineers, inspectors, etc. are not included in the cost impact.
CPI	Consumer Price Index
DB	Design-Build: Under a DB, the private sector delivers the design and construction (build) of a project to the public sector. The public sector owns, operates, and maintains the asset. Build refers to constructing the road, which includes reviewing conditions at the building site, providing construction staff and materials, selecting equipment, and, when necessary, amending the design to address problems discovered during the construction phase.
DBFO/M	Design Build Finance Operate / Design Build Finance Operate Maintain: Under a DBFO or a DBFOM, the private sector delivers the design and construction (build) of a project to the public sector. It also obtains project financing and assumes operations and maintenance of an asset upon its completion.
Debt Tranche Grace	Grace period for Example Project Bond.
Debt Tranche Interest Only Period	Interest only period for Example Project Bond.
Design Phase	The Design phase, often referred to as a Pre-Construction phase, involves completing plans for the project such as, the development of detailed construction documents and logistics plans, issuance of permits, selecting construction materials and the construction site, and development of detailed cost and schedule estimates. During this phase, the public sector can solicit proposal or bids from qualified contractors and vendors to execute the work based on the detailed design and or operations criteria. Depending on the delivery method, the bid solicitations may take place early or late in the design phase. For example, under P3 or Design-Build, solicitations can take place early or possibly even before the Design Phase while under traditional Design-Bid-Build bid solicitations are unlikely to be issued until a complete set of construction documents in finalized towards the end of the design phase.
Design Type	Asset Type in reference to the Assumptions sheet of the PSC Tool.
Discount Rate	The discount rate is a percentage by which a cash flow element in the future (i.e., project costs and revenues) is reduced for each year that cash flow is expected to occur.



Term	Description
Discount Rate (Nominal)	Discount rate factoring in the inflation rate.
Discount Rate (Real)	Discount rate that does not account for inflation.
Finance	Finance refers to the phase or delivery aspect of the project that includes providing capital for the project, which may include issuing debt or equity and verifying the feasibility of plans for repaying debt or providing returns on investment.
Impact Phase	A project's life cycle typically consists of multiple phases, from inception to contract close-out. While these phases may be defined differently depending on the project and the organization, typical phases for a highway project include planning, design, construction, commissioning, turn-over, and operations. When managing risks and conducting risk assessments, it is important to understand the project's exposure to risk over each project phase. By allocating risks across the project phases, it is possible for project teams to view the risk profile of the project over its entire life cycle. The example risks provided in the Risk Assessment Tool are assigned to specific phases, and a breakdown by phase of the total risk exposure is presented in the output sheet. While some risks may carry over into multiple phases, the model allows each risk to be allocated to only one specific phase called the Impact Phase (i.e. the phase in which the exposure to the risk is greatest). If possible, the risk in such situations can be broken down into individual portions which could be assigned to a specific impact phase.
Inflation: Consumer Price Index	Inflation Consumer Price Index used as a base rate for inflation assumptions.
Leveraging	Leveraging is the degree to which an investor or business is utilizing borrowed money.
Maintenance	The maintenance phase includes keeping the project in a state of good repair, which includes filling potholes, repaving or rebuilding roadways, and ensuring the integrity of bridges and highways.
Non-Road Pricing Revenue	Non-road pricing revenues cover a vast landscape of strategies to help pay for non-tolled improvements or facilities, such as transit.
Non-Agency Subsidy	Percentage of construction costs provided by Non-Agency government subsidy.
Net Present Cost (NPC)	Net Present Cost is the estimated cash flows associated with PSC analysis.
Net Present Value (NPV)	Net Present Value is the present value of the expected future cash flows minus the cost.
NPC Base	Net Present Cost of the base project (excluding risk).
NPC P10	NPC of the project at the 10th risk percentile.
NPC P70	NPC of the project at the 70th risk percentile.
NPC P90	NPC of the project at the 90th risk percentile.
Operations Phase	During the Operations phase, the completed asset is operated and maintained to facilitate continuation of beneficial use and/or revenue generation over the life of the asset. Operations refer to the process of ensuring the continuing performance and availability of the highway, which includes removing debris and snow and collecting tolls and data on traffic.
Periodic Maintenance	Repairing damage normally expected from seasonal and occasionally unusual natural conditions or occurrences.
Periodic Maintenance Cost Period	The time period between periodic maintenance works.
Planning Phase	Planning is the earliest phase of the project in which the project is purely conceptual with relatively low design definition, and very rough high level estimates of the cost and schedule. Tasks in this phase typically consists of financial and technical feasibility studies, development of rough budget and schedule estimates, public forums if applicable, and an assessment of existing assets for a replacement or renewal project.
Primer	Within the context of the <i>Public Sector Comparator Tool User Manual</i> , "Primer" refers to the FHWA's <i>Primer on Value for Money Assessment for Public-Private Partnerships</i> , which provides an overview of general/basic concepts of the VfM and PSC development processes. Also, FHWA's <i>Primer on Financial Structuring and Assessment</i> provides an overview of basic financing concepts.
Project Financing	The percentage of total construction cost and project cost that are not funded by subsidy that will be funded by debt financing.

Term	Description
Public Sector Comparator (PSC)	The Public Sector Comparator (PSC) represents the most efficient public procurement cost (including all capital and operating costs and share of overheads) after adjustments for Competitive Neutrality, Retained Risk and Transferable Risk to achieve the required service delivery outcomes. This benchmark is used as the baseline for assessing the potential value for money of private party bids in projects.
Retained Risk	The value of those risks or parts of a risk that government proposes to bear itself under a partnership arrangement.
Revenue Leakage	Assumed annual revenue losses for a tolling facility.
RFP	Request for Proposal
ROW	Right of Way (in reference to a type of Project Cost in the Assumptions sheet of the PSC Tool).
Risk Allocation	The process of assigning operational and financial responsibility for specific risks to parties involved in the provision of services under P3. Also see risk transfer.
Risk Transfer	The process of moving the responsibility for the financial consequences of a risk from the public to the private sector.
Routine Maintenance	Routine Maintenance is defined as work that is planned and performed on a routine basis to maintain and preserve the condition of the highway system or to respond to specific conditions and events that restore the highway system to an adequate level of service.
Schedule Impact	Schedule impact is defined as the delay that the event may cause to the project schedule.
Transferrable Risk	The value of any risk that is transferable to the bidder.
Value for Money (VfM)	The procurement of a P3 project represents VfM when – relative to a public sector procurement option – it delivers the optimum combination of net life cycle costs and quality that will meet the objectives of the project.

Appendix B: References

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