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Guide to P3-VALUE 2.3 Addendum: Methodologies to Estimate VfM Analysis Inputs Pursuant to the Bipartisan Infrastructure Law

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1 Introduction

The purpose of this addendum to the P3-VALUE 2.3 User Guide and Concept Guide is to provide additional guidance to users to help them comply with Section 70701 of the Bipartisan Infrastructure Law (BIL). More specifically, the addendum aims to help practitioners with the following value for money analysis-related requirements contained in the BIL:

- Section 70701 (a) (2): Evaluation of the costs of using public funding versus private financing for the project.
- Section 70701 (a) (3) (A): Analysis of any Federal grants or loans and subsidies received or expected (including tax depreciation costs).
- Section 70701 (a) (3) (B): Analysis of the key terms of the proposed public-private partnership agreement, if applicable (including the expected rate of return for private debt and equity), and major compensation events.
- Section 70701 (a) (3) (C): A discussion of the benefits and costs associated with the allocation of risk.
- Section 70701 (a) (3) (D): The determination of risk premiums assigned to various project delivery scenarios.

2 Estimating Rates of Return

In a separate effort through the Build America Center, FHWA supported the development of the Guidebook on Estimating Costs of Capital for Value for Money Assessments. In that guidebook, rules of thumb are suggested for the cost of debt and equity as well as the debt-to-equity ratio. Please note that the input for cost of equity in P3-VALUE is the minimum required pre-tax equity return. Based on tax and other inputs, P3-VALUE then calculates the projected actual pre- and post-tax equity returns.

Recommendation:

Practitioners can use the ranges included in the Guidebook on Estimating Costs of Capital for Value for Money Assessments to estimate the overall weighted average cost of capital (WACC) for P3 projects for early-stage Value for Money analyses. Furthermore, practitioners can use the rules of thumb suggested for the cost of debt and equity as well as the debt-to-equity ratio as inputs for P3-VALUE 2.3.

3 Analysis of Federal Grants or Loans and Subsidies

3.1 Introduction

Sec. 70701 of the Bipartisan Infrastructure Law (BIL) requires the Value for Money analysis to include "an analysis of any Federal grants or loans and subsidies received or expected" (see also Appendix 1). The P3-VALUE toolkit already accommodates the inclusion of (federal) grants in the Value for Money analysis.

Regarding Federal loans, two popular loan programs provide subsidized financing in the form of below-market interest bearing loans: TIFIA and RRIF. Both loan programs provide loans with an interest rate equal to US Treasuries of comparable maturity1, meaning that borrowers effectively receive a subsidy in the form of lower interest rates. Whereas the value of the implicit credit subsidy in TIFIA/RRIF loans has historically not been considered in Value for Money analyses, this chapter provides guidance on how it may be incorporated.

From the perspective of an agency procuring an infrastructure project, the size of the implicit credit subsidy is irrelevant in the Value for Money analysis as the cost to the agency is already fully captured through the financing cash flows on both sides.

From a Federal perspective, the relevant consideration in a Value for Money analysis is whether the implicit credit subsidy in a TIFIA/RRIF loan is larger under P3 delivery compared to conventional delivery, assuming that under both delivery options, a TIFIA/RRIF loan would be available. If the implicit credit subsidy is equal under both delivery methods, there is no impact on Value for Money.

3.2 Estimating Value of Implicit Credit Subsidy in Federal Loan Programs

To incorporate Federal credit subsidies in a Value for Money analysis, we need to determine the value of the implicit credit subsidy under both P3 delivery and conventional delivery. One way to evaluate the implicit subsidy contained in a RRIF or TIFIA loan would be to look at how the Federal government accounts for the cost of these programs.

Under the Federal Credit Reform Act of 1990, the Department of Transportation (USDOT) must reserve sufficient capital to cover the anticipated long-term cost of a Federal credit instrument such as RRIF and TIFIA loans, which would include any expected credit losses.[2] The RRIF and TIFIA programs have different approaches on how to fund those anticipated costs. Whereas the RRIF program requires borrowers to pay an upfront "credit risk premium" (which is reimbursed once borrowers have fully repaid their RRIF loan), the TIFIA program funds its "credit subsidy" directly from its annual budget authority.

[1] To price loans with maturities that do not correspond exactly to the maturities available on Treasuries, the USDOT's Build America Bureau relies on the State and Local Government Series (SLGS) daily rates, which in turn are priced using an interpolated monthly Treasury yield curve minus 0.01%. As such, RRIF and TIFIA loans are priced at the appropriate SLGS rate plus 0.01%, which is the equivalent to the Treasury rate.
[2] Bureau Credit Program Guide, March 2017 and 2 U.S.C. §661c(b)

As the RRIF program includes an actual payment from the borrower to the USDOT, its value will be known to the borrower. However, not all RRIF loans require a credit risk premium payment; if the credit risk is deemed sufficiently low or if the borrower pledges sufficient collateral, the credit risk premium may be zero. Furthermore, details on how the credit risk premium payment is determined are not available publicly. Given the above, the credit risk premium may not be an accurate estimate of the implicit credit subsidy in a RRIF loan for the purpose of a VfM analysis, as a zero credit risk premium would (incorrectly) imply that the loan has the same risk profile as US treasuries.

For the TIFIA program, credit subsidies for individual loans are not publicized and therefore not useful for the purpose of a Value for Money analysis.

An alternative way to evaluate the implicit subsidy would be to compare the debt service on a proposed RRIF/TIFIA loan to the debt service on an alternative (non-subsidized) debt instrument, while accounting for any differences in principal value and possible differences in maturity. This comparison would need to be done for both the P3 and conventional delivery options, as the alternative (non-subsidized) debt instrument may be different. The differential in net present values of debt serviceis effectively the value of the implicit credit subsidy provided by the federal government to the borrower, be it a Project Company or a public agency. For RRIF loans, this analysis should also account for any credit risk premium paid by the borrower and the subsequent reimbursement by the Federal government once the loan is repaid, as such cash flows would impact the implicit subsidy. The NPV of the difference in debt service (adjusted for any credit risk premiums paid by and reimbursed to the borrower), discounted at a project risk free discount rate, equals the value of the implicit credit subsidy, which would need to be calculated for both the P3 and conventional delivery option. An example of how this can be done is described in Appendix 2.

From the above, it will be clear that the difference in the implicit credit subsidy between P3 and conventional delivery is driven by 1) any differences in loan size and 2) any differences in the interest rate differential between the subsidized interest rate and the interest rate of the debt instrument that would have been used if no subsidized loan was available.

It is important to note that the loan size under a P3 delivery is not necessarily the same as under conventional delivery, as the RRIF and TIFIA programs consider, among other things, the level and uncertainty in projected revenues when sizing a loan. As the projected revenues under a P3 delivery may be different from the projected revenue under a conventional delivery, the resulting loan size can vary.

The interest rate differential will depend on both the creditworthiness of the borrowing entity (SPV under P3 delivery or public agency under conventional delivery) as well as the revenue pledged to debt repayment (toll revenues or availability payments under P3 delivery, toll revenues or tax revenues under conventional delivery). Given that the pricing of RRIF and TIFIA loans are fixed (i.e., equal to US Treasuries of comparable maturity at the day of closing), this means that everything else being equal the implicit credit subsidy will be higher for less creditworthy borrowers and more uncertain revenue pledges, as they would likely have to pay a higher interest rate on a non-subsidized debt instrument when compared to borrowers with a higher creditworthiness and/or more certain revenue pledges. As such, assuming no differences in loan size, a P3 will likely benefit more from a subsidized loan than a highly rated public agency due to the larger interest rate differential.

3.3 Implications for Tax-Exempt Financing

In addition to Federal loan programs like TIFIA and RRIF, the Federal government also does not tax the interest on state and local government bonds (municipal bonds), or bonds sold by private entities to deliver public services or

benefits (Private Activity Bonds or PABs)[3]. Since 1988, when the Supreme Court ruled that the principle of Intergovernmental Tax Immunity did not apply to interest on debt issued by state and local governments, this tax exemption has been considered by the Federal government to be a subsidy it provides to state and local governmental activities. However, calculating the level of this subsidy has been a source of significant debate among economists and policy makers for decades. Disagreements exist on many significant topics including the lack of relevant taxable borrowing benchmarks (because municipalities and corporations are rated using very different criteria – BBB-rated municipalities default and recover at similar rates as AAA-rated corporates), and the overall stimulative economic impact of having state and local governments finance infrastructure at lower interest rates (which would result in increased tax revenues to the Treasury). Furthermore, some question the efficiency of tax-exempt financing as a source of subsidization as varying marginal tax rates across individual taxpayers means that taxpayers in higher tax brackets may experience a disproportionate gain from holding tax-exempt bonds. In other words, some of the tax losses that the Federal government incurs may not be fully reflected in the difference between the taxable and tax-exempt interest rates.

Whereas there is no consensus among academics, government officials, and market practitioners on how to properly value the credit subsidy given the above considerations, one possible approach would be to apply the methodology described in Appendix 2 to conduct a comparison of tax-exempt vs. taxable debt as a proxy. This approach focuses on the cost savings to the issuer, not the overall revenue loss to the Federal government, meaning that it likely underestimates the cost of the credit subsidy to the Federal government. Furthermore, this approach ignores any higher order effects on the wider economy and still requires practitioners to estimate the tax-exempt equivalent interest rate for taxable debt. Whereas it is impossible to provide generic guidance on how to estimate the tax-exempt equivalent interest rate for taxable debt, an experienced financial advisor will likely be able to provide an estimate for a specific transaction at a particular point in time. With that information in hand, one could compare the debt service of taxable and tax-exempt bonds for both the P3 and conventional delivery option to estimate the credit subsidy amount for tax exempt debt, as described in more detail in Appendix 2.

3.4 Practical Implications for P3-VALUE Toolkit

Once the implicit credit subsidy under both the P3 and conventional delivery have been calculated, they can be entered in P3-VALUE as inputs and will be considered in the Value for Money analysis that is conducted from a Federal perspective, as described in more detail in Appendix 2.

As P3-VALUE uses the difference in weighted average cost of capital between the P3 and conventional delivery to estimate the value of lifecycle performance risk and revenue uncertainty adjustment, differences in implicit credit subsidy will also impact these risk valuations. To correct for this, users could run P3-VALUE using market interest rates instead of the subsidized TIFIA/RRIF interest rates to calculate the value of the lifecycle performance risk and revenue uncertainty adjustment and use those subsequently as inputs in a new run of P3-VALUE using the actual TIFIA/RRIF interest rate and associated financing conditions. An example of how this can be done is described in Appendix 2.

[3] Note that interest from PABS is subject to alternative minimum tax (AMT). To the extent the AMT reforms of the 2017 Tax Cuts and Jobs Act are not extended past 2025, this may result in notable pricing differences between PABS and other similar tax-exempt bonds.

Recommendation:

For the purpose of a Value for Money analysis from the perspective of a non-Federal public agency, Federal grants and implicit credit subsidies would simply lower the cost to the public agency and a correction for the cost of Federal grants and implicit credit subsidies to the Federal taxpayer is not required.

When conducting a Value for Money analysis from the perspective of the Federal government, grants and implicit credit subsidies should logically be considered. To determine the impact of implicit credit subsidies on Value for Money, practitioners will need to determine the implicit credit subsidy under both P3 and conventional delivery.

To calculate these implicit credit subsidies, the differential in debt services between the proposed RRIF/TIFIA loan and the debt service on an alternative (non-subsidized) debt instrument needs to be calculated for both P3 and conventional delivery. To the extent that the size of the RRIF or TIFIA loan is expected to be different between P3 and conventional delivery (for example, because of differences in the underlying revenue pledge), the debt service calculation should be based on the expected loan size of the respective delivery model.

4 Tax Depreciation and Tax Payments

4.1 Introduction

FHWA's 2017 discussion paper "Consideration of Tax Issues in Developing and Evaluating Public-Private Partnership Concessions for Transportation" discusses the relevant tax-related principles of P3 structures, which provides a useful framework for estimating tax payments, tax depreciation, and net operating losses (NOLs).

Generally speaking, taxes to be considered under a P3 structure include taxes paid by the Engineering Procurement and Construction (EPC) contractor, Operations & Maintenance (O&M) contractors and the Special Purpose Vehicle (SPV). The taxes paid at the EPC and O&M level are likely to be comparable to those under conventional delivery, although they may differ as a result of differences in the (expected) overall dollar value of EPC and O&M work. For example, if lifecycle costing and innovation are believed to drive down overall cost of ownership, the tax paid on the EPC and O&M work under a P3 may be lower provided that the anticipated cost savings are achieved. On the other hand, if some of the O&M activities would be self-performed by the agency under conventional delivery, taxes paid under that delivery model would be lower, as the agency is not a taxable entity.

With regards to taxes paid by the SPV (or its ultimate owners, as SPVs are typically structured as pass-through vehicles from a tax perspective), these taxes are additional under P3 delivery, as under conventional delivery the SPV role is performed by a public agency that does not pay taxes. The SPV is incentivized to minimize taxes paid over the lifecycle of the project, as high taxes would lead to a less attractive bid from the perspective of the procuring agency, therefore reducing the consortium's chances of winning the procurement. A key consideration in determining tax liabilities for the SPV is depreciation and/or NOLs, as the IRS allows companies to deduct depreciation of long-term assets and NOLs to determine their taxable income. As depreciation for a large infrastructure project is typically sizeable relative to net income, depreciation can significantly reduce the SPV's tax liability, especially in the early years. NOL carry forward can similarly help an SPV significantly reduce its tax liability. As such, the additional taxable layer in the P3 structure compared to conventional delivery may not cause too significant of an additional tax burden for the P3 concessionaire and therefore the procuring agency.

For the purpose of this effort, we distinguish estimation of tax payments and tax depreciation losses before and after receipt of (committed) financial proposals.

4.2 Before Receipt of (Committed) Financial Proposals

The BIL requires the analysis of tax payments and tax depreciation losses to be done prior to signing of the Project Agreement. This clarification is useful because such an analysis can realistically only be done using a project- and financing solution-specific detailed financial model, meaning that this analysis cannot be completed before the receipt of bids.

FHWA's discussion paper "Consideration of Tax Issues in Developing and Evaluating Public-Private Partnership Concessions for Transportation" states the following:

> *While tax considerations are important for private sector bidders as well as city, state, and federal P3 sponsors, there is currently no specific federal legislation or policy that details the tax treatment of P3 projects. This is primarily because each P3 is unique by nature, pursued in light of the specifics of local economic and political conditions, and structured to match the desired amount of private sector involvement with respect to that particular project. In addition, many of the taxes that might be incurred by a P3 are state and local taxes, and each state has a different tax regime. The choice of legal structure is also heavily reliant on location and the relevant applicable tax laws at federal, state, or local levels.*

> *This paper, therefore, seeks not to define a particular approach to tax implications and considerations for P3s, but attempts to highlight some key tax-related principles of P3 structures in the U.S. for both public and private sector participants. As such, we have kept language and descriptions broadly applicable where possible.*

As per the above, FHWA's discussion paper provides the relevant tax-related principles of P3 structures, which can be qualitatively considered but not quantitatively estimated in the context of an early stage Value for Money analysis, because of the context-specific complexities of tax optimization.

4.3 After Receipt of (Committed) Financial Proposals

After receipt and evaluation of the financial proposals, the financial model provided by the preferred bidder can serve as a source for determining the tax payments and tax depreciation losses at the SPV level (or its ultimate owners) under the proposed P3 structure. The tax payments and depreciation losses remain indicative at this point in time, as the actual tax payments, depreciation losses, and NOLs will depend on the overall construction schedule and actual capital expenditure as well as the project's realized operational costs. Furthermore, as SPVs are typically structured as pass-through vehicles, the tax liability will be paid by the investors, making the calculation of actual tax payments even more challenging to estimate. Corporate income tax paid by the EPC contractor and by O&M contractors are not incorporated in the financial model and cannot accurately be estimated as these depend on the contractors' company-wide profits, which will likely involve numerous different projects.

Given the above, it is common practice to not make any explicit corrections for taxation. This is methodologically correct for a VfM analysis conducted from the perspective of a procuring agency that is not the recipient of any taxation income. Whereas a VfM analysis from the state or Federal perspective should logically account for differences in taxation, practical constraints as discussed above cause most VfM analysis to forego a detailed quantitative analysis in favor of a more qualitative discussion.

Recommendation:

Considering the complexities of tax optimization under P3 delivery, the significant effort and costs associated with determining tax payments and tax depreciation losses and the fact that tax payments will typically be higher under P3 delivery, it is recommended to only qualitatively consider tax payments and tax depreciation losses in a Value for Money analysis. FHWA's discussion paper "Consideration of Tax Issues in Developing and Evaluating Public-Private Partnership Concessions for Transportation" provides relevant background on tax implications of P3 delivery.

5 Key Terms of the Proposed P3 Agreement

5.1 Introduction

Sec. 70701 of the BIL requires the Value for Money analysis to include an evaluation of the key terms of the P3 agreement including the expected rate of return for private debt and equity and major compensation events (also known as supervening events).

Since the expected rate of return for private debt and equity are needed to determine the weighted average cost of capital that is typically used for the quantitative analysis, this will naturally be included in any Value for Money analysis. Value for money analyses typically also describe the expected P3 risk allocation. As such, it is natural to focus on compensation / supervening events, because these describe to a large extent the risk allocation in a P3 Project Agreement.

Beyond the supervening events, it is recommended to also specify other key terms of the P3 delivery, including contract duration, payment mechanism, and termination. This chapter discusses the categorization and definition of supervening events and the type and extent of relief granted in the P3 Project Agreement for these supervening events.

5.2 Supervening Events

In a P3, the Project Company is responsible for delivering the services within the scope and according to the specifications. The Project Company usually bears all the risks associated with designing, building, operating, and maintaining the project, with the exception of the risks that are explicitly excluded from its responsibility under the P3 Project Agreement. Supervening events constitute exceptions to the general responsibility of the Project Company. These events are the circumstances that negatively impact the Project Company's ability to perform its obligations under the P3 Project Agreement within the time and/or cost originally projected for the project. Some of these circumstances may be beyond the control of the Project Company; others may be best managed by the government.

P3 Project Agreements generally distinguish three different categories of these exceptions or supervening events: compensation events, delay events, and force majeure events. Each of the events result in some type of relief for the Project Company in the P3 Project Agreement.

Event	Description	Examples
Compensation Events	A set of events for which the Government broadly accepts the risk, because the events are under the control of the Government or are most efficiently managed by the Government.	• changes imposed by the government during project implementation; • relevant changes in law; • inaccuracy of factual data provided by the government and therefore of a contractual nature; • damage to infrastructure caused by incidents; • the failure of the authority to fulfil its contractual obligations, except where it fails to fulfil a particular obligation to pay a sum of money; • an infringement by the Contractor of the intellectual property rights of a third party as a result of contractual documents imposed by the government;

Event	Description	Examples
		• additional conditions imposed for the issue of permits that could not have been anticipated on the Contract Date or on the date of the final offer; • the presence on the construction site of unforeseen pollution, an archaeological site, explosives or other obstacles which were not or could not have been known to the Contractor from the information provided.
Delay Events	A set of events typically outside of the Contractor's control. The Contractor is (in comparison to the Government) best placed to manage the risk. The P3 Project Agreement provides partial relief, including extending deadlines that the Contractor is required to meet but is unable to as a direct result of the relevant Delay Event.	• the suspension of the works due to the presence of protected animal or plant species; • the failure of requested permits to be executed within the applicable legal time limits; • other special circumstances, depending on the risk distribution by the government, can also be cases of postponement. Some examples: • the failure of the managers or owners of cables or pipelines to cooperate within a reasonable period of time to remove or relocate those cables or pipelines. • unexpected delays in the permitting process.
Force Majeure Events	A set of unforeseeable events outside either Party's control, which results in the Contractor being unable to fulfill its contractual obligations.	• war, civil war, riot, armed conflict, revolution, terrorism, protests; • pandemics, epidemics, and quarantines; • nuclear explosions, ionizing radiations or radioactive, chemical or biological contamination; • fire or explosions as a result of the detonation of an explosion not caused by the Contractor; • pressure waves caused by airplanes travelling at supersonic speeds; • plane crash; and • natural disasters such as earthquakes, landslides, lightning, floods, storms, cyclones and other extreme climatic or environmental circumstances recognized as natural disasters by the authorities.

Most P3 Project Agreements include a (long) list of specific circumstances defining more specifically the three types of events. Whereas there is a lot of overlap between the definitions across projects, project-specific risks result in customized definitions of supervening events.

5.3 Relief for Supervening Events

The type and extent of relief granted in the P3 Project Agreement is a determining factor for the risk allocation. In general, the relief can be described as follows:

Event	**Performance / Breach Relief:** Project Company not penalized for not meeting performance requirements	**Schedule relief:** Project Company may take extra time to meet certain milestones.	**Delay cost compensation:** Project Company compensated for extra financing costs (and other delay costs)	**Cost compensation:** Project Company is compensated for extra costs	**Termination right:** Project Company has right to terminate contract (beyond a predefined period)
Compensation event	•	•	•	•	
Delay event	•	•	•		•
Force Majeure event	•	•	•		•

The relief provided for supervening events – together with compensation for termination for such events – define the retained risk under P3 delivery.

Recommendation:

Considering the fact that compensation / supervening events describe to a large extent the risk allocation in a P3 Agreement, it is recommended to consider the expected definition of these events and the type of relief provided in the P3 agreement when describing the expected risk allocation under P3 delivery in a Value for Money analysis.

6 Retained Risks

6.1 Introduction

Sec. 70701 of the BIL requires the determination of risk premiums assigned to various project delivery scenarios, which leads to a need for approaches to analyzing and valuing transferred and retained risks under both conventional and P3 delivery models. Risks that are transferred to the P3 Project Company are captured and valued in the P3 bid. Lifecycle risks that are retained by the government under P3 delivery typically fall under the definition of supervening events, as described in the previous chapter. This chapter describes how to best incorporate these retained risks under P3 delivery and the relief provided for such events in a Value for Money analysis. Moreover, this chapter also discusses risks that are unique to P3 delivery.

6.2 Valuation of Retained Risks

The Guidebook for Risk Assessment in Public Private Partnerships developed by FHWA provides general guidance on risk analysis and risk valuation. In general, guidance on risk valuation focuses on applying the commonly utilized probability x impact approach. As described in the Guidebook, different categories of risks require different valuation methods, and the simultaneous use of more than one valuation approach can increase the reliability of information.

The Guidebook does not specifically discuss retained lifecycle risks under P3 delivery, as these are hard to analyze and manage (which is exactly the reason that these are being retained) and are considered to be equal for conventional delivery and P3 delivery and therefore irrelevant for the purpose of Value for Money analysis. This is different for risks that are not related to the project but are generated by P3 delivery itself. These are being discussed in the next sub-section 4.3.

Since generally accepted valuation methods are not available for these retained lifecycle risks under P3 delivery, it is recommended that they be discussed qualitatively. To the extent that agencies would want to quantitatively analyze them, the following valuation methods that are described in the Guidebook for Risk Assessment in Public Private Partnerships seem most appropriate 1) estimation of probability multiplied by damage for each supervening event, 2) estimation and benchmarking of insurance premiums for some categories of supervening events and 3) cost estimation of risk mitigation measures. In addition to such valuation of individual retained risks, agencies may want to consider including a contingency or allowance reflective of the (retained) risk profile—in terms of a percentage of total project cost—that would include both identified and unidentified risks and that could be applied on the basis of past experience, and in relation to the applicable cost estimate methodology. Again, as there is no particular reason to believe that the retained lifecycle risks are different between P3 and conventional delivery, no difference in the quantification of these risks would be expected.

6.3 P3-specific risks

P3 delivery can present a number of unique risks and challenges compared to more conventional delivery. These risks and challenges may include:

- Performance issues due to conflicting interests: The private sector partner may prioritize its own financial gain over the public interest. To the extent the P3 Project Agreement does not protect the public interest through clear and measurable performance metrics and a credible penalty regime, this can lead to issues such as inadequate maintenance or subpar performance. This risk can be mitigated by developing a well-structured payment mechanism that links performance to financial incentives.
- Complex legal arrangements: P3 projects often involve complex legal arrangements, which does create not only high upfront transaction costs for both parties (that will need to be accounted for in the Value for

Money assessment) but also potential costs and uncertainties associated with managing disputes or claims related to these agreements.

- Reduced flexibility: Whereas P3 Project Agreements vary in terms of their flexibility, they typically allow for changes or adjustments to be made to the project and/or its surroundings. However, P3 Project Agreements may be less flexible than conventional contracting methods due to their long-term nature. This is particularly true for toll concessions, as the Project Agreement will typically contain language that requires the agency to compensate the Project Company for lost revenues if it decides to build a competing facility or add additional general purpose lanes.
- Limited competitive pressure for future change orders: Changes to a project can be costly regardless of the delivery method. Particularly in the design and construction phases of the project, there should not be any major distinctions between delivery methods. In the operations and maintenance phase however, there is a risk that changes are more costly under P3 delivery since the Project Company is not subject to competitive pressure, whereas under conventional delivery there would be competitive pressure. Particularly if the partnership is not working well, the lack of competitive pressure under P3 delivery could make it challenging to secure fair market pricing for change orders.

Since there are no valuation methods for these P3 specific costs and they also depend on how well the P3 Project Agreement is developed and – more importantly – how well the partnership is going to function, it is recommended to discuss them qualitatively.

Recommendation:

Considering the fact that retained risks under P3 delivery are by definition difficult to quantify and these risks are considered to be equal for conventional delivery and P3 delivery, it is recommended to focus on qualitatively considering the individual retained risks and including a contingency or allowance reflective of the (retained) risk profile (all identified and unidentified retained risks) in a Value for Money analysis.

Considering the fact that a Value for Money analysis is intended to consider all the differences – positive and negative – between P3 delivery and conventional delivery, it is recommended to also consider risks that are unique to P3 delivery.

Appendix 1: Sec. 70701 of the BIL

TITLE VII--PUBLIC-PRIVATE PARTNERSHIPS

SEC. 70701. <<NOTE: 23 USC 601 note.>> VALUE FOR MONEY ANALYSIS.

(a) <<NOTE: Evaluation.>> In General.--Notwithstanding any other provision of law, in the case of a project described in subsection (b), the entity carrying out the project shall, during the planning and project development process and prior to signing any Project Development Agreement, conduct a value for money analysis or comparable analysis of the project, which shall include an evaluation of--

(1) the life-cycle cost and project delivery schedule;

(2) the costs of using public funding versus private financing for the project;

(3) a description of the key assumptions made in developing the analysis, including--

(A) an analysis of any Federal grants or loans and subsidies received or expected (including tax depreciation costs);

(B) the key terms of the proposed public-private partnership agreement, if applicable (including the expected rate of return for private debt and equity), and major compensation events;

(C) a discussion of the benefits and costs associated with the allocation of risk;

(D) <<NOTE: Determination.>> the determination of risk premiums assigned to various project delivery scenarios;

(E) assumptions about use, demand, and any user fee revenue generated by the project; and

(F) any externality benefits for the public generated by the project;

(4) a forecast of user fees and other revenues expected to be generated by the project, if applicable; and

(5) <<NOTE: Determination.>> any other information the Secretary of Transportation determines to be appropriate.

(b) Project Described.--A project referred to in subsection (a) is a transportation project--

(1) with an estimated total cost of more than $750,000,000;

(2) carried out--

(A) by a public entity that is a State, territory, Indian Tribe, unit of local government, transit agency, port authority, metropolitan planning organization, airport authority, or other political subdivision of a State or local government; and

(B) in a State in which there is in effect a State law authorizing the use and implementation of public-private partnerships for transportation projects; and

(3) (A) that intends to submit a letter of interest, or has submitted a letter of interest after the date of enactment of this Act, to be carried out with--

(i) assistance under the TIFIA program under chapter 6 of title 23, United States Code; or

(ii) assistance under the Railroad Rehabilitation and Improvement Financing Program of the Federal Railroad Administration established under chapter 224 of title 49, United States Code; and

(B) that is anticipated to generate user fees or other revenues that could support the capital and operating costs of such project.

(c) Reporting Requirements.--

(1) Project reports.--For each project described in subsection (b), the entity carrying out the project shall--

(A) <<NOTE: Web posting.>> include the results of the analysis under subsection (a) on the website of the project; and

(B) submit the results of the analysis to the Build America Bureau and the Secretary of Transportation.

(2) <<NOTE: Coordination.>> Report to congress.--The Secretary of Transportation, in coordination with the Build America Bureau, shall, not later than 2 years after the date of enactment of this Act--

(A) compile the analyses submitted under paragraph (1)(B); and

(B) submit to Congress a report that--

(i) includes the analyses submitted under paragraph (1)(B);

(ii) describes--

(I) the use of private financing for projects described in subsection (b); and

(II) the costs and benefits of conducting a value for money analysis; and

(iii) identifies best practices for private financing of projects described in subsection (b).

(d) <<NOTE: Coordination.>> Guidance.--The Secretary of Transportation, in coordination with the Build America Bureau, shall issue guidance on performance benchmarks, risk premiums, and expected rates of return on private financing for projects described in subsection (b).

Appendix 2: Numerical Example using P3-VALUE 2.3

Estimating Value of Credit Subsidy

This appendix provides a simplified hypothetical numerical example of how the value of the credit subsidy can be determined using differences in debt service between market-based and subsidized debt financing. The table below shows the key financing assumption used in this example. As explained in section 1.2, the drivers of the credit subsidy are the differential in interest rate between market-based and subsidized debt as well as potential differences in the principal amount. Furthermore, this simplified analysis assumes no interest capitalization and a mortgage-style annuity repayment.

Inputs	Public Sector Comparator (PSC)		Public-Private Partnership (P3)	
	Market-based debt	Subsidized debt	Market-based debt	Subsidized debt
Principal amount	$120.0M	$120.0M	$100.0M	$100.0M
Interest rate	4.50%	4.00%	5.00%	4.00%
Payment frequency	Annual	Annual	Annual	Annual
Final maturity	30 years	30 years	30 years	30 years

The next table shows the annual debt service as well as the net present value of the annual debt service, discounted at an assumed project-risk free rate of 4.00%. The implicit credit subsidy equals the difference between the net present value of the market-based debt service and the subsidized debt service.

Outputs	Public Sector Comparator (PSC)		Public-Private Partnership (P3)	
	Market-based debt	Subsidized debt	Market-based debt	Subsidized debt
Annual debt service	$7.4M	$6.90M	$6.1M	$5.8M
NPV of debt service	$127.4M	$120.0M	$106.2M	$100.0M
Credit subsidy	N/A	$7.4M	N/A	$6.2M

In this example, the value of the credit subsidy equals $7.4M for the Public Sector Comparator versus $6.2M for the P3 option. Users can enter these values in P3-VALUE 2.3 under the "Competitive Neutrality Adjustments" section on the "Project Inputs" tab, as shown below.

Competitive Neutrality Adjustment	
State tax considered for competitive neutrality adjustment?	* FALSE
Federal tax considered for competitive neutrality adjustment?	* FALSE
Value of construction self-insurance (% of transferred implementation costs)	* 0.00%
Value of O&M and major maintenance self-insurance (% of transferred O&M costs)	* 0.00%
Value of credit subsidy or tax benefits under PSC delivery	* $7.4M
Value of credit subsidy or tax benefits under P3 delivery	* $6.4M

After optimizing the model, the (rounded) difference in credit subsidy values will appears under "Cost Item 5: Competitive Neutrality Adjustment" on the "VfM Output Summary" tab, as shown below.

Cost item 5: Competitive neutrality adjustment	PSC	P3
State taxes	N.A.	-
Federal taxes	N.A.	-
Value of public agency self-insurance	N.A.	-
Net credit subsidy adjustment (NPV PSC credit subsidy - P3 credit subsidy)	N.A.	$1M
Cost item 5: Competitive neutrality adjustment subtotal	**-**	***$1M***

Accounting for Credit Subsidy in Lifecycle Performance Calculations

P3-VALUE 2.3 uses the difference in weighted average cost of capital between the P3 and conventional delivery to estimate the value of the lifecycle performance risk and revenue uncertainty adjustment. As such, differences in implicit credit subsidy will also impact the valuation of these risks. To correct for this, users could first run P3-VALUE using market interest rates instead of the subsidized TIFIA/RRIF interest rates to calculate the value of the lifecycle performance risk and revenue uncertainty adjustment and use those subsequently as inputs in a new run of P3-VALUE using the actual TIFIA/RRIF interest rate and associated financing conditions. The remainder of this section will demonstrate how that calculation can be done.

The screenshot below shows sample financing inputs from the "Project Inputs" for a tolled facility. In this example, the hypothetical market interest rates are assumed to be 4.50% and 5.00% for the Public Sector Comparator (PSC) and the P3 option, respectively.

Delivery, Funding & Financing	P3	Delayed PSc	PSC
Facility tolled?	* TRUE		TRUE
P3 delivery model			* Toll concession
PSC upfront funding or public debt financing?	* Debt financing		
Subsidy/milestone payment (see note 2)	* $0.0M		* $0.0M
Cost of equity			* 12.00%
Gearing			* 75.00%
Public debt financing type (note 3)	* GO bonds		
Long-term debt maturity (from start construction)	* 35 years		* 35 years
Long-term debt repayment profile (sculpted or annuity)	* Annuity		* Sculpted
Long-term debt grace period (for annuity only)	* 0 years		0 years
Long-term debt interest rate	* 4.50%		* 5.00%
Construction loan interest rate			* 2.50%
Minimum required DSCR (multiple of debt service)	* 1.30x		* 1.30x
DSRA sizing	* 6 months		* 6 months
Interest rate on reserves	* 1.00%		* 1.00%
Debt issuance/arrangement fee	* 1.50%		* 1.50%

The user would also need to select "Option 1" for the "Lifecycle performance risk calculation method." This selection also automatically triggers the selection of "Option 1" for the "Revenue uncertainty adjustment calculation method."

Lifecycle Performance Risk & Revenue Uncertainty Adjustment Inputs	
Lifecycle performance risk calculation method (see options below)	* Option 1
Lifecycle performance risk aggregate premium (in million $, option 2 only)	* $0.0M
Revenue uncertainty adjustment calculation method (see options below)	Option 1

Guidance for Lifecycle Performance Risks Valuation Options
Option 1: WACC-based risk premium is calculated to determine the value of lifecycle performance risks
Option 2: User to provide a risk premium for the aggregate value of lifecycle performance risks
Option 3: Lifecycle performance risks are ignored in the analysis

Guidance for Revenue Uncertainty Adjustment Valuation Options
Option 1: WACC-based risk premium is calculated to determine value of revenue uncertainty adjustment
Option 2: User to provide a risk premium for the value of annual revenue uncertainty adjustment
Option 3: Revenue uncertainty is ignored in the analysis

After optimizing using the above inputs, the screenshot below shows the calculated market value of the lifecycle performance risk and the revenue uncertainty adjustment, both in NPV terms and in nominal dollars across the life of

the concession. As these are calculated using market interest rates, this is P3-VALUE 2.3's best estimate of how the market prices the lifecycle performance risk. This overview can be found in the "VfM PSC & P3 Summary" tab.

Costs & revenues under Conventional Delivery	NPV @ X%	Nominal total
Toll revenues	$1,021M	$2,322M
Pre-construction & implementation costs	($420M)	($464M)
O&M costs	($163M)	($363M)
No Build O&M cost savings	$314M	$680M
Base variability	-	-
Pure risks	-	-
Financing fees	($2M)	($3M)
Unadjusted net revenues / (costs) under Conventional Delivery	***$749M***	***$2,173M***
Calculated market value of lifecycle performance risk	($206M)	($414M)
Calculated market value of revenue uncertainty adjustment	($261M)	($594M)
Adjusted net revenues / (costs) under Conventional Delivery	***$282M***	***$1,165M***

X = 3.00% (project risk free discount rate)

Now that the value of the lifecycle performance risk ($414M in nominal dollars) and the revenue uncertainty adjustment ($594M in nominal dollars) have been determined using market interest rates, the user can use these values as an input for the next model run. To do so, the user will first need to select "Option 2" and then enter the calculated nominal value of the lifecycle performance risk over the life of the concession. Furthermore, the user will need to enter the calculated revenue uncertainty adjustment, expressed as a percentage of overall revenue (i.e., $594M divided by $2,322M, or 25.56%).

Lifecycle Performance Risk & Revenue Uncertainty Adjustment Inputs	
Lifecycle performance risk calculation method (see options below)	* Option 2
Lifecycle performance risk aggregate premium (in million $, option 2 only)	* $413.9M
Revenue uncertainty adjustment calculation method (see options below)	Option 2
Delta between availability payment & toll concession WACC (in percent, option 1 only)	* 1.60%
Revenue uncertainty adjustment (% of annual toll revenue collection, option 2 only)	* 25.56%

Next, the user will need to update the interest rate assumptions to the subsidized interest rate, which we assume to be 4.00% under both the PSC and P3, as shown below.

Delivery, Funding & Financing	P3	Delayed PSc	PSC
Facility tolled?	* TRUE		TRUE
P3 delivery model			* Toll concession
PSC upfront funding or public debt financing?	* Debt financing		
Subsidy/milestone payment (see note 2)	* $0.0M		* $0.0M
Cost of equity			* 12.00%
Gearing			* 75.00%
Public debt financing type (note 3)	* GO bonds		
Long-term debt maturity (from start construction)	* 35 years		* 35 years
Long-term debt repayment profile (sculpted or annuity)	* Annuity		* Sculpted
Long-term debt grace period (for annuity only)	* 0 years		0 years
Long-term debt interest rate	* 4.00%		* 4.00%
Construction loan interest rate			* 2.50%
Minimum required DSCR (multiple of debt service)	* 1.30x		* 1.30x
DSRA sizing	* 6 months		* 6 months
Interest rate on reserves	* 1.00%		* 1.00%
Debt issuance/arrangement fee	* 1.50%		* 1.50%

The user can now re-optimize the model, thus ensuring that the lifecycle performance risk and revenue uncertainty adjustment are calculated using market interest rates while the subsidized interest rates are used in the financing calculations.